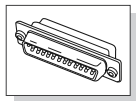
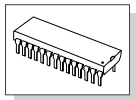
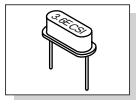
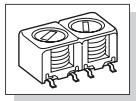
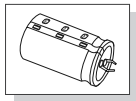
Section Reference Index

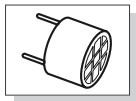

Connectors, Cable Assemblies, IC Sockets . . . . . 12-132 INCLUDES SMT A

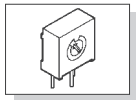

Semiconductors, ICs, Transistors, Diodes, Rectifiers . . . 133-239 INCLUDES SMT B

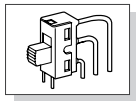

Crystals, Oscillators . . . . . 240-253 INCLUDES SMT C

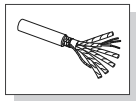

Inductors, Coils, Filters . . . . . 254-280 INCLUDES SMT D

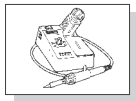

Capacitors . . . . . 281-348 INCLUDES SMT E


Audio, Buzzers, Microphones, Speakers . . . . . 349-352 F

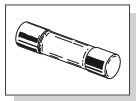

Resistors, Potentiometers, Thermistors, ZNRs. . . . . 353-400 INCLUDES SMT G

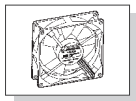

Switches, Relays, Electromechanical . . . . . 401-449 INCLUDES SMT H

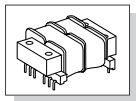

Wire, Cable, and Accessories . . . . . 450-458 I

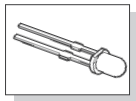

Prototyping, Tools, Solder, Test Equipment. . . . . 459-492 INCLUDES SMT J

Batteries . . . . . 493-500 INCLUDES SMT K


Fuses . . . . . 501-515 INCLUDES SMT L


Fans . . . . . 516-521 M


Transformers, Power Supplies . . . . . 522-546 INCLUDES SMT N


Optoelectronics, LEDs, LCDs, Lasers, Displays . . . . . 547-584 INCLUDES SMT O

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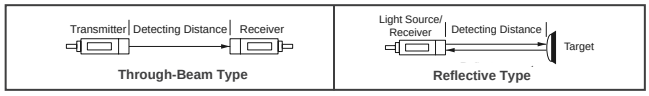
Non-Amplified Optical Sensors

Omron's optical sensors are designed to meet the needs of positioning, detection of components and objects, cam-timer switching-control and robotic control. Available in two types: nonamplified optical sensors are low cost, fast response optical sensors used mainly in design-in processes. Amplified optical sensors are ideal for plug and play applications where external light does not affect performance and wide input voltages can be applied.



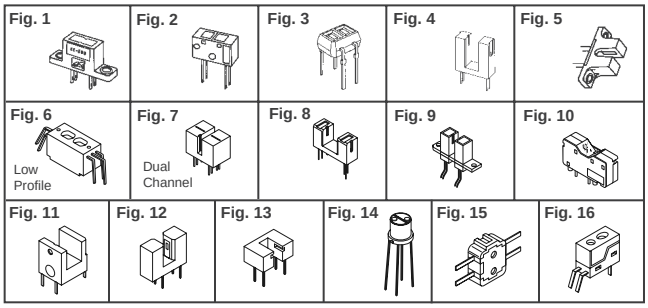


Fig.	Sensing Method	Sensing Distance	Terminal Type	Typ. t_{on}/t_{off} (µsec.)	Digi-Key Part No.	Pricing 1	25	100	Omron Part No.
1	Reflective	5mm	Solder	30/30	OR500-ND	4.43	101.35	358.25	EE-SB5
1	Reflective	5mm	PC Board	30/30	OR501-ND	4.43	101.35	358.25	EE-SB5-B
2	Reflective	5mm	Solder	30/30	OR502-ND	4.35	99.41	351.41	EE-SF5
2	Reflective	5mm	PC Board	30/30	OR503-ND	4.35	99.41	351.41	EE-SF5-B
5	Slot	3.6mm	Solder	4/4	OR504-ND	3.32	75.95	268.47	EE-SG3
5	Slot	3.6mm	PC Board	4/4	OR505-ND	3.32	75.95	268.47	EE-SG3-B
3	Reflective	1mm	PC Board	35/25	OR520-ND	1.76	40.15	141.93	EE-SY124
3	Reflective	1mm	SMT	35/25	OR557-ND	1.76	40.15	141.93	EE-SY125
4	Slot	5mm	PC Board	4/4	OR518-ND	1.54	35.31	124.83	EE-SX1042
4	Slot	4.6mm	PC Board	500 Hz	OR556-ND	1.80	41.12	145.35	EE-SX1061
6	Reflective	5mm	PC Board	50 Hz	OR525-ND	3.19	73.05	258.21	EE-SY310
6	Reflective	5mm	PC Board	50 Hz	OR526-ND	3.19	73.05	258.21	EE-SY410
7	Slot	3.4mm	PC Board	4/4	OR523-ND	3.79	86.59	306.09	EE-SX1031
8	Slot	8mm	PC Board	3 KHz	OR524-ND	1.79	40.88	144.50	EE-SX4070
9	Slot	8mm	PC Board	3 KHz	OR571-ND	1.52	34.78	122.93	EE-SX1070
9	Vert Slot	3.4mm	61cm Wires	4/4	OR562-ND	6.15	140.72	497.42	EE-SX1088-W1
9	Horz Slot	3.4mm	61cm Wires	4/4	OR563-ND	5.80	132.66	468.92	EE-SX1096-W1
10	Reflect/Vert	4.5mm	PC Board	30/30	OR564-ND	7.92	181.25	640.68	EE-SY190
10	Reflect/Horz	4.5mm	PC Board	30/30	OR565-ND	7.92	181.25	640.68	EE-SY191
11	Slot	2mm	PC Board	30/30	OR566-ND	1.55	35.48	125.40	EE-SX1101
12	Slot	3.4mm	PC Board	4/4	OR569-ND	2.81	64.34	227.43	EE-SJ3-D
13	Slot	3mm	PC Board	4/4	OR570-ND	2.64	60.47	213.75	EE-SX1046
14	Reflective	1 mm	PC Board	35/25	OR577-ND	7.76	177.48	627.38	EE-SMR1-1
15	Reflective	4 mm	PC Board	180/60	OR578-ND	3.22	73.75	260.68	EE-SY201
16	Red LED Reflect	4 mm	PC Board	30/30	OR581-ND	9.60	219.52	775.96	EE-SY169
16	IR Reflective	4 mm	PC Board	30/30	OR582-ND	8.59	196.40	694.26	EE-SY169A

Long Distance Amplified Optical Sensors

These General Purpose Optical Sensors are small DC Sensors (10-30VDC Input) available in both a transmitter-receiver pair or a reflected beam type with sensing distances of 23 feet (7 meters). Ideal for conveyor systems and doorway sensing with direct interface to PLC's. Meets NEMA 4X, 6 and IP67 standards. Through-beam sensors include separate transmitter and receiver. Refelective sensors include transceiver and E39-R1 reflector. Horizontal mount sensors include mounting bracket. All sensors include mounting hardware.

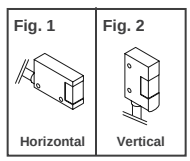
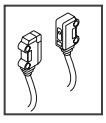


Fig.	Sensing Method	Mounting Type/Features	Distance (max.)	Terminal Type	Digi-Key Part No.	Pricing 1	25	100	Omron Part No.
1	Through-Beam	Horizontal	7 meters	2m Cable	OR584-ND	127.92	2878.20	10873.20	E3S-AT11
1	Reflective	Horizontal	2 meters	2m Cable	OR585-ND	110.24	2480.40	9370.40	E3S-AR11
2	Through-Beam	Vertical	7 meters	2m Cable	OR586-ND	127.92	2878.20	10873.20	E3S-AT61
2	Reflective	Vertical	2 meters	2m Cable	OR587-ND	110.24	2480.40	9370.40	E3S-AR61
—	Mounting Bracket for Vertical Sensors (2 required for Through-Beam Type)				OR588-ND	5.60	126.00	476.00	E39-L59
—	Light Reflector for Confirming Optical Alignment during Setup (Clips onto Receiver)				OR589-ND	16.80	378.00	1428.00	E39-R5
—	Light Interference Filter Eliminates Ambient Light Problems (Snaps onto Receiver)				OR590-ND	20.80	468.00	1768.00	E39-E6

Amplified Mini Optical Sensors with Pin Point Beam

Miniature optical sensor with "Pin-point" beam for sensing minute objects (1-2mm dia.). Use both indoors or outdoors for detecting where small body size is desired. Perfect for security, conveyor detection as well as emergency stop detection and limit control and more. Sensor not affected by ambient light. Comes standard with 2 meter molded cords attached.

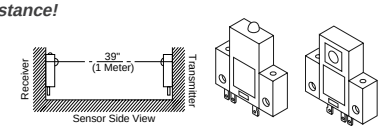


Sensing Method	Mounting Type/Features	Distance (max.)	Terminal Type	Digi-Key Part No.	Pricing 1	25	100	Omron Part No.
Through-Beam	Side/Light-On	1 M	2m Cable	OR591-ND	88.40	1989.00	7514.00	E3T-ST11
Through-Beam	Side/Dark-On	1 M	2m Cable	OR592-ND	88.40	1989.00	7514.00	E3T-ST12
Reflective, Retro	Side/Light-On	200 mm	2m Cable	OR593-ND	83.20	1872.00	7072.00	E3T-SR11
Reflective, Retro	Side/Dark-On	200 mm	2m Cable	OR594-ND	83.20	1872.00	7072.00	E3T-SR12
Reflective, Diff.	Flat/Light-On	30 mm	2m Cable	OR595-ND	78.00	1755.00	6630.00	E3T-FD11
Reflective, Diff.	Flat/Dark-On	30 mm	2m Cable	OR596-ND	78.00	1755.00	6630.00	E3T-FD12

Amplified Optical Sensors

1 Meter (39 Inches) Sensing Distance!

- One meter sensing distance
- Supply voltage of 5 to 24 VDC for easy interface with TTL circuits, relays and programmable controllers
- IP60 sealability rating. Comes with two — 2m cables with connectors



Description	Digi-Key Part No.	Price Each	Omron Part No.
Through-Beam Receiver/Transmitter Pair - Dark on/Beige Colored Body	OR544-ND	75.09	EE-SPW311
Through-Beam Receiver/Transmitter Pair - Light on/Beige Colored Body	OR545-ND	75.09	EE-SPW411

Amplified Optical Sensors

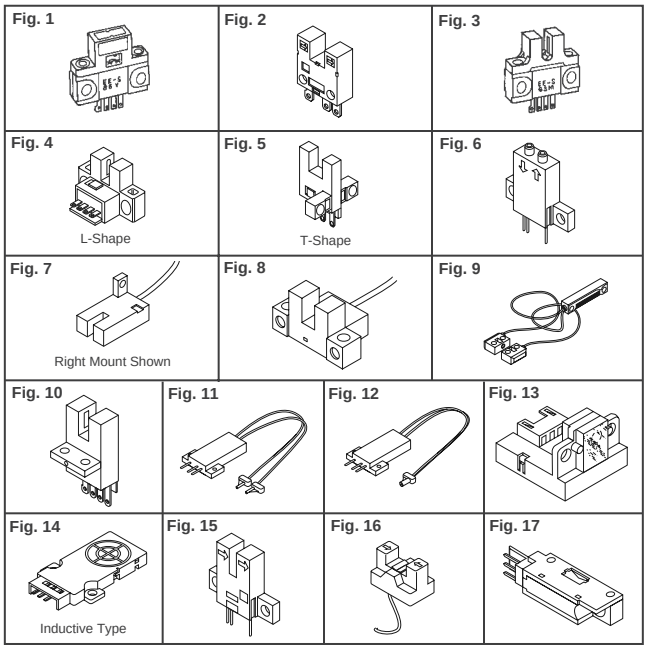


Fig.	Sensor Type/Features	Sensing Distance	Config-uration	Digi-Key Part No.	Pricing 1	25	Omron Part No.
1	Reflective (General Purpose)	5mm	Light-On	OR506-ND	11.57	264.56	EE-SB5V
1	Reflective (General Purpose)	5mm	Dark-On	OR507-ND	11.57	264.56	EE-SB5VC
1	Reflective (General Purpose)	19mm	Light-On	OR519-ND	16.17	369.89	EE-SB5V-E
1	Reflective (Side Detecting)	5mm	Light-On	OR535-ND*	32.37	740.27	EE-SPY311
1	Reflective (Side Detecting)	5mm	Light-On	OR536-ND*	32.37	740.27	EE-SPY411
1	Reflective (Top Detecting)	5mm	Dark-On	OR572-ND*	33.34	762.61	EE-SPY312
1	Reflective (Top Detecting)	5mm	Light-On	OR573-ND*	32.37	740.41	EE-SPY412
1	Reflective (Side Detecting)	5mm	Light/Dark-On	OR531-ND†	18.83	430.71	EE-SY671
1	Reflective (Top Detecting)	5mm	Light/Dark-On	OR532-ND†	18.83	430.71	EE-SY672
—	Slot (Compact Size 2mm slot)	2mm	Light-On	OR568-ND	3.09	70.68	EE-SX4101
2	Wide Slot (13mm slot)	13mm	Dark-On	OR533-ND*	33.66	769.94	EE-SPX303
2	Wide Slot (13mm slot)	13mm	Light-On	OR534-ND*	33.66	769.94	EE-SPX403
3	Slot (Dust Proof Slit)	5mm	Light/Dark-On	OR528-ND	16.04	366.92	EE-SX670
4	Slot (L-shaped, Dust Proof Slit)	5mm	Light/Dark-On	OR529-ND	16.38	374.58	EE-SX671
5	Slot (T-shaped, Dust Proof Slit)	5mm	Light/Dark-On	OR530-ND	16.57	379.03	EE-SX672
6	Reflective (Long Distance)	200mm	Dark-On	OR538-ND*	43.55	996.17	EE-SPZ301A
6	Reflective (Long Distance)	200mm	Light-On	OR539-ND*	43.55	996.17	EE-SPZ401A
—	IR Reflector for EE-SPZ Series, 60 x 40mm			OR540-ND	8.04	186.00	E39-R1
7	Slot (Left Mnt w/1m Cable)	3.6mm	Dark-On	OR541-ND*	47.91	1095.81	EE-SPX302-W2A
7	Slot (Right Mnt w/1m Cable)	3.6mm	Dark-On	OR542-ND*	51.78	1184.33	EE-SPX304-W2A
8	Slot (Top Mnt w/1m Cable)	3.6mm	Dark-On	OR543-ND*	53.73	1228.83	EE-SPX305-W2A
9	Slot (Wide Sensing Distance)	30mm	Dark-On	OR546-ND*	144.86	3313.19	EE-SPW321
9	Slot (Wide Sensing Distance)	30mm	Light-On	OR547-ND*	144.86	3313.19	EE-SPW421
10	Slot (Close Mounting style)	5mm	Light/Dark-On	OR549-ND	17.16	392.39	EE-SX673
11	Fiber (19" Optical Fiber)	30mm	Dark-On	OR552-ND*	59.55	1362.10	EE-SPZ301W-01
11	Fiber (19" Optical Fiber)	30mm	Light-On	OR553-ND*	59.55	1362.10	EE-SPZ401W-01
12	Reflective (11" Optical Fiber)	1-3mm	Dark-On	OR554-ND*	62.39	1427.09	EE-SPZ301Y-01
12	Reflective (11" Optical Fiber)	1-3mm	Light-On	OR555-ND*	62.39	1427.09	EE-SPZ401Y-01
13	Reflective (External A-D Needed)	7.5mm	10 bit A/D	OR548-ND	48.65	1112.63	Z4D-A01
14	Inductive (Detects Ferrous Metal)	5mm	N/O Output	OR560-ND	20.00	457.41	E2R-A01
—	3 Pin Conn. w/ 1 Meter Cable for Fig. 14 above			OR561-ND	5.35	122.39	E22-01
15	Slot (General Purpose)	3.6mm	Dark-On	OR574-ND*	33.34	762.61	EE-SPX301
15	Slot (General Purpose)	3.6mm	Light-On	OR575-ND*	33.34	762.61	EE-SPX401
16	Slotted Liquid Level Detector	6-13mm	Dark/Light-On	OR579-ND*	77.00	1722.36	EE-SPX613
17	Reflective (General Purpose)	11mm	Dark-On	OR580-ND*	10.69	244.46	EE-SPY415
—	Converter from NPN to PNP Output for Amp Sensors			OR550-ND	21.22	485.35	EE-2001
—	Converter from NPN to PNP Output for Amp Sensors			OR551-ND	21.22	485.35	EE-2002
—	4 Pin Connector for Fig. 1-5 & 10 above			OR527-ND	2.14	48.96	EE-1001
—	4 Pin Conn. w/ 2 Meter Cable for 1-5 & 10 above			OR559-ND	10.26	234.64	EE-1006
—	Panel Mount Holder Clip for OR559-ND			OR576-ND	3.16	72.24	EE-1006A
—	3 Pin Connector for 6, 11, 12 & 15 above			OR537-ND	2.15	49.20	EE-1002
—	3 Pin Conn. w/ 2 Meter Cable for 4, 11 & 12 above			OR558-ND	3.86	88.27	EE-1003
—	Panel Mount Holder Clip for OR558-ND			OR583-ND	1.23	28.06	EE-1003A

* Sensors not influenced by external light. † Built-in sensitivity adjuster.

QT OPTOELECTRONICS

Optoisolators

Fig. 1 Photo-Transistor Output

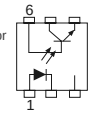


Fig. 2 Photo-Darlington Output

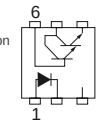


Fig. 3 High-Speed Transistor Output

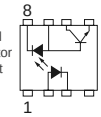


Fig. 4 High Gain Split Darlington Output

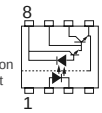


Fig. 5 AC Input Photo-Transistor Output

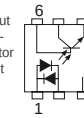


Fig. 6 High Voltage Photo-Darlington Output

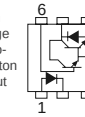


Fig. 7 Dual Channel High Speed Transistor Output

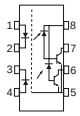


Fig. 8 Dual Split Darlington Output

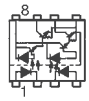


Fig. 9 Dual Photo Transistor Output

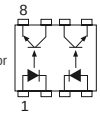


Fig. 10 Dual Photo Transistor Output

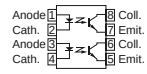


Fig. 11 Non-zero Crossing Triac Output

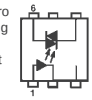


Fig. 12 SCR Output

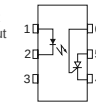


Fig. 13 High Speed TTL Buffered Output

Fig. 14 High Speed TTL Inverted Output

Fig. 15 High Speed CMOS Buffered Output

Fig. 16 High Speed CMOS Inverted Output

Fig. 17 Schmitt Trigger Inverted OC Output

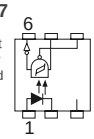


Fig. 18 Very High Speed TTL, 5V CMOS Output

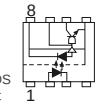


Fig. 19 Dual Very High Speed TTL, 5V CMOS Output

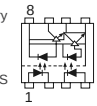


Fig. 20 AC Line Monitor TTL Output

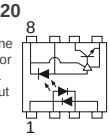


Fig. 21 Bilateral Analog FET Output

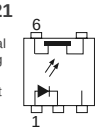


Fig. 22 4-Pin Transistor Output

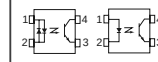


Photo Transistor Output Optoisolators

Fig.	Isolation Voltage	Current Transfer Ratio - Typ.	VCEO (Max.)	Typ. t_{on}/t_{off} (µsec.)	Digi-Key Part No.	Pricing 1	10	100
1	2500	20%	30	2.5/2.6	4N25QT-ND	.40	3.76	34.40
1	2500	20%	30	3.0/3.0	4N26QT-ND	.40	3.76	34.40
1	2500	10%	30	3.0/3.0	4N27QT-ND	.38	3.53	32.25
1	2500	10%	30	2.5/2.6	4N28QT-ND	.38	3.53	32.25
2	2500	100%	30	5.0/40	4N29QT-ND	.40	3.76	34.40
2	2500	100%	30	5.0/40	4N30QT-ND	.40	3.76	34.40
2	2500	50%	30	5.0/40	4N31QT-ND	.38	3.53	32.25
2	2500	500%	30	5.0/100	4N32QT-ND	.45	4.23	38.70
2	2500	500%	30	5.0/100	4N33QT-ND	.45	4.23	38.70
1	3550	100%	30	5.0/5.0	4N35QT-ND	.43	4.00	36.55
1	2500	100%	30	5.0/5.0	4N36QT-ND	.40	3.76	34.40
1	1500	100%	30	5.0/5.0	4N37QT-ND	.38	3.53	32.25
1	5300	20%	80	—	4N38QT-ND	.70	6.58	60.20
3	2500	7%	15V	1.5/1.5	6N135QT-ND	.90	8.46	77.40
3	2500	19%	15V	.8/.8	6N136QT-ND	.93	8.70	79.55
4	2500	300%	7V	10/35	6N138QT-ND	1.00	9.40	86.00
4	2500	400%	18V	1/7	6N139QT-ND	1.13	10.58	96.75
1	5300	40-80%	70	2.0/11	CNY17-1ZQT-ND †	.55	5.17	47.30
1	5300	63-125%	70	10/10	CNY17-2QT-ND	.50	4.70	43.00
1	5300	63-125%	70	3.0/14	CNY17-2ZQT-ND †	.55	5.17	47.30
1	5300	100-200%	70	10/10	CNY17-3QT-ND	.50	4.70	43.00
1	5300	100-200%	70	3.0/14	CNY17-3ZQT-ND †	.55	5.17	47.30
1	5300	160-320%	70	10/10	CNY17-4QT-ND	.50	4.70	43.00
1	5300	160-320%	70	3.0/14	CNY17-4ZQT-ND †	.55	5.17	47.30
1	5300	50%	70	—	H11A1QT-ND	.50	4.70	43.00
1	5300	50%	30	2.0/2.0	H11A1ZQT-ND †	.55	5.17	47.30
1	5300	20%	70	—	H11A2QT-ND	.45	4.23	38.70
1	2500	30%	30	2.0/2.0	H11A5QT-ND	.48	4.47	40.85
5	5300	20%	30	—	H11AA1ZQT-ND †	.80	7.52	68.80
5	2500	20%	30	2.0/2.0	H11AA1QT-ND	.75	7.05	64.50
5	2500	10%	30	2.0/2.0	H11AA2QT-ND	.63	5.88	53.75
5	2500	50%	30	2.0/2.0	H11AA3QT-ND	.78	7.29	66.65
5	2500	100%	30	2.0/2.0	H11AA4QT-ND	.83	7.76	70.95
1	4000	300%	30	5.0/5.0	H11AG1QT-ND	1.25	11.75	107.50
2	5300	500%	25	—	H11B1QT-ND	.63	5.88	53.75
2	5300	500%	25	—	H11B1ZQT-ND †	.68	6.35	58.05
2	5300	200%	25	—	H11B2QT-ND	.60	5.64	51.60
1	4000	100%	70	3.0/2.5	CNW11AV-1QT-ND	1.00	9.40	86.00
1	4000	50%	70	3.0/2.5	CNW11AV-2QT-ND	.90	8.46	77.40
1	5300	20%	300	—	H11D1QT-ND	.75	7.05	64.50
1	5300	20%	300	5.0/5.0	H11D1ZQT-ND †	.80	7.52	68.80
1	5300	20%	300	—	H11D2QT-ND	.75	7.05	64.50
1	5300	20%	300	5.0/5.0	H11D2ZQT-ND †	.80	7.52	68.80
1	5300	20%	200	—	H11D3QT-ND	.70	6.58	60.20
6	4000	1000%	100	5/100	H11G1QT-ND	.80	7.52	68.80
6	4000	1000%	80	5/100	H11G2QT-ND	.78	7.29	66.65
6	5300	200%	25	—	H11G3QT-ND	.75	7.05	64.50
6	4000	250%	55	50/500	H11G45QT-ND	1.90	17.86	163.40
6	4000	500%	55	50/500	H11G46QT-ND	2.18	20.45	187.05
3	2500	12%	15V	.8/.8	HCPL2503QT-ND	1.38	12.93	118.25
7	2500	16%	—	1.5/1.5	HCPL-2530QT-ND	2.00	18.80	172.00
7	2500	16%	—	.8/.8	HCPL-2531QT-ND	2.38	22.33	204.25
8	2500	300%	7V	20/35	HCPL2730QT-ND	2.20	20.68	189.20
8	2500	400%	18V	2/10	HCPL2731QT-ND	2.25	21.15	193.50
1	2500	150%	30	5/5	MCT210QT-ND	.63	5.88	53.75
1	5300	20%	30	6/5	MCT2200ZQT-ND †	.55	5.17	47.30
1	2500	20%	30	5/5	MCT26QT-ND	.38	3.53	32.25
1	2500	50%	30	10/10	MCT270QT-ND	.48	4.47	40.85
1	2500	45-90%	30	7/7	MCT271QT-ND	.55	5.17	47.30
1	2500	20%	30	5/5	MCT2EQT-ND	.48	4.47	40.85
1	2500	20%	30	5/5	MCT2QT-ND	.48	4.47	40.85
1	2500	200%	30	2/17	MCT5200QT-ND	.88	8.23	75.25
1	2500	300%	30	6/19	MCT5201QT-ND	.90	8.46	77.40
1	2500	70%	30	10/12	MCT5210QT-ND	.93	8.70	79.55
1	2500	110%	30	20/20	MCT5211QT-ND	.95	8.93	81.70
9	2500	50%	30	2.4/15	MCT61QT-ND	.80	7.52	68.80
9	2500	100%	30	2.4/15	MCT62QT-ND	.88	8.23	75.25
9	2500	12%	30	2.4/15	MCT6QT-ND	.75	7.05	64.50
10	2500	50%	55	2.4/2.4	MCT9001QT-ND	1.00	9.40	86.00
1	5300	12.5%	70	10/10	TIL111QT-ND	.38	3.53	32.25

† Z denotes VDE approval.

SCR and Triac Output Optoisolators

Fig.	Isolation Voltage	Max I_F Trigger (mA)	Min. Blocking Voltage	Max. I_R (uA)	Digi-Key Part No.	Pricing 1	10	100
11	5300	30	250V	100	MOC3009QT-ND	.58	5.41	49.45
11	5300	15	250V	100	MOC3010QT-ND	.60	5.64	51.60
11	5300	10	250V	100	MOC3011QT-ND	.63	5.88	53.75
11	5300	30	400V	100	MOC3020QT-ND	.60	5.64	51.60
11	5300	15	400V	100	MOC3021QT-ND	.63	5.88	53.75
11	5300	10	400V	100	MOC3022QT-ND	.65	6.11	55.90
11	5300	10	400V	100	MOC3022ZQT-ND	.70	6.58	60.20
11	5300	5	400V	100	MOC3023QT-ND	.70	6.58	60.20
12	5300	14	200V	1000	4N39QT-ND	1.05	9.87	90.30
12	5300	14	200V	1000	4N40QT-ND	1.33	12.46	113.95
12	5300	20	200V	—	H11C1QT-ND	1.00	9.40	86.00
12	5300	20	200V	—	H11C2QT-ND	.95	8.93	81.70
12	5300	30	200V	—	H11C3QT-ND	.90	8.46	77.40
12	5300	20	400V	—	H11C4QT-ND	1.05	9.87	90.30
12	5300	20	400V	—	H11C5QT-ND	1.00	9.40	86.00
12	5300	30	400V	—	H11C6QT-ND	.95	8.93	81.70

Logic Output Optoisolators

Fig.	Function	Input: LSTTL Output	15M Baud Rt. Output Configuration	Digi-Key Part No.	Pricing 1	10	100
13	Buff.	TTL	Totem Pole	740L6000QT-ND	3.13	29.38	268.75
14	Inv.	TTL	Totem Pole	740L6001QT-ND	3.13	29.38	268.75
15	Buff.	CMOS	Open Collect.	740L6010QT-ND	3.13	29.38	268.75
16	Inv.	CMOS	Open Collect.	740L6011QT-ND	3.13	29.38	268.75

Fig.	Isolation Voltage	I_{Fon} Current (Max.)	I_{CCL} (Max.)	Operating Voltage (Max.)	Digi-Key Part No.	Pricing 1	10	100
17	5300	1.6mA	5	16V	H11L1QT-ND	1.00	9.40	86.00
17	5300	1.6mA	5	16V	H11L1ZQT-ND	1.05	9.87	90.30
17	5300	10mA	5	16V	H11L2QT-ND	.75	7.05	64.50
17	5300	5mA	5	16V	H11L3QT-ND	.88	8.23	75.25
17	5300	3.2mA	10	16V	H11N1QT-ND	5.63	52.88	483.75
17	5300	10mA	10	16V	H11N3QT-ND	3.13	29.38	268.75

Fig.	Isolation Voltage	Max. Prop. Delay(nS)	Typ. CMR V/µsec.	I_F (mA)	Digi-Key Part No.	Pricing 1	10	100
18	2500	75	10,000	5	HCPL2601QT-ND	1.73	16.22	148.35
19	2500	75	10,000	5	HCPL2630QT-ND	3.00	28.20	258.00
19	2500	75	10,000	5	HCPL2631QT-ND	3.25	30.55	279.50
18	2500	75	10,000	5	6N137QT-ND	1.13	10.58	96.75

Fig.	Isolation Voltage	BV_{CEO} (Min.)	Typ. t_{on}/t_{off} (µsec.)	Digi-Key Part No.	Pricing 1	10	100
20	2500	5V	1/1	MID400QT-ND	3.38	31.73	290.25

FET Outputs

Fig.	Isolation Voltage	Rds ON (ohm)	Vbr (Min.)	Typ. t_{on}/t_{off} (µS)	Digi-Key Part No.	Pricing 1	10	100
21	5300	200	30	25/25	H11F1QT-ND	3.13	29.38	268.75
21	5300	330	30	25/25	H11F2QT-ND	2.75	25.85	236.50
21	5300	470	15	25/25	H11F3QT-ND	1.75	16.45	150.50

4-Pin Couplers

Fig.	Isolation Voltage	Current Transfer Ratio - Typ.	VCEO (Max.)	Typ. t_{on}/t_{off} (µsec.)	Digi-Key Part No.	Pricing 1	10	100
22	5300	20	100	2.4/2.4	H11AA814QT-ND	.70	6.58	60.20
22	5300	50	100	2.4/2.4	H11AA814AQT-ND	.80	7.52	68.80
22	5300	50	100	2.4/2.4	H11A817QT-ND	.38	3.53	32.25
22	5300	80	100	2.4/2.4	H11A817AQT-ND	.40	3.76	34.40
22	5300	130	100	2.4/2.4	H11A817BQT-ND	.40	3.76	34.40
22	5300	200	100	2.4/2.4	H11A817CQT-ND	.40	3.76	34.40
22	5300	300	100	2.4/2.4	H11A817DQT-ND	.63	5.88	53.75

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NEC Optoelectronic Products

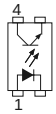
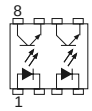
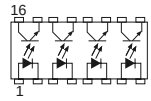
Fig. 1


Photo Transistor Output

Fig. 2


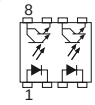
Dual Photo Transistor Output

Fig. 3


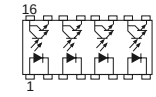
Quad Photo Transistor Output

Fig. 4

Photo Darlington Output

Fig. 5


Dual Photo Darlington Output

Fig. 6


Quad Photo Darlington Output

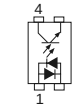
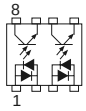
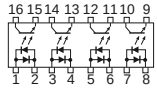
Fig. 7


Photo Transistor Output

Fig. 8


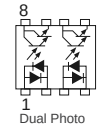
Dual Photo Transistor Output

Fig. 9


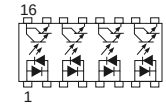
Quad Photo Transistor Output

Fig. 10

Photo Darlington Output

Fig. 11


Dual Photo Darlington Output

Fig. 12


Quad Photo Darlington Output

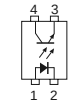
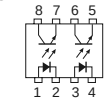
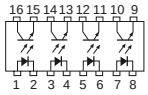
Fig. 13


Photo-Transistor Output, Surface Mount

Fig. 14


Dual Photo-Transistor Output, Surface Mount

Fig. 15


Quad Photo Transistor Output, Surface Mount

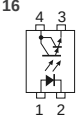
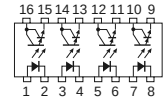
Fig. 16


Photo Darlington Output, Surface Mount

Fig. 17

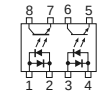
Dual Photo Darlington Output, Surface Mount

Fig. 18


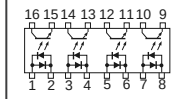
Quad Photo Darlington Output, Surface Mount

Fig. 19

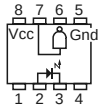
Photo Transistor Output Surface Mount

Fig. 20


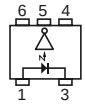
Dual Photo Transistor Output, Surface Mount

Fig. 21


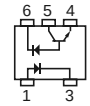
Quad Photo Transistor Output, Surface Mount

Fig. 22


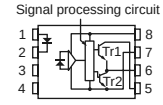
DIP and Lead-Bent

Fig. 23


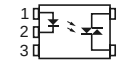
SOP

Fig. 24


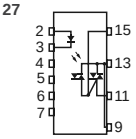
SOP

Fig. 25


DIP and Lead-Bent

Fig. 26


DIP and Lead-Bent

Fig. 27


DIP and Lead-Bent

Photo Transistor Output Optoisolators

Fig.	Isolation Voltage	Current Transfer Ratio - Typ.	VCEO (Max.)	Typ. t_{on}/t_{off} (µsec.)	Digi-Key Part No.	Pricing 1	10	100	500	Digi-Key Part No.	Tape & Reel Pricing 900	2,500	3,500
1	5000	80-600%	80	3/5	PS2501-1NEC-ND	.51	4.42	36.00	175.00	—	—	—	—
2	5000	80-600%	80	3/5	PS2501-2NEC-ND	.99	8.58	73.00	350.00	—	—	—	—
3	5000	80-600%	80	3/5	PS2501-4NEC-ND	1.98	17.16	146.00	700.00	—	—	—	—
4	5000	200-2000+%	40	100/100	PS2502-1NEC-ND	.72	6.24	54.00	260.00	—	—	—	—
5	5000	200-2000+%	40	100/100	PS2502-2NEC-ND	1.47	12.74	108.00	520.00	—	—	—	—
6	5000	200-2000+%	40	100/100	PS2502-4NEC-ND	2.94	25.48	215.00	1030.00	—	—	—	—
7	5000	80-600%	80	3/5	PS2505-1NEC-ND	.66	6.00	54.00	260.00	—	—	—	—
8	5000	80-600%	80	3/5	PS2505-2NEC-ND	1.35	12.30	108.00	520.00	—	—	—	—
9	5000	80-600%	80	3/5	PS2505-4NEC-ND	2.71	24.60	215.00	1030.00	—	—	—	—
10	5000	200-2000+%	40	100/100	PS2506-1NEC-ND	.81	7.02	60.00	285.00	—	—	—	—
11	5000	200-2000+%	40	100/100	PS2506-2NEC-ND	1.62	14.04	119.00	570.00	—	—	—	—
12	5000	200-2000+%	40	100/100	PS2506-4NEC-ND	3.24	28.08	238.00	1145.00	—	—	—	—
13	2500	50-300%	40	3/5	PS2701-1NEC-ND †	.84	7.28	56.00	270.00	PS2701-1TR-ND	—	—	448.00/M
14	2500	50-300%	40	3/5	PS2701-2NEC-ND	1.68	14.56	111.00	535.00	—	—	—	—
15	2500	50-300%	40	3/5	PS2701-4NEC-ND	3.39	29.38	226.00	1017.00	—	—	—	—
16	2500	200-2000+%	40	200/200	PS2702-1NEC-ND †	.90	7.80	60.00	285.00	PS2702-1TR-ND	432.00	—	—
17	2500	200-2000+%	40	200/200	PS2702-2NEC-ND	1.80	15.60	119.00	570.00	—	—	—	—
18	2500	200-2000+%	40	200/200	PS2702-4NEC-ND	3.60	31.20	238.00	1145.00	—	—	—	—
13	2500	50-400%	120	10/10	PS2703-1NEC-ND †	.87	7.54	58.00	280.00	PS2703-1TR-ND	—	—	464.00/M
14	2500	50-400%	120	10/10	PS2703-2NEC-ND	1.74	15.08	115.00	550.00	—	—	—	—
15	2500	50-400%	120	10/10	PS2703-4NEC-ND	3.57	30.94	238.00	1071.00	—	—	—	—
19	2500	50-300%	40	3/5	PS2705-1NEC-ND †	.84	7.28	56.00	270.00	PS2705-1TR-ND	—	—	448.00/M
20	2500	50-300%	40	3/5	PS2705-2NEC-ND	1.68	14.56	111.00	535.00	—	—	—	—
21	2500	50-300%	40	3/5	PS2705-4NEC-ND	3.36	29.12	222.00	1070.00	—	—	—	—
13	2500	80-600%	80	3/5	PS2801-1NEC-ND †	1.02	8.84	73.00	340.00	PS2801-1TR-ND	—	—	570.00/M
15	2500	80-600%	80	3/5	PS2801-4NEC-ND †	3.60	33.00	319.00	1500.00	PS2801-4TR-ND	—	2300.00/M	—
19	2500	80-600%	80	3/5	PS2805-1NEC-ND †	1.29	11.18	102.00	430.00	PS2805-1TR-ND	—	—	790.00/M
21	2500	80-600%	80	3/5	PS2805-4NEC-ND	4.80	41.60	414.00	1600.00	—	—	—	—

† Cut Tape pricing

High Speed Digital

Fig.	Isolation Voltage	Prop Delay	Digi-Key Part No.	Pricing 1	10	100	500
22	5000	50ns	PS9601NEC-ND	3.10	30.50	301.00	1460.00
22	5000	50ns	PS9601LNEC-ND	3.10	30.50	301.00	1460.00
23	2500	50ns	PS9701NEC-ND	2.74	27.00	266.00	1290.00
24	2500	.3µs	PS2741NEC-ND	2.88	28.30	279.00	1355.00

Coupler For IGBT Driver

Fig.	Isolation Voltage	Prop Delay	Digi-Key Part No.	Pricing 1	10	100	500
25	5000	3µs	PS9634NEC-ND	1.50	14.80	146.00	705.00
25	5000	3µs	PS9634LNEC-ND	1.54	15.10	149.00	720.00

High Sensitivity Triac

Fig.	Isolation Voltage	Ift (Max.)	Vdrm (Max.)	It (rms) (Max.)	Digi-Key Part No.	Pricing 1	10	100	500
26	5000	5mA	600V	100mA	PS3601LNEC-ND	1.15	11.30	112.00	540.00
27	5000	5mA	600V	1.2A	PS3901LNEC-ND	2.26	22.20	219.00	1065.00

TOSHIBA

Optoisolators

Fig. 1

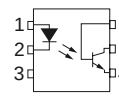
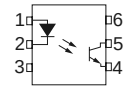


Fig. 2



No Base Connection

Fig. 3

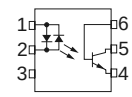


Fig. 4

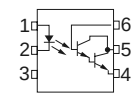
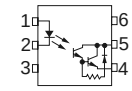


Fig. 5



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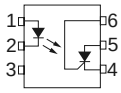
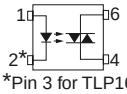


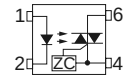
Fig. 7



*Pin 3 for TLP160

(TLP160G-ND and TLP160J-ND SMT)

Fig. 8



(TLP161G-ND and TLP161J-ND SMT)

Fig. 9

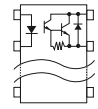


Fig. 10 - SMT

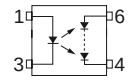


Fig. 11

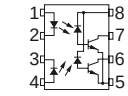


Fig. 12

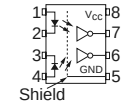


Fig. 13

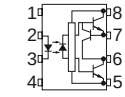


Fig. 14

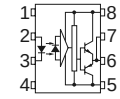


Fig. 15 - SMT

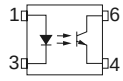


Fig. 16 - SMT

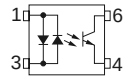


Fig. 17 - SMT

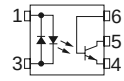


Fig. 18 - SMT

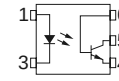


Fig. 19 - SMT

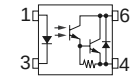


Fig. 20 - SMT

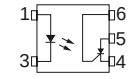
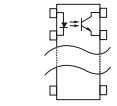


Fig. 21



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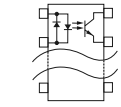

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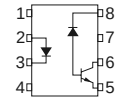


Fig. 24

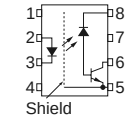


Fig. 25

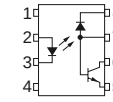


Fig. 26

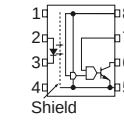


Fig. 27

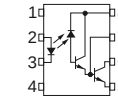


Fig. 28

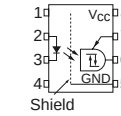
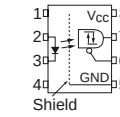


Fig. 29



Transistor Output Optoisolators

Fig.	Current Transfer Ratio Min. (%)	Max. (%)	@IF (ma)	VCE (V)	Collector Breakdown V(BR)	Isolation Voltage (Vrms)	Digi-Key Part No.	Pricing 1	10	100
1	20	—	10	10	30	2500	4N25ASHORT-ND	.81	6.69	56.32
1	20	—	10	10	30	2500	4N25SHORT-ND	.81	6.69	56.32
1	100	—	10	10	30	2500	4N35SHORT-ND	.62	5.13	43.20
1	100	—	10	10	30	2500	4N36SHORT-ND	.81	6.69	56.32
1	10	—	10	10	80	2500	4N38SHORT-ND	.81	6.69	56.32
19	1000	—	1	1	300	2500	TLP127-ND	1.29	10.56	89.10
1	100	1200	1	0.5	55	5000	TLP331-ND	1.70	13.92	117.45
2	100	1200	1	0.5	55	5000	TLP332-ND	1.70	13.92	117.45
22	50	600	±5	—	55	5000	TLP620-ND	1.01	8.36	70.40
22	50	600	±5	—	55	5000	TLP620-2-ND	1.72	14.08	118.80
22	100	600	±5	—	55	5000	TLP620-2GB-ND	1.72	14.08	118.80
22	50	600	±5	—	55	5000	TLP620-4-ND	2.48	19.50	157.50
22	100	600	±5	—	55	5000	TLP620-4GB-ND	2.48	19.50	157.50
22	100	600	±5	—	55	5000	TLP620GB-ND	1.01	8.36	70.40
22	100	300	±5	—	55	5000	TLP620GR-ND	1.11	9.20	77.44
21	50	600	5	—	55	5000	TLP621-2-ND	1.67	13.73	115.83
21	100	600	5	—	55	5000	TLP621-2GB-ND	1.67	13.73	115.83
21	50	600	5	—	55	5000	TLP621-4-ND	2.90	22.88	184.80
21	100	600	5	—	55	5000	TLP621-4GB-ND	2.90	22.88	184.80
21	200	600	5	—	55	5000	TLP621BLT-ND	.92	7.60	64.00
21	100	600	5	—	55	5000	TLP621GBT-ND	.74	6.08	51.20
21	100	300	5	—	55	5000	TLP621GRT-ND	.87	7.22	60.80
21	50	600	5	—	55	5000	TLP621-ND	.74	6.08	51.20
21	100	1200	1	—	55	5000	TLP624-ND	.98	8.00	67.50
21	100	1200	1	—	55	5000	TLP624-2-ND	1.65	13.00	105.00
21	100	1200	1	—	55	5000	TLP624-4-ND	2.60	21.00	170.00
22	100	1200	±1	—	55	5000	TLP626-ND	1.40	11.52	97.20
22	100	1200	±1	—	55	5000	TLP626-2-ND	2.38	18.72	151.20
22	100	1200	±1	—	55	5000	TLP626-4-ND	4.16	33.60	272.00
3	50	600	±5	5	55	5000	TLP630TAIE-ND	1.45	11.94	100.71
1	50	600	5	5	55	5000	TLP631-ND	.99	8.10	68.31
1	100	600	5	5	55	5000	TLP631GB-ND	.99	8.10	68.31
2	50	600	5	5	55	5000	TLP632-ND	1.29	10.56	89.10

Thyristor Output Optoisolators

Fig.	LED Trigger Current Max. (ma)	dv/dt Typical (V/uS)	Blocking Voltage	Isolation Voltage	Digi-Key Part No.	Pricing 1	10	100
20	10	10	400	2500	TLP141G-ND	1.76	14.40	121.50
7	10	500	400	2500	TLP160G-ND	1.37	11.20	94.50
7	10	500	600	2500	TLP160J-ND	1.56	12.80	108.00
8	10	500	400	2500	TLP161G-ND	1.64	13.44	113.40
8	10	500	600	2500	TLP161J-ND	1.91	15.68	132.30
7	10	500	400	5000	TLP3022-ND	1.17	9.60	81.00
7	5	500	400	5000	TLP3023-ND	1.17	9.60	81.00
7	10	—	600	5000	TLP3052-ND	1.56	12.80	108.00
6	10	10	400	4000	TLP741GTAIE-ND	1.24	10.21	86.13
6	10	10	600	4000	TLP741JTAIE-ND	1.37	11.26	95.04
6	10	10	400	4000	TLP741GD4-TAIE-ND*	1.37	11.26	95.04
8	10	500	400	5000	TLP3042-ND†	1.17	9.60	81.00
8	5	500	400	5000	TLP3043-ND†	1.25	10.24	86.40
8	10	500	600	5000	TLP3062-ND†	1.40	11.52	97.20
8	5	500	600	5000	TLP3063-ND†	1.56	12.80	108.00

* VDE Approved † Zero Crossing

High Speed Output Optoisolators

Fig.	Output Current Min. (ma)	@IF (ma)	@VO (V)	Data Rate Typical (bit/s)	Max. Supply Voltage (V)	Isolation Voltage (Vrms)	Digi-Key Part No.	Pricing 1	10	100
25	1.12	16	0.4	1M	15	2500	6N135T-ND	1.76	14.40	121.50
25	3.04	16	0.4	1M	15	2500	6N136T-ND	1.76	14.40	121.50
26	13	5	0.6	10M	5	2500	6N137T-ND	1.76	14.40	121.50
27	4.8	1.6	0.4	100K	7	2500	6N138T-ND	1.76	14.40	121.50
27	2	0.5	0.4	100K	18	2500	6N139T-ND	1.76	14.40	121.50
29	6.4 -2.6	0 1.6	0.5 2.4	5M	20	2500	TLP2200-ND	2.73	22.05	178.50
11	1.12	16	0.4	1M	15	2500	TLP2530-ND	4.29	34.65	280.50
11	3.04	16	0.4	1M	15	2500	TLP2531-ND	4.29	34.65	280.50
26	13	5	0.6	10M	5	2500	TLP2601-ND	3.15	25.41	205.70
12	13	5	0.6	10M	5	2500	TLP2630-ND	5.15	41.58	336.60
12	13	5	0.6	10M	5	2500	TLP2631-ND	5.15	41.58	336.60
23	1.6	16	0.4	1M	15	2500	TLP550-ND	1.93	15.24	123.06
28	6.4 -2.6	1.6 0	0.4 2.4	5M	20	2500	TLP558-ND	4.72	38.12	308.55
24	3.2	16	0.4	1M	15	2500	TLP559-ND	2.92	23.04	186.06

Darlington Transistor Output

Fig.	Current Transfer Ratio Min. (%)	Max. (%)	@IF (ma)	VCE (V)	Saturation Voltage Max. (V)	@IC (ma)	@IF (ma)	Collector Break-down V(BR)	Iso-lation Volt.	Digi-Key Part No.	Pricing 1	10	100
4	100	—	10	10	1	2	8	30	2500	4N29ASHORT-ND	.86	7.11	59.84
4	100	—	10	10	1	2	8	30	2500	4N29SHORT-ND	.86	7.11	59.84
4	500	—	10	10	1	2	8	30	2500	4N32SHORT-ND	.86	7.11	59.84
4	500	—	10	10	1	2	8	30	2500	4N33SHORT-ND	.86	7.11	59.84
16	100	1200	±1	0.5	0.4	0.5	1	80	3750	TLP126-ND	1.40	11.52	97.20
17	50	600	±5	5	0.4	2.4	8	80	3750	TLP130-ND	1.21	9.92	83.70
17	100	600	±5	5	0.4	2.4	8	80	3750	TLP130GB-ND	1.36	11.17	94.23
18	50	600	5	5	0.4	2.4	8	80	3750	TLP131-ND	1.09	8.96	75.60
18	100	600	5	5	0.4	2.4	8	80	3750	TLP131GB-ND	1.21	9.92	83.70
18	100	1200	1	0.5	0.4	0.5	1	80	3750	TLP137-ND	1.05	8.61	72.63
15	50	600	5	5	0.4	2.4	8	80	3750	TLP181-ND	.99	8.17	68.80
15	100	600	5	5	0.4	2.4	8	80	3750	TLP181GB-ND	.99	8.17	68.80
4	1000	—	1	1	1.2	100	10	300	5000	TLP371-ND	1.05	8.64	72.90
5	1000	—	1	1	1.2	100	10	300	5000	TLP372-ND	1.78	14.62	123.39
9	1000	—	1	1	1.2	100	10	300	5000	TLP627-ND	.98	8.00	67.50
9	1000	—	1	1	1.2	100	10	300	5000	TLP627-2-ND	1.65	13.00	105.00
9	1000	—	1	1	1.2	100	10	300	5000	TLP627-4-ND	2.64	21.34	172.72

Photovoltaic Coupler

Fig.	Short Current Min. (uA)	@IF (ma)	Open Voltage Typical (V)	Switching Time (@UF=20 mA, CL=1000pF) T on (ms)	T off (ms)	Isolation Voltage (VRMS)	Digi-Key Part No.	Pricing 1	10	100
10	12	10	8	0.2	2	2500	TLP190B-ND	3.12	25.20	204.00

Power Transistor Outputs

Fig.	Output Current IO (A)	@IF (ma)	Propagation Delay Typical (us)	Max. Supply Voltage (V)	Isolation Voltage (VRMS)	Digi-Key Part No.	Pricing 1	10	100
14	±0.5	5	0.2	35	2500	TLP250-ND	4.68	37.80	306.00
13	0.25	5	1	16	2500	TLP557-ND	2.51	19.79	159.81

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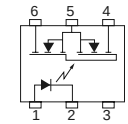
NEC OCMOS FET Solid State Relays

Fig.	BV V	IL mA	PD mW	Ron Ohms	t_{on} ms	t_{off} ms	Output Type	Digi-Key Part No.	Price Each 1	10	100
2	100	100	375	6	0.4	0.2	2ch NO	PS7111-2ANEC-ND	5.40	4.32	2.98
2	100	100	375	6	0.4	0.2	2ch NO	PS7111L-2ANEC-ND*	5.40	4.32	3.00
1	100	200	560	6	0.4	0.2	1ch NO	PS7112-1ANEC-ND	2.75	2.20	1.49
1	100	200	560	6	0.4	0.2	1ch NO	PS7112L-1ANEC-ND*	2.75	2.20	1.51
1	100	350	560	2.5	3	0.2	1ch NO	PS7113-1ANEC-ND	3.00	2.40	1.64
1	100	350	560	2.5	3	0.2	1ch NO	PS7113L-1ANEC-ND*	3.00	2.40	1.66
2	100	350	375	2.5	3	0.2	2ch NO	PS7113-2ANEC-ND	5.80	4.64	3.28
2	100	350	375	2.5	3	0.2	2ch NO	PS7113L-2ANEC-ND*	5.80	4.64	3.28
1	200	200	560	5	2	0.2	1ch NO	PS7122-1ANEC-ND	3.25	2.60	1.79
1	200	200	560	5	2	0.2	1ch NO	PS7122L-1ANEC-ND*	3.25	2.60	1.80
2	200	200	375	5	2	0.2	2ch NO	PS7122-2ANEC-ND	6.50	5.20	3.58
2	200	200	375	5	2	0.2	2ch NO	PS7122L-2ANEC-ND*	6.50	5.20	3.59
1	400	150	560	30	1	0.2	1ch NO	PS7141-1ANEC-ND	3.00	2.40	1.64
1	400	150	560	30	1	0.2	1ch NO	PS7141L-1ANEC-ND*	3.00	2.40	1.66
1	400	150	560	24	0.02	0.2	1ch NC	PS7141-1BNEC-ND	3.55	2.84	1.94
1	400	150	560	24	0.02	0.2	1ch NC	PS7141L-1BNEC-ND*	3.55	2.84	1.95
2	400	150	375	24	0.02	0.2	1A & 1B	PS7141-1CNEC-ND	6.50	5.20	3.58
2	400	150	375	24	0.02	0.2	1A & 1B	PS7141L-1CNEC-ND*	6.50	5.20	3.59
2	400	150	375	30	1	0.2	2ch NO	PS7141-2ANEC-ND	5.98	4.78	3.28
2	400	150	375	30	1	0.2	2ch NO	PS7141L-2ANEC-ND*	5.98	4.78	3.29
2	400	150	375	24	0.02	0.2	2ch NC	PS7141-2BNEC-ND	7.00	5.60	3.88
2	400	150	375	24	0.02	0.2	2ch NC	PS7141L-2BNEC-ND*	7.00	5.60	3.89
1	400	200	560	10	5	0.2	1ch NO	PS7142-1ANEC-ND	3.25	2.60	1.79
1	400	200	560	10	5	0.2	1ch NO	PS7142L-1ANEC-ND*	3.25	2.60	1.80
1	600	90	560	50	1.5	0.2	1ch NO	PS7160-1ANEC-ND	3.00	2.40	1.64
1	600	90	560	50	1.5	0.2	1ch NO	PS7160L-1ANEC-ND*	3.00	2.40	1.66
2	600	90	375	50	1.5	0.2	2ch NO	PS7160-2ANEC-ND	5.98	4.78	3.28
2	600	90	375	50	1.5	0.2	2ch NO	PS7160L-2ANEC-ND*	5.98	4.78	3.29
2	100	100	150	6	2	0.2	2ch NO	PS7211-2ANEC-ND†	5.98	4.78	3.28
4	400	120	430	30	1	0.2	1A & PS2701	PS7241-AT1NEC-ND†	3.25	2.60	1.79
3	400	120	430	30	1	0.2	1A & PS2705	PS7241-AT5NEC-ND†	3.25	2.60	1.79
1	400	150	560	10	2	0.2	1ch NO	PS7341-1ANEC-ND	3.28	2.62	1.79
1	400	150	560	10	2	0.2	1ch NO	PS7341L-1ANEC-ND*	3.28	2.62	1.80
1	400	200	560	5	5	0.2	1ch NO	PS7342-1ANEC-ND	4.05	3.24	2.24
1	400	200	560	5	5	0.2	1ch NO	PS7342L-1ANEC-ND*	4.05	3.24	2.25
1	600	90	560	50	2	0.2	1ch NO	PS7360-1ANEC-ND	3.25	2.60	1.79
1	600	90	560	50	2	0.2	1ch NO	PS7360L-1ANEC-ND*	3.25	2.60	1.80
1	200	200	560	5	12	6.5	1ch NO	PS7522-1ANEC-ND	4.10	3.28	2.24
2	200	200	375	5	12	6.5	2ch NO	PS7522-2ANEC-ND	6.00	4.80	3.28

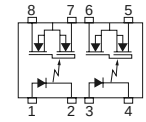
* Lead-Bent † SOP-8

Fig. 1



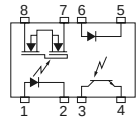
1 LED Anode
2 LED Cathode
3 NC
4 MOSFET Drain
5 MOSFET Source
6 MOSFET Drain

Fig. 2



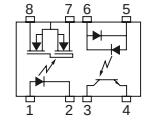
1 LED Anode
2 LED Cathode
3 LED Anode
4 LED Cathode
5 MOSFET
6 MOSFET
7 MOSFET
8 MOSFET

Fig. 3



1 LED Anode
2 LED Cathode
3 Tr Collector
4 Tr Emitter
5 LED Anode
6 LED Cathode
7 MOSFET
8 MOSFET

Fig. 4



1 LED Anode
2 LED Cathode
3 Tr Collector
4 Tr Collector
5 LED Anode/Cathode
6 LED Anode/Cathode
7 MOSFET
8 MOSFET

ISOCOM

Photo Transistor Output Optoisolators

Fig.	Isolation Voltage	Current Transfer Ratio - Typ.	VCEO (Max.)	Typ. t_{on}/t_{off} (µsec.)	Digi-Key Part No.	Pricing 1	10	100	500
1	1500	50%	30	5.0/40	4N31IS-ND	.32	3.06	28.75	138.00

SCR & Triac Output Optoisolators

Fig.	Isolation Voltage	Max. I_F Trigger	Min. Blocking Voltage	I_{out} (mA)	Digi-Key Part No.	Pricing 1	10	100	500
2	660	14mA	400V	300	4N40IS-ND	1.23	11.52	105.35	465.50
3	7500	30mA	250V	100	MOC3030IS-ND	1.58	14.81	135.45	598.50
3	7500	15mA	250V	100	MOC3031IS-ND	1.60	15.04	137.60	608.00
3	7500	10mA	250V	100	MOC3032IS-ND	1.63	15.28	139.75	617.50
3	7500	30mA	400V	100	MOC3040IS-ND	1.60	15.04	137.60	608.00
3	7500	15mA	400V	100	MOC3041IS-ND	1.63	15.28	139.75	617.50
3	7500	10mA	400V	100	MOC3042IS-ND	1.65	15.51	141.90	627.00

Logic Output Optoisolators

Fig.	V_{ISO} (RMS)	I_{fon} Current (Max.)	Max. DataRate (NRZ)	Operating Voltage Min/Max	Digi-Key Part No.	Pricing 1	10	100	500
4	2500V	1.6mA	1.0MHz	3V/16V	H11L1IS-ND	1.20	11.28	103.20	456.00
4	2500V	10mA	1.0MHz	3V/16V	H11L2IS-ND	1.13	10.58	96.75	427.50

Fig. 1

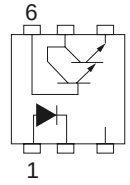
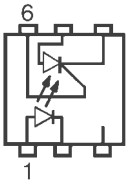


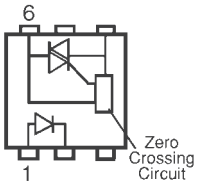
Photo-Darlington Output

Fig. 2



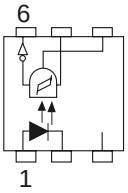
SCR Output

Fig. 3



Zero Crossing Triac Output

Fig. 4



Schmitt Trigger Inverted OC Output

Infrared Photodiodes

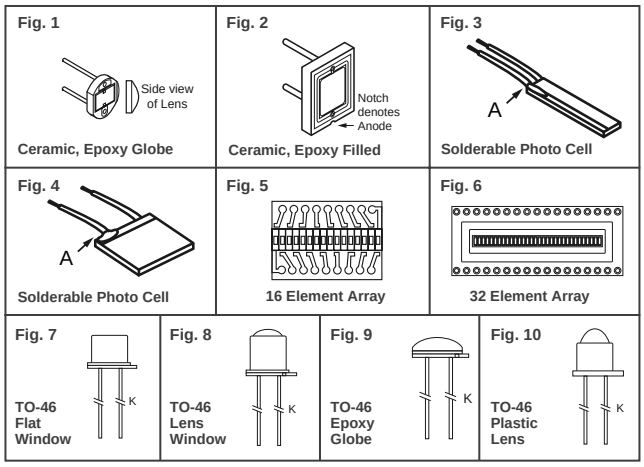


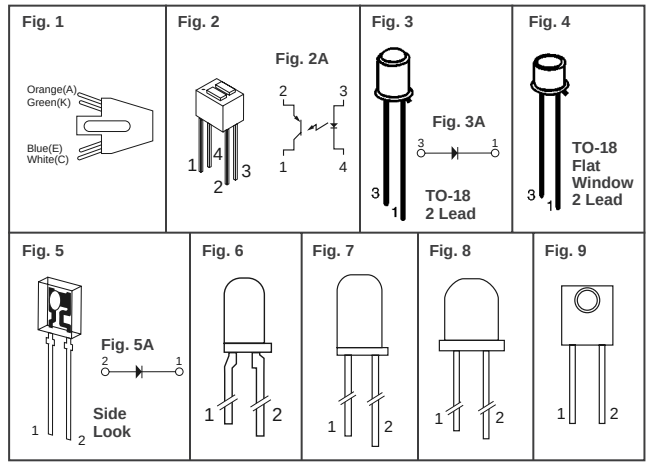
Fig.	Short Circuit Current I_{SC} (µA)	Dark Current I_D (nA)	Peak Sensitivity Wave-length (nm)	Break-down Voltage V_{BR} (V)	Active Area (mm sq.)	Digi-Key Part No.	Price Each 1	25	100	250
Blue Enhanced Photovoltaic Detectors										
1	155	1.0	950	10	17	PDB-V107-ND	2.00	1.80	1.60	1.45
1	70	5	950	15	7.75	PDB-V113-ND	1.65	1.48	1.30	1.20
2	85	2	950	10	100	PDB-V110-ND	42.00	34.00	29.00	27.00
Blue Enhanced Photoconductive Detectors										
1	215	5	950	100	17	PDB-C107-ND	2.25	1.90	1.70	1.55
1	70	15	950	100	7.75	PDB-C113-ND	1.48	1.45	1.30	1.20
1	325	25	940	35	29	PDB-C140-ND	4.00	3.60	3.25	2.95
2	90	5	950	100	100	PDB-C110-ND	45.00	36.00	32.00	30.00
Blue Enhanced Solderable Photo Cells										
3	185	10	950	100	16.6	PDB-C607-2-ND	4.40	4.18	4.07	3.95
3	650	30	950	100	54	PDB-C612-2-ND	8.85	8.50	7.95	7.70
3	4200	250	950	100	243	PDB-C615-2-ND	23.00	20.90	18.65	18.50
4	400	20	950	100	44.68	PDB-C609-2-ND	7.75	7.50	7.25	7.00
4	850	0.5	950	100	90	PDB-C613-2-ND	11.00	10.45	10.15	9.90
Blue Enhanced Multi-Element Detector Arrays										
7*	60	0.5	350-1100	75	6.4	PDB-C203-ND	29.00	26.00	22.00	18.75
5	40	1.0	400-1100	35	1.8	PDB-C216-ND	45.00	38.00	28.00	24.00
6	10	20	350-1100	30	1.4	PDB-C232-ND	125.00	106.00	90.00	75.00
Detector-Amplifier Hybrid (TO-5 Package)										
8*	45	10	350-1100	10	5.1	PDB-715-100-ND	36.00	30.00	25.00	24.20

High Power Infrared Emitters

Fig.	Continuous Forward Current (mA)	Reverse Breakdown Voltage (V)	Peak Sensitivity Wave-length (nm)	Output Power mW	Beam Angle	Digi-Key Part No.	Price Each 1	25	100	250
7*	100	30	880	24	40°	PDI-E801-ND	2.80	2.35	2.00	1.75
8*	100	30	880	24	30°	PDI-E802-ND	2.80	2.35	2.00	1.75
8*	100	30	880	24	20°	PDI-E803-ND	2.80	2.35	2.00	1.75
9*	100	30	880	24	60°	PDI-E804-ND	2.50	2.15	1.85	1.60
10*	100	30	880	24	5°	PDI-E805-ND	3.00	2.55	2.15	1.85

* Tab denotes cathode

Infrared Photosensors



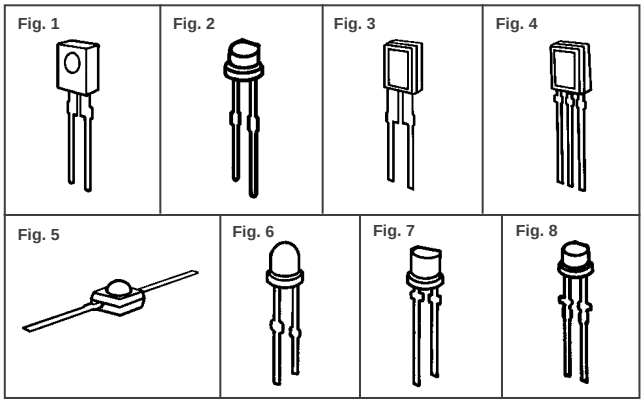
Reflective Photosensors

Fig.	Circuit	Output Type	Min/Max Output Ic @ If	Optimum Sensing Distance	Termi-nation	Digi-Key Part No.	Pricing 1	10	100	500
1	—	Transistor	.6/3 @ 40mA	3.81mm	Leads	QRB1114QT-ND	1.58	14.81	135.45	598.50
1	—	Transistor	.6/3 @ 40mA	3.81mm	Wires	QRB1134QT-ND	2.83	26.56	242.95	1073.50
2	2A	Transistor	1/5 @ 20mA	1.27mm	Leads	QRD1114QT-ND	1.50	14.10	129.00	570.00

Semiconductor Infrared Emitters (IRED LEDs)

Fig.	Circuit	Forward Voltage (V)	Max. Forward Current (mA)	Max. Power Output (mW)	Beam Angle +/-	Peak Wave-Length (nm)	Digi-Key Part No.	Pricing 1	10	100	500
3	3A	1.7	100	6.0	10	940	1N6264QT-ND	3.00	28.20	258.00	1140.00
4	3A	1.7	100	6.0	40	940	1N6265QT-ND	3.00	28.20	258.00	1140.00
3	3A	1.7	100	25.0	10	940	1N6266QT-ND	4.15	39.01	356.90	1577.00
3	3A	1.7	100	5.4	8	940	CQX14QT-ND	1.88	17.63	161.25	712.50
4	3A	1.7	100	5.4	40	940	CQX15QT-ND	1.88	17.63	161.25	712.50
3	3A	1.7	100	12.0	10	880	F5D1QT-ND	2.13	19.98	182.75	807.50
3	3A	1.7	100	9.0	10	880	F5D2QT-ND	1.95	18.33	167.70	741.00
3	3A	1.7	100	10.5	10	880	F5D3QT-ND	2.00	18.80	172.00	760.00
4	3A	1.7	100	12.0	40	880	F5E1QT-ND	2.13	19.98	182.75	807.50
4	3A	1.7	100	9.0	40	880	F5E2QT-ND	1.95	18.33	167.70	741.00
4	3A	1.7	100	10.5	40	880	F5E3QT-ND	2.00	18.80	172.00	760.00
5	5A	1.7	60	0.28	30	940	F5F1QT-ND	.43	4.00	36.55	161.50
5	5A	1.85	50	0.6	30	880	F5G1QT-ND	.60	5.64	51.60	228.00
3	3A	1.7	100	1.5	8	940	LED56QT-ND	1.75	16.45	150.50	665.00
4	3A	1.7	100	3.5	40	940	LED55BFQT-ND	1.80	16.92	154.80	684.00
3	3A	1.7	100	3.5	8	940	LED55BQT-ND	1.80	16.92	154.80	684.00
6	5A	1.7	50	0.07	8	940	QEC113QT-ND	.40	3.76	34.40	152.00
7	5A	1.5	100	0.24	12	880	QED123QT-ND	.55	5.17	47.30	209.00
7	5A	1.5	100	0.075	18	940	QED233QT-ND	.38	3.53	32.25	142.50
8	5A	1.7	100	0.1	25	880	QED423QT-ND	.60	5.64	51.60	228.00
8	5A	1.7	100	0.15	15	880	QED522QT-ND	.58	5.41	49.45	218.50
8	5A	1.7	100	0.2	15	880	QED523QT-ND	.60	5.64	51.60	228.00
9	5A	1.5	50	0.015	25	940	QEE113QT-ND	.43	4.00	36.55	161.50
9	5A	1.7	50	0.04	25	880	QEE123QT-ND	.63	5.88	53.75	237.50

Panasonic Infrared Photosensors



Infrared Light Emitting Diode

Fig.	Pulse Forward Current	Optical Power Output	Peak Emission Wavelength	Beam Angle	Digi-Key Part No.	Pricing 1	10	100	500
1	1 A	4.6mW	950nm	17°	LN54PA-ND	.92	8.70	75.33	318.06
2	1.5 A	7mW	950nm	45°	LN64PA-ND	.97	9.15	79.22	334.48
6	1.5 A	3~8mW	950nm	25°	LN66-ND	.65	6.18	53.46	225.72
3	2 A	12mW	900nm	115°	LN175PA-ND	1.99	18.81	162.81	687.42

NPN Photo Transistor

Fig.	V_{CEO}	I_C	Peak Sensitivity Wavelength	tr/tf	Digi-Key Part No.	Pricing 1	10	100	500
4	20V	10mA	900nm	8µs	PN116PA-ND	1.66	15.72	136.08	574.56
5	20V	20mA	800nm	2.5/3.5µs	PN127-SPA-ND	1.10	10.39	89.91	379.62
1	20V	20mA	800nm	4µs	PN154PA-ND	1.28	12.07	104.49	441.18
6	30V	20mA	800nm	4µs	PN168PA-ND	.45	4.21	36.45	153.90

Pin Photo Diode

Fig.	V_R	Peak Sensitivity Wavelength	tr/tf	Digi-Key Part No.	Pricing 1	10	100	500
7	30V	960nm	50ns	PN323BPA-ND	.83	7.86	68.04	287.28
8	50V	900nm	2ns	PN334PA-ND	1.34	12.64	109.35	461.70

Isocom Interrupter Module

Fig.	Circuit	Output Type	Output Current I_F @ mA	BV_{CEO}	Typ. t_{on}/t_{off} (µsec.)	Digi-Key Part No.	Pricing 1	10	100	500
2	B	Transistor	20 @ 1.0	30	8/50	H21A1IS-ND	1.66	15.77	141.10	622.50

QT Optoelectronics Semiconductor Interrupter Modules

Fig.	Circuit	Output Type	Gap Current I_C @ I_f (mA)	Slot Width (mm)	Lead Spacing (mm)	Digi-Key Part No.	Pricing 1	10	100	500
5	A	Darlington	3/15 @ 5mA	3.99	10.16	QCK4QT-ND	2.00	18.80	172.00	760.00
3	B	Transistor	1/4 @ 20mA	3.18	5.59	QVA11134QT-ND	1.18	11.05	101.05	446.50
3	B	Transistor	1/4 @ 20mA	3.18	7.62	QVA11234QT-ND	1.18	11.05	101.05	446.50
3	B	Transistor	1/4 @ 20mA	3.18	8.13	QVA11334QT-ND	1.18	11.05	101.05	446.50
2	B	Transistor	1/4 @ 20mA	3.18	5.59	QVB111134QT-ND	1.18	11.05	101.05	446.50
2	B	Transistor	1/4 @ 20mA	3.18	7.62	QVB11234QT-ND	1.18	11.05	101.05	446.50
2	B	Transistor	1/4 @ 20mA	3.18	8.13	QVB11334QT-ND	1.18	11.05	101.05	446.50
4	C	Transistor	.5/- @ 20mA	3.81	7.62	QVE11233QT-ND	1.23	11.52	105.35	465.50
1	B	Transistor	1.9/3.0 @ 30mA	3.02	7.24	H21A1QT-ND	1.00	9.40	86.00	380.00
3	B	Transistor	1.9/3.0 @ 30mA	3.02	7.24	H22A1QT-ND	1.00	9.40	86.00	380.00
1	A	Darlington	7.5/- @ 10mA	3.02	7.24	H21B1QT-ND	1.43	13.40	122.55	541.50
3	A	Darlington	7.5/- @ 10mA	3.15	7.24	H22B1QT-ND	1.43	13.40	122.55	541.50

QT Optoelectronics Semiconductor Matched Emitter Detector Pairs

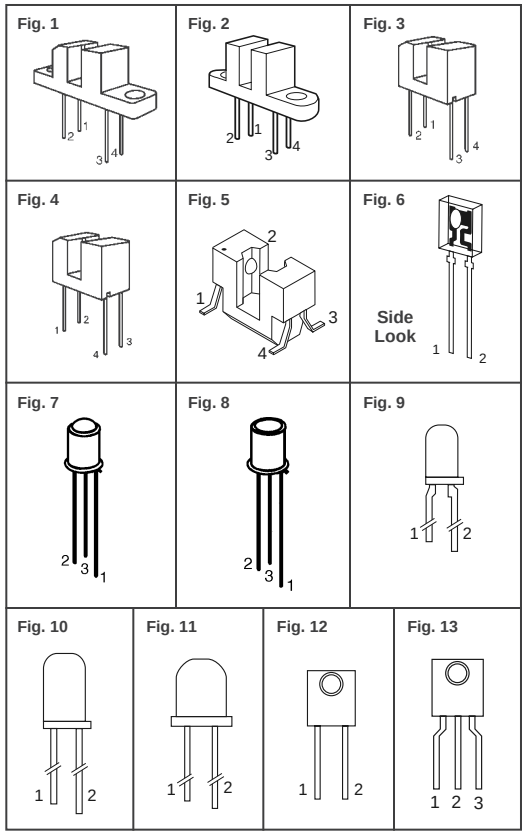
Fig.	Circuit	Output Type	Ic Min (mA)	Forward Voltage	Separation (mm)	Digi-Key Part No.	Pricing 1	10	100	500
6	F	Transistor	1.5	1.7	3.94	H23A1QT-ND	.93	8.70	79.55	351.50
6	G	Darlington	7.5	1.7	3.94	H23B1QT-ND	1.03	9.64	88.15	389.50

QT Optoelectronics Semiconductor Infrared Photo Detectors

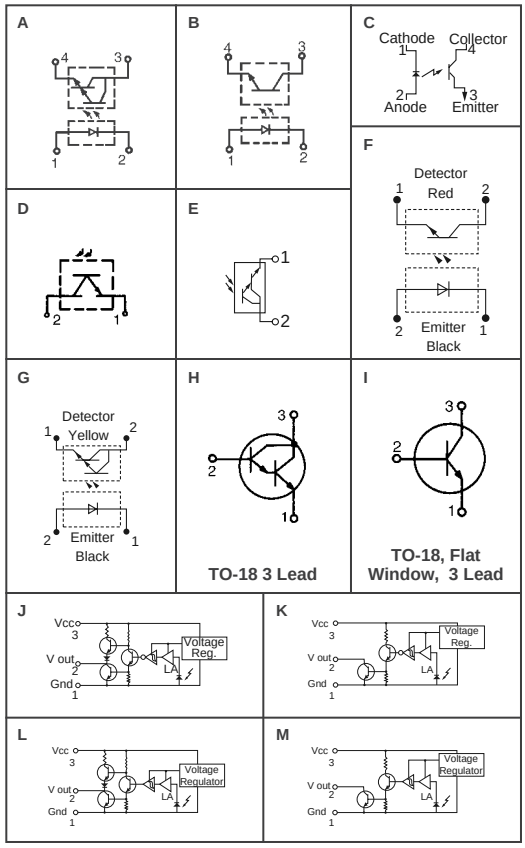
Fig.	Circuit	BV_{CEO} (V)	Min. Ic @ 5Vce (mA)	Rise/Fall (µ sec)	Reception Angle +/-	Peak Wave-Length Sensitivity	Digi-Key Part No.	Pricing 1	10	100	500
7	I	45	6	8/7	—	880	BPW36QT-ND	1.63	15.28	139.75	617.50
7	I	45	3	8/7	—	880	BPW37QT-ND	1.50	14.10	129.00	570.00
8	I	50	1	5/5	60	880	L14C1QT-ND	1.63	15.28	139.75	617.50
8	I	50	0.5	5/5	60	880	L14C2QT-ND	1.50	14.10	129.00	570.00
7	I	45	6	8/7	—	880	L14G1QT-ND	1.63	15.28	139.75	617.50
7	I	45	3	8/7	—	880	L14G2QT-ND	1.50	14.10	129.00	570.00
7	I	45	12	8/7	—	880	L14G3QT-ND	1.75	16.45	150.50	665.00
8	I	30	3	10/12	30	880	L14N1QT-ND	1.70	15.98	146.20	646.00
8	I	30	6	14/16	30	880	L14N2QT-ND	1.75	16.45	150.50	665.00
7	I	30	4	10/12	12	880	L14P1QT-ND	1.80	16.92	154.80	684.00
7	I	30	8	14/16	12	880	L14P2QT-ND	1.85	17.39	159.10	703.00
6	D	30	1	8/50	—	880	L14Q1QT-ND	.33	3.06	27.95	123.50
7	H	25	3	300/250	8	880	BPW38QT-ND	2.20	20.68	189.20	836.00
7	H	25	3	300/250	8	880	L14F1QT-ND	2.20	20.68	189.20	836.00
7	H	25	1	300/250	8	880	L14F2QT-ND	2.08	19.51	178.45	788.50
6	E	30	5	45/250	—	880	L14R1QT-ND	.55	5.17	47.30	209.00
9	D	30	1	5/5	8	880	QSC112QT-ND	.40	3.76	34.40	152.00
9	D	30	2	5/5	8	880	QSC113QT-ND	.43	4.00	36.55	161.50
9	D	30	4	5/5	8	880	QSC114QT-ND	.48	4.47	40.85	180.50
10	D	30	1.6	7/7	12	880	QSD122QT-ND	.40	3.76	34.40	152.00
10	D	30	3.2	7/7	12	880	QSD123QT-ND	.43	4.00	36.55	161.50
10	D	30	7.5	7/7	12	880	QSD124QT-ND	.45	4.23	38.70	171.00
11	D	30	0.3	8/8	25	880	QSD422QT-ND	.68	6.35	58.05	256.50
11	D	30	0.8	8/8	25	880	QSD423QT-ND	.70	6.58	60.20	266.00
11	D	30	1.6	8/8	25	880	QSD424QT-ND	.73	6.82	62.35	275.50
11	D	30	1.2	8/8	12	880	QSD722QT-ND	.68	6.35	58.05	256.50
11	D	30	3	8/8	12	880	QSD723QT-ND	.70	6.58	60.20	266.00
12	D	30	0.32	8/8	8	880	QSE112QT-ND	.60	5.64	51.60	228.00
12	D	30	0.64	8/8	8	880	QSE113QT-ND	.33	3.06	27.95	123.50
12	D	30	1.28	8/8	8	880	QSE114QT-ND	.35	3.29	30.10	133.00

QT Optoelectronics Logic Detectors

Fig.	Circuit	Output Type	VCC	Isink (mA)	Isource (mA)	Rise/Fall (ns)	Reception Angle +/-	Peak Wavelength Sensitivity	Digi-Key Part No.	Pricing 1	10	100	500
13	J	T.P. BUFF	4.5 - 16	50	10	70	25	935	QSE156QT-ND	1.58	14.81	135.45	598.50
13	K	T.P. INV.	4.5 - 16	50	10	70	25	935	QSE157QT-ND	1.58	14.81	135.45	598.50
13	L	O.C. BUFF	4.5 - 16	50	—	100	25	935	QSE158QT-ND	1.58	14.81	135.45	598.50
13	M	O.C. INV.	4.5 - 16	50	—	100	25	935	QSE159QT-ND	1.58	14.81	135.45	598.50



Circuits



OPTREX DOT MATRIX Type LCD Modules

FEATURES:

- Interface with 8-bit or 4-bit MPU is available.
- 192 kinds of characters, numerals, symbols and special characters can be displayed by built-in character generator (ROM).
- Other preferred characters can be displayed by character generator (RAM).
- Various functions of instruction are available by programming: clear display, cursor at home, on/off cursor, blink character, shift display, shift cursor, read/write display data, etc.
- Compact and lightweight design.
- Low power consumption.

Standard Pin Connections

Pin No.	Symbol	Pin No.	Symbol
1	Vss	8	DB1
2	Vcc	9	DB2
3	VEE	10	DB3
4	RS	11	DB4
5	R/W	12	DB5
6	E	13	DB6
7	DB0	14	DB7

40x4 Pin Connections

Pin No.	Symbol	Pin No.	Symbol	Pin No.	Symbol
1	DB7	7	DB1	13	Vss
2	DB6	8	DB0	14	Vcc
3	DB5	9	E1	15	E2
4	DB4	10	R/W	16	NC
5	DB3	11	RS	17	K
6	DB2	12	VEE	18	A

Optrex Numbering System

DMC – 50000 N Y H U – S E B 1

1 2 3 4 5 6 7 8 9 10

1. Type of Display: Character Dot Matrix
2. Development Number: Successive Number (3 digits to 5 digits)
3. LCD TYPE: Nil = TN N = STN
4. Background Color: Nil = Neutral Y = Yellow B = Blue K = Dark Blue
5. Operating Temp.: Nil = Normal H = Extended
6. Viewing Direction: Nil = 6:00 U = 12:00 L = 9:00 R = 3:00
7. Display Mode: Nil = Reflective, Transmissive with Backlight S = Transflective T = Transmissive without Backlight
8. Backlight: Nil = Without Backlight E = EL L = LED
9. Backlight Color: Nil = Without Backlight W = White B = Blue Y = Yellow
10. Supplemented Specification: Successive Number (No. 1 to 99)

Inverter Needed	Display Format	Matching Bezel ‡	Character Format	Outline Dim. W x H x D (mm)	Viewing Area W x H (mm)	Character Size W x H (mm)	Dot Size W x H (mm)	Operating Temp. (°C)	Storage Temp. (°C)	Supply Volt. (V)	Digi-Key Part No.	Price Each 1	Price Each 100	Optrex Part No.
Standard LCD Dot Matrix Modules (Data Book Sold Separately)														
—	16x1	PRD250LPW1-ND	5x8 dots	80 x 36 x 10	64.5 x 13	3.2 x 5.95	.6 x .7	0 to +50	-20 to +70	5	73-1012-ND	12.88	9.36	DMC-16117A
—	16x1	PRD250LPW1-ND	5x7 CURS	122 x 33 x 11	99 x 13	4.84 x 9.66	.92 x 1.1	0 to +50	-20 to +70	5	73-1013-ND	20.20	14.68	DMC-16128
—	16x1	PRD250LPW1-ND	5x7 CURS	122 x 33 x 11	99 x 13	4.84 x 9.66	.92 x 1.1	0 to +50	-20 to +70	5	73-1015-ND	22.36	16.24	DMC-16129
—	16x2	PRD250LPW-ND	5x8 dots	80 x 40 x 10.9	59.5 x 16	2.95 x 5.55	.55 x .65	0 to +50	-20 to +70	5	73-1033-ND	18.86	13.70	DMC-16204
—	16x2	PRD250LPW-ND	5x8 dots	84 x 44 x 11	61 x 16	2.95 x 5.55	.55 x .55	0 to +50	-20 to +70	5	73-1025-ND	19.18	13.93	DMC-16207
—	16x2	PRD250LPW-ND	5x8 dots	84 x 44 x 11	61 x 16	2.95 x 5.55	.55 x .55	-20 to +70	-30 to +80	+5, -7	73-1036-ND	19.40	14.09	DMC-16207H
—	16x2	PRD250LPW-ND	5x8 dots	84 x 44 x 11	61 x 16	2.95 x 5.55	.55 x .55	0 to +50	-20 to +70	5	73-1054-ND	17.50	12.71	DMC-16207U
—	16x2	PRD250LPW-ND	5x7 CURS	122 x 44 x 11	99 x 24	4.84 x 9.66	.92 x 1.1	0 to +50	-20 to +70	5	73-1026-ND	22.90	16.64	DMC-16230
—	16x2	PRD250LPW-ND	5x7 CURS	122 x 44 x 11	99 x 24	4.84 x 9.66	.92 x 1.1	-20 to +70	-30 to +80	+5, -7	73-1041-ND	28.22	20.51	DMC-16230H
—	16x2	PRD250LPW-ND	5x7 CURS	122 x 44 x 11	99 x 24	4.84 x 9.66	.92 x 1.1	0 to +50	-20 to +70	5	73-1030-ND	22.90	16.64	DMC-16230U
—	16x2	PRD250LPW-ND	5x8 dots	80 x 36 x 11	64.5 x 13.8	2.95 x 4.35	.55 x .5	0 to +50	-20 to +70	5	73-1037-ND	16.62	12.07	DMC-16249B
—	16x2	PRD250LPW-ND	5x8 dots	80 x 36 x 11	64.5 x 13.8	2.95 x 4.35	.55 x .5	0 to +50	-20 to +70	5	73-1039-ND	16.62	12.07	DMC-16249UB
—	16x4	N/A	5x8 dots	87 x 60 x 11	61.8 x 25.2	2.95 x 4.75	.55 x .55	0 to +50	-20 to +70	5	73-1080-ND	35.02	25.44	DMC-16433
—	16x4	N/A	5x8 dots	87 x 60 x 11	61.8 x 25.2	2.95 x 4.75	.55 x .55	-20 to +70	-30 to +80	+5, -7	73-1108-ND	35.02	25.44	DMC-16433H
—	20x1	N/A	5x7 CURS	182 x 33.5 x 12.7	154 x 15.3	6.7 x 11.5	1.3 x 1.3	0 to +50	-20 to +70	5	73-1021-ND	30.93	24.78	DMC-20171
—	20x2	PRD360LPW-ND	5x8 dots	116 x 37 x 11	83 x 18.6	3.2 x 5.55	.6 x .65	0 to +50	-20 to +70	5	73-1056-ND	29.56	21.48	DMC-20261
—	20x2	PRD360LPW-ND	5x8 dots	116 x 44 x 11	83 x 18.6	3.2 x 5.55	.6 x .65	0 to +50	-20 to +70	5	73-1055-ND	22.90	16.64	DMC-20215A
—	20x2	PRD360LPW-ND	5x8 dots	116 x 37 x 11	83 x 18.6	3.2 x 5.55	.6 x .65	0 to +50	-20 to +70	5	73-1058-ND	24.24	17.61	DMC-50218
—	24x2	PRD360LPW1-ND	5x8 dots	118 x 36 x 11	93.5 x 15.8	3.2 x 5.55	.6 x .65	0 to +50	-20 to +70	5	73-1064-ND	26.94	19.57	DMC-24227
—	40x2	N/A	5x8 dots	182 x 33.5 x 11	152 x 16.5	3.2 x 5.55	.6 x .65	0 to +50	-20 to +70	5	73-1069-ND	43.10	31.31	DMC-40218
—	40x4	N/A	5x8 dots	190 x 54 x 11	147 x 29.5	2.78 x 4.89	.5 x .55	0 to +50	-20 to +70	5	73-1099-ND	83.52	60.69	DMC-40457
Supertwist LCD Modules (Data Book Sold Separately)														
—	8x2	N/A	5x8 dots	40 x 35.4 x 8.2	30.4 x 13.9	2.95 x 4.75	.55 x .55	0 to +50	-20 to +70	5	73-1106-ND	13.50	9.81	DMC-50448N
—	16x2	PRD250LPW-ND	5x7 dots	64.2 x 27.6 x 2.2	56.2 x 12.7	5.2 x 2.6	.48 x .7	0 to +50	-20 to +70	+3,-7	73-1177-ND	15.08	10.96	DMC-50747NF
—	16x2	PRD250LPW-ND	5x8 dots	84 x 44 x 11	61 x 16	2.95 x 5.55	.55 x 65	0 to +50	-20 to +70	5	73-1044-ND	22.90	16.64	DMC-16207N
—	16x2	PRD250LPW-ND	5x7 CURS	122 x 44 x 11	99 x 24	4.84 x 9.66	.92x 1.10	0 to +50	-20 to +70	5	73-1028-ND	25.60	18.60	DMC-16230N
—	16x2	PRD250LPW-ND	5x8 dots	80 x 36 x 11	64.5 x 13.8	2.95 x 4.35	.55x .50	0 to +50	-20 to +70	5	73-1038-ND	19.76	14.36	DMC-16249N
—	16x4	N/A	5x8 dots	87 x 60 x 11	61.8 x 25.2	2.95 x 4.75	.55 x .55	0 to +50	-20 to +70	5	73-1083-ND	37.72	27.40	DMC-16433N
—	20x2	PRD360LPW-ND	5x8 dots	116 x 37 x 11	83 x 18.6	3.2 x 5.55	.6 x .65	0 to +50	-20 to +70	5	73-1060-ND	23.94	19.18	DMC-20261N
—	20x4	N/A	5x8 dots	98 x 60 x 11	76 x 25.2	2.95 x 4.75	.55 x .55	0 to +50	-20 to +70	5	73-1091-ND	48.72	35.41	DMC-20434N
—	40x4	N/A	5x8 dots	190 x 54 x 10	147 x 29.5	2.78 x 4.89	.5 x .55	0 to +50	-20 to +70	5	73-1102-ND	86.20	62.63	DMC-40457N
High Contrast Supertwist LCD Modules (Data Book Sold Separately)														
—	16x2	PRD250LPW-ND	5x8 dots	84 x 44 x 11	61 x 16	2.95 x 5.55	.55 x .65	0 to +50	-20 to +70	5	73-1045-ND	22.90	16.64	DMC-16207N-B
—	16x4	N/A	5x8 dots	87 x 60 x 11	61.8 x 25.2	2.95 x 4.75	.55 x .55	0 to +50	-20 to +70	5	73-1084-ND	28.93	23.19	DMC-16433N-B
—	20x2	PRD360LPW-ND	5x8 dots	116 x 37 x 11	83 x 18.6	3.2 x 5.55	.6 x .65	0 to +50	-20 to +70	5	73-1061-ND	24.76	17.99	DMC-50218N-B
—	20x4	N/A	5x8 dots	98.5 x 60 x 11	76 x 25.2	2.95 x 4.75	.55 x .55	0 to +50	-20 to +70	5	73-1092-ND	44.70	32.47	DMC-20434N-B
—	24x2	PRD360LPW1-ND	5x8 dots	118 x 36 x 11	93.5 x 15.8	3.2 x 5.55	.6 x .65	0 to +50	-20 to +70	5	73-1066-ND	28.28	20.55	DMC-24227N-B
Supertwist LCD Modules With Yellow LED Backlighting (Data Book Sold Separately)														
—	16x1	PRD250LPW1-ND	5x7 CURS	122 x 33 x 15.7	99 x 13	4.84 x 9.66	.92 x 1.10	0 to +50	-20 to +70	5	73-1011-ND	30.98	22.52	DMC-16128NY-LY
—	16x1	PRD250LPW1-ND	5x8 dots	80 x 36 x 15	64.5 x 13	3.2 x 5.85	.6 x .7	0 to +50	-20 to +70	5	73-1018-ND	26.94	19.57	DMC-16105NY-LY
—	16x1	PRD250LPW1-ND	5x8 dots	151 x 40 x 14.2	120 x 23	6.0 x 14.54	1.152 x 1.76	0 to +50	-20 to +70	5	73-1014-ND	63.30	45.99	DMC-16188NY-LY
—	16x2	PRD250LPW-ND	5x8 dots	84 x 45 x 15.1	61 x 16	2.95 x 5.55	.55 x .65	0 to +50	-20 to +70	5	73-1048-ND	26.94	19.57	DMC-16202NY-LY
—	16x2	PRD250LPW-ND	5x8 dots	80 x 40 x 16.1	59.5 x 16	2.95 x 5.55	.55 x .65	0 to +50	-20 to +70	5	73-1034-ND	22.90	16.64	DMC-16204NY-LY
—	16x2	PRD250LPW-ND	5x8 dots	88 x 34 x 16.1	59.5 x 16	2.95 x 5.55	.55 x .65	0 to +50	-20 to +70	5	73-1035-ND	26.94	19.57	DMC-16205NY-LY
—	16x2	PRD250LPW-ND	5x7 CURS	122 x 44 x 14.6	99 x 24	4.84 x 9.66	.92 x 1.1	0 to +50	-20 to +70	5	73-1051-ND	35.02	25.44	DMC-16230NY-LY
—	16x2	PRD250LPW-ND	5x7 CURS	122 x 44 x 14.6	99 x 24	4.84 x 9.66	.92 x 1.1	0 to +50	-20 to +70	5	73-1053-ND	35.02	25.44	DMC-16230NYU-LY
—	20x2	PRD360LPW-ND	5x8 dots	116 x 37 x 15.7	83 x 18.6	3.2 x 5.55	.6 x .65	0 to +50	-20 to +70	5	73-1062-ND	35.02	25.44	DMC-20261NY-LY

Inverter Needed	Display Format	Matching Bezel ‡	Character Format	Outline Dim. W x H x D (mm)	Viewing Area W x H (mm)	Character Size W x H (mm)	Dot Size W x H (mm)	Operating Temp. (°C)	Storage Temp. (°C)	Supply Volt. (V)	Digi-Key Part No.	Price Each 1	Price Each 100	Optrex Part No.
—	20x4	N/A	5x8 dots	98.5 x 61 x 15.6	76 x 25.2	2.95 x 4.75	.55 x .55	0 to +50	-20 to +70	5	73-1094-ND	45.80	33.28	DMC-20481NY-LY
—	20x4	N/A	5x8 dots	98.5 x 61 x 15.6	76 x 25.2	2.95 x 4.75	.55 x .55	0 to +50	-20 to +70	5	73-1097-ND	45.80	33.28	DMC-20481NYU-LY
—	40x2	N/A	5x8 dots	182 x 34.5 x 15.1	152.5 x 16.5	3.2 x 5.55	.6 x .65	0 to +50	-20 to +70	5	73-1076-ND	71.40	51.87	DMC-40267NY-LY
—	40x2	N/A	5x8 dots	182 x 34.5 x 15.1	152.5 x 16.5	3.2 x 5.55	.6 x .65	-20 to +70	-30 to +80	+5, -7	73-1078-ND	71.40	51.87	DMC-40267NYJ-LY
High Contrast Supertwist LCD Modules with Yellow LED Backlighting (Data Book Sold Separately)														
—	16x2	PRD250LPW-ND	5x8 dots	84 x 45 x 15.1	61 x 16	2.95 x 5.55	.55 x .65	0 to +50	-20 to +70	5	73-1047-ND	26.94	19.57	DMC-16202N-LY-B
—	16x2	PRD250LPW-ND	5x8 dots	84 x 45 x 15.1	61 x 16	2.95 x 5.55	.55 x .65	0 to +50	-20 to +70	5	73-1043-ND	26.94	19.57	DMC-16202NY-LY1
—	16x2	PRD250LPW-ND	5x8 dots	84 x 45 x 15.1	61 x 16	2.95 x 5.55	.55 x .65	-20 to +70	-30 to +80	+5, -7	73-1032-ND	26.94	19.57	DMC-16202NYJ-LY-D
—	16x2	PRD250LPW-ND	5x7 CURS	122 x 44 x 14.6	99 x 24	4.84 x 9.66	.92 x 1.10	0 to +50	-20 to +70	5	73-1052-ND	36.36	26.42	DMC-16230NY-LY-B
—	16x2	PRD250LPW-ND	5x7 CURS	122 x 44 x 14.6	99 x 24	4.84 x 9.66	.92 x 1.10	-20 to +70	-30 to +80	+5, -7	73-1050-ND	37.72	27.41	DMC-16230NYJ-LYD
—	20x2	PRD360LPW-ND	5x8 dots	116 x 37 x 15.7	83 x 18.6	3.20 x 5.55	.60 x .65	0 to +50	-20 to +70	5	73-1057-ND	35.02	25.44	DMC-20261ANY-LYB
—	20x2	PRD360LPW-ND	5x8 dots	116 x 37 x 15.7	83 x 18.6	3.20 x 5.55	.60 x .65	-20 to +70	-30 to +80	+5, -7	73-1063-ND	35.02	25.44	DMC-20261NYJ-LY-D
—	20x4	N/A	5x8 dots	98.5 x 61 x 15.6	76 x 25.2	2.95 x 4.75	.55 x .55	0 to +50	-20 to +70	5	73-1095-ND	45.80	33.28	DMC-20481NY-LY-B
—	24x2	PRD360LPW1-ND	5x8 dots	121.5 x 33.5 x 16.1	93.5 x 15.8	3.2 x 5.55	.6 x .65	0 to +50	-20 to +70	5	73-1024-ND	48.70	35.38	DMC-50149NYU-LY-B
—	40x2	N/A	5x8 dots	182 x 34.5 x 15.1	147.5 x 11.5	3.2 x 5.55	.6 x .65	0 to +50	-20 to +70	5	73-1179-ND	64.66	46.98	DMC-40202NY-LY-B
—	40x2	N/A	5x8 dots	182 x 34.5 x 15.1	152.5 x 16.5	3.2 x 5.55	.6 x .65	0 to +50	-20 to +70	5	73-1072-ND	49.82	39.92	DMC-40267NY-SLYB
—	40x4	N/A	5x8 dots	190 x 54 x 13.6	147 x 29.5	2.78 x 4.89	.5 x .55	0 to +50	-20 to +70	5	73-1101-ND	113.00	82.10	DMC-40457NY-LY-B
Standard LCD Modules With Blue-Green EL Backlighting (must order inverter) (Data Book Sold Separately)														
73-1173-ND	16x4	N/A	5x8 dots	87 x 60 x 11	61.8 x 25.5	2.95 x 4.75	.55 x .55	0 to +50	-20 to +70	5	73-1081-ND	31.92	25.58	DMC-16433E
73-1173-ND	20x4	N/A	5x8 dots	98 x 60 x 11	76 x 25.2	2.95 x 4.75	.55 x .55	0 to +50	-20 to +70	5	73-1087-ND	49.84	36.22	DMC-20434E
73-1173-ND	20x4	N/A	5x8 dots	98 x 60 x 11	76 x 25.2	2.95 x 4.75	.55 x .55	-20 to +70	-30 to +80	+5, -7	73-1090-ND	52.54	38.17	DMC-20434HE
High Contrast Supertwist LCD Modules With Blue-Green EL Backlighting (must order inverter) (Data Book Sold Separately)														
73-1172-ND	16x2	PRD250LPW-ND	5x8 dots	84 x 44 x 11	61 x 16	2.95 x 5.55	.55 x .55	0 to +50	-20 to +70	5	73-1040-ND	29.64	21.53	DMC-16207N-EB
73-1173-ND	16x2	PRD250LPW-ND	5x7 CURS	122 x 44 x 11	99 x 24	4.84 x 9.66	.92 x 1.1	0 to +50	-20 to +70	5	73-1046-ND	35.02	25.44	DMC-16230N-EB
73-1173-ND	20x4	N/A	5x8 dots	98 x 60 x 11	76 x 25.2	2.95 x 4.75	.55 x .55	0 to +50	-20 to +70	5	73-1088-ND	59.30	43.08	DMC-20434N-EB
73-1172-ND	24x2	PRD360LPW1-ND	5x8 dots	118 x 36 x 11	93.5 x 15.8	3.2 x 5.55	.6 x .65	0 to +50	-20 to +70	5	73-1067-ND	33.68	24.47	DMC-24227N-EB
73-1171-ND	40x2	N/A	5x8 dots	182 x 33.5 x 11	152 x 16.5	3.2 x 5.55	.6 x .65	0 to +50	-20 to +70	5	73-1071-ND	57.92	42.09	DMC-40218N-EB
73-1174-ND	40x4	N/A	5x8 dots	190 x 54 x 11	147 x 29.5	2.78 x 4.89	.5 x .55	0 to +50	-20 to +70	5	73-1100-ND	108.00	78.46	DMC-40457N-EB
Supertwist LCD Modules With White EL Backlighting (must order inverter) (Data Book Sold Separately)														
73-1173-ND	20x4	N/A	5x8 dots	98 x 60 x 11	76 x 25.2	2.95 x 4.75	.55 x .55	0 to +50	-20 to +70	5	73-1093-ND	59.30	43.08	DMC-20434N-SEW
High Contrast Supertwist LCD Modules With White EL Backlighting (must order inverter) (Data Book Sold Separately)														
73-1173-ND	16x4	N/A	5x8 dots	87 x 60 x 11	61.8 x 25.5	2.95 x 4.75	.55 x .55	0 to +50	-20 to +70	5	73-1109-ND	44.46	32.31	DMC-16433N-SEW-B
73-1171-ND	40x2	N/A	5x8 dots	182 x 33.5 x 11	152 x 16.5	3.2 x 5.55	.6 x .65	0 to +50	-20 to +70	5	73-1075-ND	43.89	35.17	DMC-40218N-SEW-B
Inverters For EL Backlighting (Converts 5 VDC to 100 VAC 400Hz) (Data Book Sold Separately)														
Inverter for use with EL Backlit Character Modules											73-1171-ND	10.01	—	INV-TH-203 (2)
Inverter for use with EL Backlit Character Modules											73-1173-ND	8.71	—	INV-TH-202 (2)
Inverter for use with EL Backlit Character Modules											73-1174-ND	9.43	—	INV-TH-204 (2)
Optrex Data Book											73-1001-ND	2.42	—	—

‡ Bezels can be found under PRD Plastics in the manufacture index.

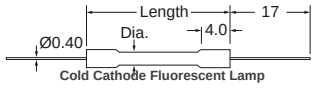
JKL COMPONENTS CORPORATION

Cold Cathode Fluorescent Lamps

Dia. (mm)	Length (mm)	Start Volt (V)	Lamp Volt (V)	Lamp Curr. (mA)	Intensity (nt)	Digi-Key Part No.	Price Each 1	Price Each 10	Price Each 50	JKL Part No.
3.2	25	400	165	5	19,000	289-1002-ND	10.29	9.31	7.84	BF325-22B
3.2	50	500	195	5	28,000	289-1003-ND	10.29	9.31	7.84	BF350-20B
3.2	86	540	220	5	28,000	289-1004-ND	10.29	9.31	7.84	BF386-20B
3.2	100	665	270	5	28,000	289-1005-ND	10.29	9.31	7.84	BF3100-20B
3.2	160	850	345	5	28,000	289-1006-ND	10.29	9.31	7.84	BF3160-20B
3.2	228	1150	460	5	28,000	289-1007-ND	10.29	9.31	7.84	BF3228-21B
3.2	250	1200	520	5	28,000	289-1008-ND	10.29	9.31	7.84	BF3250-20B
5.6	118	600	305	5	7,000	289-1009-ND	10.29	9.31	7.84	BF5118-20B
5.6	200	850	445	5	7,000	289-1010-ND	10.29	9.31	7.84	BF5200-20B
6.5	50	390	170	5	6,500	289-1011-ND	10.29	9.31	7.84	BF650-20B
6.5	100	550	230	5	6,500	289-1012-ND	10.29	9.31	7.84	BF6100-20B
6.5	150	600	250	5	6,500	289-1013-ND	10.29	9.31	7.84	BF6150-20B
6.5	178	650	270	5	6,500	289-1014-ND	10.29	9.31	7.84	BF6178-20B
6.5	200	680	290	5	6,500	289-1015-ND	10.29	9.31	7.84	BF6200-20B
6.5	225	750	340	5	6,500	289-1016-ND	10.29	9.31	7.84	BF6225-20B
6.5	262	850	350	5	6,500	289-1017-ND	10.29	9.31	7.84	BF6262-20A

Narrow Spectrum Ultraviolet Lamps

Dia. (mm)	Length (mm)	Start Volt (V)	Lamp Volt (V)	Watts @ 5mA	Output uW/cm2@1"	Digi-Key Part No.	Price Each 1	Price Each 10	Price Each 50	JKL Part No.
3.0	25	350	140	0.70	0.30	289-1018-ND	10.29	9.31	7.84	BF325-UV1
3.0	50	500	195	0.98	0.30	289-1019-ND	10.29	9.31	7.84	BF350-UV1
3.0	100	675	270	1.35	0.25	289-1020-ND	10.29	9.31	7.84	BF3100-UV1
3.0	120	865	280	1.35	0.25	289-1021-ND	10.29	9.31	7.84	BF3120-UV1
3.0	240	950	500	2.50	0.25	289-1022-ND	10.29	9.31	7.84	BF3240-UV1
9.0	59	375	150	0.75	0.15	289-1023-ND	10.29	9.31	7.84	BF959-UV1/3



Cold Cathode Fluorescent Lamp

Inverters for CCFL & UV Lamps

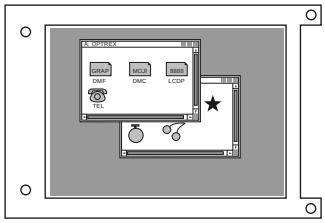
Input Volt (V)	Output Volt (V)	Output Curr. (mA)	Digi-Key Part No.	Price Each 1	Price Each 10	Price Each 50	JKL Part No.
5	700	5	289-1024-ND	15.12	13.86	11.97	BXA-501/KIT
12	850	5	289-1025-ND	15.12	13.86	11.97	BXA-12529
12	1500	5	289-1026-ND	15.12	13.86	11.97	BXA-12579/INV
24	1000	5	289-1027-ND	15.12	13.86	11.97	BXA-24529
Accessories							
Input connector assembly for BXA-12579/INV			289-1037-ND	2.00	—	—	BXA-12580/CONN
Output connector assembly for BXA-12579/INV			289-1038-ND	2.50	—	—	BXA-12581/CONN

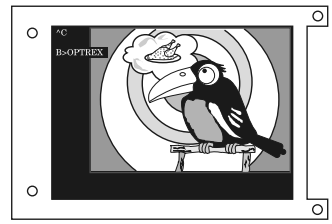
Digi-Key Part No.	Price Each 1	Price Each 10	Price Each 50	JKL Part No.
289-1028-ND	12.20	10.98	9.76	NDL-201
289-1029-ND	12.20	10.98	9.76	NDL-202
289-1030-ND	12.20	10.98	9.76	NDL-203
289-1031-ND	11.90	10.71	9.52	NDL-204
289-1032-ND	11.90	10.71	9.52	NDL-205
289-1033-ND	11.20	10.08	8.96	NDL-217
289-1034-ND	27.72	24.95	22.18	BXA-12562-6M
289-1035-ND	24.72	22.25	19.78	BXA-12564-6M
289-1036-ND	25.76	23.19	20.61	BXA-12565-6M

OPTREX Supertwist® LCD Graphic Modules

Color Display: 73-1178-ND

FEATURES: • Low voltage drive and low power consumption • Compact, light, and thin • Graphic, Figure, and Character display • STN fluid allows high contrast and wide viewing angle • Large area display like CRT





APPLICATIONS:

- Personal Computer
- Musical Instrument
- Word Processor
- Electronic Typewriter
- Copying Machine
- Instrument Device
- Telecommunication Equipment
- POS Terminal
- Fish Finder
- Oscillograph
- Medical Instrument
- Other Peripherals

Optrex Numbering System

DMF – 50000 N Y U – S E B 1

(1 = DMF, 2 = 50000, 3 = N, 4 = Y, 5 = U, 6 = S, 7 = E, 8 = B, 9 = 1)

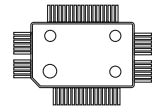
1. Type of Display: Full Dot Matrix
2. Development Number: Successive Number (3 digits to 5 digits)
3. LCD TYPE: Nil = TN N = STN
4. Background Color: Nil = Neutral B = Blue C = Color; F = FSTN K = Dark Blue; W = DSTN Y = Yellow
5. Viewing Direction: Nil = 6:00 U = 12:00 L = 9:00 R = 3:00
6. Display Mode: Nil = Reflective, Transmissive with Backlight; S = Transflective; T = Transmissive without Backlight
7. Backlight: Nil = Without Backlight; E = EL F = CFL L = LED
8. Backlight Color: Nil = Without Backlight B = Blue; W = White Y = Yellow
9. Supplemented Specification: Successive Number (No. 1 to 99)

Controller Needed	Inverter Needed	Dot Pixels W x H	Outline Dim. (mm) W x H x D	Viewing Area (mm) W x H	Dot Size (mm) W x H	Dot Pitch (mm) W x H	Display Type	Digi-Key Part No.*	Price Each 1	Price Each 100	Optrex Part No.
N/A	73-1174-ND	128 x 64	78 x 74.2 x 10.3	62 x 44	.40 x .56	.44 x .60	EL Backlighting	73-1159-ND	63.30	46.00	DMF-697N-EW
N/A	73-1174-ND	128 x 64	78 x 74.2 x 10.3	62 x 44	.40 x .56	.44 x .60	EL Backlighting	73-1162-ND	63.30	46.00	DMF-697NYJ-SEW
N/A	73-1171-ND	128 x 64	78 x 80 x 10.3	62 x 44	.40 x .56	.44 x .60	EL Backlighting	73-1123-ND	67.34	48.92	DMF-50051N-SEW
Built-in	—	160 x 128	129 x 102 x 12.8	101 x 82	.54 x .54	.58 x .58	LED Backlighting	73-1181-ND	161.64	117.44	DMF-5001NY-LY
Built-in	73-1113-ND	160 x 128	152 x 112 x 23	101 x 82	.54 x .54	.58 x .58	CFL Backlighting	73-1117-ND	168.38	122.34	DMF-5003NB-FW
Built-in	73-1113-ND	160 x 128	152 x 112 x 23	101 x 82	.54 x .54	.58 x .58	CFL Backlighting	73-1120-ND	171.06	124.28	DMF-5003NF-FW
Built-in	—	240 x 64	180 x 65 x 12	132 x 39	.49 x .49	.53 x .53	Reflective	73-1156-ND	113.14	82.20	DMF-5005N
Built-in	73-1176-ND	240 x 64	180 x 65 x 12	132 x 39	.49 x .49	.53 x .53	EL Backlighting	73-1118-ND	123.92	90.03	DMF-5005N-EB
Built-in	73-1176-ND	240 x 64	180 x 65 x 12	132 x 39	.49 x .49	.53 x .53	EL Backlighting	73-1119-ND	123.92	90.03	DMF-5005N-EW
Built-in	73-1176-ND	240 x 64	180 x 65 x 12	132 x 39	.49 x .49	.53 x .53	EL Backlighting	73-1122-ND	126.62	91.99	DMF-5005NF-SEW
Built-in	—	240 x 64	180 x 65 x 17.6	132 x 39	.49 x .49	.53 x .53	LED Backlighting	73-1157-ND	126.62	91.99	DMF-5005NY-LY
Built-in	—	240 x 64	180 x 65 x 17.6	132 x 39	.49 x .49	.53 x .53	LED Backlighting	73-1126-ND	129.76	94.27	DMF-5005NYJ-LY
N/A	—	240 x 64	180 x 75 x 15	132 x 39	.48 x .48	.53 x .53	Reflective	73-1136-ND	107.73	86.32	DMF-633N
Built-in	73-1007-ND	240 x 64	200 x 66 x 23	132 x 39	.49 x .49	.53 x .53	CFL Backlighting	73-1131-ND	156.26	113.52	DMF-5010NB-FW
Built-in	73-1007-ND	240 x 64	200 x 66 x 23	132 x 39	.49 x .49	.53 x .53	CFL Backlighting	73-1132-ND	156.26	113.52	DMF-5010NBU-FW
Built-in	73-1007-ND	240 x 64	200 x 66 x 23	132 x 39	.49 x .49	.53 x .53	CFL Backlighting	73-1133-ND	158.94	115.47	DMF-5010NF-FW
Built-in	289-1026-ND	240 x 128	170 x 105 x 14	126 x 70	.47 x .47	.50 x .50	CFL Backlighting	73-1197-ND	188.58	137.00	DMF-50773NF-FW
E-1330BA	73-1176-ND	256 x 128	147 x 116 x 12	127 x 70	.43 x .43	.47 x .47	EL Backlighting	73-1145-ND	150.86	109.61	DMF-682ANY-EB
E-1330BA	73-1176-ND	256 x 128	147 x 116 x 12	127 x 70	.43 x .43	.47 x .47	EL Backlighting	73-1144-ND	150.86	109.61	DMF-682ANF-EW
E-1330BA	73-1007-ND	256 x 128	167 x 116 x 24	120.28 x 60.12	.43 x .43	.47 x .47	CFL Backlighting	73-1127-ND	177.80	129.17	DMF-6104NB-FW
E-1330BA	73-1007-ND	256 x 128	167 x 116 x 24	120.28 x 60.12	.43 x .43	.47 x .47	CFL Backlighting	73-1128-ND	180.50	131.14	DMF-6104NF-FW
Built-in	289-1025-ND	320 x 64	180 x 70 x 14	132 x 39	.50 x .50	.53 x .53	CFL Backlighting	73-1188-ND	148.16	107.65	DMF-50316NF-FW-1
E-1330BA	289-1025-ND	320 x 240	139 x 120 x 13.2	95.97 x 71.97	.27 x .27	.30 x .30	CFL Backlighting	73-1184-ND	151.50	110.06	DMF-50081ZNB-FW
N/A	73-1112-ND	320 x 240	47.1 x 127.1 x 12.3	119.0 x 90.0	.09 x .33	.12 x .36	CFL Backlighting	73-1178-ND	425.00	308.76	DMF-50944NCU-FW-1
E-1330BA	289-1025-ND	320 x 240	174 x 112 x 14	122 x 92	.33 x .33	.36 x .36	CFL Backlighting	73-1186-ND	145.48	105.69	DMF-50174ZNB-FW
E-1330BA	289-1025-ND	320 x 240	174 x 112 x 14	122 x 92	.33 x .33	.36 x .36	CFL Backlighting	73-1187-ND	164.34	119.40	DMF-50174ZNF-FW
E-1330BA	289-1024-ND	320 x 240	167.1 x 109 x 11	120 x 90	.33 x .33	.36 x .36	CFL Backlighting	73-1193-ND	126.26	91.74	DMF-50840NB-FW
E-1330BA	289-1024-ND	320 x 240	167.1 x 109 x 11	120 x 90	.33 x .33	.36 x .36	CFL Backlighting	73-1194-ND	133.76	97.18	DMF-50840NF-FW
E-1330BA	289-1026-ND	640 x 200	270 x 142 x 13.5	231 x 105	.32 x .46	.35 x .49	CFL Backlighting	73-1182-ND	390.62	283.80	DMF-50036ZNBU-FW
E-1330BA	289-1026-ND	640 x 200	270 x 142 x 13.5	231 x 105	.32 x .46	.35 x .49	CFL Backlighting	73-1183-ND	404.10	293.59	DMF-50036ZNFU-FW
Inverters for CFL Backlighting (Converts 12 VDC to 900VAC 30 KHz)											
Inverter for use with CFL Backlit Graphic Modules								73-1170-ND	21.58	—	CXAM10L-L
Inverter for use with CFL Backlit Graphic Modules								73-1007-ND	22.51	—	CXAL10L
Inverter for use with CFL Backlit Graphic Modules								73-1114-ND	30.75	—	S-12562-6M
Inverter for use with CFL Backlit Graphic Modules								73-1115-ND	26.07	—	S-12564
Inverter for use with CFL Backlit Graphic Modules								73-1112-ND	29.47	—	S-12565
Inverter for use with CFL Backlit Graphic Modules								73-1113-ND	22.04	—	CXA-1301
Inverters for EL Backlighting (Converts 5 VDC to 100VAC 400 Hz)											
Inverter for use with EL Backlit Graphic Modules								73-1171-ND	10.01	—	INV-TH-203 (2)
Inverter for use with EL Backlit Graphic Modules								73-1174-ND	9.43	—	INV-TH-204 (2)

* Data Sheet sold separately.

EPSON ELECTRONICS AMERICA, INC. LCD Controllers

IC Controller For Graphic LCD

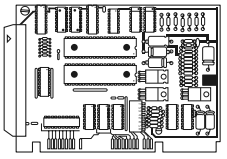


The E-1330 is a character and graphics display controller for medium-resolution dot-matrix LCD panels with up to 640 x 256 pixels. An E-1330 in combination with drivers, an LCD panel and a minimum of external components forms a complete low-power display system.

Features: • Low power consumption-8 mA operating current and 0.05 µA standby current • Single 5 V ±10% supply • 60-pin QFPs

Description	Digi-Key Part No.	Pricing 1	Pricing 25	Pricing 100	Epson Part No.
IC Controller For Graphc LCD	E-1330BA-ND	11.90	223.13	773.50	E-1330BA
Controller Board For Graphic LCD	SDU-8106-ND	310.50	—	—	SDU8106
Application Manual For E1330	9250B-ND	3.95	—	—	—

Controller Board For Graphic LCD



SDU8106B0D is a VGA controller board to use with color and monochrome LCD (Liquid Crystal Display) panels. It will operate as a stand alone video adapter card with on-board video BIOS support. Also, it will operate as 16-bit on the ISA bus.

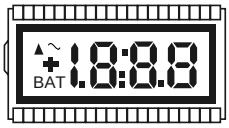
Features:

• Color/Monochrome LCD support • 16-bit ISA Bus support • 5 V operation • On-board video BIOS with additional support logic provided • 512K DRAM support (1 x 256K x 16, symmetrical) • Configuration options for different panels • Support for Software Power Save Modes • On-board +23 to +40 V adjustable power supply (VDDH for color panels) • On-board -18 to -23 V adjustable power supply (VLCD for monochrome panels).

Varitronix Limited LCDs

Reflective and Transflective

(Transflective Denoted by "FC" in Varitronix Part No.)



- Long Life/High Reliability
- Excellent Optical Quality
- High Contrast Ratio
- Wide Viewing Angle
- Large Useful Viewing Area
- Fast Response
- Low Power Consumption
- Data Sheet Included

Electrical and Optical Characteristics

	Static	HV†	Units
Oper. Temp. Range	-10°–+60°	-10°–+60°	°C
Oper. Voltage, RMS	3.0	3.9 - 4.7	V-RMS
Drive Frequency	30-300	60-300	Hz
Current Consumption	15	15	nA/mm²
Turn-On Time	120	80	ms
Turn-Off Time	100	80	ms

Format	Digit Size (mm)	No. Of Digits	Type (mm)	Conn. No. Of Pins	Dual Row Spacing (mm)	Driver IC's (Not Included) (Applies to both P/N)	LED Black-light	Matching Bezel ‡	Digi-Key Part No.	Pricing 1	5	10	Varitronix Part No.
.8.8	12.70	2	2.54 Dip	18	33.02	4543B(2);	—	PRD180LPW-ND	153-1003-ND	4.30	19.89	35.69	VI-201-DP-RC-S
						ICL7106CPL	—	PRD180LPW-ND	153-1002-ND*	4.50	20.81	37.35	VI-201-DP-FC-S
BAT 1.8:8.8	12.70	3 1/2	2.54 Dip	40	33.02	ICL7106CPL;4543B(4)	—	PRD180LP-ND	153-1005-ND	5.70	26.36	47.31	VI-322-DP-RC-S
							1	PRD180LP-ND	153-1004-ND*	6.80	31.45	56.44	VI-322-DP-FC-S
8.8:8.8	12.70	4	2.54 Dip	40	33.02	4543B(4);ICL7135CPI	—	PRD180LP-ND	153-1007-ND	5.70	26.36	47.31	VI-422-DP-RC-S
							1	PRD180LP-ND	153-1006-ND*	6.80	31.45	56.44	VI-422-DP-FC-S
1.8:8.8.8	10.16	4 1/2	2.54 Dip	40	33.02	4543B(5);ICL7135CPI	—	PRD180LP-ND	153-1009-ND	5.70	26.36	47.31	VI-502-DP-RC-S
							1	PRD180LP-ND	153-1008-ND*	6.80	31.45	56.44	VI-502-DP-FC-S
8.8:8.8.8.8	12.70	6	2.54 Dip	50	33.02	4543B(6)	—	PRD250LP-ND	153-1011-ND	9.30	43.01	77.19	VI-602-DP-RC-S
							2	PRD250LP-ND	153-1010-ND*	11.30	52.26	93.79	VI-602-DP-FC-S
8.8:8.8.8.8.8.8	12.70	8	2.54 Dip	68	33.02	4543B(8)	—	PRD360LP-ND	153-1013-ND	13.20	61.05	109.56	VI-804-DP-RC-S
							3	PRD360LP-ND	153-1012-ND*	15.10	69.84	125.33	VI-804-DP-FC-S
BAT 1.8:8.8	17.78	3 1/2	2.54 Dip	40	40.64	ICL7106CPL;4543B(4)	—	N/A	153-1015-ND	10.50	48.56	87.15	VI-319-DP-RC-S
							2	N/A	153-1014-ND*	14.30	66.14	118.69	VI-319-DP-FC-S
8.8:8.8	17.78	4	2.54 Dip	40	40.64	4543B(4);ICL7135CPI	—	N/A	153-1017-ND	11.80	54.58	97.94	VI-415-DP-RC-S
							2	N/A	153-1016-ND*	14.30	66.14	118.69	VI-415-DP-FC-S
8.8:8.8.8	10.16	5	2.54 Dip	40	33.02	4543B(5);ICL7135CPI	—	PRD180LP-ND	153-1019-ND	5.70	26.36	47.31	VI-508-DP-RC-S
							2	PRD180LP-ND	153-1018-ND*	6.80	31.45	56.44	VI-508-DP-FC-S
8.8:8.8.8.8	17.78	6	2.54 Dip	50	40.64	4543B(6)	—	N/A	153-1021-ND	15.70	72.61	130.31	VI-607-DP-RC-S
							3	N/A	153-1020-ND*	19.80	91.58	164.34	VI-607-DP-FC-S
LO BATT 1.8:8.8	12.70	3 1/2	2.54 Dip	40	33.02	ICL7106CPL;4543B(4)	—	PRD180LP-ND	153-1023-ND	5.70	26.36	47.31	VI-302-DP-RC-S
							1	PRD180LP-ND	153-1022-ND*	6.80	31.45	56.44	VI-302-DP-FC-S
LO BAT 1.8:8.8.8	10.16	4 1/2	2.54 Dip	40	33.02	4543B(5);ICL7135CPI	—	PRD180LP-ND	153-1025-ND	5.70	26.36	47.31	VI-509-DP-RC-S
							1	PRD180LP-ND	153-1024-ND*	6.80	31.45	56.44	VI-509-DP-FC-S
8.8.8.8	12.70	4	2.54 Dip	20	33.02	—	—	PRD180LP-ND	153-1046-ND†	6.40	29.60	53.12	VIM-404-DP-RC-S-H
							2	PRD180LP-ND	153-1047-ND†*	6.80	31.45	56.44	VIM-404-DP-FC-S-HV
LOW BATTERY CONTINUITY -1.8.8.8.8	10.16	4 1/2	2.54 Dip	15	33.02	ICL7129A	—	PRD180LP-ND	153-1054-ND†	5.90	27.29	48.97	VIM-503-DP-RC-S-HV
							2	PRD180LP-ND	153-1055-ND†*	6.80	31.45	56.44	VIM-503-DP-FC-S-HV
8.8:8.8.8.8.8.8	12.70	8	2.54 Dip	42	33.02	—	—	PRD360LP-ND	153-1056-ND†	11.70	54.11	97.11	VIM-808-DP-RC-S-HV
							3	PRD360LP-ND	153-1057-ND†*	17.00	78.63	141.10	VIM-808-DP-FC-S-HV

† Multiplexed Display *Transflective ‡ Bezels can be found under PRD Plastics in the manufacture index.

Backlight For Transflective LCDs

LED Backlight	Overall Size (mm) L x W x H	Active Size (mm) LE x WE	Forward Current mA at 4.1V Typ	Max	Digi-Key Part No.	Pricing 1	5	10	Varitronix Part No.
1	565 x 19.5 x 3.5	49 x 12	70	140	153-1026-ND	7.30	33.76	60.59	LED4-16264
2	75 x 26.6 x 3.8	60 x 22	135	270	153-1027-ND	11.20	51.80	92.96	LED4-20464B
3	94 x 24 x 4	84 x 19	180	360	153-1028-ND	9.50	43.94	78.85	LED4-20265

Varitronix Limited LCD Modules

153-1001-ND Varitronix LCD Modules Data Book.....**$2.98**

Display Format	Matching Bezel ‡	Character Format	Outline Dim. (mm) W x H x D	Display Area Dim. (mm) W x H	Character Size (mm) W x H	Operating Temp. (°C)	Storage Temp. (°C)	Supply Voltage (V)	Digi-Key Part No.	Pricing 1	5	10	Varitronix Part No.
Standard LCD Module (Data Book Sold Separately)													
16 x 1	PRD250LPW1-ND	5 x 8 dots	80 x 36 x 11	64.5 x 13.8	3.15 x 6.30	-5° to +50°	-20° to +60°	5	153-1031-ND	17.60	81.40	146.08	MDL-16166-LV
16 x 2	PRD250LPW-ND	5 x 8 dots	84 x 44 x 10	61.0 x 15.8	2.95 x 5.55	-5° to +50°	-20° to +60°	5	153-1036-ND	21.76	100.64	180.61	MDL-16265K-LV
24 x 2	PRD360LPW1-ND	5 x 8 dots	118 x 36 x 10	93.5 x 15.8	3.2 x 5.15	-5° to +50°	-20° to +60°	5	153-1041-ND	34.20	158.18	283.86	MDL-24265-LV
Supertwist LCD Module (Data Book Sold Separately)													
8 x 1	PRD250LPW-ND	5 x 8 dots	84 x 44 x 11	61.0 x 15.8	6.45 x 10.75	-5° to +50°	-20° to +60°	5	153-1029-ND	28.70	132.74	238.21	MDLS-81809-LV-G
16 x 1	PRD250LPW1-ND	5 x 8 dots	80 x 36 x 11	64.5 x 13.8	3.15 x 6.30	-5° to +50°	-20° to +60°	5	153-1032-ND	20.10	92.96	166.83	MDLS-16166-LV-G
16 x 2	PRD250LPW-ND	5 x 8 dots	84 x 44 x 10	61.0 x 15.8	2.95 x 5.55	-5° to +50°	-20° to +60°	5	153-1037-ND	25.00	115.63	207.50	MDLS-16265K-LV-G
16 x 4	N/A	5 x 8 dots	87 x 60 x 10	61.8 x 25.2	2.95 x 4.75	-5° to +50°	-20° to +60°	5	153-1048-ND	54.00	249.75	448.20	MDLS-16465-LV-G
20 x 1	N/A	5 x 8 dots	182 x 33.5 x 11	154 x 15.3	6.7 x 11.50	-5° to +50°	-20° to +60°	5	153-1034-ND	52.90	244.66	439.07	MDLS-20189-LV-G
20 x 2	PRD360LPW-ND	5 x 8 dots	116 x 37 x 11	83.0 x 18.6	3.2 x 5.55	-5° to +50°	-20° to +60°	5	153-1039-ND	36.80	170.20	305.44	MDLS-20265K-LV-G
20 x 4	N/A	5 x 8 dots	98 x 60 x 12	76.0 x 25.2	2.95 x 4.75	-5° to +50°	-20° to +60°	5	153-1051-ND	54.70	252.99	454.01	MDLS-20464K-LV-G
24 x 2	PRD360LPW1-ND	5 x 8 dots	118 x 36 x 10	93.5 x 15.8	3.2 x 5.15	-5° to +50°	-20° to +60°	5	153-1042-ND	41.30	191.01	342.79	MDLS-24265-LV-G
40 x 2	N/A	5 x 8 dots	182 x 33.5 x 11	154.0 x 15.8	3.15 x 5.50	-5° to +50°	-20° to +60°	5	153-1044-ND	76.90	355.66	638.27	MDLS-40266K-LV-G
40 x 2	N/A	5 x 8 dots	182 x 33.5 x 11	154.0 x 15.8	3.15 x 5.50	-5° to +50°	-20° to +60°	5	153-1067-ND	56.80	262.70	471.44	MDLS-40266-LV-G
40 x 4	N/A	5 x 8 dots	196 x 56 x 11	154.4 x 27.6	3.15 x 6.30	-5° to +50°	-20° to +60°	+5/-5	153-1052-ND	101.70	470.36	844.11	MDLS-40466-G-HV
Supertwist LCD Module w/LED Backlighting (Data Book Sold Separately)													
8 x 1	PRD250LPW-ND	5 x 8 dots	84 x 44 x 15.2	61.0 x 15.8	6.45 x 10.75	-5° to +50°	-20° to +60°	5	153-1030-ND*	37.90	175.29	314.57	MDLS-81809-LV-G-LED-04
16 x 1	PRD250LPW1-ND	5 x 8 dots	80 x 36 x 14.2	64.5 x 13.8	3.15 x 6.30	-5° to +50°	-20° to +60°	5	153-1033-ND*	29.30	135.51	243.19	MDLS-16166-LV-G-LED-04
16 x 2	PRD250LPW-ND	5 x 8 dots	84 x 44 x 13	61.0 x 15.8	2.95 x 5.55	-5° to +50°	-20° to +60°	5	153-1038-ND	36.10	166.96	299.63	MDLS-16265K-LV-G-LED4G
16 x 4	N/A	5 x 8 dots	87 x 60 x 13	61.8 x 25.2	2.95 x 4.75	-5° to +50°	-20° to +60°	5	153-1049-ND*	61.70	285.36	512.11	MDLS-16465-LV-G-LED-04
20 x 1	N/A	5 x 8 dots	182 x 33.5 x 13.3	154 x 15.3	6.7 x 11.50	-5° to +50°	-20° to +60°	5	153-1071-ND*	69.00	319.13	572.70	MDLS-20189K-LV-G-LED-04
20 x 2	PRD360LPW-ND	5 x 8 dots	116 x 37 x 14.4	83.0 x 18.6	3.2 x 5.55	-5° to +50°	-20° to +60°	5	153-1040-ND*	46.30	214.14	384.29	MDLS-20265K-LV-G-LED-04
20 x 4	N/A	5 x 8 dots	98 x 60 x 14.8	76.0 x 25.2	2.95 x 4.75	-5° to +50°	-20° to +60°	5	153-1050-ND*	67.60	312.65	561.08	MDLS-20464K-LV-G-LED4G
24 x 2	PRD360LPW1-ND	5 x 8 dots	118 x 36 x 13.4	93.5 x 15.8	3.2 x 5.15	-5° to +50°	-20° to +60°	5	153-1043-ND*	53.40	246.98	443.22	MDLS-24265-LV-G-LED-04
40 x 2	N/A	5 x 8 dots	182 x 33.5 x 15.04	154.0 x 15.8	3.15 x 5.50	-5° to +50°	-20° to +60°	5	153-1045-ND	76.10	351.96	631.63	MDLS-40266K-LV-G-LED4G
40 x 4	N/A	5 x 8 dots	196 x 56 x 16	154.4 x 27.6	3.15 x 6.30	-5° to +50°	-20° to +60°	+5/-5	153-1053-ND	124.60	576.28	1034.18	MDLS-40466-GHVLED4G

* The LED chips are distributed over the whole lit area, bonded in a pattern which gives the most uniform illumination. Power connection is made by two solder holes, marked "A" for +5V and "K" for Ground.
‡ Bezels can be found under PRD Plastics in the manufacture index.

Noritake Vacuum Fluorescent Display Modules

VFD over LCD Advantages:

- ***Higher Brightness***
- ***Wider Viewing Angle***
- ***Wider Temperature Range***

FEATURES:

- LCD compatible interface
- Same mounting locations as LCD
- +5V single power supply
- Power save mode (display off)
- 4 level brightness control (by code)
- 8-bit or 4-bit interface
- Wide operating temperature range
- 8 user definable fonts
- Power consumption similar to LCD with LED backlight
- 5mm or 9mm character height
- Color: Blue-Green

Pin Connections

Pin No.	Symbol	Pin No.	Symbol
1	Vss	8	DB1
2	Vcc	9	DB2
3	NC	10	DB3
4	RS	11	DB4
5	RW (WR)	12	DB5
6	E (RD)	13	DB6
7	DB0	14	DB7

Display Format	Character Format	Outline Dim. W x H x D (mm)	Viewing Area W x H (mm)	Character Size W x H (mm)	Dot Size W x H (mm)	Operating Temp. (°C)	Storage Temp. (°C)	Supply Volt. (V)	Digi-Key Part No.	Price Each 1	10	50	Noritake Part No.
16x2	5x7 CURS	80 x 36 x 19.6	51.36 x 11.4	2.46 x 5.46	.38 x .56	-20 to +70	-40 to +85	5	286-1002-ND	51.60	47.73	38.70	CU16025ECPB-U5J
16x2	5x7 CURS	80 x 36 x 19.6	51.36 x 11.4	2.46 x 5.46	.38 x .56	-40 to +85	-50 to +85	5	286-1003-ND	55.00	50.88	41.25	CU16025ECPB-W1J
20x2	5x7 CURS	116 x 37 x 16	70.8 x 11.5	2.4 x 5.4	.4 x .5	-20 to +70	-40 to +85	5	286-1004-ND	56.00	51.80	42.00	CU20025ECPB-U1J
20x2	5x7 CURS	116 x 37 x 16	70.8 x 11.5	2.4 x 5.4	.4 x .5	-40 to +85	-50 to +85	5	286-1005-ND	58.40	54.02	43.80	CU20025ECPB-W1J
20x2	5x7 CURS	146 x 43 x 19	102.6 x 18.8	3.8 x 9.2	.6 x .98	-20 to +70	-40 to +85	5	286-1006-ND	90.40	83.62	67.80	CU20029ECPB-U1J
24x2	5x7 CURS	125 x 36 x 13	85.2 x 11.5	2.4 x 5.4	.4 x .5	-20 to +70	-40 to +85	5	286-1007-ND	62.40	57.72	46.80	CU24025ECPB-U1J
20x4	5x7 Dots	98 x 60 x 17	70.8 x 20.9	2.4 x 4.7	.4 x .5	-20 to +70	-40 to +85	5	286-1008-ND	87.00	80.48	65.25	CU20045SCPB-U2J
40x2	5x7 CURS	182 x 33.5 x 20.5	138.8 x 11.5	2.3 x 5.4	.38 x .5	-20 to +70	-40 to +85	5	286-1009-ND	87.80	81.22	65.85	CU40025SCPB-U1J

Lucas NPC-410 & 1210 Solid State Pressure Sensors

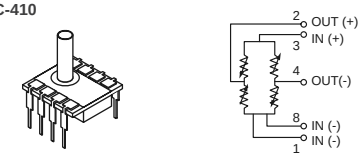
FEATURES: NPC-410: Intended for printed circuit board mounting. Optional pressure port and lead configurations give superior flexibility in low profile applications where pressure connection orientation is critical. The NPC-410 series is based on Lucas NovaSensor®'s advanced SenStable® piezoresistive sensing technology. The latest techniques in silicon micromachining have been used to ion implant piezoresistive strain gages into a Wheatstone bridge configuration, which is integrally formed on a micromachined diaphragm. Constant current or constant voltage can be used for sensor excitation. Offset and sensitivity temperature compensation and calibration can be achieved by adding external resistors. Additionally, this series is available in pressure ranges from 0 to 5 through 0 to 100 psi. **NPC-1210:** Offers the added advantage of superior temperature performance over the temperature compensated range of 0°C to +60°C. A gain set resistor is included to normalize the FSO for field interchangeability. Additionally, the NPC-1210 series is available in pressure ranges from 0 to 5 through 0 to 100 psi.

ENVIRONMENTAL: • Operating Temperature: -40° to +125°C (-40 to 257°F) • Storage Temperature: -55° to 150°C (-67 TO 302°F)

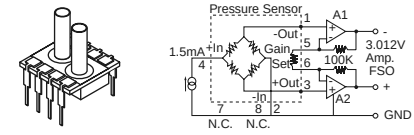
MECHANICAL: • Weight: 2.5 grams • Media Compatibility: Positive differential and gage ports - compatible with wetted materials. **NPC-410:** Wetted materials are pyrex, ceramic, silicon, RTV and nickel. **NPC-1210:** Wetted materials are pyrex, ceramic, silicon, epoxy, RTV and nickel. Absolute, negative differential ports - dry gases only.

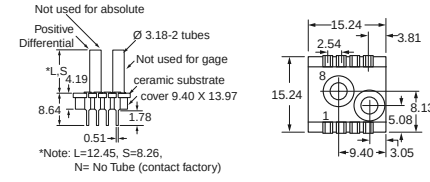
NOTES: 1. Supply current = 1.5mA and ambient temperature = 25°C, unless otherwise noted. **2.** External resistors can be added to reduce temperature errors and calibrate the offset and FSO. **3.** Best fit straight line. **4.** Temperature range 0-60°C, reference to 25°C. **5.** 3X or 200 psi maximum, whichever is less. **6.** 5 PSI offset voltage = ±75 mV(NPC-410). Call technical support for 5 PSI spec (NPC-1210). **7.** Output span of unamplified sensor. **8.** Compensation resistors are an integral part of the sensor package; no additional external resistors are required. Pins 7 and 8 must be kept open. The NPC-1210 is interchangeable only when used with the gain set resistor shown in the Schematic Diagram.

NPC-410



NPC-1210





Performance (Note 1) Parameter	NPC-410 Series Units	Min.	Typ.	Max.	Notes	NPC-1210 Series Units	Min.	Typ.	Max.	Notes
Full Scale Output (FSO)	mV	105	125	155	1	mV	75	100	150	7,8
Zero Pressure Output	mV	-50	0	50	2,6	±mV	—	—	2	8
Linearity	±%FSO	—	—	0.1	3	±%FSO	—	—	0.1	3,6
Pressure Hysteresis	±%FSO	—	—	0.1	—	±%FSO	—	—	0.1	—
Input Impedance	Ω	4000	5000	6000	—	Ω	2500	4000	6000	—
Output Impedance	Ω	4000	5000	6000	—	Ω	4000	5000	6000	—
Thermal Accuracy-Span	±%FSO	—	1.5	—	2,4	±%FSO	—	—	0.5	4,6,8
Thermal Accuracy-Zero	±%FSO	—	0.5	—	2,4	±%FSO	—	—	0.5	4,6,8
Temp. Coefficient-Resistance	%/°C	—	0.30	—	4	%/°C	—	0.22	—	4
Thermal Hysteresisi-Zero	±%FSO	—	0.1	—	4	±%FSO	—	0.1	—	4
Input Excitation	mA	—	1.5	2.0	—	mA	—	1.5	2.0	—
Long Term Stability	±%FSO/yr.	—	0.1	—	—	±%FSO/yr.	—	0.1	—	—
Pressure Overload	Rated	—	—	3X	5	Rated	—	—	3X	5

Description	Digi-Key Part No.	Price Each 1	25	50	100	Lucas Part No.
NPC-410 Series						
15psi Absl	10997-ND	17.00	13.60	12.33	11.05	NPC-410-015-A-3L
30psi Absl	10998-ND	17.00	13.60	12.33	11.05	NPC-410-030-A-3L
50psi Absl	10999-ND	17.00	13.60	12.33	11.05	NPC-410-050-A-3L
100psi Absl	11000-ND	17.00	13.60	12.33	11.05	NPC-410-100-A-3L
5psi Diff	11001-ND	17.00	13.60	12.33	11.05	NPC-410-005-D-3L
15psi Diff	11002-ND	17.00	13.60	12.33	11.05	NPC-410-015-D-3L
30psi Diff.	11003-ND	17.00	13.60	12.33	11.05	NPC-410-030-D-3L
50psi Diff.	11004-ND	17.00	13.60	12.33	11.05	NPC-410-050-D-3L
100psi Diff.	11005-ND	17.00	13.60	12.33	11.05	NPC-410-100-D-3L
5 psi Gage	11006-ND	17.00	13.60	12.33	11.05	NPC-410-005-G-3L
15psi Gage	11007-ND	17.00	13.60	12.33	11.05	NPC-410-015-G-3L
30psi Gage	11008-ND	17.00	13.60	12.33	11.05	NPC-410-030-G-3L
50psi Gage	11009-ND	17.00	13.60	12.33	11.05	NPC-410-050-G-3L
100psi Gage	11010-ND	17.00	13.60	12.33	11.05	NPC-410-100-G-3L

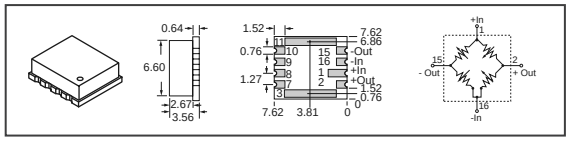
Description	Digi-Key Part No.	Price Each 1	25	50	100	Lucas Part No.
NPC-1210 Series						
15psi Tmp Absl	11011-ND	24.75	19.80	17.60	15.95	NPC-1210-015-A-3L
30psi Tmp Absl	11012-ND	24.75	19.80	17.60	15.95	NPC-1210-030-A-3L
50psi Tmp Absl	11013-ND	24.75	19.80	17.60	15.95	NPC-1210-050-A-3L
100psi Tmp Absl	11014-ND	24.75	19.80	17.60	15.95	NPC-1210-100-A-3L
5psi Tmp Diff	11015-ND	24.75	19.80	17.60	15.95	NPC-1210-005-D-3L
15psi Tmp Diff	11016-ND	24.75	19.80	17.60	15.95	NPC-1210-015-D-3L
30psi Tmp Diff	11017-ND	24.75	19.80	17.60	15.95	NPC-1210-030-D-3L
50psi Tmp Diff	11018-ND	24.75	19.80	17.60	15.95	NPC-1210-050-D-3L
100psi Tmp Diff	11019-ND	24.75	19.80	17.60	15.95	NPC-1210-100-D-3L
5psi Tmp Gage	11020-ND	24.75	19.80	17.60	15.95	NPC-1210-005-G-3L
15psi Tmp Gage	11021-ND	24.75	19.80	17.60	15.95	NPC-1210-015-G-3L
30psi Tmp Gage	11022-ND	24.75	19.80	17.60	15.95	NPC-1210-030-G-3L
50psi Tmp Gage	11023-ND	24.75	19.80	17.60	15.95	NPC-1210-050-G-3L
100psi Tmp Gage	11024-ND	24.75	19.80	17.60	15.95	NPC-1210-100-G-3L

NPC-103 Pressure Sensors in Ceramic Surface Mount Packages

FEATURES: NPC-103: Batch assembled and statistically tested using in-house automated equipment to provide the OEM user with true cost savings. When excited with 3 VDC, the NPC-103 produces a miliVolt output that is proportional to input pressure. A small hole is located in the cap to allow pressure to the sensing element. At the core of the NPC-103 is a SenStable®, Silicon Fusion Bonded (SFB) chip; the smallest silicon pressure chip of its kind. The user may provide standard signal conditioning circuitry to amplify the output signal or to maximize OEM value added.

ENVIRONMENTAL: • Operating Temperature : -40° to +125°C (-40 to +257°F) • Storage Temperature: -55° to +150°C (-67 to +302°F)

MECHANICAL: • Weight: 0.25 grams • Media Compatibility: Clean, dry air and noncorrosive gases.



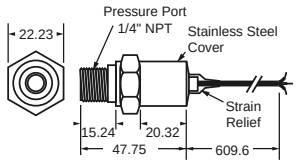
Performance Parameter	Value (5)	Units	Notes
Pressure Ranges	100	kPaA	~15 PSIA
	200	kPaA	~30 PSIA
	700	kPaA	~100 PSIA
Maximum Overpressure	3X	—	rated pressure
Electrical @ 22°C unless stated			
Excitation	3.0	VDC	12VDC MAX.
Input & Output Impedance	5000±20%	Ω	
Zero Offset	±8	mV/V	6
Full Scale Output	60±15	mV	—
Linearity	±0.20	%FSO	1
Hysteresis	±0.1	%FSO	—
Temperature Coefficient of Zero	±0.04	±%FSO/°C	2
Temp. Coefficient of Reisistance	+0.30	%/°C	2
Temp. Coefficient-Sensitivity	-0.20	±%FSO/°C	2
Thermal Hysteresisi-Zero	±0.1	%FSO	3
Long Term Stability of FSO	±0.2	%FSO	4

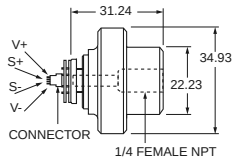
NOTES:

1. Best fit straight line.
2. Between 0° and 70°C temperature coefficients are typical values.
3. Between 0° and 70°C.
4. Typical value over 1 year.
5. All values are MIN/MAX and are measured at 3VDC and 22°C unless otherwise noted.
6. ±10 mV/V for 100kPa sensor.

Description	Digi-Key Part No.	Price Each 1	25	50	100	Lucas Part No.
NPC-103 Series						
15psi Absl SMD	11025-ND	13.00	11.40	10.40	9.80	NPC-103-100A
30psi Absl SMD	11026-ND	13.00	11.40	10.40	9.80	NPC-103-200A
100psi Absl SMD	11027-ND	13.00	11.40	10.40	9.80	NPC-103-700A

Stainless Steel Isolated Pressure Transducers





The MSP pressure transducer is designed for high-volume, low-cost commercial, industrial and off road applications which require accurate measurement of gases or liquids. Operating ranges up to 10,000 psi is available with your choice of output signal in volts, millivolts, or milliamps. The MSP uses a micro machined silicon strain gauge inorganically bonded to a machined stainless steel diaphragm; no welds, no 0-rings, no silicone oil. All wetted surfaces are stainless steel and all signal conditioning electronics are housed in a stainless steel cover which provides protection from hostile environments. The housing is permanently sealed, leak-proof and requires no maintenance. Each transducer is thoroughly tested and calibrated before shipment.

Applications: Pumps and Compressors • Hydraulic / Pneumatic Systems • Energy and Water Management • Pressure Instrumentation • Process Control, Off Road Refrigeration, HVAC.

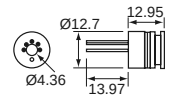
	MSP-200	MSP-300	MSP-310	MSP-320	MSP-400
Pressure Range (PSI)	0-50 to 10,000	0-100 to 10,000	0-100 to 10,000	0-25 to 75	0-100 to 10,000
Temperature Output	None	None	10mV/K	None	None
Accuracy (combined linearity, hysteresis & repeatibility)	±1% of FS	±1% of FS	±1% of FS	±1% of FS	±0.5% of FS
Pressure Overload	2X	2X	2X	2X	2X
Burst Pressure	5x or 20 PSI, whichever is less				
Supply	5VDC —	5VDC 10-30VDC	5VDC —	10-30VDC —	5VDC 10-30VDC
Outputs	0-100mV — — —	0-100mV 1-3VDC 1-5VDC 4-20mA	0-100mV — — —	1-5VDC 4-20mA — —	0.5-4.5V 1-5V 4-20mA —
Zero Offset (millivolt output) (apmlified output)	±3% of FS —	±3% of FS ±2% of FS	±3% of FS ±2% of FS	— ±2% of FS	— ±2% of FS
Span Tolerance	±2% of FS	±2% of FS	±2% of FS	±2% of FS	±2% of FS
Long-Term Stability, Typical (1 year)	±.25%	±.25%	±.25%	±.5%	±.25%
Operating Temperature (°F) (°C)	(-4 to 185) (-20 to 85)	(-4 to 185) (-20 to 85)	(-4 to 185) (-20 to 85)	(-4 to 185) (-20 to 85)	(-40 to 185) (-40 to 85)
Compensated Range (°F) (°C)	30 to 130 0 to 55	30 to 130 0 to 55	30 to 130 0 to 55	30 to 130 0 to 55	30 to 160 0 to 70
Thermo Zero Shift	<±2% of FS	<±2% of FS	<±2% of FS	<±2% of FS	<±1.5% of FS
Thermo Span Shift	<±2% of FS	<±2% of FS	<±2% of FS	<±2% of FS	<±1.5% of FS
EMI/RFI Protection	No	No	No	No	Yes
CE Marked	No	No	No	No	Yes
UL Listed	No	Yes	Yes	Yes	Yes

Op. Pressure Range Lbs. (Kg)	Supply	Digi-Key Part No.	Price Each 1	Price Each 10	MSI Part No.
NEW! 0-100mV Output NEW!					
50 (22.68)	5VDC	MSP2500P2L8-ND	94.00	76.80	MSP-200-50-P-2-L-8
100 (45.36)	5VDC	MSP2101P2L8-ND	94.00	76.80	MSP-200-100-P-2-L-8
250 (113.40)	5VDC	MSP2250P2L8-ND	94.00	76.80	MSP-200-250-P-2-L-8
500 (226.80)	5VDC	MSP2501P2L8-ND	94.00	76.80	MSP-200-500-P-2-L-8
1000 (453.60)	5VDC	MSP2102P2L8-ND	94.00	76.80	MSP-200-1000-P-2-L-8
2500 (1134.00)	5VDC	MSP2252P2L8-ND	94.00	76.80	MSP-200-2500-P-2-L-8
5000 (2268.00)	5VDC	MSP2502P2L8-ND	94.00	76.80	MSP-200-5000-P-2-L-8
0-100mV Output — 4 Wire Unamplified					
100 (45.36)	5VDC	MSP3101P1-ND	82.25	67.20	MSP-300-100-P-2-N-1
250 (113.40)	5VDC	MSP3251P1-ND	82.25	67.20	MSP-300-250-P-2-N-1
500 (226.80)	5VDC	MSP3501P1-ND	82.25	67.20	MSP-300-500-P-2-N-1
1000 (453.60)	5VDC	MSP3102P1-ND	82.25	67.20	MSP-300-1000-P-2-N-1
2500 (1134.00)	5VDC	MSP3252P1-ND	82.25	67.20	MSP-300-2500-P-2-N-1
5000 (2268.00)	5VDC	MSP3502P1-ND	82.25	67.20	MSP-300-5000-P-2-N-1
10000 (4536.00)	5VDC	MSP3103P1-ND	82.25	67.20	MSP-300-10000-P-2-N1
1-3 V Output — Ratiometric output voltage to input voltage 3 Wire supply current 10mA max.					
100 (45.36)	5VDC	MSP3101P2-ND	90.20	72.98	MSP-300-100-P-3-N-1
250 (113.40)	5VDC	MSP3251P2-ND	90.20	72.98	MSP-300-250-P-3-N-1
500 (228.60)	5VDC	MSP3501P2-ND	90.20	72.98	MSP-300-500-P-3-N-1
1000 (453.60)	5VDC	MSP3102P2-ND	90.20	72.98	MSP-300-1000-P-3-N-1
2500 (1134.00)	5VDC	MSP3252P2-ND	90.20	72.98	MSP-300-2500-P-3-N-1
5000 (2268.00)	5VDC	MSP3502P2-ND	90.20	72.98	MSP-300-5000-P-3-N-1
10000 (4536.00)	5VDC	MSP3103P2-ND	90.20	72.98	MSP-300-10000-P-3-N1
1-5 V Output — Fixed - 3 Wire supply current 10mA max.					
100 (45.36)	10-32 VDC	MSP3101P3-ND	96.60	78.66	MSP-300-100-P-4-N-1
250 (113.40)	10-32 VDC	MSP3251P3-ND	96.60	78.66	MSP-300-250-P-4-N-1
500 (226.80)	10-32 VDC	MSP3501P3-ND	96.60	78.66	MSP-300-500-P-4-N-1
1000 (453.60)	10-32 VDC	MSP3102P3-ND	96.60	78.66	MSP-300-1000-P-4-N-1
2500 (1134.00)	10-32 VDC	MSP3252P3-ND	96.60	78.66	MSP-300-2500-P-4-N-1
5000 (2268.00)	10-32 VDC	MSP3502P3-ND	96.60	78.66	MSP-300-5000-P-4-N-1
10000 (4536.00)	10-32 VDC	MSP3103P3-ND	96.60	78.66	MSP-300-10000-P-4-N1
NEW! 1-5V Output NEW!					
100 (45.36)	10-32 VDC	MSP3101P4A1-ND	108.10	88.32	MSP-300-100-P-4-A-1
250 (113.40)	10-32 VDC	MSP3251P4A1-ND	108.10	88.32	MSP-300-250-P-4-A-1
500 (226.80)	10-32 VDC	MSP3501P4A1-ND	108.10	88.32	MSP-300-500-P-4-A-1
1000 (453.60)	10-32 VDC	MSP3102P4A1-ND	108.10	88.32	MSP-300-1000-P-4-A-1
4-20mA Output — 2 Wire regulated supply					
100 (45.36)	10-32 VDC	MSP3101P4-ND	104.50	85.25	MSP-300-100-P-5-N-1
250 (113.40)	10-32 VDC	MSP3251P4-ND	104.50	85.25	MSP-300-250-P-5-N-1
500 (226.80)	10-32 VDC	MSP3501P4-ND	104.50	85.25	MSP-300-500-P-5-N-1
1000 (453.60)	10-32 VDC	MSP3102P4-ND	104.50	85.25	MSP-300-1000-P-5-N-1
2500 (1134.00)	10-32 VDC	MSP3252P4-ND	104.50	85.25	MSP-300-2500-P-5-N-1
5000 (2268.00)	10-32 VDC	MSP3502P4-ND	104.50	85.25	MSP-300-5000-P-5-N-1
10000 (4536.00)	10-32 VDC	MSP3103P4-ND	104.50	85.25	MSP-300-10000-P-5-N1
NEW! 4-20mA Output NEW!					
100 (45.36)	10-32 VDC	MSP3101P5A1-ND	129.25	105.60	MSP-300-100-P-5-A-1
250 (113.40)	10-32 VDC	MSP3251P5A1-ND	129.25	105.60	MSP-300-250-P-5-A-1
500 (226.80)	10-32 VDC	MSP3501P5A1-ND	129.25	105.60	MSP-300-500-P-5-A-1
1000 (453.60)	10-32 VDC	MSP3102P5A1-ND	129.25	105.60	MSP-300-1000-P-5-A-1
0-100mV with Temperature Output — 5 Wire					
100 (45.36)	5VDC	MSP1101P1-ND	117.50	96.00	MSP-310-100-P-2-N-1
250 (113.40)	5VDC	MSP1251P1-ND	117.50	96.00	MSP-310-250-P-2-N-1
500 (226.80)	5VDC	MSP1501P1-ND	117.50	96.00	MSP-310-500-P-2-N-1
1000 (453.60)	5VDC	MSP1102P1-ND	117.50	96.00	MSP-310-1000-P-2-N-1
2500 (1134.00)	5VDC	MSP1252P1-ND	117.50	96.00	MSP-310-2500-P-2-N-1
5000 (2268.00)	5VDC	MSP1502P1-ND	117.50	96.00	MSP-310-5000-P-2-N-1
10000 (4536.00)	5VDC	MSP1103P1-ND	117.50	96.00	MSP-310-10000-P-2-N1
1-5 V Output — Fixed — 3 Wire supply current 10mA max.					
25 (11.34)	10-30VDC	MSP2025P3-ND	132.30	107.73	MSP-320-25-P-4-N-1
50 (22.68)	10-30VDC	MSP2050P3-ND	132.30	107.73	MSP-320-50-P-4-N-1
75 (34.02)	10-30VDC	MSP2075P3-ND	132.30	107.73	MSP-320-75-P-4-N-1
4-20mA Output — 2 Wire regulated supply					
25 (11.34)	10-30VDC	MSP2025P4-ND	165.90	135.09	MSP-320-25-P-5-N-1
50 (22.68)	10-30VDC	MSP2050P4-ND	165.90	135.09	MSP-320-50-P-5-N-1
75 (34.02)	10-30VDC	MSP2075P4-ND	165.90	135.09	MSP-320-75-P-5-N-1
0-100mV Output — 4 Wire unamplified					
100 (45.36)	5VDC	MSP4101P1-ND	84.00	68.40	MSP-400-100-P-2-N-1
250 (113.40)	5VDC	MSP4251P1-ND	84.00	68.40	MSP-400-250-P-2-N-1
500 (226.80)	5VDC	MSP4501P1-ND	84.00	68.40	MSP-400-500-P-2-N-1
1000 (453.60)	5VDC	MSP4102P1-ND	84.00	68.40	MSP-400-1000-P-2-N-1
2500 (1134.00)	5VDC	MSP4252P1-ND	84.00	68.40	MSP-400-2500-P-2-N-1
5000 (2268.00)	5VDC	MSP4502P1-ND	84.00	68.40	MSP-400-5000-P-2-N-1
10000 (4536.00)	5VDC	MSP4103P1-ND	84.00	68.40	MSP-400-10000-P-2-N1
0.5-4.5 V Output — Ratiometric output voltage to input voltage 3 Wire supply current 10mA max.					
100 (45.36)	5VDC	MSP4101P2-ND	102.90	83.79	MSP-400-100-P-3-N-1
250 (113.40)	5VDC	MSP4251P2-ND	102.90	83.79	MSP-400-250-P-3-N-1
500 (226.80)	5VDC	MSP4501P2-ND	102.90	83.79	MSP-400-500-P-3-N-1
1000 (453.60)	5VDC	MSP4102P2-ND	102.90	83.79	MSP-400-1000-P-3-N-1
2500 (1134.00)	5VDC	MSP4252P2-ND	102.90	83.79	MSP-400-2500-P-3-N-1
5000 (2268.00)	5VDC	MSP4502P2-ND	102.90	83.79	MSP-400-5000-P-3-N-1
10000 (4536.00)	5VDC	MSP4103P2-ND	102.90	83.79	MSP-400-10000-P-3-N1
1-5 V Output — Fixed — 3 Wire supply current 10mA max.					
100 (45.36)	10-32VDC	MSP4101P3-ND	146.48	119.28	MSP-400-100-P-4-N-1
250 (113.40)	10-32VDC	MSP4251P3-ND	146.48	119.28	MSP-400-250-P-4-N-1
500 (226.80)	10-32VDC	MSP4501P3-ND	146.48	119.28	MSP-400-500-P-4-N-1
1000 (453.60)	10-32VDC	MSP4102P3-ND	146.48	119.28	MSP-400-1000-P-4-N-1
2500 (1134.00)	10-32VDC	MSP4252P3-ND	146.48	119.28	MSP-400-2500-P-4-N-1
5000 (2268.00)	10-32VDC	MSP4502P3-ND	146.48	119.28	MSP-400-5000-P-4-N-1
10000 (4536.00)	10-32VDC	MSP4103P3-ND	146.48	119.28	MSP-400-10000-P-4-N1
4-20mA Output — 2 Wire regulated supply					
100 (45.36)	10-32VDC	MSP4101P4-ND	174.83	142.36	MSP-400-100-P-5-N-1
250 (113.40)	10-32VDC	MSP4251P4-ND	174.83	142.36	MSP-400-250-P-5-N-1
500 (226.80)	10-32VDC	MSP4501P4-ND	174.83	142.36	MSP-400-500-P-5-N-1
1000 (453.60)	10-32VDC	MSP4102P4-ND	174.83	142.36	MSP-400-1000-P-5-N-1
2500 (1134.00)	10-32VDC	MSP4252P4-ND	174.83	142.36	MSP-400-2500-P-5-N-1
5000 (2268.00)	10-32VDC	MSP4502P4-ND	174.83	142.36	MSP-400-5000-P-5-N-1
10000 (4536.00)	10-32VDC	MSP4103P4-ND	174.83	142.36	MSP-400-10000-P-5-N1

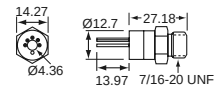
SenSym

Stainless Steel Isolated Pressure Sensors & Compensated Sensors

13mm Cell Package

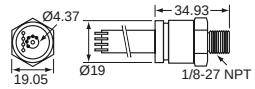


13mm Ported Male Package



Note: Ø 0.22" ±0.001" (0.56mm ±0.03mm) Pins on Ø 0.230" (5.84mm) pin circle.

19mm 1/8" (3.18mm) 27 NPT Male Port Package



Note: 2" (50.8mm) NOMEX ribbon cable with 0.100" (2.54mm) pin spacing (24 AWG wire size).

Pressure	Pressure Type	Output	Pkg.	Max. Supply (VDC)	Response Time*	Operating Temp.	Digi-Key Part No.	Price Each 1	10	25	SenSym Part No.
Sensors — 13mm Steel											
0-1000 PSIA	Absolute	0-200mV	Cell	+12	100µSec	-40°C to +125°C	287-1301-ND	60.00	47.00	39.00	13U1000AC
0-1000 PSIA	Absolute	0-200mV	Male Port	+12	100µSec	-40°C to +125°C	287-1302-ND	55.00	42.50	35.00	13U1000AM
0-2500 PSIA	Absolute	0-200mV	Cell	+12	100µSec	-40°C to +125°C	287-1303-ND	60.00	47.00	39.00	13U2500AC
0-2500 PSIA	Absolute	0-200mV	Male Port	+12	100µSec	-40°C to +125°C	287-1304-ND	55.00	42.50	35.00	13U2500AM
0-5000 PSIA	Absolute	0-200mV	Cell	+12	100µSec	-40°C to +125°C	287-1305-ND	60.00	47.00	39.00	13U5000AC
0-5000 PSIA	Absolute	0-200mV	Male Port	+12	100µSec	-40°C to +125°C	287-1306-ND	72.00	56.50	47.25	13U5000AM
Calibrated Compensated Sensors — 19mm Steel											
0-15 PSIA	Absolute	0-100mV		+15	100µSec	-40°C to +125°C	287-1901-ND	72.00	63.00	54.60	19C015A4
0-15 PSIG	Gage	0-100mV		+15	100µSec	-40°C to +125°C	287-1902-ND	72.00	63.00	54.60	19C015G4
0-30 PSIA	Absolute	0-100mV		+15	100µSec	-40°C to +125°C	287-1903-ND	72.00	63.00	54.60	19C030A4
0-30 PSIG	Gage	0-100mV		+15	100µSec	-40°C to +125°C	287-1904-ND	72.00	63.00	54.60	19C030G4
0-50 PSIA	Absolute	0-100mV		+15	100µSec	-40°C to +125°C	287-1905-ND	72.00	63.00	54.60	19C050A4
0-50 PSIG	Gage	0-100mV	1/8"	+15	100µSec	-40°C to +125°C	287-1906-ND	72.00	63.00	54.60	19C050G4
0-100 PSIA	Absolute	0-100mV	(3.18mm)	+15	100µSec	-40°C to +125°C	287-1907-ND	72.00	63.00	54.60	19C100A4
0-100 PSIG	Gage	0-100mV	27NPT	+15	100µSec	-40°C to +125°C	287-1908-ND	72.00	63.00	54.60	19C100G4
0-200 PSIA	Absolute	0-100mV	Male	+15	100µSec	-40°C to +125°C	287-1909-ND	72.00	63.00	54.60	19C200A4
0-200 PSIG	Gage	0-100mV		+15	100µSec	-40°C to +125°C	287-1910-ND	72.00	63.00	54.60	19C200G4
0-300 PSIA	Absolute	0-100mV		+15	100µSec	-40°C to +125°C	287-1911-ND	72.00	63.00	54.60	19C300A4
0-300 PSIG	Gage	0-100mV		+15	100µSec	-40°C to +125°C	287-1912-ND	72.00	63.00	54.60	19C300G4
0-500 PSIA	Absolute	0-100mV		+15	100µSec	-40°C to +125°C	287-1913-ND	72.00	63.00	54.60	19C500A4
0-500 PSIG	Gage	0-100mV		+15	100µSec	-40°C to +125°C	287-1914-ND	72.00	63.00	54.60	19C500G4

* Response time for a 0 psi to full scale span pressure step change, 10% to 90% rise time.

SenSym

Solid State Pressure Sensors

For use in medical equipment, pneumatic controls, computer peripherals and pressure instrumentation, process and flow control.

Fig. 1 — Sensor AMP

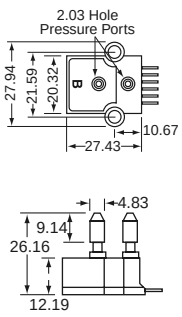


Fig. 2 — SDX A4, D4

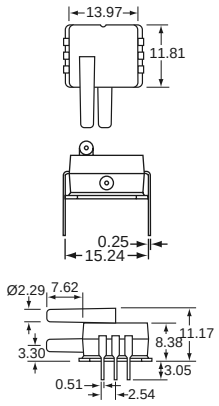


Fig. 3 — SDX A2/G2/D2

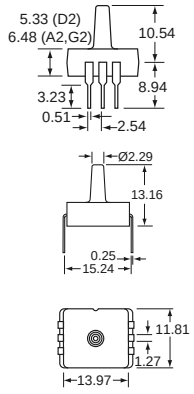
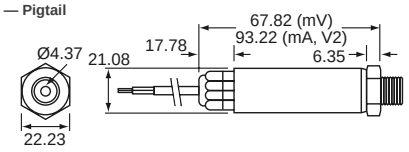


Fig. 4 — Pigtail



Note: 4-Conductor Cable. 24 AWG conductors shielded with drain wire 24" (61cm) long.

Fig. 5 — Button Sensor

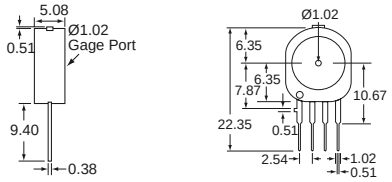


Fig.	Pressure	Pressure Type	Output	Pkg.	Supply (VDC)	Response Time*	Operating Temp.	Digi-Key Part No.	Price Each 1	10	25	SenSym Part No.
Signal Conditioned Pressure Sensors												
1	0-1 PSID	Differential/Gage	0.25 to 4.5V	SIP	+4.5 to +16	100µSec	-25°C to +105°C	287-1002-ND	47.70	34.20	27.10	ASCX01DN
	0-5 PSID	Differential/Gage	0.25 to 4.5V	SIP	+4.5 to +16	100µSec	-25°C to +105°C	287-1003-ND	47.70	34.20	27.10	ASCX05DN
	0-15 PSIA	Absolute	0.25 to 4.5V	SIP	+4.5 to +16	100µSec	-25°C to +105°C	287-1008-ND	47.70	34.20	27.10	ASCX15AN
	0-15 PSID	Differential/Gage	0.25 to 4.5V	SIP	+4.5 to +16	100µSec	-25°C to +105°C	287-1009-ND	47.70	34.20	27.10	ASCX15DN
	0-30 PSIA	Absolute	0.25 to 4.5V	SIP	+4.5 to +16	100µSec	-25°C to +105°C	287-1010-ND	47.70	34.20	27.10	ASCX30AN
	0-30 PSID	Differential/Gage	0.25 to 4.5V	SIP	+4.5 to +16	100µSec	-25°C to +105°C	287-1011-ND	47.70	34.20	27.10	ASCX30DN
	0-100 PSIA	Absolute	0.25 to 4.5V	SIP	+4.5 to +16	100µSec	-25°C to +105°C	287-1004-ND	47.70	34.20	27.10	ASCX100AN
	0-100 PSID	Differential/Gage	0.25 to 4.5V	SIP	+4.5 to +16	100µSec	-25°C to +105°C	287-1005-ND	47.70	34.20	27.10	ASCX100DN
	0-150 PSIA	Absolute	0.25 to 4.5V	SIP	+4.5 to +16	100µSec	-25°C to +105°C	287-1006-ND	47.70	34.20	27.10	ASCX150AN
	0-150 PSID	Differential/Gage	0.25 to 4.5V	SIP	+4.5 to +16	100µSec	-25°C to +105°C	287-1007-ND	47.70	34.20	27.10	ASCX150DN
Manometers & Evaluation Board												
Precision Digital Manometer - 100 PSI								287-1012-ND	422.80	—	—	PDM100P
Precision Digital Manometer - 200 CM H2O								287-1013-ND	569.80	—	—	PDM200CD
Precision Digital Manometer - 200 MM HG								287-1014-ND	484.00	—	—	PDM200M
Precision Digital Manometer - 20 PSI								287-1015-ND	484.00	—	—	PDM20P
SCX Evaluation Board V Out (order Sensor & LT1014CN seperately)								287-1016-ND	86.60	—	—	SCX-E1
Handbook								287-1001-ND	5.00	—	—	DA-B-7/96-15K
Precision Compensated Pressure Sensors												
1	0-1 PSID	Differential/Gage	0-18mV	SIP	+20	100µSec	-40°C to +85°C	287-1017-ND	54.90	41.25	35.75	SCX01DN
	0-5 PSID	Differential/Gage	0-60mV	SIP	+20	100µSec	-40°C to +85°C	287-1018-ND	44.70	33.75	29.25	SCX05DN
	0-15 PSIA	Absolute	0-90mV	SIP	+20	100µSec	-40°C to +85°C	287-1023-ND	44.70	33.75	29.25	SCX15AN
	0-15 PSID	Differential/Gage	0-90mV	SIP	+20	100µSec	-40°C to +85°C	287-1024-ND	44.70	33.75	29.25	SCX15DN
	0-30 PSIA	Absolute	0-90mV	SIP	+20	100µSec	-40°C to +85°C	287-1025-ND	44.70	33.75	29.25	SCX30AN
	0-30 PSID	Differential/Gage	0-90mV	SIP	+20	100µSec	-40°C to +85°C	287-1026-ND	44.70	33.75	29.25	SCX30DN
	0-100 PSIA	Absolute	0-100mV	SIP	+20	100µSec	-40°C to +85°C	287-1019-ND	54.90	41.25	35.75	SCX100AN
	0-100 PSID	Differential/Gage	0-100mV	SIP	+20	100µSec	-40°C to +85°C	287-1020-ND	54.90	41.25	35.75	SCX100DN
	0-150 PSIA	Absolute	0-90mV	SIP	+20	100µSec	-40°C to +85°C	287-1021-ND	54.90	41.25	35.75	SCX150AN
	0-150 PSID	Differential/Gage	0-90mV	SIP	+20	100µSec	-40°C to +85°C	287-1022-ND	54.90	41.25	35.75	SCX150DN
	0-4" H2O	WC	0.5 to 4.5V	SIP	+18	500µSec	0°C to 70°C	287-1027-ND	78.80	57.80	41.70	SCXL004DN

Fig.	Pressure	Pressure Type	Output	Pkg.	Max. Supply (VDC)	Response Time*	Operating Temp.	Digi-Key Part No.	Price Each 1	10	25	SenSym Part No.
2	0-1 PSID	Differential/Gage	0-18mV	DIP	+20	100µSec	-40°C to +85°C	287-1028-ND	25.00	20.25	17.55	SDX01D4
	0-5 PSID	Differential/Gage	0-60mV	DIP	+20	100µSec	-40°C to +85°C	287-1030-ND	25.00	20.25	17.55	SDX05D4
	0-15 PSIA	Absolute	0-90mV	DIP	+20	100µSec	-40°C to +85°C	287-1037-ND	25.00	20.25	17.55	SDX15A4
	0-15 PSID	Differential/Gage	0-90mV	DIP	+20	100µSec	-40°C to +85°C	287-1038-ND	25.00	20.25	17.55	SDX15D4
	0-30 PSIA	Absolute	0-90mV	DIP	+20	100µSec	-40°C to +85°C	287-1041-ND	25.00	20.25	17.55	SDX30A4
	0-30 PSID	Differential/Gage	0-90mV	DIP	+20	100µSec	-40°C to +85°C	287-1042-ND	25.00	20.25	17.55	SDX30D4
	0-100 PSIA	Absolute	0-100mV	DIP	+20	100µSec	-40°C to +85°C	287-1033-ND	25.00	20.25	17.55	SDX100A4
	0-100 PSID	Differential/Gage	0-100mV	DIP	+20	100µSec	-40°C to +85°C	287-1034-ND	25.00	20.25	17.55	SDX100D4
	0-5" H2O	WC	0-25mV	DIP	+20	100µSec	-40°C to +85°C	287-1044-ND	42.60	36.00	31.20	SDXL005D4
	0-10" H2O	WC	0-25mV	DIP	+20	100µSec	-40°C to +85°C	287-1045-ND	42.60	36.00	31.20	SDXL010D4
3	0-1 PSIG	Gage	0-18mV	DIP	+20	100µSec	-40°C to +85°C	287-1029-ND	25.00	20.25	17.55	SDX01G2
	0-5 PSIG	Gage	0-60mV	DIP	+20	100µSec	-40°C to +85°C	287-1031-ND	25.00	20.25	17.55	SDX05G2
	0-15 PSIA	Absolute	0-90mV	DIP	+20	100µSec	-40°C to +85°C	287-1036-ND	25.00	20.25	17.55	SDX15A2
	0-15 PSIG	Gage	0-90mV	DIP	+20	100µSec	-40°C to +85°C	287-1039-ND	25.00	20.25	17.55	SDX15G2
	0-30 PSIA	Absolute	0-90mV	DIP	+20	100µSec	-40°C to +85°C	287-1040-ND	25.00	20.25	17.55	SDX30A2
	0-30 PSIG	Gage	0-90mV	DIP	+20	100µSec	-40°C to +85°C	287-1043-ND	25.00	20.25	17.55	SDX30G2
	0-100 PSIA	Absolute	0-100mV	DIP	+20	100µSec	-40°C to +85°C	287-1032-ND	25.00	20.25	17.55	SDX100A2
	0-100 PSIG	Gage	0-100mV	DIP	+20	100µSec	-40°C to +85°C	287-1035-ND	25.00	20.25	17.55	SDX100G2
Calibrated and Temperature Compensated Steel Sensors												
4	0-5 PSIG	Gage	1-6VDC	Steel 1/4" (6.35mm) 18NPT (Male) 2" (61cm) Pigtail Electrical Connection	+10 to +30	100µSec	-40°C to +125°C	287-1046-ND	144.86	126.75	109.85	STIV20005G2A
	0-5 PSIG	Gage	4-20mA		+10 to +30	100µSec	-40°C to +125°C	287-1052-ND	144.86	126.75	109.85	STIMA0005G2A
	0-5 PSIG	Gage	0-100mV		+2.5 to +16	100µSec	-40°C to +125°C	287-1058-ND	123.26	107.85	93.47	STIMV0005G2A
	0-15 PSIG	Gage	1-6VDC		+10 to +30	100µSec	-40°C to +125°C	287-1047-ND	144.86	126.75	109.85	STIV20015G2A
	0-15 PSIG	Gage	4-20mA		+10 to +30	100µSec	-40°C to +125°C	287-1053-ND	144.86	126.75	109.85	STIMA0015G2A
	0-15 PSIG	Gage	0-100mV		+2.5 to +16	100µSec	-40°C to +125°C	287-1059-ND	123.26	107.85	93.47	STIMV0015G2A
	0-30 PSIG	Gage	1-6VDC		+10 to +30	100µSec	-40°C to +125°C	287-1048-ND	144.86	126.75	109.85	STIV20030G2A
	0-30 PSIG	Gage	4-20mA		+10 to +30	100µSec	-40°C to +125°C	287-1054-ND	144.86	126.75	109.85	STIMA0030G2A
	0-30 PSIG	Gage	0-100mV		+2.5 to +16	100µSec	-40°C to +125°C	287-1060-ND	123.26	107.85	93.47	STIMV0030G2A
	0-100 PSIG	Gage	1-6VDC		+10 to +30	100µSec	-40°C to +125°C	287-1049-ND	144.86	126.75	109.85	STIV20100G2A
	0-100 PSIG	Gage	4-20mA		+10 to +30	100µSec	-40°C to +125°C	287-1055-ND	144.86	126.75	109.85	STIMA0100G2A
	0-100 PSIG	Gage	0-100mV		+2.5 to +16	100µSec	-40°C to +125°C	287-1061-ND	123.26	107.85	93.47	STIMV0100G2A
	0-300 PSIG	Gage	1-6VDC		+10 to +30	100µSec	-40°C to +125°C	287-1050-ND	144.86	126.75	109.85	STIV20300G2A
	0-300 PSIG	Gage	4-20mA		+10 to +30	100µSec	-40°C to +125°C	287-1056-ND	144.86	126.75	109.85	STIMA0300G2A
	0-300 PSIG	Gage	0-100mV		+2.5 to +16	100µSec	-40°C to +125°C	287-1062-ND	123.26	107.85	93.47	STIMV0300G2A
	0-500 PSIG	Gage	1-6VDC		+10 to +30	100µSec	-40°C to +125°C	287-1051-ND	144.86	126.75	109.85	STIV20500G2A
	0-500 PSIG	Gage	4-20mA		+10 to +30	100µSec	-40°C to +125°C	287-1057-ND	144.86	126.75	109.85	STIMA0500G2A
	0-500 PSIG	Gage	0-100mV		+2.5 to +16	100µSec	-40°C to +125°C	287-1063-ND	123.26	107.85	93.47	STIMV0500G2A
High-Impedance Bridge Sensors												
2	0-1 PSID	Differential	0-20mV	DIP	+12	100µSec	-40°C to +85°C	287-1065-ND	22.20	16.70	14.20	SX01DD4
	0-5 PSID	Differential	0-75mV	DIP	+12	100µSec	-40°C to +85°C	287-1068-ND	18.00	13.20	12.30	SX05DD4
	0-15 PSIA	Absolute	0-110mV	DIP	+12	100µSec	-40°C to +85°C	287-1080-ND	18.00	13.20	12.30	SX15AD4
	0-15 PSID	Differential	0-110mV	DIP	+12	100µSec	-40°C to +85°C	287-1082-ND	18.00	13.20	12.30	SX15DD4
	0-30 PSIA	Absolute	0-110mV	DIP	+12	100µSec	-40°C to +85°C	287-1086-ND	18.00	13.20	12.30	SX30AD4
	0-30 PSID	Differential	0-110mV	DIP	+12	100µSec	-40°C to +85°C	287-1088-ND	18.00	13.20	12.30	SX30DD4
	0-100 PSIA	Absolute	0-150mV	DIP	+12	100µSec	-40°C to +85°C	287-1072-ND	22.20	16.70	14.20	SX100AD4
	0-100 PSID	Differential	0-150mV	DIP	+12	100µSec	-40°C to +85°C	287-1074-ND	22.20	16.70	14.20	SX100DD4
3	0-1 PSIG	Gage	0-20mV	DIP	+12	100µSec	-40°C to +85°C	287-1066-ND	22.20	16.70	14.20	SX01GD2
	0-5 PSIG	Gage	0-75mV	DIP	+12	100µSec	-40°C to +85°C	287-1069-ND	18.00	13.20	12.30	SX05GD2
	0-15 PSIA	Absolute	0-110mV	DIP	+12	100µSec	-40°C to +85°C	287-1079-ND	18.00	13.20	12.30	SX15AD2
	0-15 PSIG	Gage	0-110mV	DIP	+12	100µSec	-40°C to +85°C	287-1083-ND	18.00	13.20	12.30	SX15GD2
	0-30 PSIA	Absolute	0-110mV	DIP	+12	100µSec	-40°C to +85°C	287-1085-ND	18.00	13.20	12.30	SX30AD2
	0-30 PSIG	Gage	0-110mV	DIP	+12	100µSec	-40°C to +85°C	287-1089-ND	18.00	13.20	12.30	SX30GD2
	0-100 PSIA	Absolute	0-150mV	DIP	+12	100µSec	-40°C to +85°C	287-1071-ND	22.20	16.70	14.20	SX100AD2
	0-100 PSIG	Gage	0-150mV	DIP	+12	100µSec	-40°C to +85°C	287-1075-ND	22.20	16.70	14.20	SX100GD2
5	0-1 PSID	Differential	0-20mV	Button	+12	100µSec	-40°C to +85°C	287-1064-ND	22.20	16.70	14.20	SX01D
	0-5 PSID	Differential	0-75mV	Button	+12	100µSec	-40°C to +85°C	287-1067-ND	18.00	13.20	12.30	SX05D
	0-15 PSID	Differential	0-110mV	Button	+12	100µSec	-40°C to +85°C	287-1081-ND	18.00	13.20	12.30	SX15D
	0-15 PSIA	Absolute	0-110mV	Button	+12	100µSec	-40°C to +85°C	287-1078-ND	18.00	13.20	12.30	SX15A
	0-30 PSID	Differential	0-110mV	Button	+12	100µSec	-40°C to +85°C	287-1087-ND	18.00	13.20	12.30	SX30D
	0-30 PSIA	Absolute	0-110mV	Button	+12	100µSec	-40°C to +85°C	287-1084-ND	18.00	13.20	12.30	SX30A
	0-100 PSIA	Absolute	0-150mV	Button	+12	100µSec	-40°C to +85°C	287-1070-ND	22.20	16.70	14.20	SX100A
	0-100 PSID	Differential	0-150mV	Button	+12	100µSec	-40°C to +85°C	287-1073-ND	22.20	16.70	14.20	SX100D
	0-150 PSIA	Absolute	0-110mV	Button	+12	100µSec	-40°C to +85°C	287-1076-ND	22.20	16.70	14.20	SX150A
	0-150 PSID	Differential	0-110mV	Button	+12	100µSec	-40°C to +85°C	287-1077-ND	22.20	16.70	14.20	SX150D

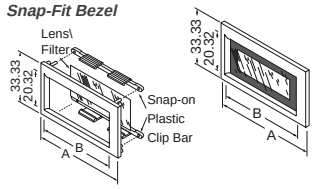
* Response time for a 0 psi to full scale span pressure step change, 10% to 90% rise time.

PRD Plastics
Bezels

Bezel material is polystyrene plastic. Recommended panel thickness for mounting snap-fit bezel is 8.13mm to 3.18mm.

Digi-Key Part No.	Dimensions (mm) A	B	Panel Cut-Out For Snap Fit Bezel Height	Width
PRD180□-ND	58.74	45.72	26.99	52.39
PRD250□-ND	76.20	63.50	26.99	69.85
PRD360□-ND	104.78	91.44	26.99	98.43

Snap-Fit Bezel



Lo-Profile Polycarbonite/ABS with Non-Removeable Lens (requires adhesive strips)

Description	Digi-Key Part No.	Pricing 1	10	100	Mfg. Part No.
Snap Fit Bezels					
45.72mm Wide Bezel Black Plastic	PRD180B-ND	1.35	11.25	90.00	6101010
63.50mm Wide Bezel Black Plastic	PRD250B-ND	1.65	13.75	110.00	6102010
91.44mm Wide Bezel Black Plastic	PRD360B-ND	1.92	16.00	128.00	6103010
For Use With LCDs					
Clear Lens for 45.72mm Bezel	PRD180C-ND	1.20	10.00	80.00	6201010
Clear Lens for 63.50mm Bezel	PRD250C-ND	1.35	11.25	90.00	6202010
Clear Lens for 91.44mm Bezel	PRD360C-ND	1.50	12.50	100.00	6203010
For Use With LEDs					
Smoke Lens for 45.72mm Bezel	PRD180S-ND	1.20	10.00	80.00	6201020
Smoke Lens for 63.50mm Bezel	PRD250S-ND	1.35	11.25	90.00	6202020
Smoke Lens for 91.44mm Bezel	PRD360S-ND	1.50	12.50	100.00	6203020
Red Lens for 45.72mm Bezel	PRD180R-ND	1.20	10.00	80.00	6201030
Red Lens for 63.50mm Bezel	PRD250R-ND	1.35	11.25	90.00	6202030
Red Lens for 91.44mm Bezel	PRD360R-ND	1.50	12.50	100.00	6203030
Green Lens for 45.72mm Bezel	PRD180G-ND	1.20	10.00	80.00	6201040
Green Lens for 63.50mm Bezel	PRD250G-ND	1.35	11.25	90.00	6202040
Green Lens for 91.44mm Bezel	PRD360G-ND	1.50	12.50	100.00	6203040

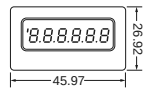
Description	Digi-Key Part No.	Pricing 1	10	100	Mfg. Part No.
Masked Lenses					
25.40mm x 22.23mm Window for 45.72mm	PRD180W-ND	1.20	10.00	80.00	6201050
60.96mm x 16.00mm Window for 63.50mm	PRD250W-ND	1.35	11.25	90.00	6202050
65.41mm x 13.79mm Window for 63.50mm	PRD250W1-ND	1.35	11.25	90.00	6202060
83.01mm x 18.59mm Window for 91.44mm	PRD360W-ND	1.50	12.50	100.00	6203050
93.35mm x 15.80mm Window for 91.44mm	PRD360W1-ND	1.50	12.50	100.00	6203060
Lo-Profile Polycarbonite/ABS					
*Lo-Profile For LCDs **					
45.72mm Bezel with Clear Lens	PRD180LP-ND	2.55	21.25	170.00	6301010
45.72mm Bezel and Clear Lens with 25.40mm x 22.23mm Window	PRD180LPW-ND	2.55	21.25	170.00	6301020
63.50mm Bezel with Clear Lens	PRD250LP-ND	3.00	25.00	200.00	6302010
63.50mm Bezel with Clear Lens with 60.96mm x 16.00mm Window	PRD250LPW-ND	3.00	25.00	200.00	6302020
63.50mm Bezel with Clear Lens with 65.41mm x 13.79mm Window	PRD250LPW1-ND	3.00	25.00	200.00	6302030
91.44mm Bezel with Clear Lens	PRD360LP-ND	3.42	28.50	228.00	6303010
91.44mm Bezel with Clear Lens with 83.01mm x 18.59mm Window	PRD360LPW-ND	3.42	28.50	228.00	6303020
91.44mm Bezel with Clear Lens with 93.35mm x 15.80mm Window	PRD360LPW1-ND	3.42	28.50	228.00	6303030
*Lo-Profile For LEDs **					
45.72mm Bezel with Smoke Lens	PRD180LPS-ND	2.55	21.25	170.00	6301040
45.72mm Bezel with Red Lens	PRD180LPR-ND	2.55	21.25	170.00	6301050
45.72mm Bezel with Green Lens	PRD180LPG-ND	2.55	21.25	170.00	6301060
63.50mm Bezel with Smoke Lens	PRD250LPS-ND	3.00	25.00	200.00	6302040
63.50mm Bezel with Red Lens	PRD250LPR-ND	3.00	25.00	200.00	6302050
63.50mm Bezel with Green Lens	PRD250LPG-ND	3.00	25.00	200.00	6302060
91.44mm Bezel with Smoke Lens	PRD360LPS-ND	3.42	28.50	228.00	6303040
91.44mm Bezel with Red Lens	PRD360LPR-ND	3.42	28.50	228.00	6303050
91.44mm Bezel with Green Lens	PRD360LPG-ND	3.42	28.50	228.00	6303060
Accessories					
Adhesive Strips 2/Pad	PRDAS-ND	.25	2.40	22.33	6000010

*** Requires Adhesive Strips (recommend 2 pads for the 91.44mm Bezel).**

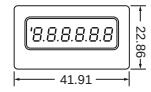
RED LION CONTROLS MDMU Miniature Electronic 6-Digit Counter/Timer/Tach

• LCD, Positive Image Reflective or Negative Image Transmissive with yellow/green or red LED backlighting • Counter, timer and tach all in a single unit • Rate multiplier/prescaler from 0.0001 to 1.9999 in count and tach modes • 10 ranges in timer mode • Selectable decimal points • 5 VDC powered • Panel mount or PC board mount

Panel Mount



Circuit Board Mount



DESCRIPTION

The MDMU is a complete 6-digit counter/timer/tach in a small panel or printed circuit board mounted package. It is designed to operate from a 5 VDC power supply. It has a 6-digit LCD with 0.35" (8.89mm) high digits and 5 selectable decimal points. In the timer modes, a flashing annunciator is supplied to indicate that the signal input of the MDMU is active. The displays are available in Positive Image Reflective (black digits, reflective background) or Negative Image Transmissive (illuminated digits, dark background) with red or yellow/green backlighting.

The **Counter** mode can be selected by setting the Mode Select Inputs to the appropriate levels (Hardware selection). A rate multiplier of 0.0001 to 1.9999 and a decimal point of 0 through 0.00000 can be selected using the *Program* mode. Decimal points may also be set using the DP Inputs (Hardware selection). Both the Count (CNT) and LSC Inputs can be used. (Using the *Program* mode options causes the counter to increment on the opposite edge of the Input signal.)

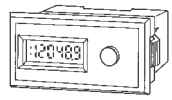
The **Timer** mode and range can be selected by either setting the Mode Select Inputs to the appropriate levels (Hardware selection) or by selecting the range in the *Program* mode. The timing range increments available are 1 msec, 10 msec, 100 msec, 1 sec, 0.1 min., 1 min., 0.01 hr, 0.1 hr, 1 hr, and hr:min:sec. The *Timer Active* annunciator will flash at a 2 Hz rate when the input to the timer is activated. Both the CNT and the LSC inputs can be used. The Inhibit (INH) Input can be used to enable or disable Leading Zero Blanking (LZB).

The **Tach** mode can be selected by setting the Mode Select Inputs to the appropriate levels (Hardware selection). In the **Tach** mode, the MDMU operates as a fixed 1 second time base tachometer. In the *Program* mode, the time base can be set 1 through 7 seconds (in whole second increments). The rate multiplier can also be programmed from 0.0001 through 1.9999. Decimal points can be set from 0 through 0.00000. Decimal points may also be set using the DP Inputs. Both the CNT and the LSC Inputs can be used.

Description	Digi-Key Part No.	Price Each	Red Lion Part No.
MDMU 6-Digit Panel Mount, Reflective Display	RLCU00-ND	35.00	MDMU0000
MDMU 6-Digit Panel Mount, Yellow Backlight	RLCU01-ND	45.00	MDMU0010
MDMU 6-Digit Panel Mount, Red Backlight	RLCU02-ND	45.00	MDMU0020
MDMU 6-Digit PCB Mount, Reflective Display	RLCU10-ND	32.00	MDMU0100
MDMU 6-Digit PCB Mount, Yellow Backlight	RLCU11-ND	42.00	MDMU0110
MDMU 6-Digit PCB Mount, Red Backlight	RLCU12-ND	42.00	MDMU0120

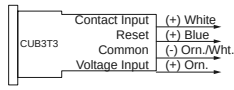
RED LION CONTROLS

CUB III — Operates from switch contact or NPN open collector inputs • Self powered, 2-wire connection, eliminates power wiring. **Description:** Nylon case snap-fits into a standard rectangular opening without screws or other hardware.

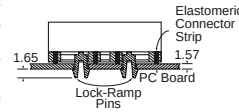


Hook-up is simply a matter of connecting two wires. No external power, internal batteries provide year of uninterruptible service. **Specifications:** • 6-digit, LCDm 0.2" (5.08mm) high • **Power:** 2 replaceable Alkaline "N" cells. Nominal battery life 4 years. Front panel reset button • **Count Input:** Switch contact of solid-state transistor switch. Counter increments on negative going edge of input. • **Count Speed:** 100 counts/sec. Batteries not supplied with counter, order separately.

CUB 3T3 — The CUB3T3 is designed to be used as hour, tenth hour, hundredth hour or tenth minute timers. The timing function can be activated by either a contact closure or the application of 10 to 300 (AC 50/60 Hz or DC) and is equipped with a remote reset. Time is displayed on a 6-digit LCD that will wrap around from a full display of "999999" to "000000" when an overflow occurs. **Specifications:** • **Display:** 6-digit, LCD, 0.2" (5.08mm) high. • **Power:** 3 volts supplied by a non-replaceable lithium battery. Nominal battery life is 7 years. • **Remote Reset:** 15 msec min. pulse width (active low) from 3.0 V bi-polar output, an open collector transistor, or a switch contact to common. • **Signal Input:** Contact Connections: Switch Contact or Solid-State Transistor Switch. A maintained closed switch will actuate the timer. • **10 to 300 V Connections:** 10 V min. to 300 V max. Constant voltage applied to the inputs will actuate the timer.

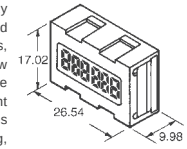


SUPER SUB CUB — True quadrature — with resolutions up to 4 times the encoded input • Bi-directional counting with up/down control • Anti-coincidence addition and subtraction • Polarity indication • 8-digit counting capability (6-digit display) • Decimal point and leading zero blanking selection • Solderless, elastomeric interconnects (snap mounts directly on P.C. board) • Ultra low power, 25µA at 5V (typical). **Description:** The Super Sub Cub provides all the capabilities and features of the Sub Cub 2 plus four "built-in" modes of operation: Bi-direction counting with up/down control, quadrature counting, coincidence summing and anti-coincidence add/subtract counting. *For dimensions, see Sub Cub 2.*



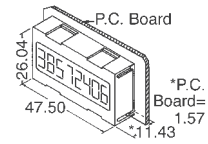
SUB CUB I — Complete 6-Digit Component Counters

• LSI counter chip with LCD display • Snap mounts directly on P.C. board • 0.2" (5.08mm) high display • Solderless, elastomeric interconnects • Ultra-low power, 5V at 15µA typical • Latchable display with leading zero blanking • Count rates to 500 KHZ • Ideal in applications for: Register, status and usage counting, frequency, EPUT, and RPM indication timer, pulse-width and period readout. **Description:** The modules contain a custom monolithic counter/driver chip that performs all the counting functions together with a 6-digit LCD readout. To be used as frequency or rate meters, timers, phase-angle or pulse width indicators and for other complex readout requirements in addition to simple high speed counting.



SUB CUB II — Complete 6-Digit Component Counters

• LSI counter chip with LCD display • Snap mounts directly on P.C. board • 0.35" (8.89mm) high display • Solderless, elastomeric interconnects • Ultra-low power, 5V at 15µA typical • Latchable display with leading zero blanking • Count rates to 500 KHZ • Ideal in applications for: Register, status and usage counting, frequency, INPUT, and RPM indication timer, pulse-width and period readout. **Description:** The modules contain a custom monolithic counter/driver chip that performs all the counting functions together with a 6-digit LCD readout. To be used as frequency or rate meters, timers, phase-angle or pulse width indicators and for other complex readout requirements in addition to simple high speed counting.



SUB CUB 2-8A • LSI counter chip and 0.30" (7.62mm) high LCD display • Solderless, elastomeric interconnects (snap mounts directly onto PC board) • Latchable display with selectable leading zero blanking • Count rates to 750Khz • Low power, 30µA at 5V (typical) **Description:** 8-digit LCD component up-counter • Test feature allows all decades to count in parallel to provide rapid testing. *For dimensions, see Sub Cub 2.*

SUB CUB D • True quadrature with resolutions up to 4 times the encoded input • Bi-directional counting with up/down control • Polarity indication • 3 position decimal point with selectable leading zero blanking • Solderless, elastomeric interconnects (snap mounts directly onto P.C. board) • Ultra low power, 15UA at 5.0V (typical). **Description:** The Sub Cub D provides all of the capabilities of the Sub Cub 2 with two additional modes of operation: Bi-directional counting with up/down control and quadrature counting. *For dimensions, see Sub Cub 2.*

SUB CUB T • LSI timer/counter chip with crystal controlled oscillator and .35" (8.89mm) high LCD display • Snap mounts directly onto P.C. board. • Solderless, elastomeric interconnect • Ultra low power, 15UA at 5.0 VDC typical • Times in hours, 0.1 hours, 0.01 hours, and 0.1 minutes • Counts in X1, :10, :100, and :1000 • Debounce selectable in counter modes • Counts rates up to 500 KHZ • Annunciator to indicate timer running • Accepts AC voltage on signal input directly through input resistor. **Description:** Completely self-contained timer/counter/display module. Ideal for internal "on board" applications where a readout of elapsed time or count is needed. *For dimensions, see Sub Cub 2.*

SUB CUB R • LSI counter chip with time base chip and .35" (8.89mm) high LCD display • Snap mounts directly onto P.C. board • Solderless, elastomeric interconnects • Ultra low power, 25UA at 3V • Selectable time base from 3.9 msec to 15.9 sec • Frequency doubling capability • Selectable decimal point positions • Master reset to synchronize time base with external functions. **Description:** Completely self-contained tachometer/display module. Contains a custom monolithic counter/driver chip, a custom time base chip, and a 6-digit liquid crystal display. Ideal for internal "on board" applications where readout of rate or frequency is needed. *For dimensions, see Sub Cub 2.*

Description	Digi-Key Part No.	Price Each	Red Lion Part No.
CUB III, CUB 3TR and CUB 3T3			
CUB III (Requires 2 N-Cell Batteries)	RLC03-ND	28.00	CUB III
CUB III w/Lithium Battery (Battery life 10 yrs. depending on usage)	RLC04-ND	33.00	CUB3L000/A
N-Cell Battery	P147-ND	1.08	AM5X
CUB 3TR Timer, Resettable 10-130V, 0.1 hour	RLC3TR-11-ND	38.04	CUB3-TR-11/A
CUB 3T300 Timer, Remote Reset, 1 hour	RLC3TR-30-ND	48.00	CUB3T300
CUB 3T310 Timer, Remote Reset, 0.1 hour	RLC3TR-31-ND	48.00	CUB3T310
CUB 3T320 Timer, Remote Reset, 0.01 hour	RLC3TR-32-ND	48.00	CUB3T320
CUB 3T330 Timer, Remote Reset, 0.1 minute.	RLC3TR-33-ND	48.00	CUB3T330
SUPER SUB CUB			
Super Sub-Cub Display/Counter Module	RLC200A-ND	38.00	SSCUB200
Super Sub-Cub Prototype P.C. Board	RLC08-ND	14.00	DM-0SC-B03/A
SUB CUB I and II			
Evaluation Kit (batteries included, RLC02-ND and display counter needed)	RLC01-ND	52.00	DM-OSC-B01/A
Mounting PCB for Display Counter to Evaluation Kit	RLC02-ND	10.00	DM-OSC-B02/A
Display Counter .2" (5.08mm) High Digits	RLC1000-ND	22.00	SCUB-1000
Display Counter .35" (8.89mm) High Digits	RLC2000-ND	28.00	SCUB-2000

Description	Digi-Key Part No.	Price Each	Red Lion Part No.
SUB CUB 2-8A			
8 Digit LCD component up-counter	RLC2-8A-ND	40.00	SCUB28A0
SUB CUB D			
8 Digit Bi-directional Module w/6 Digit LCD Display	RLC05-ND	30.00	SCUBD-200/A
Sub Cub D Prototype P.C. Board	RLC09-ND	14.00	DM-0SC-B04/A
SUB CUB T			
Time/Counter 5 Digit	RLC07-ND	29.00	SCUBT-200/A
SUB CUB R			
6 Digit Rate Indicator Module	RLC06-ND	37.00	SCUBR-200/A
Bezels			
Bezel Kit w/P.C. Board & Cable (For RLC05-ND, RLC06-ND, RLC07-ND)	RLC10-ND	24.00	HWK-60-000/A
Panel Bezel Kit w/P.C. Board & Cable (For RLC2-8-ND)	RLC28-ND	22.00	HWK-28-000/A
Panel Bezel Kit w/o P.C. Board & Cable (For RLC05-ND, RLC07-ND, RLC2-8-ND, RLC200A-ND, RLC2000-ND)	RLC30-ND	10.00	HWK-30-000/A
Panel Bezel Kit w/P.C. Board & Cable (For RLC2000-ND)	RLC40-ND	20.00	HWK-40-000/A
Super Sub-Cub Panel Bezel Kit with P.C. Board & Cable (For RLC200A-ND)	RLC50A-ND*	24.00	HWK-50-000/A

* Does not include SUPER SUB-CUB Display/Counter Module. Order SUPER SUB-CUB Module separately.

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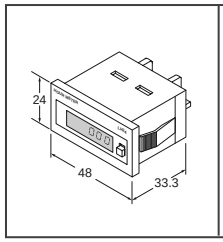
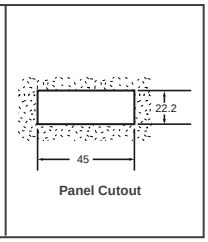
9278B-ND Aromat Timers, Counters Data Book.....**$2.95**

LCD Hour Meters





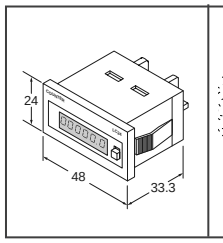
Aromat hour meters display total time when the signal input terminal is connected either together (No-Voltage, using a switch or relay) or the rated input voltage is applied directly to the input terminal (AC/DC Volt type).

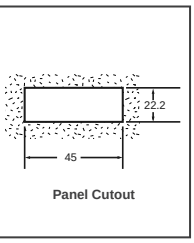
All hour meters feature a built-in 10 year battery for long life and screw terminals for easy connections.

Features:
- Large 7-digit LCD display value reading
- Wide range of measurement: 0 to 39999 days, 23.9 hours; 0 to 99999.99 hours; 0 to 9999 hours, 59.9 min.

Input Type	Time Range	Reset	Digi-Key Part No.	Price Each 1	25	50	Aromat Part No.
No-Voltage	0-3999 days, 23.9 hrs	Manual PB	255-1177-ND	48.45	45.90	43.35	LH24-F-DH
No-Voltage	0-99999.99 hrs	Manual PB	255-1178-ND	48.45	45.90	43.35	LH24-F-H
No-Voltage	0-9999 hrs, 59.9 min.	Manual PB	255-1179-ND	48.45	45.90	43.35	LH24-F-HM
100-120VAC	0-3999 days, 23.9 hrs.	Manual PB	255-1180-ND	62.70	59.40	56.10	LH24-F-DH-AL
100-120VAC	0-99999.99 hrs	Manual PB	255-1181-ND	62.70	59.40	56.10	LH24-F-H-AL
100-120VAC	0-9999 hrs, 59.9 min	Manual PB	255-1182-ND	62.70	59.40	56.10	LH24-F-HM-AL
200-240VAC	0-3999 days, 23.9 hrs	Manual PB	255-1183-ND	62.70	59.40	56.10	LH24-F-DH-AH
200-240VAC	0-99999.99 hrs	Manual PB	255-1184-ND	62.70	59.40	56.10	LH24-F-H-AH
200-240VAC	0-9999 hrs, 59.9 min.	Manual PB	255-1185-ND	62.70	59.40	56.10	LH24-F-HM-AH
4.5-30VDC	0-3999 days, 23.9 hrs	Manual PB	255-1186-ND	62.70	59.40	56.10	LH24-F-DH-DL
4.5-30VDC	0-99999.99 hrs	Manual PB	255-1187-ND	56.05	53.10	50.15	LH24-F-H-DL
4.5-30VDC	0-9999 hrs, 59.9 min.	Manual PB	255-1188-ND	56.05	53.10	50.15	LH24-F-HM-DL

LCD Up Totalize Counters





Aromat LCD Up Counters will display a totalized count when the input terminals have the proper input applied. No-Voltage and AC input types have a maximum count of 30 cps and DC input types have a maximum count of 70 cps.

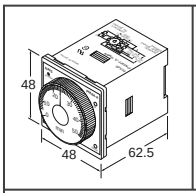
All counters are powered by a 10 year internal battery and feature screw terminals for easy connection.

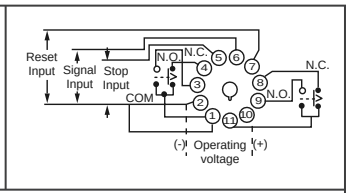
Features:
- Large 7-digit LCD display
- Unnecessary "0"s are eliminated from the upper digits of elapsed value for easy reading.
- Wide counting range

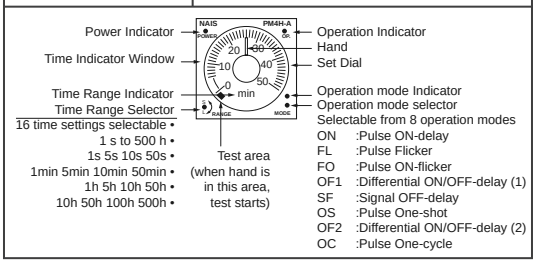
Input Type	Max. Count	Reset	Digi-Key Part No.	Price Each 1	25	50	Aromat Part No.
No-Voltage	30cps	Manual PB	255-1189-ND	45.60	43.20	40.80	LC24-F
No-Voltage	30cps	Manual PB	255-1190-ND*	38.00	36.00	34.00	LC24-C
100-120VAC	30cps	Manual PB	255-1191-ND	57.95	54.90	51.85	LC24-F-AL
200-240VAC	30cps	Manual PB	255-1192-ND	57.95	54.90	51.85	LC24-F-AH
4.5-30VDC	70cps	Manual PB	255-1193-ND	53.20	50.40	47.60	LC24-F-DL

**255-1190 is a PCB mounted counter.*

PM4H-A Analog Timer







Aromat's PM4H-A series of analog timers operates in one of eight different modes. Available in 11 pin octal base or built-in screw terminals for easy connection. All are IP65 sealed for water and dust and are capable of switching 5A @ 250 VAC with a DPDT timed out relay. Screw terminal types include gasket and mounting bracket.

Features: • Front panel of IP65 type is protected against water-splash and dust • 100-240V AC free-voltage input • Built-in screw terminals • 8 different operation modes • Multiple time ranges—1 s to 500 h

Operating Voltage	Terminal	Digi-Key Part No.	Price Each 1	25	50	Aromat Part No.
100-240VAC	11 pin octal	255-1198-ND	51.30	48.60	45.90	PM4HA-H-AC240VW
100-240VAC	Screw	255-1199-ND	57.95	54.90	51.85	PM4HA-H-AC240VSW
24VAC/DC	11 pin octal	255-1200-ND	51.30	48.60	45.90	PM4HA-H-24VW
24VAC/DC	Screw	255-1201-ND	57.95	54.90	51.85	PM4HA-H-24VSW
12VDC	11 pin octal	255-1202-ND	51.30	48.60	45.90	PM4HA-H-DC12VW
12VDC	Screw	255-1203-ND	57.95	54.90	51.85	PM4HA-H-DC12VSW

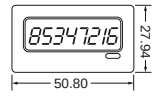
Relay Accessories

Description	Digi-Key Part No.	Price Each 1	25	50	Aromat Part No.
Track Mounted Socket for 11 pin octal only	255-1205-ND	9.50	9.00	8.50	ATC18004
Snap-in Bezel, Gray for PM4HA Series	255-1206-ND	1.90	1.80	1.70	AT7811
Snap-in Bezel, Black for PM4HA Series	255-1207-ND	1.90	1.80	1.70	AT7812
Snap-in Bezel, Silver for PM4HA Series	255-1208-ND	1.90	1.80	1.70	AT7813
Clear Protective Cover for PM4HA Series	255-1209-ND	3.80	3.60	3.40	N-TC
40" Din Rail Mounting Track for Track Sockets	255-1210-ND	5.70	5.40	5.10	AT8-DLA1
End Stop Plate for Din Rail Mounting Track	255-1211-ND	1.90	1.80	1.70	ATA4806

RED LION CONTROLS

CUB7 Series Miniature Electronic 8-Digit Counter

CUB7 / CUB7W (with Voltage Input)



- LCD, Positive Image Reflective or Negative Image Transmissive with yellow/green or red LED backlighting (9-28 VDC power supply required for versions with LED backlighting)
- 0.35" (8.89mm) high digits
- Replaceable internal lithium battery provides up to 7 years of uninterrupted operation
- NEMA 4X/IP65 sealed front bezel
- Front panel reset or remote reset
- Wire connection made via screw clamp type terminals
- Fits DIN standard cut-out 1.77" (45 mm) x 0.874" (22.2 mm)
- Low speed count to 30Hz from switch closure or O.C. transistor. High speed count to 10 KHz (CUB7)

DESCRIPTION:

The *CUB7* and *CUB7W* are an 8-digit miniature counter with large 0.35 inch (8.89 mm) high digits. They have an LCD read-out available in Positive Image Reflective, Negative Image Transmissive with yellow/green or red LED backlighting. The backlight versions require an external 9 to 28 VDC power supply.

The *CUB7* series is housed in a lightweight, high impact plastic case with a clear viewing window. The sealed front panel with the silicone rubber reset button meets NEMA 4X/IP65 specifications for wash-down and/or dusty environments, when properly installed.

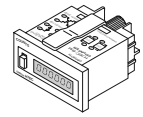
The *CUB7W* accepts most machine control voltage signals. The input accepts AC (50/60 Hz) or DC control voltages from 10 to 300 V at count speeds up to 30 counts per second (cps).

Description	Digi-Key Part No.	Price Each	Red Lion Part No.
CUB7 8-Digit Reflective Display	RLC700-ND	48.00	CUB70000
CUB7 8-Digit Yellow/Green Backlight	RLC701-ND	68.00	CUB70010
CUB7 8-Digit Red Backlight	RLC702-ND	68.00	CUB70020
CUB7W 8-Digit Reflective w/Voltage Input	RLCW70-ND	52.00	CUB7W000
CUB7W 8-Digit Yellow Backlight w/Voltage Input	RLCW71-ND	72.00	CUB7W010
CUB7W 8-Digit Red Backlight w/Voltage Input	RLCW72-ND	72.00	CUB7W020

O

OMRON Totalize Counter

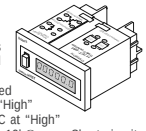
9248B-ND Omron Counters Full Line Catalog $2.00



Omron's self-powered totalizing counters feature either no-voltage inputs, DC voltage only or combined AC/DC voltage inputs. Offered in both 1KHz input for high speed, no chatter input signals or 30/20Hz inputs for relay and switch (high chatter) inputs. Available with electrical reset or manual-electrical reset • Operating mode: up count • Display: LCD Digital, 0.2 in. high. **Specifications:** • Supply voltage: Not required (powered by built-in battery) • Input: AC/DC voltage — 24 to 240VAC ±10%, 50/60 Hz, or 6 to 240VDC ±10% at "High" (logic) level, 0 to 1.5VAC ±10%, 50/60 Hz, or 0 to 2VDC at "Low" (logic) level • DC voltage — 4.5 to 30VDC at "High" (logic) level, 0 to 2VDC at "Low" (logic) level • No-voltage — Maximum short-circuit impedance: 10kΩ max. • Reset time: 20 ms reset signal. • Approvals: UL File No. E41515, CSA File No. LR22310. • Instruction Sheet Included.

No. of Digits	Type of Input	Counting Speed	Terminal Type	Reset Type	Digi-Key Part No.	Price Each 1	25	50	Omron Part No.
7	No-voltage	1 kcps	WW	Electrical	Z860-ND	46.20	42.78	39.93	H7EC
7	No-voltage	1 kcps	Screw	Electrical	Z861-ND	46.20	42.78	39.93	H7EC-B
7	No-voltage	30 cps	Screw	Electrical	Z862-ND	47.21	43.71	40.80	H7EC-BL
6	No-voltage	1 kcps	Screw	Elec./Manual	Z863-ND	47.21	43.71	40.80	H7EC-BM
6	No-voltage	30 cps	Screw	Elec./Manual	Z864-ND	47.21	43.71	40.80	H7EC-BLM
6	DC only	1 kcps	Screw	Elec./Manual	Z865-ND	47.21	43.71	40.80	H7EC-BVM
6	DC only	30 cps	Screw	Elec./Manual	Z866-ND	47.21	43.71	40.80	H7EC-BVLM
7	AC/DC volt.	20 cps	Screw	Electrical	Z867-ND	47.21	43.71	40.80	H7EC-FBV

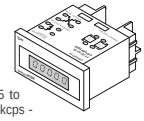
Timer Counter



Omron's self-powered time totalizers displays cumulative time by counting the output signals received from a sensor. When the proper input has been applied, the timing circuit is enabled allowing the timer to start, disabling the inputs will stop the timing sequence. Available with electrical reset or manual-electrical reset. **Specifications:** • Supply voltage: Not required (powered by built-in battery) • Input: AC/DC voltage — 24 to 240VAC, or 6 to 240VDC at "High" (logic) level, 0 to 1.5VAC, or 0 to 2VDC at "Low" (logic) level. DC voltage — 4.5 to 30VDC at "High" (logic) level, 0 to 2VDC at "Low" (logic) level. No-voltage — Max. short-circuit impedance: 10kΩ max. Short-circuit residual voltage: 0.5 Vmax. Minimum open impedance: 500kΩ max. • Reset time: 20 ms reset signal. • Terminal: Screw type • **Approvals:** UL File No. E41515, CSA File No. LR22310. • Instruction Sheet Included.

Type of Input	Time Range	Reset Type	Digi-Key Part No.	Price Each 1	25	50	Omron Part No.
No-voltage	0 to 999999.9h	Electrical	Z870-ND	54.24	50.22	46.88	H7ET-B
No-voltage	0 to 99999.9h	Elec./Manual	Z871-ND	54.24	50.22	46.88	H7ET-BM
DC voltage only	0 to 999999.9h	Electrical	Z872-ND	54.24	50.22	46.88	H7ET-BV
No-voltage	0 to 99h.59m.59.9s	Electrical	Z873-ND	53.23	49.29	46.01	H7ET-B1
AC/DC voltage	0 to 99h.59m.59.9s	Electrical	Z874-ND	67.29	62.31	58.16	H7ET-FBV1
AC/DC voltage	0 to 999999.9h	Electrical	Z875-ND	67.29	62.31	58.16	H7ET-FBV

Tachometer Counter



Omron's self-powered tachometer is completely selectable for RPM or RPS measurement. On board rotary switches allow you to set your divider/multiplier network. Tachometer reads up to 10KHz maximum. • Operating Mode: UP Type • Display: LCD digital, 0.2" high • Count Input: DC voltage input. **Specifications:** • Powered by built-in battery • Input: DC voltage — 4.5 to 30VDC at "High" (logic) level. 0 to 2VDC at "Low" (logic) level • Maximum counting speed: 1kcps - Gate time: 1 second. 10 kcps - Gate time: 1 second. • Instruction Sheet Included.

Max. Counting Speed	Number of Digits	Terminal Type	Digi-Key Part No.	Price Each 1	25	50	Omron Part No.
10 kcps	5	Screw	Z869-ND	87.38	80.91	75.52	H7ER-SBV

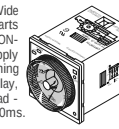
Counter Accessories

Description	Digi-Key Part No.	Price Each 1	25	Omron Part No.
Horizontal Panel Mounting Adapter for H7 Series	Z998-ND	2.49	2.31	Y92F-75
Vertical Panel Mounting Adapter for H7 Series	Z999-ND	2.49	2.31	Y92F-76

Solid State Timers

9249B-ND Omron Solid State Timers Catalog.....$1.00

Series H3CR



Features: • Field-selectable time ranges from 0.05 second to 300 hours • Wide range AC supply voltage models (100 to 240 VAC) fits most applications and reduces spare parts inventories • Three external signal inputs for remote control of the timer. • Timing functions: ON-delay, Repeat cycle (B, B2), Signal ON/OFF delay. Signal OFF-delay, Interval. **Specifications:** • Supply voltage: 100 to 240 VAC, 50/60Hz • Operating voltage: 85%–110% of rated supply voltage • Timing functions: ON-delay, Repeat cycle signal OFF start, Repeat cycle signal ON start, Signal ON/OFF delay, Signal OFF-delay, Interval • Control output: Type - DPDT relay, Max. load - 5A, 250VAC, Min. load - 10mA, 5VDC • Repeat Accuracy: ±0.3% full scale max., except in 1.2 s range ±0.3%, ±10ms. **Approvals:** UL File No. E41515, CSA File No. LR22310

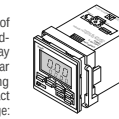
Description	Digi-Key Part No.	Price Each 1	25	50	Omron Part No.
Analog Timer 120/240VAC Time Select DPDT	Z876-ND	49.90	46.20	43.12	H3CR-A-AC100-240
Analog Timer 12VDC Time Selectable DPDT	Z996-ND	60.65	54.27	47.88	H3CR-A-DC12
Analog Timer 24VDC/AC Time Selectable DPDT	Z997-ND	51.71	47.88	44.69	H3CR-A-AC/DC24
Track Mount Relay Socket for H3CR Series	Z884-ND	7.42	6.68	5.94	P2CF-11
Protective Panel Cover, Black For H3CR	Z929-ND	3.69	3.42	3.19	Y92P-48GB

Series H3G

Features: • DPDT contact Form • Fits standard 8-pin sockets • Ideal replacement for time relays • LED power-ON indicator • On-delay only. **Specifications:** • Supply Voltage: 100/110/120 VAC • Operating Voltage: 85 to 110% of rated voltage • Timing Functions: ON-delay • Control Output, DPDT: Max. load - 5A, 125/250VAC (resistive lead), Min. load - 100mA, 5VDC • Repeat accuracy: ±2% max. • Indicators: Power ON (LED) • Operating Temperature: 14°F to 131°F (-10°C to 55°C) • Variation due to voltage change: ±2% max. • Variation due to temperature change: ±5% max. • Mechanical Service Life: 10 million operations min. • Electrical Service Life: 100,000 operations min. at max. ratings. **Approvals:** UL File No. E41515, CSA File No. LR22310.

Description	Digi-Key Part No.	Price Each 1	25	50	Omron Part No.
Analog Timer 120VAC 1-10 Second DPDT	Z877-ND	30.13	27.90	26.04	H3G8CAC100/110/12010
Analog Timer 120VAC 6-60 Second DPDT	Z930-ND	32.66	30.24	28.23	H3G8CAC10011012060S
Analog Timer 120VAC 1-10 Minute DPDT	Z931-ND	32.66	30.24	28.23	H3G8CAC10011012010M
Analog Timer 120VAC 6-60 Minute DPDT	Z932-ND	32.66	30.24	28.23	H3G8CAC10011012060M
Back Mount Relay Socket for H3G/H5CR Series	Z883-ND	8.40	7.56	6.72	P3G-08
Panel Mount Adapter for H3G Series	Z886-ND	3.01	2.79	2.61	Y92F-31

Series H5CR



Features: • Nine field-selectable output modes accommodate a wide variety of applications • All parameters set by scroll-through menus accessed from the front panel • Field-selectable time ranges from 0.001 second to 9999 hours • High-visibility alphanumeric LCD display has 8 mm high characters and built-in backlight • Precision control possible to 0.001 second • 10-year battery back-up • Selectable elapsed time (UP) and time remaining (DOWN) display • Timing functions: 9 selectable, including ON-delay, repeat cycle, OFF-delay, interval, and one-shot • Contact type: SPDT relay. **Specifications:** • Supply voltage: 100 to 240VAC, 50/60Hz • Operating voltage: 85%–110% of rated voltage • Relay control output: Max. load - 5A, 250VAC; Min. load - 10mA, 5VDC • Repeat accuracy: Power start - ±0.01%, Signal start - ±0.005% • Indicators: H5CR-L: 4-digit LCD alphanumeric display, 8mm; H5CR-B: 4-digit LCD alphanumeric display with backlighting, 8mm • Memory function: Retains preset values for 10 years at 25°C • Operating Temp.: 14° to 131°F (-10°C to 55°C) • Mechanical service life: 10 million operations min. • Electrical service life: 100,000 operations min. at 5A, 240VAC, resistive load (p.f. = 1). **Approvals:** UL File No. E41515, CSA File No. LR22310, SEV File No. 1021.

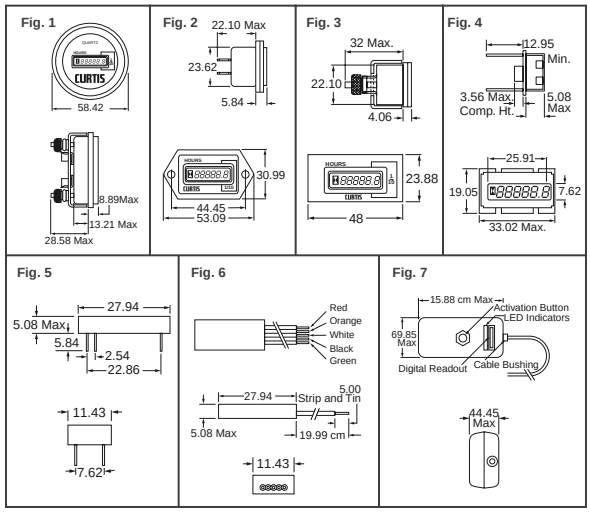
Description	Digi-Key Part No.	Price Each 1	25	50	Omron Part No.
Digital Timer 120/240VAC Time Select SPDT	Z880-ND	118.52	109.74	102.43	H5CR-L-AC100-240
Digital Timer w/Backlight 120/240VAC Time Select	Z881-ND	129.57	119.97	111.98	H5CR-B-AC100-240
Panel Mount Adapter for H3CR/H5CR Series	Z885-ND	5.02	4.65	4.34	Y92F-30
Back Mount Relay Socket for H3G/H5CR Series	Z883-ND	8.40	7.56	6.72	P3G-08

Programmable Weekly Timer

Large LCD display with 7 day x 24 hour programming. Perfect for controlling On-Off cycles for lighting, industrial and security. Two independent 15A control circuits and 16 step front program options allows fast and easy program changes. Wire connections are made by screw terminals from either the front or the back. Timer may be wall mounted, recessed into panel or Din rail mounted. All mounting hardware and instructions are included. Optional protective hard plastic cover prevents accidental resetting and protects from dirt and water.

Description	Digi-Key Part No.	Price Each 1	25	Omron Part No.
Programmable Timer 100-240VAC w/Manual Override	Z1000-ND	201.10	179.93	H5L-A
Clear Protective Cover (Hard Plastic) for H5L-A	Z1001-ND	9.31	8.33	Y92A-96A

CURTIS Timers/Counters



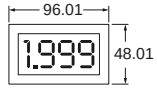
700 Series Solid State (Hour Meters and Counters) — Curtis Modules are ideally suited for OEM's panel makers and contract manufacturers to measure equipment usage for preventive maintenance scheduling, warranty validation and renting/leasing. These unique modules can be used as timers/counters in vending machines, medical equipment, fuel pumps, office equipment, flow instruments, consumer products and many other applications. **FEATURES:** • Attractive and easy to read 6-digit Liquid Crystal Displays with 5 mm digit height. • Compact size ideal for electronic subassemblies. • Wide voltage range. • AC/DC operation on most products. • Input Frequency of 500 Hz on DC counters; 1 Hz on AC/DC counters • Exceptional reliability due to non-volatile (EEPROM) memory which can retain data for 25+ years. • Resettable option. **SPECIFICATIONS: Resolution:** 99,999.9 Hours; 999,999 Counts. **Accuracy:** ±0.1% hours; ±1 count. **Mechanical Shock:** SAE J1378 55g. **Vibration:** SAE J 1378 20g. **Humidity:** 95% RH. **Operating Temperature:** -40°C to +85°C **Storage Temperature:** -50°C to +90°C

200 Series Solid State (Use Measurement Devices) — The 200 Series devices measure the use of industrial and commercial equipment that, due to environmental or cost constraints, could not previously be measured. The compact size, 1.10" x 0.45" (27.94mm x 11.43mm) and exceptional reliability result in a device that can travel with the equipment and provide critical information for warranty determination, maintenance scheduling and design validation in many products. **FEATURES:** • Reliability through the combination of surface mount circuits, EEPROM memory and sealed packages. • Serial digital output for computer or peripheral reader interface. • Printed Circuit or Wire Lead mounting. • Resettable option. **SPECIFICATIONS: Voltage Range:** 4.5 to 1. **Reset Voltage:** 20VDC ±5%. **Reset Pulse Width:** 100 sec min; 1 sec max. **Recording Capability:** 99,999.99 Hours; 99,999 Events. **Resolution:** 0.01 hour; 1 event. **Accuracy:** ±0.1% hours; 1 count (full scale). **Current Consumption:** 0.4 mA max @ 5 VDC. **Operating Temp.:** -40°C to +85°C. **Storage Temp.:** -45°C to +90°C.

Fig.	Operating mode	Op. Voltage DC	AC	Reset	Digi-Key Part No.	Pricing 1	10	Curtis Part No.
1	Hour Meter	12-48	20-60	Elect	267-1001-ND	32.46	292.10	701QR1248D2060A
1	Hour Meter	48-150	100-230	Elect	267-1002-ND	32.46	292.10	701QR48150D100230A
2	Hour Meter	12-48	20-60	Elect	267-1003-ND	32.46	292.10	701FR1248D2060A
2	Hour Meter	48-150	100-230	Elect	267-1004-ND	32.46	292.10	701FR48150D100230A
3	Hour Meter	12-48	20-60	Elect	267-1005-ND	32.46	292.10	701DR1248D2060A
3	Hour Meter	48-150	100-230	Elect	267-1006-ND	32.46	292.10	701DR48150D100230A
3	Counter	12-48	20-60	Elect	267-1007-ND	32.46	292.10	703DR1248D2060A
3	Counter	48-150	100-230	Elect	267-1008-ND	32.46	292.09	703DR48150D100230A
4	Hour Meter	5-12	—	Elect	267-1009-ND	23.96	215.60	17075102
4	Hour Meter	12-48	—	Elect	267-1010-ND	23.96	215.60	17075112
4	Counter	5-12	—	Elect	267-1011-ND	23.96	215.60	17082102
4	Counter	12-48	—	Elect	267-1012-ND	23.96	215.60	17082112
5	Hour Meter	4.5-10	—	Elect	267-1013-ND	20.76	—	201PCR5VDC
5	Counter	4.5-10	—	Elect	267-1014-ND	20.76	—	202PCR5VDC
6	Hour Meter	4.5-10	—	Elect	267-1015-ND	24.76	—	201RWR5VDC
6	Counter	4.5-10	—	Elect	267-1016-ND	24.76	—	202RWR5VDC
7	Reader	—	—	—	267-1017-ND	225.00	—	1170-003

C-Ton Industries Digital Panel Meter

Fig. 1 — 1/8 Din BIG DIGIT Series



Front Bezel View

Fig. 2 — Surface Mount 3.5 Digit LCD

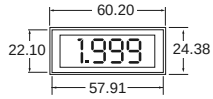


Fig. 3 — Snap-in 3.5 Digit LCD

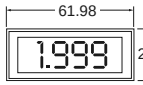


Fig. 4 — Snap-in 3.5 Digit LCD

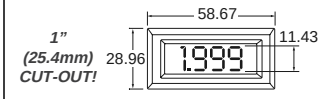


Fig. 5 — Mini 3.5 Digit LCD

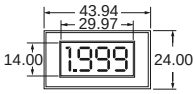


Fig. 6 — 4.5 Digit LCD

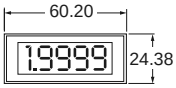
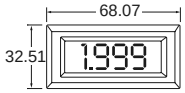


Fig. 7 — 3.5 Digit LED



General LCD Specifications: • **Type:** 7-segment, liquid crystal display (LCD) • **Polarity:** Displays (-) automatically • **Over/Under Range:** Overrange displays "1" and underrange displays "-1" • **Configuration:** True differential input and reference • **Protection:** 250 VDC or 150V RMS continuous. 300 VDC intermittent max. • **Com Mode Voltage:** ±1V max. • **Com Mode Reject:** >86 decibels • **Zeroing:** Automatic • **Operating Temperature:** Standard 0 to 50°C • **5-Year Unconditional Warranty**

1/8 DIN Big Digit Series ***Specifications:*** • 3-1/2 digit 7-segment LED or LCD • +5 VDC powered • Overrange indication and automatic zero • **Height:** 20.32mm LED, 24.89mm LCD • **Input:** Single ended or true differential • **Polarity:** "--" displayed for negative reading • **Current Draw:** 80mA LED, 2.2mA LCD • **Operating Temperature:** -10° to 50°C LED, 0 to 50°C LCD • **Connection:** Screw terminals

3.5 Digit LCD ***Specifications:*** • **Annunciators:** 9 VDC powered meters have "LO BAT" when power <7.2 VDC • **Decimal Point:** User selectable 3-position • **Full Scale Ranges:** ±200 mVDC, ±2 VDC, ±20 VDC • **Power:** 9 VDC isolated @ 180 µA, 5 VDC @ 3 mA • **Conversion Rate:** 2.5 per second • **Storage Temperature:** -20° to 70°C • **Type:** Surface Mount • **Pins:** 13 or 10 pins, .64mm square on 2.54mm centers • **Backlit Power Options:** +5 VDC, ±5%, Red 165 mA typical (200 mA max.); Green 115 mA typical (160 mA max.) • **Backlit Connections:** Standard 2 solder pads • **Styles:** Surface/window or snap-in bezel

Miniature LCD ***Specifications:*** • **Annunciators:** 11 different user selectable annunciators: BAT, °C, °F, ~, m, µ, MΩ, KΩ, V, A, HOLD • **Decimal Point:** User selectable 3-position • **Full Scale Range:** Standard ±200 mVDC, ±2 VDC • **Power:** 9 VDC isolated (7.2-15V) at 150 µA, 5 VDC @ 5 mA • **Conversion Rate:** 2.5 per second • **Storage Temperature:** -20° to 70°C • **Type:** Snap-in Bezel Mount • **Pins:** Standard 26 pins, .46mm square, DIP style

4.5 Digit LCD ***Specifications:*** • **Annunciators:** 9 VDC powered meters have "BT" when power <7.2 VDC • **Decimal Point:** User selectable 4-position • **Hold:** Standard feature • **Full Scale Range:** ±200 mVDC and ±2 VDC • **Power:** 9 VDC isolated @ 1mA, 5 VDC @ 3.5 mA • **Conversion Rate:** 2 per second • **Storage Temperature:** -10° to 60°C • **Types:** Surface/window mount • **Pins:** 13 pins, .64mm square on 2.54mm centers.

3.5 Digit LED ***Specifications:*** • **Type:** 7-segment light emitting diode (LED) • **Digits:** 0.56" (12.7mm) height • **Color:** Green or Red • **Polarity:** Displays (-) automatically • **Decimal Point:** User selectable 3-position • **Over/Under Range:** Overrange displays "1" and underrange displays "-1" • **Hold:** Standard feature • **Full Scale Ranges:** ±200 mVDC, ±2 VDC, ±20 VDC • **Configuration:** Bipolar, fully differential • **Power:** +5 VDC, ±5% at 200 mA • **Conversion Rate:** 3 per second • **Zeroing:** Automatic • **Operating Temperature:** 0 to 50°C • **Storage Temperature:** -20° to 70°C • **Relative Humidity:** 0 to 95% non-condensing • **Type:** Bezel Mount • **Pins:** Standard10 pins, .64mm square on 2.54mm centers • **5-Year Unconditional Warranty**

Process Meter ***Specifications:*** • Meter and loop powered/controlled PCB in one unit • 3.5 or 4.5 digit • LCD and red or green LED • Fully scalable • 300Ω Impedence, nominal

Fig.	Supply	Input	Color	Digi-Key Part No.	Price Each 1	10	50	C-Ton Part No.
1/8 DIN Big 3.5 Digit LCD								
1	+5	200mV	—	CDPM801-ND	70.80	67.26	61.95	DK801
	+5	2V	—	CDPM802-ND	70.80	67.26	61.95	DK802
	+5	20V	—	CDPM803-ND	70.80	67.26	61.95	DK803
	Loop	4-20mA	—	CDPM807-ND	70.80	67.26	61.95	DK807
1/8 DIN Big 3.5 Digit LED								
1	+5	200mV	Red	CDPM851-ND	70.80	67.26	61.95	DK851
	+5	2V	Red	CDPM852-ND	70.80	67.26	61.95	DK852
	+5	20V	Red	CDPM853-ND	70.80	67.26	61.95	DK853
	+5	4-20mA	Red	CDPM857-ND	70.80	67.26	61.95	DK857
1	+5	200mV	Green	CDPM951-ND	70.80	67.26	61.95	DK951
	+5	2V	Green	CDPM952-ND	70.80	67.26	61.95	DK952
	+5	20V	Green	CDPM953-ND	70.80	67.26	61.95	DK953
	+5	4-20mA	Green	CDPM957-ND	70.80	67.26	61.95	DK957
Surface Mount 3.5 Digit LCD								
2	+9	200mV	—	CDPM101-ND	44.52	42.30	38.96	DK101
	+9	2V	—	CDPM102-ND	44.52	42.30	38.96	DK102
	+9	20V	—	CDPM103-ND	44.52	42.30	38.96	DK103
2	+5	200mV	—	CDPM301-ND	44.52	42.30	38.96	DK301
	+5	2V	—	CDPM302-ND	44.52	42.30	38.96	DK302
	+5	20V	—	CDPM303-ND	44.52	42.30	38.96	DK303
2	+9	200mV	+ Green	CDPM311-ND	60.80	57.76	53.20	DK311
	+9	2V	+ Green	CDPM312-ND	60.80	57.76	53.20	DK312
	+5	200mV	+ Green	CDPM331-ND	60.80	57.76	53.20	DK331
	+5	2V	+ Green	CDPM332-ND	60.80	57.76	53.20	DK332
2	+9	200mV	- Green	CDPM411-ND	60.80	57.76	53.20	DK411
	+9	2V	- Green	CDPM412-ND	60.80	57.76	53.20	DK412
	+5	200mV	- Green	CDPM431-ND	60.80	57.76	53.20	DK431
	+5	2V	- Green	CDPM432-ND	60.80	57.76	53.20	DK432
2	+9	200mV	- Red	CDPM511-ND	60.80	57.76	53.20	DK511
	+9	2V	- Red	CDPM512-ND	60.80	57.76	53.20	DK512
	+5	200mV	- Red	CDPM531-ND	60.80	57.76	53.20	DK531
	+5	2V	- Red	CDPM532-ND	60.80	57.76	53.20	DK532
Snap-in 3.5 Digit LCD								
3	+5	200mV	—	CDPM500-ND	44.52	42.30	38.96	DK500
	+5	2V	—	CDPM501-ND	44.52	42.30	38.96	DK501
	+5	20V	—	CDPM502-ND	44.52	42.30	38.96	DK502
Snap-in 3.5 Digit LCD — 25.40mm Cutout								
4	+5	200mV	—	CDPM110-ND	44.52	42.30	38.96	DK110
	+5	2V	—	CDPM111-ND	44.52	42.30	38.96	DK111
	+5	20V	—	CDPM112-ND	44.52	42.30	38.96	DK112
Miniature 3.5 Digit LCD								
5	+5	200mV	—	CDPM201-ND	41.82	39.73	36.60	DK201
	+5	2V	—	CDPM202-ND	41.82	39.73	36.60	DK202
	+9	200mV	—	CDPM203-ND	41.82	39.73	36.60	DK203
	+9	2V	—	CDPM204-ND	41.82	39.73	36.60	DK204
4.5 Digit LCD								
6	+5	200mV	—	CDPM702-ND	97.02	92.17	84.90	DK702
	+5	2V	—	CDPM703-ND	97.02	92.17	84.90	DK703
	+9	200mV	—	CDPM704-ND	97.02	92.17	84.90	DK704
	+9	2V	—	CDPM705-ND	97.02	92.17	84.90	DK705
3.5 Digit LED								
7	+5	200mV	Green	CDPM601-ND	39.90	37.91	34.92	DK601
	+5	2V	Green	CDPM602-ND	39.90	37.91	34.92	DK602
	+5	20V	Green	CDPM603-ND	39.90	37.91	34.92	DK603
7	+5	200mV	Red	CDPM604-ND	39.90	37.91	34.92	DK604
	+5	2V	Red	CDPM605-ND	39.90	37.91	34.92	DK605
	+5	20V	Red	CDPM606-ND	39.90	37.91	34.92	DK606
Process Meter								
3	Loop	4-20mA	—	CDPM590-ND	65.00	61.75	56.88	DK590
4	Loop	4-20mA	—	CDPM190-ND	65.00	61.75	56.88	DK190
7	+5	4-20mA	Red	CDPM694-ND	65.00	61.75	56.88	DK694
7	+5	4-20mA	Green	CDPM691-ND	65.00	61.75	56.88	DK691
6	Loop	4-20mA	—	CDPM792-ND	120.00	114.00	105.00	DK792

Jewell Digital Panel Meter

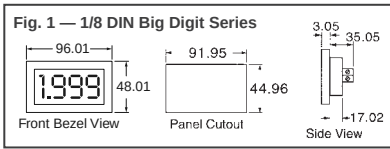
Specifications:

1/8 DIN Big Digit Series • 3-1/2 digit 7-segment LED or LCD • +5 VDC powered • Overrange indication and automatic zero • **Height:** .8" (20.32mm) LED, .98" (24.89mm) LCD • **Input:** Single ended or true differential • **Polarity:** "—" displayed for negative reading • **Current Draw:** 80mA LED, 2.2mA LCD • **Operating Temperature:** -10°C to 50°C LED, 0°C to 50°C LCD • **Connection:** Screw terminals for supply and input

690 Series LCD • **Type:** 7-segment reflective, dual edge, liquid crystal display (LCD) • **Polarity:** Displays (-) automatically • **Over/Under Range:** Overrange displays "1" and underrange displays "-1" • **Configuration:** True differential input and reference • **Protection:** 250 VDC or 150 V RMS continuous. 300 VDC intermittent max. • **Com Mode Voltage:** ±1V max. • **Com Mode Reject:** >86 decibels • **Zeroing:** Automatic • **Operating Temperature:** Standard 0 to 50°C • **Warranty:** One year limited warranty • **Annunciators:** 9 VDC powered meters have "LO BAT" when power <7.2 VDC • **Decimal Point:** User selectable 3 position decimal point • **Full Scale Range:** Standard ±200 mVDC, ±2 VDC • **Conversion Rate:** 2.5 per second • **Storage Temperature:** Standard -20 to 70°C • **Type:** Surface Mount • **Pins:** Standard 13 pins, .64mm square on 2.54mm centers • **Backlit Power Options:** +5 VDC, ±5%, red 165 mA typical (200 mA max), green 115 mA typical (160 mA max) • **Backlit Connections:** Standard 2 solder pads. **NOTE:** 9V meters require isolated power supply. **NOTE:** Backlight Board on the side of the display is eliminated by using a 15 pin header.

69L Series LED • **Type:** 7-segment light emitting diode (LED) • **Digits:** 0.56" (12.7mm) height • **Color:** Green or Red • **Polarity:** Displays (–) automatically • **Decimal Point:** User selectable 3-position decimal point • **Over/Under Range:** Overrange displays "1" and underrange displays "-1" • **Hold:** Standard feature • **Full Scale Range:** Standard ±200 mVDC, ±2 VDC, ±20 VDC • **Configuration:** Bipolar, fully differential • **Direct Current (DC):** +5V, +5% at 200mA • **Conversion Rate:** 3.4 Second • **Zeroing:** Automatic • **Operating Temperature:** 0°C to 50°C typical • **Storage Temperature:** -20°C to 70°C typical • **Relative Humidity:** 0 to 95% non-condensing • **Type:** Bezel mount • **Pins:** Standard 10 pins, 0.025" (.64mm) square

Fig. 1 — 1/8 DIN Big Digit Series



Front Bezel View — Panel Cutout — Side View

Fig. 2 — 690 Series

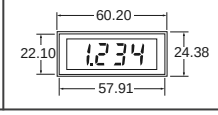


Fig. 3 — 69L Series

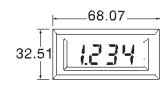


Fig.	Supply	Input	Color	Digi-Key Part No.	Price Each 1	10	50	Jewell Part No.
1/8 DIN Big 3.5 Digit LCD								
1	+5	200V	—	JDPM804-ND	70.80	67.26	61.95	1803123
	+5	200mA	—	JDPM805-ND	70.80	67.26	61.95	1803212
	+5	2mA	—	JDPM806-ND	70.80	67.26	61.95	1803211
1/8 DIN Big 3.5 Digit LED								
1	+5	200V	Red	JDPM854-ND	70.80	67.26	61.95	1801123
	+5	200mA	Red	JDPM855-ND	70.80	67.26	61.95	1801212
	+5	2mA	Red	JDPM856-ND	70.80	67.26	61.95	1801221
	+5	200V	Green	JDPM954-ND	70.80	67.26	61.95	1802123
	+5	200mA	Green	JDPM955-ND	70.80	67.26	61.95	1802212
	+5	2mA	Green	JDPM956-ND	70.80	67.26	61.95	1802221
690 Series — 3.5 Digit LCD								
2	+9	2V	—	JDPM102A-ND	34.30	31.24	29.40	6900100190
	+5	200mV	—	JDPM301A-ND	34.30	31.24	29.40	6900100040
	+9	200mV	+ Green	JDPM311A-ND	47.78	43.52	40.96	6900102091
	+9	2V	+ Green	JDPM312A-ND	47.78	43.52	40.96	6900102191
	+9	200mV	- Green	JDPM411A-ND	47.78	43.52	40.96	6900104091
	+5	200mV	- Green	JDPM431A-ND	47.78	43.52	40.96	6900104041
	+5	2V	- Green	JDPM432A-ND	47.78	43.52	40.96	6900104141
	+9	200mV	- Red	JDPM511A-ND	48.83	44.48	41.86	6900106091
	+9	2V	- Red	JDPM512A-ND	48.83	44.48	41.86	6900106191
69L Series — 3.5 Digit LED								
3	+5	200mV	Red	JDPM604A-ND	68.00	64.60	59.50	69LH559040
	+5	2V	Red	JDPM605A-ND	68.00	64.60	59.50	69LH559140

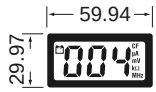
MARTEL ELECTRONICS Digital Panel Meters

When choosing a Martel Panel Meter for your application, be aware of the difference between standard versions and "single-ended" versions designated by the suffix "S". Use standard versions with floating (isolated) input signals and use single-ended (S-type) versions when the signal to be measured shares the same ground as the meter's power supply. If in question, contact Digi-Key top obtain full data sheets before ordering.

Panel Cutout:
22.10mm x 44.96mm

DPM125 LCD Series

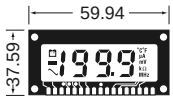
The DPM125 features auto-zero, auto-polarity, 200mV fsr, 12.5 mm digit height, low battery indication, and selectable decimal points. The meter will plug directly into a 12 pin SIL socket or can be panel mounted using snap-in bezel provided.



Panel Cutout:
26.92mm x 56.90mm

DPM500 LCD Series

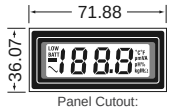
The DPM500 features auto-zero, auto-polarity, 200mV-2V-20V fsr, 12.5 mm digit height, low battery indication, selectable decimal points, and 10 user-selected annunciators. The meter will plug into a 40 pin DIL socket or can be panel mounted using snap-in bezel provided. Also available with LED backlight.



Panel Cutout:
32.00mm x 61.98mm External Bezel

DPM600/700 LCD Series

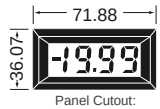
The DPM600 features auto-zero, auto-polarity, 200mV-2V-20V fsr, 12.5 mm digit height, adjustable low battery indication, selectable decimal points, and 12 user-selected annunciators. The meter has 36 pins for PCB mounting or can be panel mounted with optional bezel (p/n MB10). The 700 series also has LED backlighting.



Panel Cutout:
33.02mm x 68.07mm

DPM2000 LCD Series

The DPM2000 features auto-zero, auto-polarity, 200mV-2V-20V fsr, 15 mm digit height, adjustable low battery indication, selectable decimal points, and 12 user-selected annunciators. The meter will plug into a 40 pin DIL socket or can be panel mounted using snap-in bezel provided.



Panel Cutout:
33.02mm x 68.07mm

DPM40 LED Series

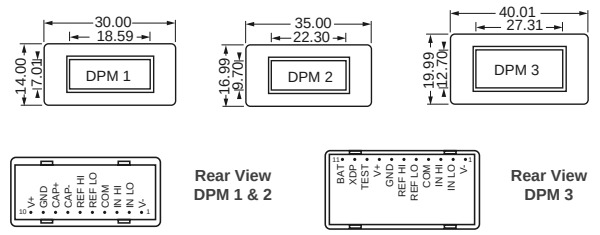
The DPM40 features auto-zero, auto-polarity, 200mV-2V-20V fsr, 11 mm LED digit height, and selectable decimal points. The meter is supplied with a bezel and filter to give a high contrast display.

Specification		Min.	Typ.	Max.	Unit
Accuracy			0.05	0.1	% (+1 Count)
Linearity				+1	count
Sample Rate			3		per sec
Temperature Stability			100		ppm/°C
Temperature Range		0		50	°C
Supply Voltage	DPM125/500	7.5	9	14	V
	DPM500S	3.5	5	6.5	V
	DPM600/700	5	9	14	V
	DPM2000	5	9	15	V
	DPM40	4.5	5	5.5	V
Supply Current	LCD normal		150		µA
	LCD S-type		450		µA
	LED		100	200	mA
Input Leakage Current		1		10	pA
Low Battery Threshold	DPM125/500		7.5		V
	DPM500S		3.7		V
	DPM600/700		7		V
	DPM2000		6.4		V
Backlight	DPM500		5		V @ 30mA
	DPM700		5		V @ 50mA

Supply	Input	Digi-Key Part No.	Pricing 1	5	10	Martel Part No.
7.5-15	200mV	227-1007-ND	64.32	305.52	578.88	DPM125
7.5-15	200mV	227-1008-ND	80.52	382.47	724.68	DPM125L
7.5-15	200mV	227-1009-ND	67.16	319.01	604.44	DPM500
7.5-15	2V	227-1010-ND	67.16	319.01	604.44	DPM500-2
7.5-15	20V	227-1011-ND	67.16	319.01	604.44	DPM500-20
7.5-15	200mV	227-1012-ND	89.58	425.51	806.22	DPM500L
7.5-15	2V	227-1013-ND	89.58	425.51	806.22	DPM500L-2
7.5-15	20V	227-1014-ND	89.58	425.51	806.22	DPM500L-20
3.6-6.5	200mV	227-1015-ND	78.16	371.26	703.44	DPM500S
3.6-6.5	2V	227-1016-ND	78.16	371.26	703.44	DPM500S-2
3.6-6.5	20V	227-1017-ND	78.16	371.26	703.44	DPM500S-20
3.6-6.5	200mV	227-1018-ND	100.52	477.47	904.68	DPM500SL
3.6-6.5	2V	227-1019-ND	100.52	477.47	904.68	DPM500SL-2
3.6-6.5	20V	227-1020-ND	100.52	477.47	904.68	DPM500SL-20
5-15	200mV	227-1021-ND	67.16	319.01	604.44	DPM600
5-15	2V	227-1022-ND	67.16	319.01	604.44	DPM600-2
5-15	20V	227-1023-ND	67.16	319.01	604.44	DPM600-20
5-15	200mV	227-1024-ND	84.38	400.81	759.42	DPM700
5-15	2V	227-1025-ND	84.38	400.81	759.42	DPM700-2
5-15	20V	227-1026-ND	84.38	400.81	759.42	DPM700-20
5-15	200mV	227-1027-ND	70.40	334.40	633.60	DPM2000
5-15	2V	227-1028-ND	70.40	334.40	633.60	DPM2000-2
5-15	20V	227-1029-ND	70.40	334.40	633.60	DPM2000-20
5	200mV	227-1030-ND	86.06	408.79	774.54	DPM40
5	2V	227-1031-ND	86.06	408.79	774.54	DPM40-2
5	20V	227-1032-ND	86.06	408.79	774.54	DPM40-20
Bezel for DPM 600/700		227-1033-ND	3.08	14.63	27.72	MB10

MARTEL ELECTRONICS Universal Volt/Ammeter

When choosing a Martel Panel Meter for your application, be aware of the difference between standard versions and "single-ended" versions designated by the suffix "S". Use standard versions with floating (isolated) input signals and use single-ended (S-type) versions when the signal to be measured shares the same ground as the meter's power supply. If in question, contact Digi-Key top obtain full data sheets before ordering.



Martel uses advanced components and the latest miniaturization techniques to produce the world's smallest DPM module. Miniature size means the module can be integrated into the smallest of enclosures for local indication. Its low cost means it will suit high and low volume applications. The snap-in integral bezel makes mounting easy.

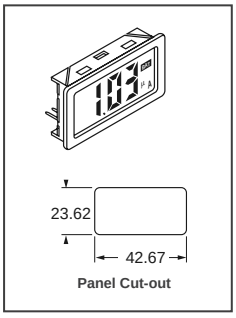
The "Normal" DPM features true differential input, auto-zero, auto-polarity, programmable decimal points, and a 200mV Full Scale Reading (F.S.R). The FSR is adjustable with the use of external resistors.

Very low power consumption allows long battery life making it very useful in handheld equipment. For single rail use, the "S-type" DPM features a built in negative rail generator enabling the meter to measure a signal referenced to its own power supply 0V.

Specification		Min.	Typ.	Max.	Unit
Accuracy (overall error)		0.1		% (±1 count)	
Linearity				±1	count
Sample Rate			3		per/sec
Temperature Range		0		50	°C
Temperature Stability	Normal		200		ppm/°C
	S-type		100		
Supply Voltage	Normal (V+ to V-)	7	9	14	V
	S-type (V+ to GND)	3	5	7	
Supply Current	Normal		150		µA
	S-type		250		
Input Leakage Current (Vin = 0V)			1	10	pA

Panel Cutout (mm)	Digi-Key Part No.	Pricing 1	5	10	Martel Part No.
28.19 x 11.18	227-1001-ND	45.10	214.23	405.90	DPM1
	227-1002-ND	57.12	271.32	514.08	DPM1S
32.77 x 14.99	227-1003-ND	45.10	214.23	405.90	DPM2
	227-1004-ND	57.12	271.32	514.08	DPM2S
37.85 x 17.78	227-1005-ND	45.10	214.23	405.90	DPM3
	227-1006-ND	57.12	271.32	514.08	DPM3S

RED LION CONTROLS Miniature Display Module D.C. Voltmeter



Panel Cut-out

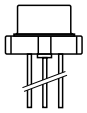
Specifications:

- **Display:** 3 1/2-digit, .4" (10.2mm) high digits. A minus(-) sign is displayed when voltage is negative.
- **Decimal Points:** Selectable decimal points are activated at the rear terminal pins to allow the display to be read in tenths, hundredths or thousandths.
- **Annunciators:** 5 selectable annunciators, BAT, V, A, µ and m are activated at the appropriate rear terminal.
- **Power Requirements:** 4.8VDC to 6VDC @ 5mA Max.
- **Input Range:** 0 to ±199.9m VDC
- **Overrange Indication:** Overrange is indicated by a "1" displayed in the most significant digit and the blanking of the three least significant digits.
- **Reading Rate:** 2 1/2 readings per second
- **Common Mode Rejection Ratio:** 70dB
- **Input Impedance:** 1000MΩ
- **Operating Range:** 0° to 60°C

Description	Digi-Key Part No.	Price Each	Red Lion Part No.
Panel Mount, Reflective Display	RLC000-ND	35.90	MDMV0000
Panel Mount, Yel/Grn Backlight Display	RLC010-ND	51.40	MDMV0010
Panel Mount, Red Backlight Display	RLC020-ND	51.40	MDMV0020
PC Board Mount, Reflective Display	RLC100-ND	35.90	MDMV0100
PC Board Mount, Yel/Grn Backlight Display	RLC110-ND	51.40	MDMV0110
PC Board Mount, Red Backlight Display	RLC120-ND	51.40	MDMV0120
MDMV Cable Assembly	RLC70-ND	12.00	HWK70000

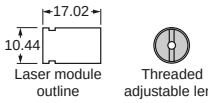
NVG Inc.

Adjustable Focus Laser Diode Modules



DANGER
VISIBLE LASER LIGHT
AVOID DIRECT EYE EXPOSURE

Fig. 1 - Adjustable Focus Laser Module



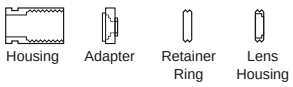
Po: 5mW Class IIIa
Supply Voltage: 2.5 - 12Vdc

Fig. 2 - Visible Laser Diode

1. Laser cathode
2. Common case(laser anode)
3. PD anode (standard pinout)

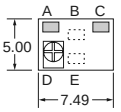
Po: 5mW Class IIIa
Wide Spectrum Range, Standard Pinout

Fig. 3 - Laser Diode Housing Kit



Includes: Housing/Heatsink, 5.6mm to 9mm Adapter, Retaining Ring, Adjustable Focus Lens

Fig. 4 - SMD Laser Power Supply



Soldering pads
A: Laser diode cathode
B: Laser/pd common (+)
C: Photodiode anode
D: Potentiometer
E: Negative lead (-)

Adjustable Output Power VIA On-Board Potentiometer

Fig.	Description	Wavelength (nm)	Iop (mA)	Size (mm)	Digi-Key Part No.	Price Each	NVG Part No.
1	Visible Laser Module*	660	55-65	17.02 x 10.44	11044-ND	32.66	M6605I
1	Visible Laser Module*	650	65-80	17.02 x 10.44	11045-ND	37.00	M6505I
1	Visible Laser Module*	640	70-90	17.02 x 10.44	11046-ND	98.00	M6405I
1	Infrared Laser Module*	808	60-70	17.02 x 10.44	11047-ND	64.00	M8085I
2	Visible Laser Diode	660	12-20	5.6	11049-ND	9.00	D6605I
2	Visible Laser Diode	650	65-85	5.6	11050-ND	16.00	D6505I
2	Visible Laser Diode	640	70-90	9	11051-ND	70.00	D6405I
3	Housing/Heatsink Kit				11053-ND	18.00	HOUSING KIT
4	SMD Laser Power Supply				11052-ND	16.00	NS102
—	5.6mm to 9mm Adapter				11054-ND	4.00	ADAPTER

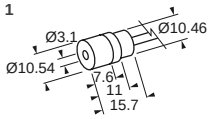
* Module denotes complete assembly.

Quarton Inc.

Visible Laser Diode Modules

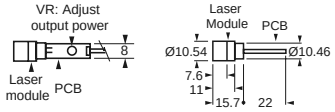
FEATURES: • Built-in driver circuit. Small size • Class IIIa laser product • Operating temperature: -10° to +50°C • Storage temperature range: -40° to +85°C

Fig. 1



Specifications: • Cw optical power: 3±1mW • Operating current: 50±15 mA • Typical Operating Voltage: 3.0V

Fig. 2



Specifications: • Cw optical power: ≤ 5 mW. • Operating current: 50 ±15 mA • Typical Operating Voltage: 3.0V

Fig.	Emission Wavelength Typ. (nm)	Output Power Typ. (mW)	Operating Voltage Typ. (V)	Operating Current Typ. (mA)	Digi-Key Part No.	Pricing 1	10	100
1	670	3.0	3.0	60	VLM-670-01L-ND	32.08	288.75	2695.00
	655	3.0	3.0	60	VLM-650-01L-ND	40.00	360.00	3360.00
	635	3.0	3.0	60	VLM-635-01L-ND	75.00	675.00	6300.00
2	670	3.0	3.0	60	VLM-670-02L-ND	34.92	314.25	2933.00
	655	3.0	3.0	60	VLM-650-02L-ND	42.00	378.00	3528.00
	635	3.0	3.0	60	VLM-635-02L-ND	76.67	690.00	6440.00

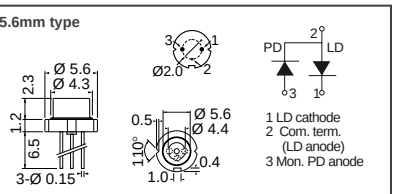
Panasonic®

Visible Red Laser Diodes

FEATURES:
• Oscillating wavelength 670nm: Luminous efficiency 2000 times a conventional laser • Low threshold oscillation: 25mA • Stable single transverse oscillation • Low astigmatism characteristics: ≤10µm

SPECIFICATIONS:
Maximum Optical Power Output: 5mW. **Oscillating Wavelength:** 670nm. **Threshold Current:** 25mA. **Operating Current:** 35mA. **LD operating Voltage:** 2.5V. **Radiation Horizontal Angle:** 8°. **Radiation Perpendicular Angle:** 30°

5.6mm type



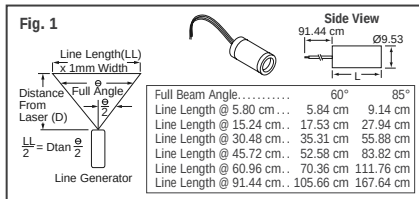
Digi-Key Part No.	Pricing 1	10	100	250	Panasonic Part No.
P460-ND	33.75	303.75	2835.00	6581.25	LN9R05MS

COHERENT® AUBURN GROUP Visible Laser Diode Modules

Features: • Fully collimated lens • 2-year limited warranty • ESD Protection (over 2200 Volts) • Reverse Polarity Protection • Visual ON/OFF Indicator • Regulated Output Power • Diode Life of 100,000 hours. ***Specifications:*** • Operating Temperature: -10°C to +40°C • Storage Temperature: -40°C to +80°C • Laser Operation: Continuous Wave

DANGER
VISIBLE LASER LIGHT
AVOID DIRECT EYE EXPOSURE

Fig. 1



Full Beam Angle.....	60°	85°
Line Length @ 5.80 cm...	5.84 cm	9.14 cm
Line Length @ 15.24 cm..	17.53 cm	27.94 cm
Line Length @ 30.48 cm..	35.31 cm	55.88 cm
Line Length @ 45.72 cm..	52.58 cm	83.82 cm
Line Length @ 60.96 cm..	70.36 cm	111.76 cm
Line Length @ 91.44 cm..	105.66 cm	167.64 cm

Fig. 2

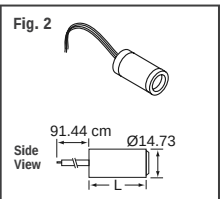


Fig. 3 — Variable Focus

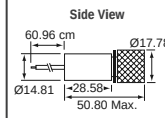


Fig. 4 — Modulation & Variable Power

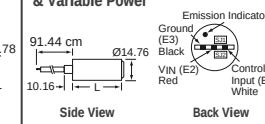


Fig. 5 — Industrial Housing

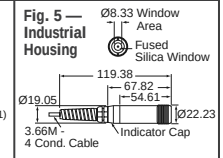


Fig. 6 — Adjustable Mount

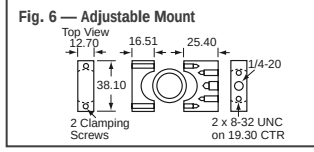


Fig. 7

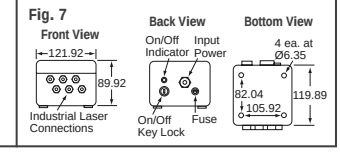


Fig.	Length (mm)	Emission Wavelength (nm)	Vop (Vdc)	Iop (mA)	Output Power (mW)	Laser Class	Beam Size/Angle (mm)	Digi-Key Part No.	Price Each	Coherent Part No.
Fixed Focus Visible Laser Module										
1	18.54	670	3-6	65-80	4.2	IIIa	4.0 x 1.0	188-1001-ND	99.00	0220-968-00
1	18.54	635	3-6	65-80	2.5	IIIa	4.0 x 1.0	188-1002-ND	173.00	0220-832-00
2	28.58	635	5-10	80-100	4.2	IIIa	5.0 x 1.2	188-1018-ND	282.00	0221-534-00
5	119.38	635	5-10	80-100	4.2	IIIa	5.0 x 1.2	188-1005-ND	511.00	0221-535-00
Fixed Focus Visible Module — Round Beam										
1	29.59	635	3-6	35-55	1.0	II	4.0 x 5.0	188-1012-ND	173.00	0221-816-01
2	31.62	635	5-10	60-90	4.9	IIIa	1.4 Dia.	188-1013-ND	650.00	0221-700-01
2	31.62	635	5-10	60-90	3.0	IIIa	1.4 Dia.	188-1014-ND	473.00	0221-699-01
Variable Focus Visable Laser Module										
3	50.80 Max	670	5-10	50-70	4.2	IIIa	4.0 x 1.0	188-1008-ND	367.00	0220-857-00
3	50.80 Max	670	5-10	50-70	.95	II	3.0 Dia.	188-1009-ND	434.00	0220-862-00
3	50.80 Max	635	5-10	80-100	2.5	IIIa	5.0 x 1.2	188-1010-ND	390.00	0220-843-00
3	50.80 Max	635	5-10	80-100	.95	II	3.0 Dia.	188-1011-ND	473.00	0221-691-00
Modulation & Variable Power Visible Module										
4	46.86	670	6-10	—	4.2	IIIa	4.0 x 1.0	188-1015-ND	574.00	0221-202-00
4	60.35	670	6-10	—	.95	II	3.0 Dia.	188-1016-ND	633.00	0221-460-00
4	46.86	635	6-10	—	4.2	IIIa	5.0 x 1.2	188-1017-ND	614.00	0221-763-00
Fixed Focus Visible Line Generator										
1	22.61	670	3-6	55-70	2.5	II	85°	188-1003-ND	170.00	0221-153-00
1	22.61	635	3-6	80-100	1.4	II	85°	188-1004-ND	233.00	0220-838-00
5	119.38	635	5-10	80-100	1.4	II	85°	188-1006-ND	562.00	0220-975-00
5	119.38	635	5-10	80-100	1.4	II	60°	188-1007-ND	562.00	0220-976-00
Accessories										
6	Adjustable mount for Fig. 5 lasers.							188-1019-ND	62.00	0221-449-00
6	Adjustable mount for Fig. 2, 3, 4 lasers							188-1020-ND	62.00	0221-437-00
6	Adjustable mount for Fig. 1 lasers.							188-1021-ND	62.00	0221-448-00
7	Industrial laser power supply for up to six lasers							188-1022-ND	415.00	0221-183-00

QT Optoelectronics LEDs

Fig. 1

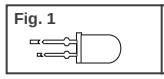


Fig. 2

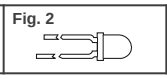


Fig. 3

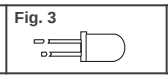


Fig. 4

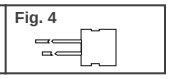


Fig.	Pkg.	Op. Volt.	Lens Source Color	Luminous Type (Diffused)	Viewing Angle	Intensity mcd	Digi-Key Part No.	Pricing 1	10	100
Integrated T-1 3/4 Resistor Lamps										
1	T-1 3/4	5V	Red	Red	60°	2.0	MR3050QT-ND	.45	4.23	38.70
1	T-1 3/4	12V	Red	Red	60°	2.0	MR3051QT-ND	.45	4.23	38.70
1	T-1 3/4	5V	Hi. Eff. Green	Green	60°	4.0	MR3450QT-ND	.45	4.23	38.70
1	T-1 3/4	12V	Hi. Eff. Green	Green	60°	4.0	MR3451QT-ND	.45	4.23	38.70
1	T-1 3/4	5V	Yellow	Yellow	60°	4.0	MR3350QT-ND	.45	4.23	38.70
1	T-1 3/4	12V	Yellow	Yellow	60°	4.0	MR3351QT-ND	.45	4.23	38.70
LEDs — Regular and High Efficiency										
2	T-1	—	Yellow	Yellow	50°	2.0	HLMP-1719QT-ND	.30	2.82	25.80
2	T-1	—	Hi. Eff. Green	Green	50°	2.0	HLMP-1790QT-ND	.30	2.82	25.80
2	T-1	—	Hi. Eff. Red	Red	50°	2.0	HLMP-1700QT-ND	.30	2.82	25.80
3	T-1 3/4	—	Yellow	Yellow	50°	2.0	HLMP-4719QT-ND	.23	2.12	19.35
3	T-1 3/4	—	Hi. Eff. Green	Green	35°	3.0	MV2454QT-ND	.23	2.12	19.35
3	T-1 3/4	—	Hi. Eff. Red	Red	50°	2.0	HLMP-4700QT-ND	.23	2.12	19.35
3	T-1 3/4	—	Hi. Eff. Red	Red	65°	3.5	HLMP-3300QT-ND	.23	2.12	19.35
3	T-1 3/4	—	Hi. Eff. Red	Red	65°	7.0	HLMP-3301QT-ND	.38	3.53	32.25
1	T-1 3/4	—	Red/Red	Red	75°	6.0	MV5094AQT-ND (Bi-Color)	.63	5.88	53.75
1	T-1 3/4	—	Red/Green	White	100°	6.0	MV5491AQT-ND (Bi-Color)	.80	7.52	68.80
4	Rec.	—	Red/Green	White	100°	6.0	MV49124AQT-ND (Bi-Color)	.68	6.35	58.05

LUMEX OPTO/COMPONENTS INC.

LED 7-Segment Displays

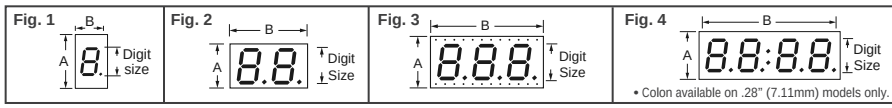


Fig.	Emitted Color	Digit Size In. (mm)	Dimensions In. (mm) A x B	VF (V)	If (mA)	Io (ucd)	Digi-Key Part No. Common Anode	Digi-Key Part No. Common Cathode	Pricing 1	10	100	Lumex Part No. Common Anode	Lumex Part No. Common Cathode
1	Red/Orng	.30 (7.62)	.75 x .40 (19.05 x 10.16)	2.0	10	5600	67-1403-ND	67-1406-ND	1.57	14.25	122.55	LDS-A304RI	LDS-C304RI
	Green	.30 (7.62)	.75 x .40 (19.05 x 10.16)	2.2	10	3500	67-1404-ND	67-1407-ND	1.57	14.25	122.55	LDS-A302RI	LDS-C302RI
	Yellow	.30 (7.62)	.75 x .40 (19.05 x 10.16)	2.1	10	3500	67-1405-ND	67-1408-ND	1.57	14.25	122.55	LDS-A303RI	LDS-C303RI
	Super-Red	.30 (7.62)	.75 x .40 (19.05 x 10.16)	1.8	10	9800	67-1413-ND	67-1414-ND	2.31	21.00	180.60	LDS-A306RI	LDS-C306RI
1	Red/Orng	.36 (9.14)	.55 x .295 (13.97 x 7.49)	2.0	10	2250	67-1415-ND	67-1417-ND	1.84	16.75	144.05	LDS-A324RI	LDS-C324RI
	Green	.36 (9.14)	.55 x .295 (13.97 x 7.49)	2.2	10	2250	67-1416-ND	67-1418-ND	1.84	16.75	144.05	LDS-A322RI	LDS-C322RI
1	Red/Orng	.43 (10.92)	.744 x .496 (18.90 x 12.60)	2.0	10	3900	67-1431-ND	67-1434-ND	1.57	14.25	122.55	LDS-A414RI	LDS-C414RI
	Green	.43 (10.92)	.744 x .496 (18.90 x 12.60)	2.2	10	2500	67-1432-ND	67-1435-ND	1.57	14.25	122.55	LDS-A412RI	LDS-C412RI
	Yellow	.43 (10.92)	.744 x .496 (18.90 x 12.60)	2.1	10	2500	67-1433-ND	67-1436-ND	1.57	14.25	122.55	LDS-A413RI	LDS-C413RI
	Super-Red	.43 (10.92)	.744 x .496 (18.90 x 12.60)	1.8	10	12300	67-1445-ND	67-1446-ND	2.31	21.00	180.60	LDS-A416RI	LDS-C416RI
1	Red/Orng	.50 (12.70)	.748 x .50 (19.00 x 12.70)	2.0	10	3900	67-1451-ND	67-1453-ND	1.84	16.75	144.05	LDS-A504RI	LDS-C504RI
	Green	.50 (12.70)	.748 x .50 (19.00 x 12.70)	2.2	10	3900	67-1452-ND	67-1454-ND	1.84	16.75	144.05	LDS-A502RI	LDS-C502RI
1	Red/Orng	.56 (14.22)	.75 x .48 (19.05 x 12.19)	2.0	10	3900	67-1463-ND	67-1466-ND	1.57	14.25	122.55	LDS-A514RI	LDS-C514RI
	Green	.56 (14.22)	.75 x .48 (19.05 x 12.19)	2.2	10	3900	67-1464-ND	67-1467-ND	1.57	14.25	122.55	LDS-A512RI	LDS-C512RI
	Yellow	.56 (14.22)	.75 x .48 (19.05 x 12.19)	2.1	10	3900	67-1465-ND	67-1468-ND	1.57	14.25	122.55	LDS-A513RI	LDS-C513RI
	Super-Red	.56 (14.22)	.75 x .48 (19.05 x 12.19)	1.8	10	13300	67-1475-ND	67-1476-ND	2.31	21.00	180.60	LDS-A516RI	LDS-C516RI
1	Red/Orng	.80 (20.32)	1.091 x .788 (27.71 x 20.02)	2.0	10	5600	67-1477-ND	67-1480-ND	2.28	20.75	178.45	LDS-A814RI	LDS-C814RI
	Green	.80 (20.32)	1.091 x .788 (27.71 x 20.02)	2.2	10	2500	67-1478-ND	67-1481-ND	2.28	20.75	178.45	LDS-A812RI	LDS-C812RI
	Yellow	.80 (20.32)	1.091 x .788 (27.71 x 20.02)	2.1	10	2500	67-1479-ND	67-1482-ND	2.28	20.75	178.45	LDS-A813RI	LDS-C813RI
	Super-Red	.80 (20.32)	1.091 x .788 (27.71 x 20.02)	1.8	10	15000	67-1483-ND	67-1484-ND	3.14	28.50	245.10	LDS-A816RI	LDS-C816RI
1	Red/Orng	1.0 (25.40)	1.34 x .945 (34.04 x 24.00)	4.0	10	9800	67-1485-ND	67-1487-ND	3.08	28.00	240.80	LDS-AA14RI	LDS-CA14RI
	Green	1.0 (25.40)	1.34 x .945 (34.04 x 24.00)	4.4	10	6300	67-1486-ND	67-1488-ND	3.08	28.00	240.80	LDS-AA12RI	LDS-CA12RI
1	Red/Orng	2.25 (57.15)	2.76 x 1.89 (70.10 x 48.01)	8.0	10	9000	67-1489-ND	67-1491-ND	9.46	86.00	739.60	LDS-AD14RI	LDS-CD14RI
	Green	2.25 (57.15)	2.76 x 1.89 (70.10 x 48.01)	8.4	10	6300	67-1490-ND	67-1492-ND	9.46	86.00	739.60	LDS-AD12RI	LDS-CD12RI
	Super-Red	2.25 (57.15)	2.76 x 1.89 (70.10 x 48.01)	6.8	10	22500	67-1493-ND	67-1494-ND	10.84	98.50	847.10	LDS-AD16RI	LDS-CD16RI
2	Red/Orng	.30 (7.62)	.60 x .61 (15.24 x 15.49)	2.0	10	3900	67-1409-ND†	67-1411-ND†	2.50	22.75	195.65	LDD-E304NI	LDD-F304NI
	Green	.30 (7.62)	.60 x .61 (15.24 x 15.49)	2.2	10	3900	67-1410-ND†	67-1412-ND†	2.50	22.75	195.65	LDD-E302NI	LDD-F302NI
2	Red/Orng	.40 (10.16)	.63 x .796 (16.00 x 20.22)	2.0	10	3900	67-1437-ND	67-1438-ND	2.39	21.75	187.05	LDD-A404NI	LDD-C404NI
	Green	.40 (10.16)	.63 x .796 (16.00 x 20.22)	2.2	10	3900	67-1419-ND	67-1421-ND	2.39	21.75	187.05	LDD-A402NI	LDD-C402NI
	Yellow	.40 (10.16)	.63 x .796 (16.00 x 20.22)	2.1	10	3900	67-1420-ND	67-1422-ND	2.39	21.75	187.05	LDD-A403NI	LDD-C403NI
	Super-Red	.40 (10.16)	.63 x .796 (16.00 x 20.22)	1.8	10	6300	67-1447-ND	67-1448-ND	3.69	33.50	288.10	LDD-A406NI	LDD-C406NI
2	Red/Orng	.56 (14.22)	.75 x .98 (19.05 x 24.89)	2.0	10	3900	67-1455-ND	67-1458-ND	2.39	21.75	187.05	LDD-A514RI	LDD-C514RI
	Green	.56 (14.22)	.75 x .98 (19.05 x 24.89)	2.2	10	3900	67-1456-ND	67-1459-ND	2.39	21.75	187.05	LDD-A512RI	LDD-C512RI
	Yellow	.56 (14.22)	.75 x .98 (19.05 x 24.89)	2.1	10	3900	67-1457-ND	67-1460-ND	2.39	21.75	187.05	LDD-A513RI	LDD-C513RI
	Super-Red	.56 (14.22)	.75 x .98 (19.05 x 24.89)	1.8	10	13300	67-1461-ND	67-1462-ND	3.69	33.50	288.10	LDD-A516RI	LDD-C516RI
2	Red/Orng	.80 (20.32)	1.01 x 1.41 (25.65 x 35.81)	2.0	10	5600	67-1469-ND	67-1472-ND	3.99	36.25	311.75	LDD-A814RI	LDD-C814RI
	Green	.80 (20.32)	1.01 x 1.41 (25.65 x 35.81)	2.2	10	2500	67-1470-ND	67-1473-ND	3.99	36.25	311.75	LDD-A812RI	LDD-C812RI
	Yellow	.80 (20.32)	1.01 x 1.41 (25.65 x 35.81)	2.1	10	2500	67-1471-ND	67-1474-ND	3.99	36.25	311.75	LDD-A813RI	LDD-C813RI
3	Red/Orng	.56 (14.22)	.75 x 1.48 (19.05 x 37.59)	2.1	10	5600	67-1423-ND	67-1425-ND	5.09	46.25	397.75	LDT-A514RI	LDT-C514RI
	Green	.56 (14.22)	.75 x 1.48 (19.05 x 37.59)	2.2	10	3500	67-1424-ND	67-1426-ND	5.09	46.25	397.75	LDT-A512RI	LDT-C512RI
4	Red/Orng	.28 (7.11)	.398 x 1.264 (10.11 x 32.11)	2.0	10	5000	67-1427-ND†	—	7.40	67.25	578.35	LDQ-M284RI	—
	Green	.28 (7.11)	.398 x 1.264 (10.11 x 32.11)	2.2	10	2200	67-1428-ND†	—	7.40	67.25	578.35	LDQ-M282RI	—
	Yellow	.28 (7.11)	.398 x 1.264 (10.11 x 32.11)	2.1	10	3000	67-1429-ND†	—	7.40	67.25	578.35	LDQ-M283RI	—
	Super-Red	.28 (7.11)	.398 x 1.264 (10.11 x 32.11)	1.8	10	9000	67-1430-ND†	—	14.16	128.75	1107.25	LDQ-M286RI	—
4	Red/Orng	.56 (14.22)	.748 x 1.98 (19.00 x 50.29)	2.1	10	3900	67-1439-ND†•	67-1442-ND†	7.40	67.25	578.35	LDQ-M514RI	LDQ-N514RI
	Green	.56 (14.22)	.748 x 1.98 (19.00 x 50.29)	2.2	10	3900	67-1440-ND†•	67-1443-ND†	7.40	67.25	578.35	LDQ-M512RI	LDQ-N512RI
	Yellow	.56 (14.22)	.748 x 1.98 (19.00 x 50.29)	2.1	10	3900	67-1441-ND†•	67-1444-ND†	7.40	67.25	578.35	LDQ-M513RI	LDQ-N513RI
	Super-Red	.56 (14.22)	.748 x 1.98 (19.00 x 50.29)	1.8	10	12000	67-1449-ND†•	67-1450-ND†	7.40	67.25	578.35	LDQ-M516RI	LDQ-N516RI

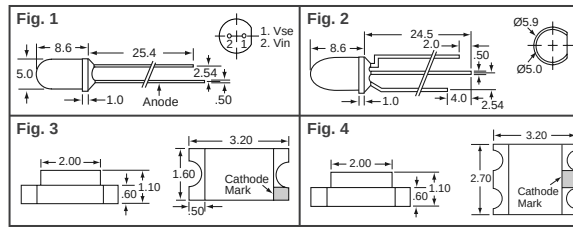
HEWLETT-PACKARD CROSS REFERENCE	
HP Part No.	Digi-Key Part No.
5082-7611	67-1403-ND
5082-7613	67-1406-ND
5082-7621	67-1405-ND
5082-7623	67-1408-ND
HDSP-A101	67-1428-ND
HDSP-A151	67-1429-ND
HDSP-A901	67-1416-ND
HDSP-A903	67-1418-ND
HDSP-E101	67-1445-ND
HDSP-E103	67-1446-ND
HDSP-N101	67-1483-ND
HDSP-N103	67-1484-ND
HDSP-3601	67-1404-ND
HDSP-3603	67-1407-ND
HDSP-3731	67-1431-ND
HDSP-3733	67-1434-ND
HDSP-3901	67-1477-ND
HDSP-3903	67-1480-ND
HDSP-4131	67-1433-ND
HDSP-4133	67-1436-ND
HDSP-4201	67-1479-ND
HDSP-4203	67-1482-ND
HDSP-4601	67-1432-ND
HDSP-4603	67-1435-ND
HDSP-5501	67-1463-ND
HDSP-5503	67-1466-ND
HDSP-5521	67-1455-ND
HDSP-5523	67-1458-ND
HDSP-5601	67-1452-ND
HDSP-5603	67-1454-ND
HDSP-5621	67-1456-ND
HDSP-5623	67-1459-ND
HDSP-5701	67-1451-ND
HDSP-5703	67-1453-ND
HDSP-5721	67-1457-ND
HDSP-5723	67-1460-ND
HDSP-7501	67-1415-ND
HDSP-7503	67-1417-ND
HDSP-8601	67-1478-ND
HDSP-8603	67-1481-ND

† Multiplexed Display
• Colon available on .28" (7.11mm) models only.

Low Battery Indicators

Fig.	Emitted Color	Wave-Length (NM)	Inten-sity (mcd)	Detection Voltage (V)	Standby Current (uA)	View-ing Angle	Digi-Key Part No.	Cut Tape Pricing 1	25	100	Tape & Reel Pricing* 2,000	Lumex Part No.
1	Red	660	3	2.5	5	60	67-1195-ND	1.11	23.13	74.00	—	SSL-LX5093LBI-SRD
2	Red	660	3	3.75 - 7.5	5	60	67-1196-ND	1.44	30.00	96.00	—	SSL-LX5099LBI-SRD
3	Red	660	3	2.5	5	140	67-1193-1-ND	1.80	—	135.00	747.00/M	SML-LX1206LBI-SRD
4	Red	660	3	3.75 - 7.5	5	140	67-1194-1-ND	2.28	—	171.00	946.20/M	SML-LX1210LBI-SRD

* For Tape & Reel part no. change part number from "1-ND" to "2-ND".

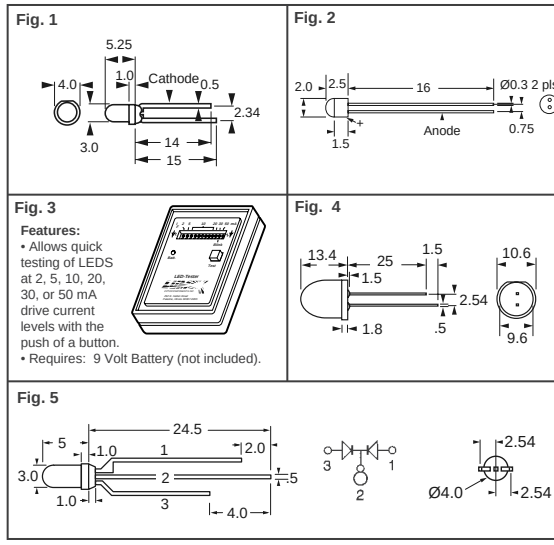


LEDs

Fig.	LED Dia. (mm)	Emitted Color	Oper Curr. MA	Oper Type Volt(v)	Digi-Key Part No.	Pricing 1	10	25	100	200	Lumex Part No.
					LEDs						
1	3	Red	20	2.1	67-1402-ND	—	1.77	—	—	29.50	SSL-LX3052ID
	3	Green	20	2.1	67-1396-ND	—	1.80	—	—	30.00	SSL-LX3052GD
	3	Yellow	20	2.1	67-1397-ND	—	1.80	—	—	30.00	SSL-LX3052YD
					Ceramic Stem LEDs						
2	2	Orange/Red	20	2.0	67-1197-ND	1.02	—	21.25	68.00	—	SSL-LX203CIT
	2	Green	20	2.1	67-1198-ND	1.02	—	21.25	68.00	—	SSL-LX203CGT
	2	Yellow	20	2.1	67-1199-ND	1.02	—	21.25	68.00	—	SSL-LX203CYT
	2	Red	20	1.6	67-1200-ND	1.26	—	26.25	84.00	—	SSL-LX203CSRT
3	LED Tester Box				67-1398-ND	38.00 each					LED Tester Box

Fig.	Emitted Color	Epoxy Lens Color	Typical mCD Intensity @ 20mA If	Emittion Total Angle	Peak Wave-length	Vf @ 20mA If Typ.	Max.	Steady If Max.	Digi-Key Part No.	Pricing 10	200	1,000	Lumex Part No.
					10MM Mega-Brite Lites								
4	Or/Red	Clear	3000	18°	620nm	1.8	2.4	25mA	67-1399-ND	23.70	395.00	1580.00	SSL-LX100133XOC
	Green	Clear	500	18°	568nm	2.1	2.7	25mA	67-1400-ND	7.20	120.00	480.00	SSL-LX100133XGC
	Yellow	Clear	2000	18°	590nm	1.8	2.4	25mA	67-1401-ND	26.10	435.00	1740.00	SSL-LX100133XYC

Fig.	Color Pin 1	Pin 3	Vf	Io mcd	View Angle	If mA	Digi-Key Part No.	Pricing 1	25	100	250	Lumex Part No.
							Bi-Color LEDs					
5	Green	Yellow	2.0	30/30	60°	20	67-1329-ND	.75	15.69	50.20	109.81	SSL-LX3059GYW
	Red	Green	2.0	35/35	60°	20	67-1327-ND	.75	15.69	50.20	109.81	SSL-LX3059IGW
	Red	Yellow	2.0	40/30	60°	20	67-1328-ND	.75	15.69	50.20	109.81	SSL-LX3059IYW



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LUMEX OPTO/COMPONENTS INC.

NEW! LEDs

Fig.	LED Dia. (mm)	Emitted Color	Lens Color	Oper Curr. (mA)	Typ. Forward Voltage	Digi-Key Part No.	Pricing 1	10	25	100	200	Lumex Part No.
1	2x5	Amber	Diff.	30	2.1	67-1045-ND	.26	—	5.38	17.20	—	SSL-LX2573AD
	2x5	Green	Diff.	25	2.1	67-1046-ND	—	1.23	—	—	20.50	SSL-LX2573GD
	2x5	Red	Diff.	30	2.0	67-1047-ND	—	1.32	—	—	22.00	SSL-LX2573ID
	2x5	Green	Diff.	25	2.1	67-1048-ND	—	1.80	—	—	30.00	SSL-LX2573PGD
	2x5	Red	Diff.	30	1.7	67-1049-ND	—	2.13	—	—	35.50	SSL-LX2573SRD
	2x5	Yellow	Diff.	30	2.1	67-1050-ND	—	1.41	—	—	23.50	SSL-LX2573YD
2	2x5	Red/Grn	Diff.	30/25	2.1	67-1051-ND	.49	—	10.13	32.40	—	SSL-LX2577IGW
3	2.5x7	Green	Diff.	25	2.0	67-1052-ND	—	1.41	—	—	23.50	SSL-LX25783GD
	2.5x7	Red	Diff.	30	2.0	67-1053-ND	—	1.41	—	—	23.50	SSL-LX25783ID
	2.5x7	Red	Diff.	30	1.7	67-1054-ND	.26	—	5.50	17.60	—	SSL-LX25783SRD
	2.5x7	Yellow	Diff.	30	2.1	67-1055-ND	—	1.41	—	—	23.50	SSL-LX25783YD
4	3	Green	Diff.	25	2.1	67-1056-ND	—	1.80	—	—	30.00	SSL-LX3034GD
	3	Yellow	Diff.	30	2.1	67-1057-ND	—	1.95	—	—	32.50	SSL-LX3034YD
5	3	Amber	Diff.	30	2.1	67-1058-ND	—	1.47	—	—	24.50	SSL-LX3044AD
	3	Green	Clear	25	2.1	67-1059-ND	—	1.44	—	—	24.00	SSL-LX3044GC
	3	Green	Diff.	25	2.1	67-1060-ND	—	1.32	—	—	22.00	SSL-LX3044GD
	3	Green	Diff.	20	12	67-1061-ND	.32	—	6.56	21.00	—	SSL-LX3044GD-12V
	3	Green	Diff.	20	5	67-1062-ND	.40	—	8.25	26.40	—	SSL-LX3044GD-5V
	3	Green	Trans.	25	2.1	67-1063-ND	—	1.44	—	—	24.00	SSL-LX3044GT
	3	Red	Diff.	25	2.0	67-1064-ND	—	1.17	—	—	19.50	SSL-LX3044HD
	3	Red	Clear	30	2.1	67-1065-ND	—	1.47	—	—	24.50	SSL-LX3044IC
	3	Red	Diff.	30	2.0	67-1066-ND	—	1.65	—	—	27.50	SSL-LX3044ID
	3	Red	Diff.	20	12	67-1067-ND	.32	—	6.56	21.00	—	SSL-LX3044ID-12V
	3	Red	Diff.	20	5	67-1068-ND	.40	—	8.25	26.40	—	SSL-LX3044ID-5V
	3	Red	Trans.	30	2.0	67-1069-ND	—	1.47	—	—	24.50	SSL-LX3044IT
	3	Green	Diff.	25	2.1	67-1070-ND	—	1.26	—	—	21.00	SSL-LX3044LGD
	3	Red	Diff.	30	2.0	67-1071-ND	—	1.38	—	—	23.00	SSL-LX3044LID
4	3	Yellow	Diff.	30	2.1	67-1072-ND	—	1.35	—	—	22.50	SSL-LX3044LYD
5	3	Green	Diff.	25	2.1	67-1073-ND	—	1.62	—	—	27.00	SSL-LX3044PGD
	3	Orange	Clear	50	1.8	67-1074-ND	.99	—	20.63	66.00	—	SSL-LX3044SOC
	3	Red	Clear	30	1.7	67-1075-ND	.33	—	6.94	22.20	—	SSL-LX3044SRC/B
	3	Yellow	Clear	30	2.0	67-1076-ND	.86	—	18.00	57.60	—	SSL-LX3044SYC
	3	Yellow	Clear	30	2.1	67-1077-ND	—	1.53	—	—	25.50	SSL-LX3044YC
	3	Yellow	Diff.	30	2.1	67-1078-ND	—	1.41	—	—	23.50	SSL-LX3044YD
	3	Yellow	Diff.	20	12	67-1079-ND	.32	—	6.56	21.00	—	SSL-LX3044YD-12V
	3	Yellow	Diff.	20	5	67-1080-ND	.40	—	8.25	26.40	—	SSL-LX3044YD-5V
	3	Yellow	Trans.	30	2.1	67-1081-ND	—	2.07	—	—	34.50	SSL-LX3044YT
6	4x7	Green	Diff.	25	2.1	67-1082-ND	.31	—	6.44	20.60	—	SSL-LX4673GD-LA20
	4x7	Red	Diff.	20	2.0	67-1083-ND	.31	—	6.44	20.60	—	SSL-LX4673ID-LA20
	4x7	Yellow	Diff.	30	2.1	67-1084-ND	.31	—	6.44	20.60	—	SSL-LX4673YD-LA20
7	5	Green	Clear	30	2.0	67-1085-ND	—	2.34	—	—	39.00	SSL-LX5063GC
	5	Green	Diff.	25	2.0	67-1086-ND	—	1.44	—	—	24.00	SSL-LX5063GD
	5	Green	Trans.	25	2.0	67-1087-ND	—	1.53	—	—	25.50	SSL-LX5063GT
	5	Red	Diff.	25	2.0	67-1088-ND	—	1.35	—	—	22.50	SSL-LX5063HD
	5	Red	Clear	30	2.0	67-1089-ND	—	1.80	—	—	30.00	SSL-LX5063IC
	5	Red	Diff.	30	2.0	67-1090-ND	—	1.53	—	—	25.50	SSL-LX5063ID
	5	Red	Trans.	30	2.0	67-1091-ND	—	1.71	—	—	28.50	SSL-LX5063IT
	5	Green	Trans.	25	2.0	67-1092-ND	—	2.34	—	—	39.00	SSL-LX5063LGT
	5	Yellow	Clear	30	2.1	67-1093-ND	—	2.16	—	—	36.00	SSL-LX5063YC
	5	Yellow	Diff.	30	2.1	67-1094-ND	—	1.71	—	—	28.50	SSL-LX5063YD
	5	Yellow	Trans.	30	2.1	67-1095-ND	—	1.74	—	—	29.00	SSL-LX5063YT
8	5	Red	Diff.	25	2.0	67-1096-ND	—	1.20	—	—	20.00	SSL-LX5091HD
	5	Amber	Diff.	30	2.1	67-1097-ND	—	1.47	—	—	24.50	SSL-LX5093AD
	5	Green	Diff.	25	2.0	67-1098-ND	—	1.23	—	—	20.50	SSL-LX5093GD
	5	Green	Diff.	12	12	67-1099-ND	.40	—	8.25	26.40	—	SSL-LX5093GD-12V
	5	Green	Diff.	12	5	67-1100-ND	.32	—	6.56	21.00	—	SSL-LX5093GD-5V
	5	Green	Trans.	25	2.2	67-1101-ND	—	1.44	—	—	24.00	SSL-LX5093GT
	5	Red	Diff.	25	2.1	67-1102-ND	—	1.17	—	—	19.50	SSL-LX5093HD
	5	Red	Diff.	10	5	67-1103-ND	.32	—	6.56	21.00	—	SSL-LX5093HD-5V
	5	Red	Trans.	25	2.0	67-1104-ND	—	1.56	—	—	26.00	SSL-LX5093HT
	5	Red	Diff.	30	2.0	67-1105-ND	—	1.26	—	—	21.00	SSL-LX5093ID
	5	Red	Diff.	12	5	67-1106-ND	.32	—	6.56	21.00	—	SSL-LX5093ID-5V
	5	Red	Trans.	30	2.0	67-1107-ND	—	1.47	—	—	24.50	SSL-LX5093IT
	5	Green	Diff.	25	2.0	67-1108-ND	—	1.29	—	—	21.50	SSL-LX5093LGD
	5	Green	Trans.	30	2.1	67-1109-ND	—	1.47	—	—	24.50	SSL-LX5093LGT
	5	Red	Diff.	30	2.0	67-1110-ND	—	1.38	—	—	23.00	SSL-LX5093LID
	5	Yellow	Diff.	30	2.1	67-1111-ND	—	1.38	—	—	23.00	SSL-LX5093LYD
	5	Green	Diff.	25	2.1	67-1112-ND	—	1.44	—	—	24.00	SSL-LX5093PGD
	5	Orange	Clear	50	1.8	67-1113-ND	.99	—	20.63	66.00	—	SSL-LX5093SOC
	5	Red	Diff.	30	1.7	67-1114-ND	—	1.89	—	—	31.50	SSL-LX5093SRD
	5	Yellow	Clear	30	2.0	67-1115-ND	.71	—	14.88	47.60	—	SSL-LX5093SYC
	5	Yellow	Diff.	30	2.1	67-1116-ND	—	1.35	—	—	22.50	SSL-LX5093YD
	5	Yellow	Trans.	30	2.1	67-1117-ND	—	1.50	—	—	25.00	SSL-LX5093YT
9	5	Amber	Clear	25	2.1	67-1118-ND	.29	—	6.13	19.60	—	SSL-LX5093XAC
	5	Green	Clear	25	2.1	67-1119-ND	—	1.98	—	—	33.00	SSL-LX5093XGC
	5	Red	Clear	25	2.1	67-1120-ND	—	1.80	—	—	30.00	SSL-LX5093XIC
	5	Green	Clear	25	2.1	67-1121-ND	.30	—	6.19	19.80	—	SSL-LX5093XPGC
	5	Red	Clear	30	1.7	67-1122-ND	.57	—	11.94	38.20	—	SSL-LX5093XRC/4
	5	Yellow	Clear	30	2.0	67-1123-ND	1.00	—	20.75	66.40	—	SSL-LX5093XYC
10	5	Red/Grn	Diff.	30/25	2.1	67-1124-ND	.44	—	9.25	29.60	—	SSL-LX5097IGW
11	2	Red	Diff.	30	2.1	67-1125-ND	—	1.77	—	—	29.50	SSL-LX20465ID
	2	Yellow	Diff.	30	2.1	67-1126-ND	—	1.80	—	—	30.00	SSL-LX20465YD
	2	Green	Diff.	25	2.1	67-1127-ND	—	1.62	—	—	27.00	SSL-LX20465GD
12	3	Yellow	Clear	70	2.25	67-1128-ND	.81	—	16.94	54.20	—	SSL-LX30448SYC
13	1.7	Red	Diff.	30	2.1	67-1129-ND	.36	—	7.50	24.00	—	SSL-LXA223HD
14	1.8	Green	Diff.	30	5	67-1130-ND	.62	—	13.00	41.60	—	SSL-LXA227GD-5V
	1.8	Red	Diff.	30	5	67-1131-ND	.62	—	13.00	41.60	—	SSL-LXA227ID-5V
	1.8	Yellow	Diff.	20	5	67-1132-ND	.62	—	13.00	41.60	—	SSL-LXA227YD-5V
15	1.9	Green	Diff.	25	2.1	67-1133-ND	.27	—	5.63	18.00	—	SSL-LXA228GD
	1.9	Red	Clear	30	2.0	67-1134-ND	.29	—	6.13	19.60	—	SSL-LXA228IC
	1.9	Red	Diff.	30	2.0	67-1135-ND	.27	—	5.63	18.00	—	SSL-LXA228ID
	1.9	Green	Clear	30	2.1	67-1136-ND	.35	—	7.31	23.40	—	SSL-LXA228SGC
	1.9	Red	Clear	30	1.7*	67-1137-ND	.41	—	8.56	27.40	—	SSL-LXA228SRC
	1.9	Red	Diff.	30	1.7*	67-1138-ND	.46	—	9.63	30.80	—	SSL-LXA228SRD
	1.9	Yellow	Clear	20	2.0	67-1139-ND	1.27	—	26.38	84.40	—	SSL-LXA228SYC
	1.9	Yellow	Clear	20	2.0	67-1140-ND	.31	—	6.38	20.40	—	SSL-LXA228YC

* Note Anode Mark

Fig. 1

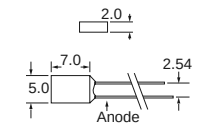


Fig. 2

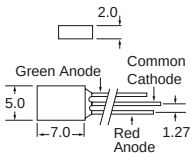


Fig. 3

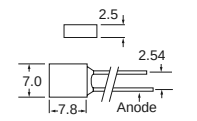


Fig. 4

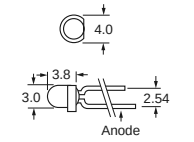


Fig. 5

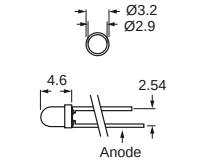


Fig. 6

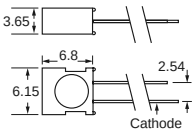


Fig. 7

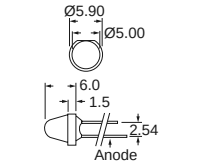


Fig. 8

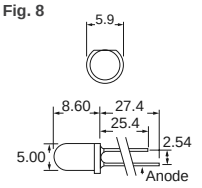


Fig. 9

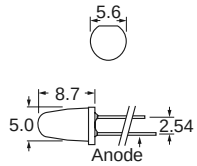


Fig. 10

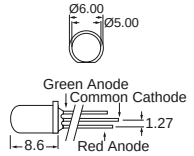


Fig. 11

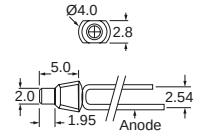


Fig. 12

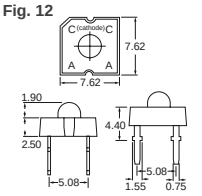


Fig. 13

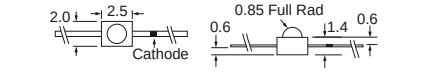


Fig. 14

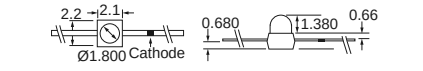
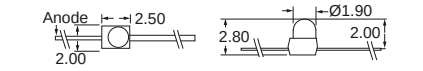


Fig. 15



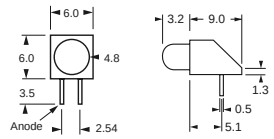
O

PC Mount LEDs

Fig.	LED Dia. (mm)	Emitted Color	Oper Curr. MA	Oper Type Volt(v)	Digi-Key Part No.	Pricing 1	25	100	Lumex Part No.
1	5	Red	50	1.7	67-1308-ND	.48	10.00	32.00	SSF-LXH100HD-01
1	5	Red	10-25	2.1	67-1309-ND•	.84	17.50	56.00	SSF-LXH100ID-1
1	5	Green	10-25	2.1	67-1310-ND•	.84	17.50	56.00	SSF-LXH100GD-01
1	5	Yellow	10-25	2.1	67-1311-ND•	.84	17.50	56.00	SSF-LXH100YD-1
1	5	Red	1-5	1.8	67-1312-ND•	.84	17.50	56.00	SSF-LXH100LID-1
1	5	Green	1-5	1.8	67-1313-ND•	.84	17.50	56.00	SSF-LXH100LGD-1
1	5	Green	10-25	2.1	67-1218-ND	.45	9.38	30.00	SSF-LXH100GD
1	5	Red	10-25	2.1	67-1217-ND	.45	9.38	30.00	SSF-LXH100ID
1	5	Green	1-5	1.8	67-1220-ND	.57	11.88	38.00	SSF-LXH100LGD
1	5	Red	1-5	1.8	67-1219-ND	.57	11.88	38.00	SSF-LXH100LID
1	5	Green	10	5.0	67-1223-ND	.72	15.00	48.00	SSF-LXH100GD-5V
1	5	Red	10	5.0	67-1222-ND	.72	15.00	48.00	SSF-LXH100ID-5V
1	5	Red/Green	10-25	2.1	67-1221-ND	.72	15.00	48.00	SSF-LXH100HGW
1	5	Yellow	10-25	2.1	67-1224-ND	.45	9.38	30.00	SSF-LXH100YD
1	5	Bright Red	10-25	1.7	67-1225-ND	.72	15.00	48.00	SSF-LXH100SRD
2	5	Green	10-25	2.1	67-1228-ND	.45	9.38	30.00	SSF-LXH100MGD
2	5	Red	10-25	2.1	67-1227-ND	.45	9.38	30.00	SSF-LXH100MID
2	5	Yellow	10-25	2.1	67-1229-ND	.45	9.38	30.00	SSF-LXH100MYD
2	5	Red/Green	10-25	2.1	67-1226-ND	.72	15.00	48.00	SSF-LXH100MHGW
2	5	Bright Red	10-25	1.7	67-1230-ND	.72	15.00	48.00	SSF-LXH100MSRD
2	5	Green	1-5	1.8	67-1232-ND	.57	11.88	38.00	SSF-LXH100MLGD
2	5	Red	1-5	1.8	67-1231-ND	.57	11.88	38.00	SSF-LXH100MLID
2	5	Green	10	5.0	67-1234-ND	.72	15.00	48.00	SSF-LXH100MGD-5V
2	5	Red	10	5.0	67-1233-ND	.72	15.00	48.00	SSF-LXH100MID-5V
3	3	Green	10-25	2.1	67-1236-ND	.39	8.13	26.00	SSF-LXH103GD
3	3	Red	10-25	2.1	67-1235-ND	.39	8.13	26.00	SSF-LXH103ID
3	3	Yellow	10-25	2.1	67-1237-ND	.39	8.13	26.00	SSF-LXH103YD
3	3	Bright Red	10-25	1.7	67-1238-ND	.54	11.25	36.00	SSF-LXH103SRD
3	3	Green	1-5	1.8	67-1240-ND	.54	11.25	36.00	SSF-LXH103LGD
3	3	Red	1-5	1.8	67-1239-ND	.54	11.25	36.00	SSF-LXH103LID
3	3	Green	10	5.0	67-1242-ND	.66	13.75	44.00	SSF-LXH103GD-5V
3	3	Red	10	5.0	67-1241-ND	.66	13.75	44.00	SSF-LXH103ID-5V
4	4.7	Green	25	2.0	67-1037-ND	.32	6.75	21.60	SSF-LXH104GD
4	4.7	Red	12	5.0	67-1038-ND	.95	19.75	63.20	SSF-LXH104HD-5V
4	4.7	Red	30	2.0	67-1039-ND	.32	6.75	21.60	SSF-LXH104ID
4	4.7	Yellow	30	2.1	67-1040-ND	.32	6.75	21.60	SSF-LXH104YD
5	1.8	Green	30	2.1	67-1041-ND	.72	15.06	48.20	SSF-LXH555GD
5	1.8	Red	30	2.0	67-1042-ND	.72	15.06	48.20	SSF-LXH555ID
5	1.8	Yellow	30	2.1	67-1043-ND	.72	15.06	48.20	SSF-LXH555YD
6	3	Green	10-25	2.1	67-1245-ND	.54	11.25	36.00	SSF-LXH1071GD
6	3	Red	10-25	2.1	67-1244-ND	.54	11.25	36.00	SSF-LXH1071ID
6	3	Yellow	10-25	2.1	67-1246-ND	.54	11.25	36.00	SSF-LXH1071YD
6	3	Bright Red	10-25	1.7	67-1247-ND	.72	15.00	48.00	SSF-LXH1071SRD
6	3	Red/Green	10-25	2.1	67-1243-ND	.81	16.88	54.00	SSF-LXH1071HGW
6	3	Green	1-5	1.8	67-1249-ND	.66	13.75	44.00	SSF-LXH1071LGD
6	3	Red	1-5	1.8	67-1248-ND	.66	13.75	44.00	SSF-LXH1071LID
7	5	Red	10-25	2.1	67-1250-ND	.90	18.75	60.00	SSF-LXH2100ID
7	5	Green	10-25	2.1	67-1251-ND	.90	18.75	60.00	SSF-LXH2100GD
7	5	Yellow	10-25	2.1	67-1252-ND	.90	18.75	60.00	SSF-LXH2100YD
7	5	Bright Red	10-25	1.7	67-1253-ND	1.08	22.50	72.00	SSF-LXH2100SRD
8	3	Green	10-25	2.1	67-1255-ND	.99	20.63	66.00	SSF-LXH2103GGD/4
8	3	Red	10-25	2.1	67-1254-ND	.99	20.63	66.00	SSF-LXH2103IID/4
8	3	Yellow	10-25	2.1	67-1256-ND	.99	20.63	66.00	SSF-LXH2103YYD/4
8	3	Bright Red	10-25	1.7	67-1257-ND	1.56	32.50	104.00	SSF-LXH2103SRSRD/4
8	3	Green	1-5	1.8	67-1259-ND	1.20	25.00	80.00	SSF-LXH2103LGLGD/4
8	3	Red	1-5	1.8	67-1258-ND	1.20	25.00	80.00	SSF-LXH2103LIID/4
8	3	Green	10	5.0	67-1261-ND	1.35	28.13	90.00	SSF-LXH2103GGD-5V/4
8	3	Red	10	5.0	67-1260-ND	1.35	28.13	90.00	SSF-LXH2103IID-5V/4
9	5	Green	10-25	2.1	67-1322-ND*	2.22	46.25	148.00	SSF-LXH400GD-1
9	5	Green	10-25	2.1	67-1286-ND	1.26	26.25	84.00	SSF-LXH400GD
9	5	Red	10-25	2.1	67-1285-ND	1.26	26.25	84.00	SSF-LXH400ID
9	5	Yellow	10-25	2.1	67-1287-ND	1.26	26.25	84.00	SSF-LXH400YD
9	5	Bright Red	10-25	1.7	67-1288-ND	2.34	48.75	156.00	SSF-LXH400SRD
9	5	Green	10	5.0	67-1291-ND	2.34	48.75	156.00	SSF-LXH400GD-5V
9	5	Red	10	5.0	67-1290-ND	2.34	48.75	156.00	SSF-LXH400ID-5V
9	5	Red/Green	10-25	2.1	67-1289-ND	2.34	48.75	156.00	SSF-LXH400HGW
10	5	Green	10-25	2.1	67-1294-ND	.96	20.00	64.00	SSF-LXH4RA5GD
10	5	Red	10-25	2.1	67-1293-ND	.96	20.00	64.00	SSF-LXH4RA5ID
10	5	Yellow	10-25	2.1	67-1295-ND	.96	20.00	64.00	SSF-LXH4RA5YD
10	5	Bright Red	10-25	1.7	67-1296-ND	1.38	28.75	92.00	SSF-LXH4RA5SRD
10	5	Red/Green	10-25	2.1	67-1292-ND	1.38	28.75	92.00	SSF-LXH4RA5HGW
10	5	Green	1-5	1.8	67-1298-ND	.96	20.00	64.00	SSF-LXH4RA5LGD
10	5	Red	1-5	1.8	67-1297-ND	.96	20.00	64.00	SSF-LXH4RA5LID
10	5	Green	10	5.0	67-1300-ND	1.38	28.75	92.00	SSF-LXH4RA5GD-5V
10	5	Red	10	5.0	67-1299-ND	1.38	28.75	92.00	SSF-LXH4RA5ID-5V
10	5	Red/Blinking	10-20	3-15	67-1301-ND†	2.64	55.00	176.00	SSF-LXH4RA5BID
11	3	Green	10-25	2.1	67-1304-ND	.96	20.00	64.00	SSF-LXH4RAGD
11	3	Red	10-25	2.1	67-1303-ND	.96	20.00	64.00	SSF-LXH4RAID
11	3	Yellow	10-25	2.1	67-1305-ND	.96	20.00	64.00	SSF-LXH4RAYD
11	3	Bright Red	10-25	1.7	67-1306-ND	1.38	28.75	92.00	SSF-LXH4RASRD

† Blinking Version

Fig. 1



• Lens height for part #'s 67-1309/10/11/12/13-ND, = 4.75mm not 3.2mm

Fig. 2

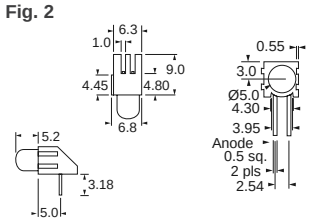


Fig. 3

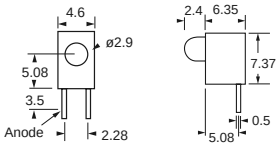


Fig. 4

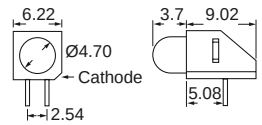


Fig. 5

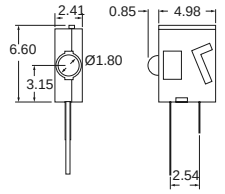


Fig. 6

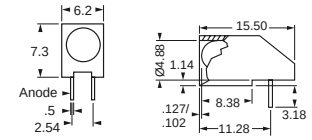


Fig. 7

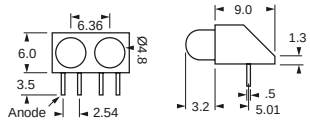


Fig. 8

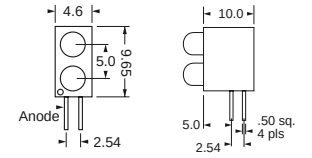
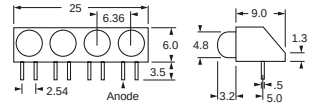


Fig. 9



* Lens height for part # 67-1322-ND = 4.75mm not 3.2mm

Fig. 10

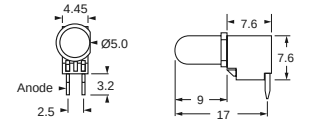


Fig. 11

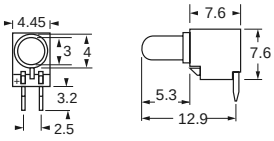


Fig. 12

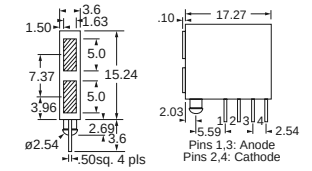


Fig. 13

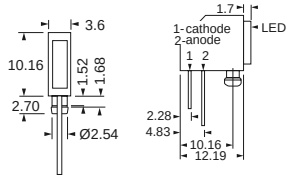


Fig. 14

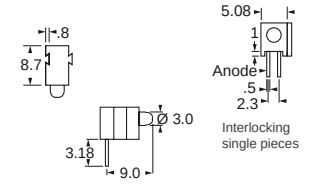


Fig.	LED Dia. (mm)	Emitted Color	Oper Curr. MA	Oper Type Volt(v)	Digi-Key Part No.	Pricing 1	25	100	Lumex Part No.
11	3	Red/Green	10-25	2.1	67-1302-ND	1.38	28.75	92.00	SSF-LXH4RAHGW
11	3	Red/Blinking	10-20	3-15	67-1307-ND†	2.64	55.00	176.00	SSF-LXH4RABID
12	2 x 5	Green	10-25	2.1	67-1263-ND	1.14	23.75	76.00	SSF-LXH22573GGD
12	2 x 5	Red	10-25	2.1	67-1262-ND	1.14	23.75	76.00	SSF-LXH22573IID
12	2 x 5	Yellow	10-25	2.1	67-1264-ND	1.14	23.75	76.00	SSF-LXH22573YYD
12	2 x 5	Bright Red	10-25	1.7	67-1265-ND	1.56	32.50	104.00	SSF-LXH22573SRSRD
12	3	Green	1-5	1.8	67-1267-ND	1.44	30.00	96.00	SSF-LXH22573LGGD
12	3	Red	1-5	1.8	67-1266-ND	1.44	30.00	96.00	SSF-LXH22573LIID
13	2.5 x 7	Green	10-25	2.1	67-1270-ND	.63	13.13	42.00	SSF-LXH25780GD
13	2.5 x 7	Red	10-25	2.1	67-1269-ND	.63	13.13	42.00	SSF-LXH25780ID
13	2.5 x 7	Yellow	10-25	2.1	67-1271-ND	.63	13.13	42.00	SSF-LXH25780YD
13	2.5 x 7	Bright Red	10-25	1.7	67-1272-ND	.93	19.38	62.00	SSF-LXH25780SRD
13	2.5 x 7	Red/Green	10-25	2.1	67-1268-ND	.93	19.38	62.00	SSF-LXH25780HGW
14	3	Green	10-25	2.1	67-1274-ND	.54	11.25	36.00	SSF-LXH2300GD
14	3	Red	10-25	2.1	67-1273-ND	.54	11.25	36.00	SSF-LXH2300ID
14	3	Yellow	10-25	2.1	67-1275-ND	.54	11.25	36.00	SSF-LXH2300YD
14	3	Bright Red	10-25	1.7	67-1276-ND	.78	16.25	52.00	SSF-LXH2300SRD
14	3	Green	1-5	1.8	67-1278-ND	.72	15.00	48.00	SSF-LXH2300LGD
14	3	Red	1-5	1.8	67-1277-ND	.72	15.00	48.00	SSF-LXH2300LID
14	3	Green	10	5.0	67-1280-ND	.78	16.25	52.00	SSF-LXH2300GD-5V
14	3	Red	10	5.0	67-1279-ND	.78	16.25	52.00	SSF-LXH2300ID-5V
15	5	Green	10-25	2.1	67-1283-ND	.96	20.00	64.00	SSF-LXHM250GGD
15	5	Red	10-25	2.1	67-1282-ND	.96	20.00	64.00	SSF-LXHM250IID
15	5	Yellow	10-25	2.1	67-1284-ND	.96	20.00	64.00	SSF-LXH250MYYD
15	5	Red/Green	10-25	2.1	67-1281-ND	1.62	33.75	108.00	SSF-LXH250MIGIGW
16	3	Red	30	2.0	67-1315-ND	2.04	42.50	136.00	SSF-LXH2300/4ID
17	5	Green	30	2.0	67-1316-ND	.84	17.50	56.00	SSF-LXH101GD-SL-1
18	5	Red	10-25	2.1	67-1317-ND	.84	17.50	56.00	SSF-LXH101ID-1
18	5	Green	10-25	2.1	67-1318-ND	.84	17.50	56.00	SSF-LXH101GD-1
19	3	Red	20	2.0	67-1320-ND	.84	17.50	56.00	SSF-LXH303ID
20	3	Red	30	2.0	67-1319-ND	1.20	25.00	80.00	SSF-LXH240IID
20	3	Green	30	2.1	67-1321-ND	1.20	25.00	80.00	SSF-LXH240GGD
21	—	Red	10	4.5	67-1323-ND	.87	18.13	58.00	SSB-LX02IC
21	—	Green	10	4.5	67-1324-ND	.87	18.13	58.00	SSB-LX02GC
21	—	Yellow	10	4.5	67-1325-ND	.87	18.13	58.00	SSB-LX02YC
21	—	Super Red	10	3.5	67-1326-ND	1.08	22.50	72.00	SSB-LX02SRC

† Blinking Version

Fig. 15

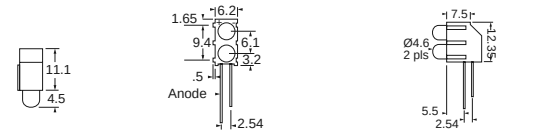


Fig. 16

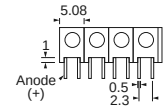


Fig. 17

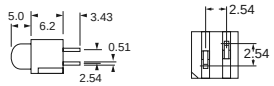


Fig. 18

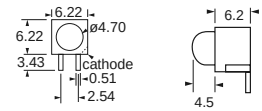


Fig. 19

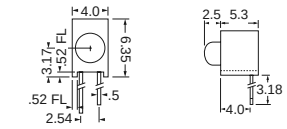


Fig. 20

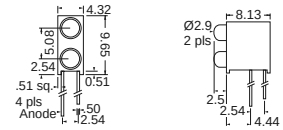
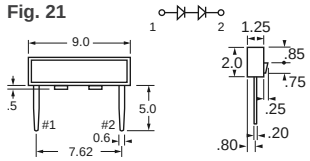


Fig. 21



PC Mount LED Arrays/Light Bars

Fig.	Emitted Color	Vf	Io mcd	If mA	Digi-Key Part No.	Pricing 1	25	100	Lumex Part No.
1	Green	2.1	10	25	67-1008-ND	2.85	59.38	190.00	SSA-LXB10GW-GF/LP
1	Red	2.1	4	30	67-1009-ND	2.13	44.31	141.80	SSA-LXB10HW-GF/LP
1	Red	2.1	10	30	67-1010-ND	2.85	59.38	190.00	SSA-LXB10IW-GF/LP
2	Red	2.3	60	100(Ip)	67-1011-ND	68.30	1366.00	4781.00	SSA-LXB8825
2	Green	2.3	70	100(Ip)	67-1012-ND	68.30	1366.00	4781.00	SSA-LXB8835
3	Red	2.1	25	30	67-1013-ND	.91	18.88	60.40	SSB-LX2300IW
4	Red	2.1	50	30	67-1014-ND	1.36	28.38	90.80	SSB-LX2350IW
3	Yellow	2.1	18	30	67-1015-ND	.91	18.88	60.40	SSB-LX2400YW
4	Yellow	2.1	38	30	67-1016-ND	1.36	28.38	90.80	SSB-LX2450YW
3	Green	2.1	25	25	67-1017-ND	.91	18.88	60.40	SSB-LX2500SGW
5	Red	2.1	25	30	67-1018-ND	1.49	31.13	99.60	SSB-LX2600IW
6	Red	2.1	25	30	67-1019-ND	2.36	49.06	157.00	SSB-LX2620IW
7	Red	2.0	50	30	67-1020-ND	2.36	49.06	157.00	SSB-LX2635IW
8	Red	2.1	45	30	67-1021-ND	1.49	31.13	99.60	SSB-LX2655IW
9	Red	2.1	80	30	67-1022-ND	2.36	49.06	157.00	SSB-LX2685IW
5	Yellow	2.1	18	30	67-1023-ND	1.49	31.13	99.60	SSB-LX2700YW
6	Yellow	2.1	18	30	67-1024-ND	2.36	49.06	157.00	SSB-LX2720YW
7	Yellow	2.1	40	30	67-1025-ND	2.36	49.06	157.00	SSB-LX2735YW
8	Yellow	2.1	35	30	67-1026-ND	1.49	31.13	99.60	SSB-LX2755YW
9	Yellow	2.1	70	30	67-1027-ND	2.36	49.06	157.00	SSB-LX2785YW
8	Red/Yel	2.1	25	30	67-1028-ND	2.49	51.88	166.00	SSB-LX2950IYW
8	Red/Grn	2.1	25	30/25	67-1029-ND	2.49	51.88	166.00	SSB-LX2965IGW
3	Red	1.7	40	30	67-1030-ND	1.04	21.69	69.40	SSB-LXA100SRW
4	Red	1.7	80	30	67-1031-ND	1.53	31.94	102.20	SSB-LXB100SRW
8	Red	1.7	80	30	67-1032-ND	2.35	48.94	156.60	SSB-LXC100SRW
5	Red	1.7	40	30	67-1033-ND	2.35	48.94	156.60	SSB-LXD100SRW
6	Red	1.7	40	30	67-1034-ND	2.72	56.56	181.00	SSB-LXE100SRW
7	Red	1.7	80	30	67-1035-ND	2.72	56.56	181.00	SSB-LXF100SRW
9	Red	1.7	150	30	67-1036-ND	2.72	56.56	181.00	SSB-LXH100SRW

Fig. 1

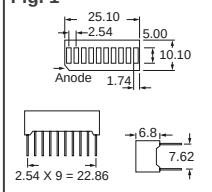


Fig. 2

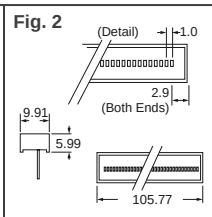


Fig. 3

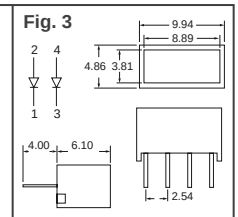


Fig. 4

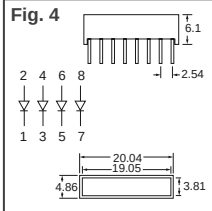


Fig. 5

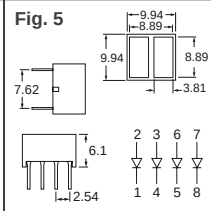


Fig. 6

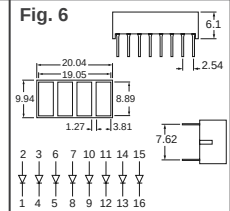


Fig. 7

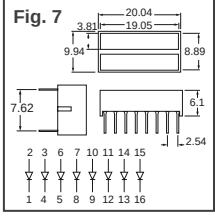


Fig. 8

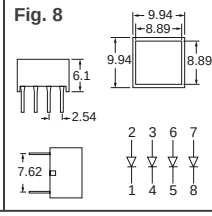
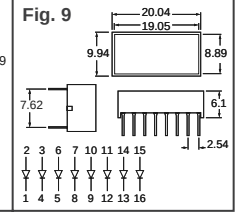


Fig. 9



Infrared LEDs

Fig.	LED Dia. (mm)	Peak Wave-Length	Lens Color	Oper. Curr. (mA)	Typ. Forward Voltage	Digi-Key Part No.	Pricing 1	10	100	Lumex Part No.
1	3	940 nm	Clear	60	1.2	67-1000-ND	.25	2.25	19.35	OED-EL-8L
2	5	940 nm	Clear	100	1.5	67-1001-ND	.27	2.48	21.29	OED-EL-1L2

Fig. 1

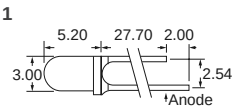
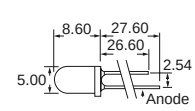


Fig. 2

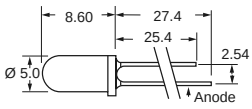


NEW! T-1 3/4 Flashing LED Lamps

Color	Color Source	IO @ VF=9V (mcd)	Viewing Angle	Digi-Key Part No.	Pricing 1	25	100	Lumex Part No.
Red/Diff.	Brt. Red	10.0	40°	67-1499-ND	.93	19.31	61.80	SSL-LX5093BSRD
Dark Red/Diff.	Red	4.0	40°	67-1497-ND	.84	17.56	56.20	SSL-LX5093BHD
Red/Diff.	Red	8.0	40°	67-1498-ND	.84	17.56	56.20	SSL-LX5093BID
Green/Diff.	Green	8.0	40°	67-1496-ND	.84	17.56	56.20	SSL-LX5093BGD
Yellow/Diff.	Yellow	8.0	40°	67-1495-ND	.84	17.56	56.20	SSL-LX5093BYD

Features:

- Operating Voltage: 3.0 to 14.0
- Blinking Frequency: 1.5 to 2.5Hz
- Operating Temperature Range: -55°C to 100°C



Panel Mount LEDs

Fig.	LED Dia. (mm)	Emitted Color	Oper Curr. MA	Oper Type Volt(v)	Digi-Key Part No.	Pricing 1	25	100	Lumex Part No.
1	3	Red	10-25	2.1	67-1190-ND	1.44	30.00	96.00	SSI-LXH312ID-150
1	3	Green	10-25	2.1	67-1191-ND	1.44	30.00	96.00	SSI-LXH312GD-150
2	3	Red	30	2.0	67-1192-ND	.75	15.63	50.00	SSI-LXH312ID
3	3	Red	10-25	2.1	67-1147-ND	1.20	25.00	80.00	SSI-LXR1612ID
3	3	Green	10-25	2.1	67-1148-ND	1.20	25.00	80.00	SSI-LXR1612GD
3	3	Yellow	10-25	2.1	67-1149-ND	1.20	25.00	80.00	SSI-LXR1612YD
3	3	Bright Red	10-25	1.7	67-1150-ND	1.50	31.25	100.00	SSI-LXR1612SRD
4	3	Red	10-25	2.1	67-1151-ND	1.20	25.00	80.00	SSI-LXR3612ID
4	3	Green	10-25	2.1	67-1152-ND	1.20	25.00	80.00	SSI-LXR3612GD
4	3	Yellow	10-25	2.1	67-1153-ND	1.20	25.00	80.00	SSI-LXR3612YD
4	3	Bright Red	10-25	1.7	67-1154-ND	1.50	31.25	100.00	SSI-LXR3612SRD
5	5	Red	10-25	2.1	67-1188-ND	1.38	28.75	92.00	SSI-LXH600ID-150
5	5	Green	10-25	2.1	67-1189-ND	1.38	28.75	92.00	SSI-LXH600GD-150
5	5	Red/Green	10-25	2.1	67-1187-ND	2.25	46.88	150.00	SSI-LXH600HGW-150
6	5	Red	10-25	2.1	67-1155-ND	1.35	28.13	90.00	SSI-LXH387ID
6	5	Green	10-25	2.1	67-1156-ND	1.35	28.13	90.00	SSI-LXH387GD
6	5	Yellow	10-25	2.1	67-1157-ND	1.35	28.13	90.00	SSI-LXH387YD
6	5	Bright Red	10-25	1.7	67-1158-ND	1.56	32.50	104.00	SSI-LXH387SRD
7	5	Red	10-25	2.1	67-1159-ND	1.20	25.00	80.00	SSI-LXH9ID/-150
7	5	Green	10-25	2.1	67-1160-ND	1.20	25.00	80.00	SSI-LXH9GD-150
7	5	Yellow	10-25	2.1	67-1161-ND	1.20	25.00	80.00	SSI-LXH9YD-150
7	5	Bright Red	10-25	1.7	67-1162-ND	1.38	28.75	92.00	SSI-LXH9SRD-150
8	5	Red	10-25	2.1	67-1163-ND	1.26	26.25	84.00	SSI-LXR4815ID
8	5	Green	10-25	2.1	67-1164-ND	1.26	26.25	84.00	SSI-LXR4815GD
8	5	Yellow	10-25	2.1	67-1165-ND	1.26	26.25	84.00	SSI-LXR4815YD
8	5	Bright Red	10-25	1.7	67-1166-ND	1.41	29.38	94.00	SSI-LXR4815SRD
9	8	Red	10-25	2.1	67-1167-ND	.84	17.50	56.00	SSI-LXH8080ID
9	8	Green	10-25	2.1	67-1168-ND	.84	17.50	56.00	SSI-LXH8080GD
9	8	Yellow	10-25	2.1	67-1169-ND	.84	17.50	56.00	SSI-LXH8080YD
9	8	Bright Red	10-25	1.7	67-1170-ND	1.02	21.25	68.00	SSI-LXH8080SRD
10	10	Red	10-25	2.1	67-1171-ND	1.02	21.25	68.00	SSI-LXH1090ID
10	10	Green	10-25	2.1	67-1172-ND	1.02	21.25	68.00	SSI-LXH1090GD
10	10	Yellow	10-25	2.1	67-1173-ND	1.02	21.25	68.00	SSI-LXH1090YD
10	10	Bright Red	10-25	1.7	67-1174-ND	1.17	24.38	78.00	SSI-LXH1090SRD
11	5	Red	10-25	2.1	67-1175-ND	.78	16.25	52.00	SSI-LXH55ID
11	5	Green	10-25	2.1	67-1176-ND	.78	16.25	52.00	SSI-LXH55GD
11	5	Yellow	10-25	2.1	67-1177-ND	.78	16.25	52.00	SSI-LXH55YD
11	5	Bright Red	10-25	1.7	67-1178-ND	.96	20.00	64.00	SSI-LXH55SRD
12	2 x 5	Red	10-25	2.1	67-1179-ND	1.14	23.75	76.00	SSI-LXMP059ID
12	2 x 5	Green	10-25	2.1	67-1180-ND	1.14	23.75	76.00	SSI-LXMP059GD
12	2 x 5	Yellow	10-25	2.1	67-1181-ND	1.14	23.75	76.00	SSI-LXMP059YD
12	2 x 5	Bright Red	10-25	1.7	67-1182-ND	1.38	28.75	92.00	SSI-LXMP059SRD
13	2.5 x 7	Red	10-25	2.1	67-1183-ND	1.02	21.25	68.00	SSI-LXH072ID
13	2.5 x 7	Green	10-25	2.1	67-1184-ND	1.02	21.25	68.00	SSI-LXH072GD
13	2.5 x 7	Yellow	10-25	2.1	67-1185-ND	1.02	21.25	68.00	SSI-LXH072YD
13	2.5 x 7	Bright Red	10-25	1.7	67-1186-ND	1.20	25.00	80.00	SSI-LXH072SRD
14	2 x 5	Red	5-25	2.2	67-1201-ND	1.83	38.13	122.00	SSA-LXB525ID
14	2 x 5	Green	5-25	2.2	67-1202-ND	1.83	38.13	122.00	SSA-LXB525GD
14	2 x 5	Yellow	5-25	2.2	67-1203-ND	1.92	40.00	128.00	SSA-LXB525YD
14	2 x 5	Bright Red	5-25	1.7	67-1204-ND	2.97	61.88	198.00	SSA-LXB525SRD
15	2.5 x 5	Red	5-25	2.2	67-1205-ND	3.72	77.50	248.00	SSA-LXH1025ID
15	2.5 x 5	Green	5-25	2.2	67-1206-ND	3.72	77.50	248.00	SSA-LXH1025GD
15	2.5 x 5	Yellow	5-25	2.2	67-1207-ND	4.17	86.88	278.00	SSA-LXH1025YD
15	2.5 x 5	Bright Red	5-25	1.7	67-1208-ND	5.34	111.25	356.00	SSA-LXH1025SRD
16	2.5 x 5	Red	5-25	2.2	67-1209-ND	5.46	113.75	364.00	SSA-LXH1225ID
16	2.5 x 5	Green	5-25	2.2	67-1210-ND	5.46	113.75	364.00	SSA-LXH1225GD
16	2.5 x 5	Yellow	5-25	2.2	67-1211-ND	5.73	119.38	382.00	SSA-LXH1225YD
16	2.5 x 5	Bright Red	5-25	1.7	67-1212-ND	7.95	165.63	530.00	SSA-LXH1225SRD
17	3	Red	5-25	2.2	67-1213-ND	4.47	93.13	298.00	SSA-LXB102ID
17	3	Green	5-25	2.2	67-1214-ND	4.47	93.13	298.00	SSA-LXB102GD
17	3	Yellow	5-25	2.2	67-1215-ND	4.17	86.88	278.00	SSA-LXB102YD
17	3	Bright Red	5-25	1.7	67-1216-ND	6.57	136.88	438.00	SSA-LXB102SRD

Panel Mount LED Holders

Fig.	Description	Panel Hole	Digi-Key Part No.	Pricing 5	25	100	Lumex Part No.
18	T1 Black Nylon LED Panel Mnt. Holder	.160" (4.06)	67-1330-ND	.60	2.25	7.50	SSH-LX3050
19	T1 Black Nylon LED Panel Mnt. Holder	.225" (5.71)	67-1331-ND	.60	2.25	7.50	SSH-LXH301
20	T1-3/4 Black Nylon LED Panel Mnt. Holder	.250" (6.35)	67-1332-ND	.40	1.50	5.00	SSH-LX5091
21	T1-3/4 Black Nylon LED Panel Mnt. Holder	.330" (8.38)	67-1333-ND	.60	2.25	7.50	SSH-LXH501
22	Mounting Clip and Ring for T1-3/4	.250" (6.35)	67-1044-ND	.36	1.35	4.50	SSH-LX5090

Fig. 1

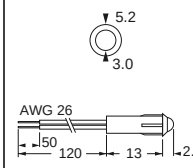


Fig. 2

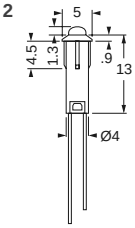


Fig. 3

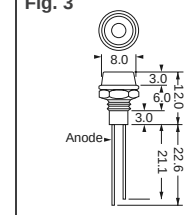


Fig. 4

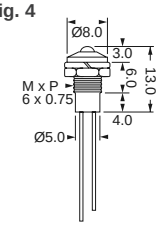


Fig. 5

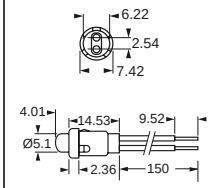


Fig. 6

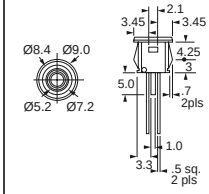
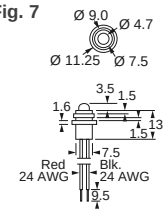
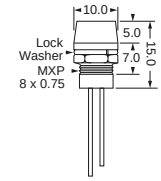


Fig. 7



(rear panel mount)

Fig. 8



(reflector bezel)

Fig. 9

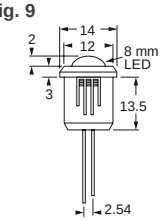
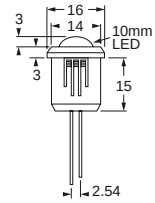


Fig. 10



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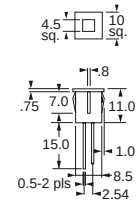


Fig. 12

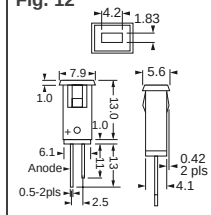


Fig. 13

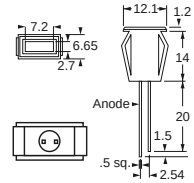


Fig. 14

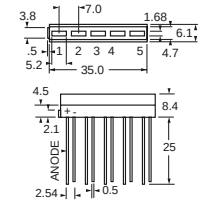


Fig. 15

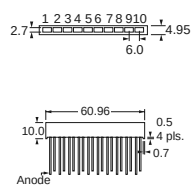


Fig. 16

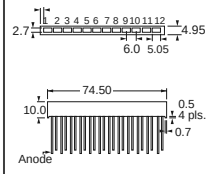
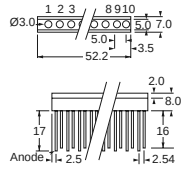


Fig. 17



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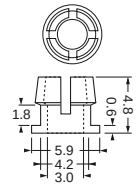
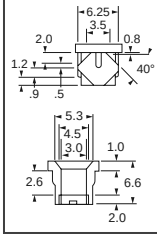


Fig. 19



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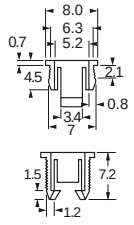


Fig. 21

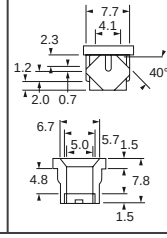
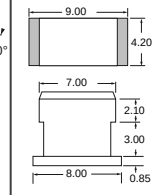


Fig. 22



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Surface Mount LEDs

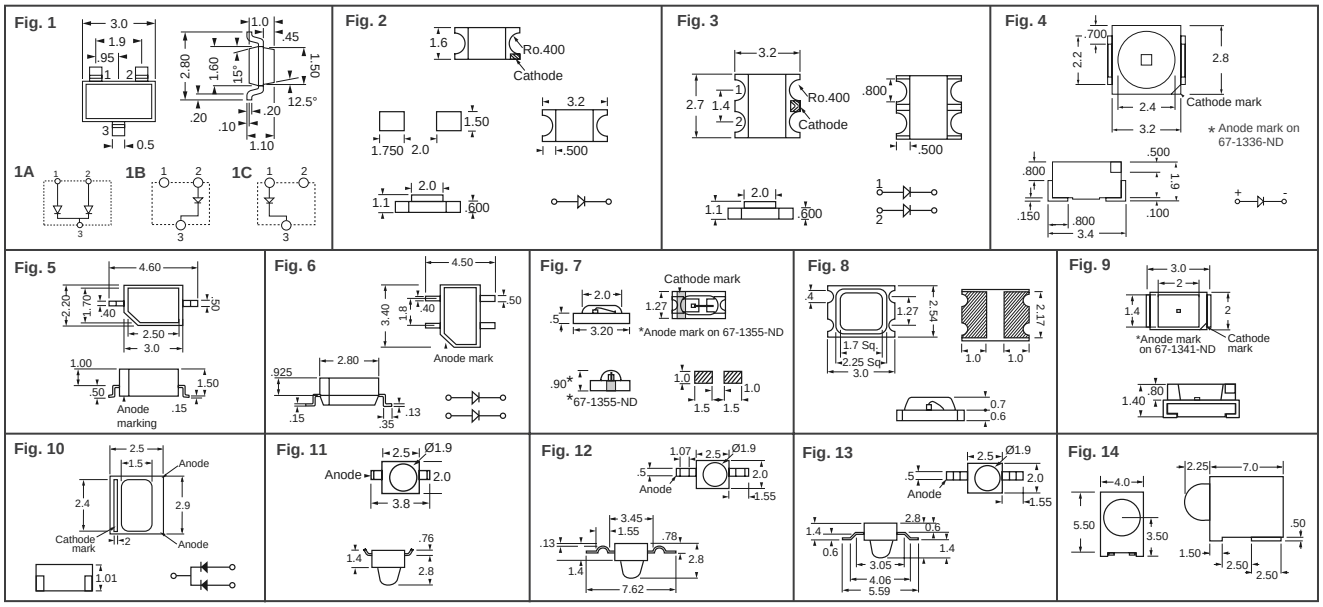
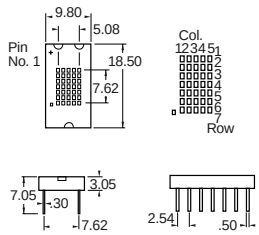


Fig. No.	Emitted Color	Vf	Io mcd	View Angle	If mA	Digi-Key Part No.	Cut Tape Pricing 1	10	100	Digi-Key Part No.	Tape & Reel Pricing 1,000	2,000	3,000	Lumex Part No.
1A	Red/Red	2.1	8	140°	40	67-1334-1-ND	.96	8.40	72.00	67-1334-2-ND	—	—	398.00/M	SSL-LX15IIC-RP-TR
1A	Green/Green	2.1	8	140°	40	67-1336-1-ND	.96	8.40	72.00	67-1336-2-ND	—	—	398.00/M	SSL-LX15GGC-RP-TR
1A	Yellow/Yellow	2.1	8	140°	40	67-1337-1-ND	.96	8.40	72.00	67-1337-2-ND	—	—	398.00/M	SSL-LX15YYC-RP-TR
1A	Red/Green	2.1	4/4	140°	20/20	67-1335-1-ND	.88	7.70	66.00	67-1335-2-ND	—	—	365.00/M	SSL-LX15IGC-RP-TR
1B	Red	2.1	4	140°	20	67-1381-1-ND	.64	5.60	48.00	67-1381-2-ND	—	—	265.60/M	SSL-LX15IC-TR
1B	Green	2.1	3	140°	20	67-1382-1-ND	.64	5.60	48.00	67-1382-2-ND	—	—	265.60/M	SSL-LX15GC-TR
1B	Yellow	2.1	3	140°	20	67-1383-1-ND	.64	5.60	48.00	67-1383-2-ND	—	—	265.60/M	SSL-LX15YC-TR
1C	Red	2.1	4	140°	20	67-1378-1-ND	.64	5.60	48.00	67-1378-2-ND	—	—	265.60/M	SSL-LX15IC-RP-TR
1C	Green	2.1	3	140°	20	67-1379-1-ND	.64	5.60	48.00	67-1379-2-ND	—	—	265.60/M	SSL-LX15GC-RP-TR
1C	Yellow	2.1	3	140°	20	67-1380-1-ND	.64	5.60	48.00	67-1380-2-ND	—	—	265.60/M	SSL-LX15YC-RP-TR
2	Red	2.0	6	140°	20	67-1356-1-ND	.36	3.15	27.00	67-1356-2-ND	—	149.40/M	—	SML-LX1206IC-TR
2	Green	2.1	10	140°	20	67-1357-1-ND	.36	3.15	27.00	67-1357-2-ND	—	149.40/M	—	SML-LX1206GC-TR
2	Yellow	2.0	6	140°	20	67-1358-1-ND	.36	3.15	27.00	67-1358-2-ND	—	149.40/M	—	SML-LX1206YC-TR
2	Super Red	1.7	15	140°	20	67-1359-1-ND	.60	5.25	45.00	67-1359-2-ND	—	249.00/M	—	SML-LX1206SRC-TR
2	Green	2.2	10	160°	25	67-1002-1-ND	.27	2.38	20.40	67-1002-2-ND	—	112.88/M	—	SML-LX1206GW-TR
2	Red	2.0	6	160°	25	67-1003-1-ND	.28	2.49	21.30	67-1003-2-ND	—	117.86/M	—	SML-LX1206IW-TR
2	Super Red	1.8	15	160°	30	67-1004-1-ND	.29	2.52	21.60	67-1004-2-ND	—	119.52/M	—	SML-LX1206SRW-TR
3	Red/Green	2.0	6/10	140°	20	67-1361-1-ND	.76	6.65	57.00	67-1361-2-ND	—	315.40/M	—	SML-LX1210IGC-TR
3	Green/Green	2.0	10	140°	20	67-1362-1-ND	.76	6.65	57.00	67-1362-2-ND	—	315.40/M	—	SML-LX1210GGC-TR
3	Yellow/Green	2.0	6/10	140°	20	67-1363-1-ND	.76	6.65	57.00	67-1363-2-ND	—	315.40/M	—	SML-LX1210YGC-TR
3	Super Red/Super Red	1.7	15	140°	20	67-1360-1-ND	1.16	10.15	87.00	67-1360-2-ND	—	481.40/M	—	SML-LX1210SRSRC-TR
4	Red	2.0	12	120°	20	67-1364-1-ND	.64	5.60	48.00	67-1364-2-ND	—	265.60/M	—	SML-LX2832IC-TR
4	Green	2.1	25	120°	20	67-1365-1-ND	.64	5.60	48.00	67-1365-2-ND	—	265.60/M	—	SML-LX2832GC-TR
4	Yellow	2.0	12	120°	20	67-1367-1-ND	.64	5.60	48.00	67-1367-2-ND	—	265.60/M	—	SML-LX2832YC-TR
4	Super Red	1.7	40	120°	20	67-1366-1-ND*	.80	7.00	60.00	67-1366-2-ND*	—	332.00/M	—	SML-LX2832SRC-TR
5	Red	2.1	12	130°	20	67-1368-1-ND	.60	5.25	45.00	67-1368-2-ND	—	249.00/M	—	SSL-LXA1725IC-TR
5	Green	2.0	25	130°	20	67-1369-1-ND	.60	5.25	45.00	67-1369-2-ND	—	249.00/M	—	SSL-LXA1725GC-TR
5	Yellow	2.1	12	130°	20	67-1370-1-ND	.60	5.25	45.00	67-1370-2-ND	—	249.00/M	—	SSL-LXA1725YC-TR
5	Super Red	1.7	40	130°	20	67-1371-1-ND	.80	7.00	60.00	67-1371-2-ND	—	332.00/M	—	SSL-LXA1725SRC-TR
6	Red/Green	2.0	12/20	125°	20	67-1372-1-ND	1.08	9.45	81.00	67-1372-2-ND	448.20	—	—	SSL-LXA3025IGC-TR
6	Yellow/Green	2.1	20	90°	20	67-1373-1-ND	1.08	9.45	81.00	67-1373-2-ND	448.20	—	—	SSL-LXA3025YGC-TR
7	Red	2.1	7.2	180°	20	67-1352-1-ND	.84	7.35	63.00	67-1352-2-ND	—	—	336.00/M	CCL-LX45IT
7	Green	2.0	7	180°	20	67-1353-1-ND	.84	7.35	63.00	67-1353-2-ND	—	—	336.00/M	CCL-LX45GT
7	Yellow	2.3	7	180°	20	67-1354-1-ND	.84	7.35	63.00	67-1354-2-ND	—	—	336.00/M	CCL-LX45YT
7	Super Red	1.8	8	180°	20	67-1355-1-ND*	1.28	11.20	96.00	67-1355-2-ND*	—	—	512.00/M	CCL-LX45SRT
8	Red	2.1	4	180°	20	67-1342-1-ND	.70	6.13	52.50	67-1342-2-ND	—	—	290.50/M	CCL-CRS10R
8	Green	2.1	10	180°	20	67-1343-1-ND	.70	6.13	52.50	67-1343-2-ND	—	—	290.50/M	CCL-CRS10G
8	Yellow	2.1	5	180°	20	67-1344-1-ND	.70	6.13	52.50	67-1344-2-ND	—	—	290.50/M	CCL-CRS10Y
8	Super Red	1.7	14	180°	20	67-1345-1-ND	1.04	9.10	78.00	67-1345-2-ND	—	—	431.60/M	CCL-CRS10SR
9	Red	2.0	20	90°	20	67-1338-1-ND	.59	5.18	44.40	67-1338-2-ND	—	245.68/M	—	SML-LX23IC-TR
9	Green	2.1	20	90°	20	67-1339-1-ND	.59	5.18	44.40	67-1339-2-ND	—	245.68/M	—	SML-LX23GC-TR
9	Yellow	2.1	20	90°	20	67-1340-1-ND	.59	5.18	44.40	67-1340-2-ND	—	245.68/M	—	SML-LX23YC-TR
9	Super Red	1.7	100	90°	20	67-1341-1-ND*	.77	6.72	57.60	67-1341-2-ND*	—	318.72/M	—	SML-LX23SRC-TR
10	Green/Green	2.0	20	90°	20	67-1350-1-ND	.96	8.40	72.00	67-1350-2-ND	—	398.40/M	—	CCL-LX253GGC
10	Yellow/Green	2.1	20	90°	20	67-1351-1-ND	.96	8.40	72.00	67-1351-2-ND	—	398.40/M	—	CCL-LX253YGC
10	Super Red/Super Red	1.7	40	90°	20	67-1349-1-ND	1.48	12.95	111.00	67-1349-2-ND	—	614.20/M	—	CCL-LX253SRSRC
11	Red	2.0	60	25°	20	67-1384-1-ND	.47	4.13	35.40	67-1384-2-ND	195.88	—	—	SSL-LXA228IC-TR11
11	Green	2.1	30	25°	20	67-1385-1-ND	.47	4.13	35.40	67-1385-2-ND	195.88	—	—	SSL-LXA228GC-TR11
11	Yellow	2.0	30	25°	20	67-1386-1-ND	.47	4.13	35.40	67-1386-2-ND	195.88	—	—	SSL-LXA228YC-TR11
11	Super Red	1.7	170	25°	20	67-1393-1-ND	.78	6.83	58.50	67-1393-2-ND	323.70	—	—	SSL-LXA228SRC-TR11
11	Green	2.1	4	50°	30	67-1141-1-ND	.48	4.17	35.70	67-1141-2-ND	197.54	—	—	SSL-LXA228GD-TR11
11	Yellow	2.0	12	50°	20	67-1145-1-ND	.48	4.17	35.70	67-1145-2-ND	197.54	—	—	SSL-LXA228YD-TR11
12	Red	2.0	60	25°	20	67-1387-1-ND	.47	4.13	35.40	67-1387-2-ND	195.88	—	—	SSL-LXA228IC-TR21
12	Green	2.1	30	25°	20	67-1388-1-ND	.47	4.13	35.40	67-1388-2-ND	195.88	—	—	SSL-LXA228GC-TR21
12	Yellow	2.0	30	25°	20	67-1389-1-ND	.47	4.13	35.40	67-1389-2-ND	195.88	—	—	SSL-LXA228YC-TR21
12	Super Red	1.7	170	25°	20	67-1394-1-ND	.78	6.83	58.50	67-1394-2-ND	323.70	—	—	SSL-LXA228SRC-TR21
12	Green	2.1	4	50°	30	67-1142-1-ND	.50	4.38	37.50	67-1142-2-ND	207.50	—	—	SSL-LXA228GD-TR21
12	Red	2.0	12	50°	30	67-1143-1-ND	.50	4.38	37.50	67-1143-2-ND	207.50	—	—	SSL-LXA228ID-TR21
12	Red	2.0	12	50°	30	67-1144-1-ND	.52	4.55	39.00	67-1144-2-ND	215.80	—	—	SSL-LXA228LID-TR21
12	Yellow	2.0	12	50°	20	67-1146-1-ND	.48	4.17	35.70	67-1146-2-ND	197.54	—	—	SSL-LXA228YD-TR21
13	Red	2.0	60	25°	20	67-1390-1-ND	.47	4.13	35.40	67-1390-2-ND	195.88	—	—	SSL-LXA228IC-TR31
13	Green	2.1	30	25°	20	67-1391-1-ND	.47	4.13	35.40	67-1391-2-ND	195.88	—	—	SSL-LXA228GC-TR31
13	Yellow	2.0	30	25°	20	67-1392-1-ND	.47	4.13	35.40	67-1392-2-ND	195.88	—	—	SSL-LXA228YC-TR31
13	Super Red	1.7	170	25°	20	67-1395-1-ND	.78	6.83	58.50	67-1395-2-ND	323.70	—	—	SSL-LXA228SRC-TR31
14	Red	2.0	40	60°	20	67-1374-1-ND	.76	6.65	57.00	67-1374-2-ND	315.40	—	—	SSF-LXH305ID-TR
14	Green	2.1	30	60°	20	67-1375-1-ND	.76	6.65	57.00	67-1375-2-ND	315.40	—	—	SSF-LXH305GD-TR
14	Yellow	2.1	30	60°	20	67-1376-1-ND	.76	6.65	57.00	67-1376-2-ND	315.40	—	—	SSF-LXH305YD-TR
14	Super Red	1.7	80	60°	20	67-1377-1-ND	1.00	8.75	75.00	67-1377-2-ND	415.00	—	—	SSF-LXH305SRD-TR

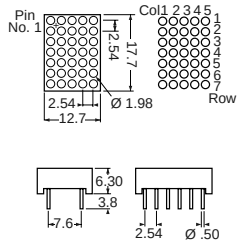
LED, Dot Matrix Displays

Fig. 1



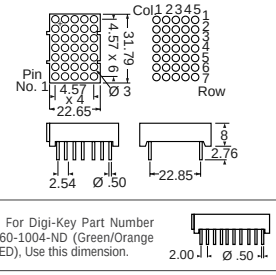
FEATURES: High brightness • Single plane, wide viewing angle • Low power requirements • Compatible with USASCII and EBCDIC codes • Categorized for luminous intensity • Solid state reliability • 36 Light Emitting Diodes • 5x7 Array with X-Y select and decimal point • Easy mounting on PC board or sockets

Fig. 2 — 1.98mm Dot Size



FEATURES: • Low power requirements • 5x7 array with X-Y select • Compatible with USASCII and EBCDIC codes • Categorized for luminous intensity • Stackable vertically and horizontally • Easy mounting on PC board or sockets

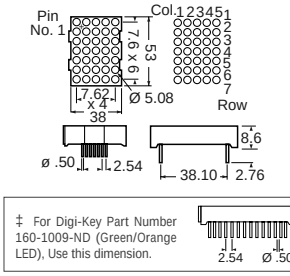
Fig. 3 — 3.0mm Dot Size



† For Digi-Key Part Number 160-1004-ND (Green/Orange LED), Use this dimension.

FEATURES: • Low power requirement • High contrast and brightness • Single plane, wide viewing angle • X-Y select • Compatible with ASACII and EBCDIC codes • Categorized for luminous intensity • Multicolor displays are applicable to three bright colors: Green, orange and yellow (green and orange mixed)

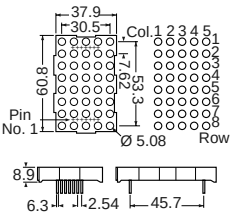
Fig. 4 — 5.0mm Dot Size



‡ For Digi-Key Part Number 160-1009-ND (Green/Orange LED), Use this dimension.

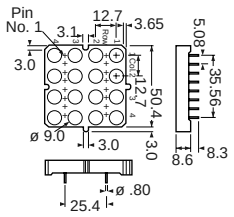
FEATURES: • Low power requirement • High contrast & brightness • Single plane, wide viewing angle • X-Y select • Compatible with ASACII and EBCDIC codes • Categorized for luminous intensity • Multicolor displays are applicable to three bright colors: Green, orange and yellow (green and orange mixed)

Fig. 5 — 5.08mm Dot Size



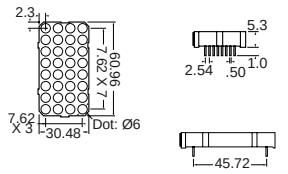
FEATURES: • Low power requirement • High contrast & brightness • Single plane, wide viewing angle • X-Y select • Compatible with ASACII and EBCDIC codes • Categorized for luminous intensity • Multicolor displays are applicable to three bright colors: Green, orange and yellow (green and orange mixed)

Fig. 6 — 9.0mm Dot Size



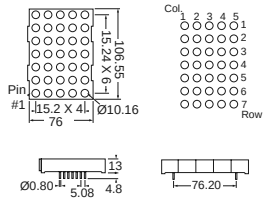
FEATURES: • Low power requirement • High contrast and brightness • Single plane, wide viewing angle • X-Y select • Compatible with USASCII and EBCDIC codes • Categorized for luminous intensity • Multicolor displays are applicable to three bright colors: Green, orange and yellow (green and orange mixed)

Fig. 7



FEATURES: • Low power requirement • High contrast & brightness • Single plane, wide viewing angle • X-Y select • Compatible with USASCII and EBCDIC codes. • Categorized for luminous intensity • Multicolor displays are applicable to three bright colors: Green, orange and yellow (green and orange mixed).

Fig. 8



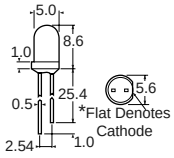
FEATURES: • Low power requirement • High contrast • High brightness • Single plane, wide viewing angle • X-Y select • Compatible with USASCII and EBCDIC codes • Stackable vertically and horizontally • Easy mounting on PC board • Categorized for luminous intensity • Multicolor displays are applicable to three bright colors: Green, orange and yellow (green and orange mixed).

Fig.	Description	Wavelength lp (nm)	If Peak per dot (mA)*	If Cont. per dot (mA)	Digi-Key Part No.	Pricing 1	25	50
1	0.3" (7.62mm) 5x7 Anode Col., Cathode Row, Lt. Hand Decimal, Red	655	100	20	160-1000-ND	2.88	64.69	115.00
	0.3" (7.62mm) 5x7 Anode Col., Cathode Row, Lt. Hand Decimal, Green	565	60	20	160-1001-ND	3.53	79.31	141.00
2	0.7" (17.78mm) 5x7 Cathode Col., Anode Row, Green	565	80	20	160-1002-ND	4.33	97.31	173.00
	0.7" (17.78mm) 5x7 Cathode Col., Anode Row, Hi. Eff. Red	635	80	20	160-1003-ND	4.33	97.31	173.00
	0.7" (17.78mm) 5x7 Cathode Col., Anode Row, Yellow	585	60	16	160-1113-ND	4.83	108.56	193.00
3	1.2" (30.48mm) 5x7 Cathode Col., Anode Row, Green/Orange	green 565, orange 630	100	25	160-1004-ND †	9.10	204.75	364.00
	1.2" (30.48mm) 5x7 Cathode Col., Anode Row, Green	565	100	25	160-1005-ND	4.93	110.81	197.00
	1.2" (30.48mm) 5x7 Cathode Col., Anode Row, Hi. Eff. Red	635	100	25	160-1006-ND	4.93	110.81	197.00
4	2" (50.80mm) 5x7 Cathode Col., Anode Row, Green	565	100	25	160-1007-ND	5.13	115.31	205.00
	2" (50.80mm) 5x7 Cathode Col., Anode Row, Hi. Eff. Red	635	100	25	160-1008-ND	5.13	115.31	205.00
	2" (50.80mm) 5x7 Cathode Col., Anode Row, Green/Orange	green 565, orange 630	100	25	160-1009-ND ‡	9.50	213.75	380.00
	2" (50.80mm) 5x7 Cathode Col., Anode Row, Yellow	585	80	20	160-1114-ND	5.75	129.38	230.00
5	2.3" (58.42mm) 5x8 Cathode Col., Anode Row, Hi. Eff. Red	635	100	25	160-1014-ND	5.90	132.75	236.00
	2.3" (58.42mm) 5x8 Cathode Col., Anode Row, Green	565	100	25	160-1016-ND	8.63	194.06	345.00
	2.3" (58.42mm) 5x8 Cathode Col., Anode Row, Yellow	585	80	20	160-1115-ND	6.60	148.50	264.00
6	2" (50.80mm) 4x4 Anode Row, Cathode Col., Green/Orange	green 565, orange 630	75	18	160-1015-ND	13.45	302.63	538.00
7	2.34" (59.44mm) 4x8 Anode Row, Cathode Col., Green/Orange	green 565, orange 630	100	25	160-1105-ND	10.35	232.88	414.00
8	4" (101.60mm) 5x7 Cathode Col., Anode Row, Hi. Eff. Red	635	80	20	160-1116-ND	19.40	436.50	776.00
	4" (101.60mm) 5x7 Cathode Col., Anode Row, Green	565	80	20	160-1117-ND	19.40	436.50	776.00
	4" (101.60mm) 5x7 Cathode Col., Anode Row, Yellow	585	60	16	160-1118-ND	21.73	488.81	869.00

*1/10 Duty Cycle, 0.1 ms Pulse Width. Absolute Max. Ratings at TA = 25°C. † See Physical Dimension Under Fig. 3. ‡ See Physical Dimension Under Fig. 4

T-1 3/4 Flashing LED Lamps

FEATURES:
Operating Voltage: 3.0-10.0V., Blinking Frequency: 2.0-2.4Hz. Operating Temp. Range: 0°C to 70°C.

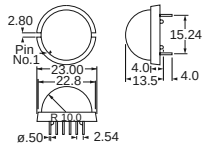


Color	Color Source	Iv (mcd)*	Viewing Ang. (deg)	Digi-Key Part No.	Pricing 1	10	100
Green/Diff.	Green	3.5-10.0	36	160-1043-ND	1.25	10.38	83.00
Yellow/Diff.	Yellow	1.7-2.4	40	160-1044-ND	1.25	10.38	83.00

* VDD: 3.0V & VDD 10.0V Absolute Max. Ratings at T_A = 25°C

.8" Big Lamps with Universal Sphere Lens

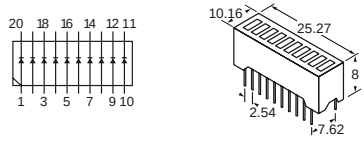
FEATURES: • High luminous intensity. • Categorized for luminous intensity. • Excellent on-off contrast. • Operating Temp. Range: -25°C to +85°C.



Color	If Peak per chip (mA)	If Cont. per chip (mA)	Digi-Key Part No.	Pricing 1	10	100
Green	100	25	160-1025-ND	2.07	17.25	138.00
Hi. Eff. Red	100	25	160-1026-ND	2.07	17.25	138.00
Yellow	80	20	160-1027-ND	2.34	19.50	156.00

Absolute Max. Ratings at T_A = 25°C, VF = 2.1, VR = 5V

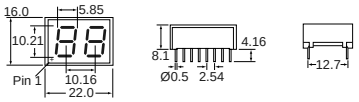
Bar Graph Array



Color	Continuous Forward Current	Forward Voltage(Vf)	Digi-Key Part No.	Pricing 1	10	100
Hi. Eff. Red	25	2.1	160-1066-ND	2.19	18.25	146.00
Green	25	2.1	160-1067-ND	2.19	18.25	146.00
Yellow	20	2.1	160-1068-ND	2.49	20.75	166.00

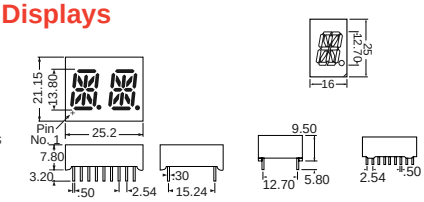
LITEON Optoelectronics

LED 7-Segment Display for CB Radios



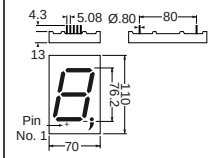
Alphanumeric Displays

FEATURES:
- Low power requirements
- Excellent character appearance
- High contrast & brightness
- Wide viewing angle
- Categorized for luminous intensity

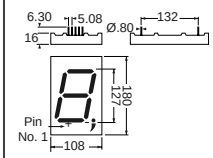


Ultra-Large 7-Segment Display

FEATURES:
- Continuous uniform segments
- Excellent character appearance
- High contrast & brightness
- Wide viewing angle
- Categorized for luminous intensity



3" (76.20mm) Size



5" (127.00mm) Size

Description	Color	Vf (V)	If (mA)	Digi-Key Part No.	Pricing 1	10	100
LED 7-Segment Display for CB Radios							
.4" (101.60mm) 7-Segment LED Common Anode	Red	1.7	20	160-1148-ND	2.15	19.50	167.70
.4" (101.60mm) 7-Segment LED Common Anode	Green	2.1	20	160-1149-ND	2.15	19.50	167.70
.4" (101.60mm) 7-Segment LED Common Anode	Orange/Red	2.0	20	160-1150-ND	2.15	19.50	167.70

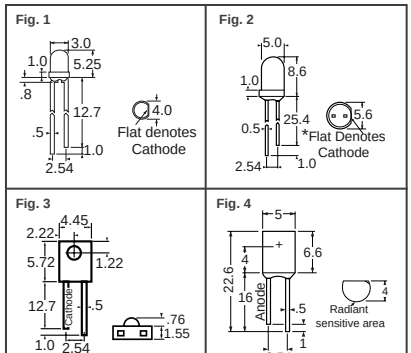
Description	If Peak per segment (mA)*	If Cont. per segment (mA)	Rev. Volt. per seg-ment (V)	Vf Typ. per segment	Oper. Temp. Range	Digi-Key Part No.	Pricing 1	25	50
2-Digit LED Alphanumeric Displays									
0.54" (13.72mm) Multiplex Common Cathode, Right Hand Decimal, Orange	100	25	5	2.1	-25°C-+85°C	160-1010-ND	3.95	88.88	158.00
0.54" (13.72mm) Multiplex Common Anode, Right Hand Decimal, Orange	100	25	5	2.1	-25°C-+85°C	160-1011-ND	3.95	88.88	158.00
0.54" (13.72mm) Multiplex Common Cathode, Right Hand Decimal, Green	100	25	5	2.1	-25°C-+85°C	160-1012-ND	3.95	88.88	158.00
0.54" (13.72mm) Multiplex Common Anode, Right Hand Decimal, Green	100	25	5	2.1	-25°C-+85°C	160-1013-ND	3.95	88.88	158.00
1-Digit LED Alphanumeric Display									
0.5" (12.70mm) Common Anode, Right Hand Decimal, Green	100	25	5	2.1	-25°C-+85°C	160-1106-ND	2.63	59.06	105.00
0.5" (12.70mm) Common Anode, Right Hand Decimal, Yellow	80	20	5	2.1	-25°C-+85°C	160-1107-ND	2.63	59.06	105.00
0.5" (12.70mm) Common Anode, Right Hand Decimal, High Efficiency Red	100	25	5	2.1	-25°C-+85°C	160-1108-ND	2.63	59.06	105.00
Ultra-Large 7-Segment LED Numeric Display									
3" (76.20mm) Common Cathode, High Efficiency Red	160	40	30	12.6	-25°C-+85°C	160-1017-ND	16.94	307.04	563.26
3" (76.20mm) Common Anode, High Efficiency Red	160	40	30	12.6	-25°C-+85°C	160-1018-ND	16.94	307.04	563.26
3" (76.20mm) Common Cathode, Green	160	40	30	12.6	-25°C-+85°C	160-1019-ND	16.94	307.04	563.26
3" (76.20mm) Common Anode, Green	160	40	30	12.6	-25°C-+85°C	160-1020-ND	16.94	307.04	563.26
5" (127.00mm) Common Cathode, High Efficiency Red	180	60	50	21	-25°C-+85°C	160-1021-ND	38.96	706.15	1295.42
5" (127.00mm) Common Anode, High Efficiency Red	180	60	50	21	-25°C-+85°C	160-1022-ND	38.96	706.15	1295.42
5" (127.00mm) Common Cathode, Green	180	60	50	21	-25°C-+85°C	160-1023-ND	38.96	706.15	1295.42
5" (127.00mm) Common Anode, Green	180	60	50	21	-25°C-+85°C	160-1024-ND	38.96	706.15	1295.42

Absolute Max. Ratings at T_A = 25°C * 1/10 duty cycle, 0.1 ms pulse width.

Infrared Emitting Diodes, Photodetectors and Photodiodes

Features of Infrared Emitting Diodes: • Selected to specific on-line intensity and radiant intensity ranges • Low cost plastic end looking package • Made with gallium aluminum arsenide window layer on gallium arsenide infrared emitting diodes

Features of Photodetectors and Photodiodes: • Lensed for high sensitivity • Low cost plastic package



Infrared Emitting Diodes

Fig.	Vf	Vr	I (ma)	Ipk amps	Viewing angle	Digi-Key Part No.	Pricing 1	10	100
1	1.2	5	50	3	20°	160-1028-ND	.45	3.75	30.00
2	1.2	5	50	3	20°	160-1029-ND	.45	3.75	30.00
2	1.2	5	50	3	40°	160-1061-ND	.32	2.70	21.60
2	1.3	7.2	150	3	35°	160-1062-ND	.34	2.80	22.40
3	1.2	5	50	3	40°	160-1063-ND	.42	3.50	28.00

Matching Photodetectors

Fig.	Vce	Vec	On-State I (ma)	Rise/Fall (us)	Digi-Key Part No.	Pricing 1	10	100
1	30	5	2	5	160-1030-ND	.48	4.00	32.00
2	30	5	2	5	160-1031-ND	.48	4.00	32.00
3	30	5	1	5	160-1065-ND	.46	3.80	30.40

Photodiodes

Fig.	Description	Digi-Key Part No.	Pricing 1	10	100
4	Black Plastic Diode	160-1032-ND	.72	6.03	48.20

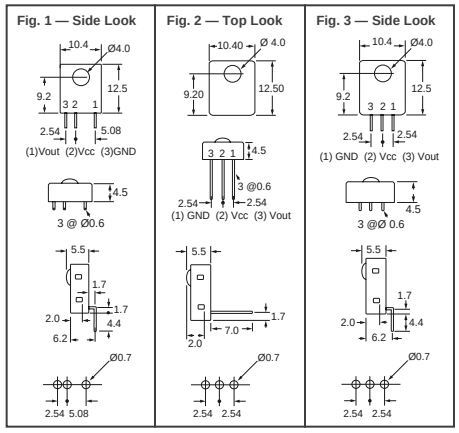
Absolute Max. Ratings at T_A = 25°C, λ = 940nm

NEW! Infrared Remote Control Receiver Modules

Miniaturized receivers for infrared remote control systems. Single unit type module which incorporates a PIN diode and receiving preamplifier IC. The demodulated output signal can directly be decoded by a microprocessor.

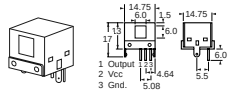
Features:
• Compact package • High immunity from ambient light • Good performance against electric field disturbance • 5 volt power supply – low power consumption • TTL and CMOS compatibility

Fig.	Detecting Window	Carrier Freq. (KHz)	Digi-Key Part No.	Pricing 1	10	100
1	Side	33	160-1151-ND	2.50	22.50	200.00
	Side	36	160-1152-ND	2.50	22.50	200.00
	Side	38	160-1153-ND	2.50	22.50	200.00
	Side	40	160-1154-ND	2.50	22.50	200.00
	Side	56.8	160-1155-ND	2.50	22.50	200.00
2	Top	33	160-1156-ND	2.50	22.50	200.00
	Top	36	160-1157-ND	2.50	22.50	200.00
	Top	38	160-1158-ND	2.50	22.50	200.00
	Top	40	160-1159-ND	2.50	22.50	200.00
	Top	56.8	160-1160-ND	2.50	22.50	200.00
3	Side	33	160-1161-ND	2.50	22.50	200.00
	Side	36	160-1162-ND	2.50	22.50	200.00
	Side	38	160-1163-ND	2.50	22.50	200.00
	Side	40	160-1164-ND	2.50	22.50	200.00
	Side	56.8	160-1165-ND	2.50	22.50	200.00



Infrared Remote Control Receiver Module

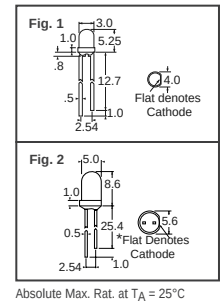
Features:
• Easy to handle small type module • Excellent mechanical strength and electrical stability • Can be installed directly to equipment • Operating Temp. Range: -10°C to +60°C • Supply Voltage (V): 4.7-5.3
• Absolute Max. Ratings at TA = 25°C



Carrier Wave Freq.	Digi-Key Part No.	Pricing 1	10	100
40 KHz	160-1060-ND	2.88	—	201.25

T-1 and T-1 3/4 Integrated Resistor Lamps

Fig.	Description	Lens	Source Color	VR	Io (mcd)	Viewing Angle	If (mA)	Digi-Key Part No.	Pricing 1	10	100
1	T-1 5V	Red Diff.	Red	7.5	0.8	40°	10	160-1045-ND	.23	1.88	15.00
	T-1 5V	Green Diff.	Green	7.5	5.6	40°	10	160-1049-ND	.23	1.88	15.00
	T-1 5V	Yellow Diff.	Yellow	7.5	5.6	40°	10	160-1053-ND	.25	2.08	16.60
1	T-1 12V	Red Diff.	Red	15	0.9	40°	12	160-1046-ND	.23	1.88	15.00
	T-1 12V	Green Diff.	Green	15	5.8	40°	12	160-1050-ND	.23	1.88	15.00
	T-1 12V	Yellow Diff.	Yellow	15	5.7	40°	12	160-1054-ND	.25	2.08	16.60
2	T-1 3/4 5V	Green Diff.	Green	7.5	8.7	36°	10	160-1051-ND	.26	2.18	17.40
	T-1 3/4 5V	Yellow Diff.	Yellow	7.5	8.7	36°	10	160-1055-ND	.29	2.38	19.00
	T-1 3/4 12V	Green Diff.	Green	15	8.9	36°	12	160-1052-ND	.26	2.18	17.40
1	T-1 5V	Orange Diff.	Orange	7.5	5.6	40°	10	160-1109-ND	.26	2.18	17.40
	T-1 12V	Orange Diff.	Orange	15	5.7	40°	12	160-1110-ND	.26	2.18	17.40
2	T-1 3/4 5V	Red Diff.	Hi. Eff. Red	7.5	8.7	36°	10	160-1111-ND	.26	2.18	17.40
	T-1 3/4 12V	Red Diff.	Hi. Eff. Red	15	8.9	36°	12	160-1112-ND	.26	2.18	17.40



Absolute Max. Rat. at T_A = 25°C

O

T-1, T-1 3/4 and 8mm LEDs

Fig. 1

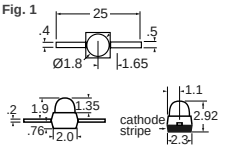


Fig. 2

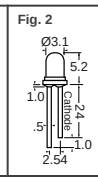


Fig. 3

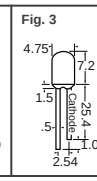


Fig. 4

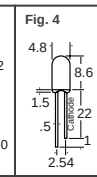


Fig. 5

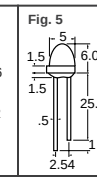


Fig. 6

Features:
- Ultra-brightness
- Sturdy leads
- IC compatible/ Low current capability
- Reliable and rugged
- Low cost

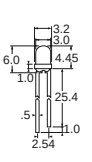
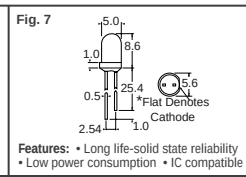
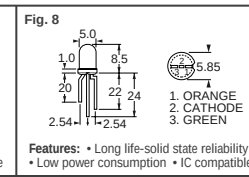


Fig. 7



Features: • Long life-solid state reliability • Low power consumption • IC compatible

Fig. 8



Features: • Long life-solid state reliability • Low power consumption • IC compatible

Fig. 9

Features:
- 8mm dia. big lamp
- Wide viewing angle
- Low power consumption • IC compatible/low current requirements
- Reliable and rugged

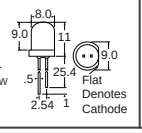


Fig. 10

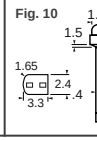


Fig. 11

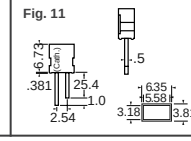


Fig. 12

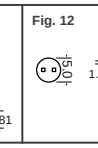


Fig. 13

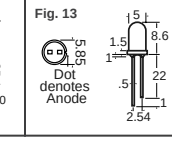


Fig. 14

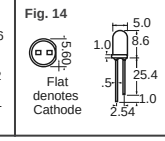


Fig. 15

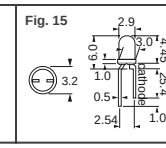


Fig.	Description	Lens	Source Color	VF	Io (mcd)	Viewing Angle	If (mA)	Digi-Key Part No.	Pricing 1	10	100
1	Sub-Mini	Water Clear	Orange	2.0	12.5	34	30	160-1069-ND	.27	2.28	18.20
	Sub-Mini	Water Clear	Green	2.1	15.0	34	30	160-1070-ND	.27	2.28	18.20
	Sub-Mini	Water Clear	Yellow	2.1	8.5	34	20	160-1071-ND	.27	2.28	18.20
	Sub-Mini	Red Diff.	Orange	2.0	3.7	90	30	160-1072-ND	.27	2.28	18.20
	Sub-Mini	Green Diff.	Green	2.1	2.5	90	30	160-1073-ND	.27	2.28	18.20
	Sub-Mini	Yellow Diff.	Yellow	2.1	5.6	90	20	160-1074-ND	.27	2.28	18.20
2	T-1 Double Flange	Red Diff.	Hi. Eff. Red	2.0	19.0	60	30	160-1078-ND	—	1.38	11.00
	T-1 Double Flange	Yellow Diff.	Yellow	2.1	12.6	60	20	160-1079-ND	—	1.38	11.00
	T-1 Double Flange	Green Diff.	Green	2.1	12.6	60	30	160-1080-ND	—	1.38	11.00
	T-1 Double Flange	Red	Hi. Eff. Red	2.0	29.0	45	30	160-1081-ND	—	1.38	11.00
	T-1 Double Flange	Yellow	Yellow	2.1	19.0	45	20	160-1082-ND	—	1.38	11.00
	T-1 Double Flange	Green	Green	2.1	40.0	45	30	160-1083-ND	—	1.38	11.00
3	T-1 3/4 No Flange	Red Diff.	Hi. Eff. Red	2.0	5.6	60	30	160-1087-ND	—	1.38	11.00
	T-1 3/4 No Flange	Yellow Diff.	Yellow	2.1	12.6	60	20	160-1088-ND	—	1.38	11.00
	T-1 3/4 No Flange	Green Diff.	Green	2.1	5.6	60	30	160-1089-ND	—	1.38	11.00
4	T-1 3/4 No Flange	Red Diff.	Hi. Eff. Red	2.0	19	45	30	160-1090-ND	—	1.53	12.20
	T-1 3/4 No Flange	Green Diff.	Green	2.1	8.7	60	30	160-1091-ND	—	1.53	12.20
5	Lo Profile T-1 3/4	Red Diff.	Orange	2.0	4.0	64	30	160-1093-ND	—	1.48	11.80
	Lo Profile T-1 3/4	Yellow Diff.	Yellow	2.2	4.0	64	20	160-1094-ND	—	1.55	12.40
	Lo Profile T-1 3/4	Green Diff.	Green	2.2	4.0	64	30	160-1095-ND	—	1.48	11.80
	Lo Profile T-1 3/4	Red	Orange	2.0	8.0	44	30	160-1096-ND	—	1.48	11.80
	Lo Profile T-1 3/4	Yellow	Yellow	2.1	12.6	44	20	160-1097-ND	—	1.55	12.40
	Lo Profile T-1 3/4	Green	Green	2.2	14.0	44	30	160-1098-ND	—	1.48	11.80
6	T-1 Ultrabright	Water Clear	Red	2.4	80	45	40	160-1034-ND	.35	2.90	23.20
	T-1 Ultrabright	Red Diff.	Red	2.4	48	60	40	160-1035-ND	.33	2.78	22.20
	T-1 B-Color	White Diff	H.E. Red/Grn.	2.0/2.1	4.7/10	60	30	160-1058-ND	.40	3.35	26.80
7	T-1 3/4 Bi-Color	White Diff.	Red/Green	2.0/2.8	1.2/8.7	50	40/30	160-1036-ND	.42	3.53	28.20
	T-1 3/4 Bi-Color	White Diff.	Green/Orange	2.1/2.0	8.7/5.5	50	30	160-1037-ND	.45	3.75	30.00
	T-1 3/4 Ultrabright Bi-Color	White Diff.	Red/Green	1.8/2.1	35/16	80	40/30	160-1038-ND	.66	5.53	44.20
	T-1 3/4 Super Bright	Water Clear	Red	1.8	1500	16	40	160-1104-ND*	.66	5.53	44.20
8	T-1 3/4 Ultrabright Bi-Color	White Diff.	Orange/Green	2.0/2.1	40/20	30	30	160-1057-ND	.45	3.73	29.80

Fig.	Description	Lens	Source Color	VF	Io (mcd)	Viewing Angle	If (mA)	Digi-Key Part No.	Pricing 1	10	100
9	8mm	Red Diff.	Hi. Eff. Red	2.8	12.6	46	30	160-1039-ND	.27	2.28	18.20
	8mm	Green Diff.	Green	2.8	12.6	46	30	160-1040-ND	.27	2.28	18.20
	8mm	Yellow Diff.	Yellow	2.8	12.6	46	20	160-1041-ND	.27	2.28	18.20
10	1.8mm Dot Point	Red	Hi. Eff. Red	2.0	3.0	38	30	160-1084-ND	.21	1.78	14.20
	1.8mm Dot Point	Yellow	Yellow	2.1	1.5	38	30	160-1085-ND	.21	1.78	14.20
	1.8mm Dot Point	Green	Green	2.1	3.5	38	20	160-1086-ND	.21	1.78	14.20
11	Rectangular	Red	Hi. Eff. Red	2.0	3.8	100	30	160-1099-ND	.35	2.90	23.20
	Rectangular	Green	Green	2.1	5.6	100	30	160-1100-ND	.35	2.90	23.20
	Rectangular	Yellow	Yellow	2.1	5.6	100	20	160-1101-ND	.35	2.90	23.20
12	T-1 3/4 Super Bright	Water Clear	Red	1.8	840	25	40	160-1102-ND	.66	5.53	44.20
13	T-1 3/4 Super Bright	Water Clear	Red	1.8	840	35	40	160-1103-ND	.66	5.53	44.20
14	T-1 3/4	Red Diff.	Red	1.7	0.8	36	20	160-1124-ND	.23	1.75	12.25
	T-1 3/4	Red Trans.	Red	1.7	5.5	16	20	160-1125-ND	.23	1.75	12.25
	T-1 3/4	Clear	Red	1.7	5.5	16	20	160-1126-ND	.23	1.75	12.25
	T-1 3/4	Red Diff.	Hi Eff. Red	2.0	8.7	36	20	160-1127-ND	.23	1.75	12.25
	T-1 3/4	Red Trans.	Hi Eff. Red	2.0	40	16	20	160-1128-ND	.23	1.75	12.25
	T-1 3/4	Green Diff.	Green	2.1	8.7	36	20	160-1130-ND	.23	1.75	12.25
	T-1 3/4	Green Trans.	Green	2.1	40	16	20	160-1131-ND	.23	1.75	12.25
	T-1 3/4	Clear	Green	2.1	60	16	20	160-1132-ND	.23	1.75	12.25
	T-1 3/4	Yellow Diff.	Yellow	2.1	8.7	36	20	160-1133-ND	.23	1.75	12.25
	T-1 3/4	Yellow Trans.	Yellow	2.1	40	16	20	160-1134-ND	.23	1.75	12.25
15	T-1	Red Diff.	Red	1.7	0.8	60	20	160-1136-ND	.23	1.75	12.25
	T-1	Clear	Red	1.7	3.7	45	20	160-1138-ND	.23	1.75	12.25
	T-1	Red Diff.	Hi Eff. Red	2.0	5.6	60	20	160-1139-ND	.23	1.75	12.25
	T-1	Red Trans.	Hi Eff. Red	2.0	12.6	45	20	160-1140-ND	.23	1.75	12.25
	T-1	Clear	Orange	2.0	12.6	45	20	160-1141-ND	.23	1.75	12.25
	T-1	Green Diff.	Green	2.1	5.6	60	20	160-1142-ND	.23	1.75	12.25
	T-1	Green Trans.	Green	2.1	12.6	45	20	160-1143-ND	.23	1.75	12.25
	T-1	Clear	Green	2.1	12.6	45	20	160-1144-ND	.23	1.75	12.25
	T-1	Yellow Diff.	Yellow	2.1	5.6	60	20	160-1145-ND	.23	1.75	12.25
	T-1	Yellow Trans.	Yellow	2.1	12.6	45	20	160-1146-ND	.23	1.75	12.25
	T-1	Clear	Yellow	2.1	12.6	45	20	160-1147-ND	.23	1.75	12.25

* For part number 160-1104-ND, flat denotes anode

Surface Mount LEDs 1206, 0805, 0603, SOT-23

160-1190-ND **Surface Mount LED Demo Kit**. Contains a sampling of 9 popular styles of SMD LEDs that you can light with the push of a button.....$8.39

Fig. 1

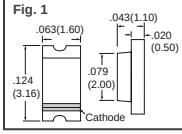


Fig. 2

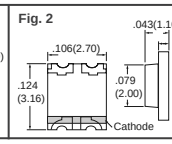
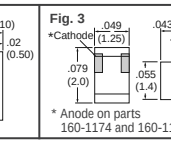
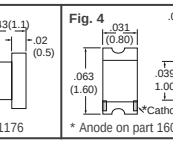


Fig. 3



* Anode on parts 160-1174 and 160-1176

Fig. 4



* Anode on part 160-1181

Fig. 5

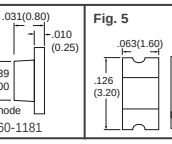
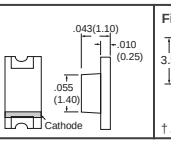


Fig. 6



† Anode on part 160-1123

Fig. 7

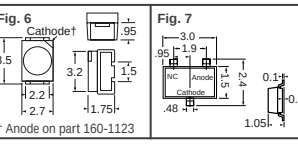


Fig.	Lens	Source Color	Wavelength λpk(nm)	VF (V)	If (mA)	Io (mcd)	Viewing Angle	Digi-Key Part No.	Cut Tape Pricing 1	10	100	Digi-Key Part No.	Tape & Reel Pricing 1,500	3,000	6,000
1	Clear	Amber	610	2.1	20	6	130	160-1166-1-ND	.22	1.80	14.40	160-1166-2-ND	—	108.00/M	—
	Clear	Red	660	1.8	20	20	130	160-1167-1-ND	.30	2.50	20.00	160-1167-2-ND	—	150.00/M	—
	Clear	Orange	635	2.0	20	6	130	160-1168-1-ND	.22	1.80	14.40	160-1168-2-ND	—	108.00/M	—
	Clear	Green	565	2.1	20	6	130	160-1169-1-ND	.22	1.80	14.40	160-1169-2-ND	—	108.00/M	—
	Clear	Yellow	585	2.1	20	6	130	160-1170-1-ND	.22	1.80	14.40	160-1170-2-ND	—	108.00/M	—
2	Clear	Green/Yellow	565/585	2.1/2.1	20/20	6/6	130/130	160-1171-1-ND	.35	2.88	23.00	160-1171-2-ND	—	172.50/M	—
	Clear	Green/Orange	565/635	2.1/2.0	20/20	6/6	130/130	160-1172-1-ND	.35	2.88	23.00	160-1172-2-ND	—	172.50/M	—
3	Clear	Green	565	2.1	20	14.2	130	160-1173-1-ND	.26	2.15	17.20	160-1173-2-ND	—	129.00/M	—
	Clear	Red	660	1.8	20	90	130	160-1174-1-ND	.58	4.80	38.40	160-1174-2-ND	—	288.00/M	—
	Clear	Yellow	585	2.1	20	6	130	160-1175-1-ND	.22	1.80	14.40	160-1175-2-ND	—	108.00/M	—
	Clear	Red	660	1.8	20	20	130	160-1176-1-ND	.43	3.58	28.60	160-1176-2-ND	—	214.50/M	—
	Clear	Amber	610	2.1	20	6	130	160-1177-1-ND	.22	1.80	14.40	160-1177-2-ND	—	108.00/M	—
	Clear	Orange	635	2.0	20	6	130	160-1178-1-ND	.22	1.80	14.40	160-1178-2-ND	—	108.00/M	—
	Clear	Green	565	2.1	20	6	130	160-1179-1-ND	.22	1.80	14.40	160-1179-2-ND	—	108.00/M	—
4	Clear	Amber	610	2.1	20	6	130	160-1180-1-ND	.22	1.80	14.40	160-1180-2-ND	—	108.00/M	—
	Clear	Red	660	1.8	20	20	130	160-1181-1-ND	.30	2.50	20.00	160-1181-2-ND	—	150.00/M	—
	Clear	Orange	635	2.0	20	6	130	160-1182-1-ND	.22	1.80	14.40	160-1182-2-ND	—	108.00/M	—
	Clear	Green	565	2.1	20	6	130	160-1183-1-ND	.22	1.80	14.40	160-1183-2-ND	—	108.00/M	—
	Clear	Yellow	585	2.1	20	6	130	160-1184-1-ND	.22	1.80	14.40	160-1184-2-ND	—	108.00/M	—
5	Clear	Amber	610	2.1	20	6	130	160-1185-1-ND	.22	1.80	14.40	160-1185-2-ND	—	108.00/M	—
	Clear	Red	660	1.8	20	20	130	160-1186-1-ND	.30	2.50	20.00	160-1186-2-ND	—	150.00/M	—
	Clear	Orange	635	2.0	20	6	130	160-1187-1-ND	.22	1.80	14.40	160-1187-2-ND	—	108.00/M	—
	Clear	Green	565	2.1	20	6	130	160-1188-1-ND	.22	1.80	14.40	160-1188-2-ND	—	108.00/M	—
	Clear	Yellow	585	2.1	20	6	130	160-1189-1-ND	.22	1.80	14.40	160-1189-2-ND	—	108.00/M	—
6	Water Clear	Orange	630	2.0	20	10	120	160-1119-1-ND	.36	3.00	24.00	160-1119-2-ND	180.00/M	—	168.00/M
	Water Clear	Green	565	2.1	20	10	120	160-1120-1-ND	.36	3.00	24.00	160-1120-2-ND	180.00/M	—	168.00/M
	Water Clear	Amber	610	2.1	20	10	120	160-1121-1-ND	.36	3.00	24.00	160-1121-2-ND	180.00/M	—	168.00/M
	Water Clear	Yellow	585	2.1	20	7	120	160-1122-1-ND	.36	3.00	24.00	160-1122-2-ND	180.00/M	—	168.00/M
	Water Clear	Red	660	1.8	20	20	120	160-1123-1-ND	.54	4.48	35.80	160-1123-2-ND	269.00/M	—	251.00/M
7	Water Clear	Orange	635	2.0	20	5.6	140	160-1075-ND*	.27	2.28	18.20	—	—	—	—
	Water Clear	Green	565	2.1	20	2.8	140	160-1076-ND*	.27	2.28	18.20	—	—	—	—
	Water Clear	Yellow	585	2.1	20	2.8	140	160-1077-ND*	.27	2.28	18.20	—	—	—	—

* Sold in bulk packaging

CHICAGO MINIATURE LAMP, INC.
WHERE INNOVATION COMES TO LIGHT

Panel Mount LED Assemblies

Fig.	Color	Rated Current (mA)	Forward Voltage Typ. (V)	Digi-Key Part No.	Pricing 1	25	100	250	Chicago Miniature Part No.
1	Red	20	2.0	L10001-ND	1.62	32.90	95.20	210.00	5100H1
1	Green	20	2.2	L10005-ND	1.62	32.90	95.20	210.00	5100H5
1	Yellow	20	2.1	L10007-ND	1.62	32.90	95.20	210.00	5100H7
1	Red	1.8	1.8	L10011-ND	1.83	37.01	107.10	236.25	5100H1LC
1	Yellow	1.9	1.9	L10017-ND	1.83	37.01	107.10	236.25	5100H7LC
1	Red	10	5.0	L10021-ND	1.86	37.60	108.80	240.00	5102H1-5V
1	Amber	10	5.0	L10023-ND	1.86	37.60	108.80	240.00	5102H3-5V
1	Green	12	5.0	L10025-ND	1.86	37.60	108.80	240.00	5102H5-5V
1	Red/Green	20	2.2	L10008-ND	2.52	51.11	147.90	326.25	5100H1/5
2	Red	20	2.0	L10031-ND	1.22	24.68	71.40	157.50	5101H1
2	Green	20	2.2	L10035-ND	1.22	24.68	71.40	157.50	5101H5
2	Yellow	20	2.1	L10037-ND	1.22	24.68	71.40	157.50	5101H7
3	Red	10	2.0	L10041-ND	1.68	34.08	98.60	217.50	5110F1
3	Green	20	2.2	L10045-ND	1.68	34.08	98.60	217.50	5110F5
3	Yellow	20	2.1	L10047-ND	1.68	34.08	98.60	217.50	5110F7
3	Red	2	1.8	L10051-ND	2.00	40.54	117.30	258.75	5110F1LC
3	Yellow	2	1.9	L10057-ND	2.00	40.54	117.30	258.75	5110F7LC
4	Red	10	2.0	L10061-ND	.84	17.04	49.30	108.75	5111F1
4	Green	20	2.2	L10065-ND	.84	17.04	49.30	108.75	5111F5
4	Yellow	20	2.1	L10067-ND	.84	17.04	49.30	108.75	5111F7
5	Red	10	2.0	L10081-ND	1.25	25.26	73.10	161.25	5200F1
5	Green	20	2.2	L10085-ND	1.25	25.26	73.10	161.25	5200F5
5	Yellow	20	2.1	L10087-ND	1.25	25.26	73.10	161.25	5200F7
6	Red	10	2.0	L10091-ND	2.06	41.71	120.70	266.25	5210F1
6	Green	20	2.2	L10095-ND	2.06	41.71	120.70	266.25	5210F5
6	Yellow	20	2.1	L10097-ND	2.06	41.71	120.70	266.25	5210F7
7	Red	20	2.0	L10071-ND	2.58	52.29	151.30	333.75	5400A1
7	Green	20	2.1	L10075-ND	2.58	52.29	151.30	333.75	5400A5
7	Yellow	20	2.1	L10077-ND	2.58	52.29	151.30	333.75	5400A7
8	Red	10	2.0	L50381-ND	2.61	52.88	153.00	337.50	3990A1
8	Amber	10	2.0	L50383-ND	2.61	52.88	153.00	337.50	3990A3
8	Green	20	2.2	L50385-ND	2.61	52.88	153.00	337.50	3990A5
8	Yellow	20	2.1	L50387-ND	2.61	52.88	153.00	337.50	3990A7

Fig.	Description	Termination	Digi-Key Part No.	Pricing 1	25	100	Mfg. Part No.
9	LED, 12.70mm dia., 6V	Wire	L5014□-ND	3.45	69.91	202.30	1091M□-6V
9	LED, 12.70mm dia., 12V	Wire	L5015□-ND	3.45	69.91	202.30	1091M□-12V
9	LED, 12.70mm dia., 24V	Wire	L5016□-ND	3.45	69.91	202.30	1091M□-24V
9	LED, 12.70mm dia., 12V	4.75mm Terminal	L5017□-ND	3.65	74.03	214.20	1091QM□-12V
9	LED, 12.70mm dia., 24V	4.75mm Terminal	L5018□-ND	3.65	74.03	214.20	1091QM□-24V
10	LED, 7.87mm dia., 6V	Wire	L5025□-ND	3.48	70.50	204.00	2191L□-6V
10	LED, 7.87mm dia., 12V	Wire	L5026□-ND	3.48	70.50	204.00	2191L□-12V
10	LED, 7.87mm dia., 24V	Wire	L5027□-ND	3.48	70.50	204.00	2191L□-24V
10	LED, 7.87mm dia., 12V	4.75mm Terminal	L5028□-ND	3.65	74.03	214.20	2191QL□-12V
10	LED, 7.87mm dia., 24V	4.75mm Terminal	L5029□-ND	3.65	74.03	214.20	2191QL□-24V
11	LED, 7.87mm dia., 6V	Wire	L5030□-ND	3.48	70.50	204.00	2191U□-6V
11	LED, 7.87mm dia., 12V	Wire	L5031□-ND	3.48	70.50	204.00	2191U□-12V
11	LED, 7.87mm dia., 24V	Wire	L5032□-ND	3.48	70.50	204.00	2191U□-24V
11	LED, 7.87mm dia., 12V	4.75mm Terminal	L5033□-ND	3.65	74.03	214.20	2191QU□-12V
11	LED, 7.87mm dia., 24V	4.75mm Terminal	L5034□-ND	3.65	74.03	214.20	2191QU□-24V

For □ in Digi-Key Part No. choose one of the following: **1**=Red; **5**=Green; **7**=Yellow

Fig. 1

Mounting: Will snap-fit in 6.32/6.45mm dia. hole in panels .79/1.57mm thick. **Wire Leads:** 24 AWG, 152.40mm long. **Housing:** Black nylon. **Anode:** (+): Red lead. **Anode for L1008-ND:** (+): Yellow lead for red light, blue lead for green light.

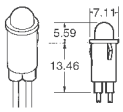


Fig. 2

Mounting: Will snap-fit in 6.32/6.45mm dia. hole in panels .79/1.57mm thick. **Terminals:** .51mm Sq. **Housing:** Black nylon.

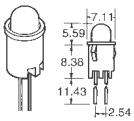


Fig. 3

Mounting: Will snap-fit in 3.94/4.01mm dia. hole in panels .79/1.57mm thick. **Wire Leads:** 24 AWG, 152.40mm long, stripped 4.57/8.13mm. **Anode** (+): Red lead. **Housing:** Black nylon.

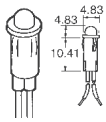


Fig. 4

Mounting: Will snap-fit in 3.94/4.01mm dia. hole in panels .79/1.57mm thick. **Terminals:** .51mm Sq. **Housing:** Black nylon.

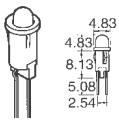


Fig. 5

Mounting: Will snap-fit into 4.75/4.88mm diameter hole in panels .51/2.46mm thick. **Lens:** Polycarbonate.

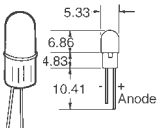


Fig. 6

Mounting: Will snap-fit into 4.75/4.88mm diameter hole in panel .51/2.46mm thick. **Wire Leads:** 26 AWG, 111.76/121.92mm long stripped. **Anode** (+): Red lead. **Lens:** Polycarbonate. **Housing:** Polycarbonate.

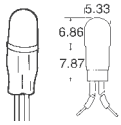


Fig. 7

Mounting: Will snap-fit into 7.92/8.05mm dia. hole in panel .51/2.49mm thick. **Wire Leads:** 24 AWG, 111.76/121.92mm long, stripped: 10.92/14.48mm. **Anode** (+): Red lead. **Lens:** Polycarbonate. **Housing:** Natural nylon.

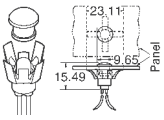


Fig. 8

Mounting: Will snap-fit into 5.51/5.61mm dia. hole in panels .79/1.57mm thick. **Wire Leads:** 26 AWG, 111.76/121.92mm long stripped. **Anode** (+): Red lead. **Lens:** Polycarbonate. **Housing:** White nylon.

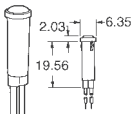
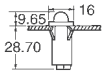


Fig. 9

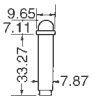


Wire Leads: 22 AWG, 111.76/121.92mm long, stripped: 10.92/14.48mm. **Anode** (+) Red Lead or Quick Connect 4.75mm Term Anode (+) marked above terminal

Fig. 10

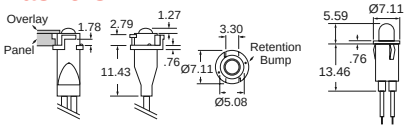
Wire Leads: 22 AWG, 111.76/121.92mm long, stripped: 10.92/14.48mm. **Anode** (+) Red Lead or Quick Connect 4.75mm Term Anode (+) marked above terminal

Fig. 11



Wire Leads: 22 AWG, 111.76/121.92mm long, stripped: 10.92/14.48mm. **Anode** (+) Red Lead or Quick Connect 4.75mm Term Anode (+) marked above terminal

Flashers



Series 5100H Flasher
Features: • Built-in flashing circuit • Flashing rate: 1.5 - 2.5 Hz • No external resistor required **Mounting:** Will snap fit in 6.32/6.45mm dia. hole in panels .79/1.57mm. **Wire Leads:** No. 24 AWG, 152.40mm insulated, bonded strands, stripped 12.70mm. **Anode (+):** Red Lead **Housing:** Black Nylon

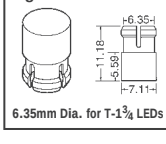
Series 5120F
Mounting: Rear twist into mounting hole specified **Wire Leads:** Red, white, 111.76/121.92mm long. 26 AWG. Stripped 10.92/14.48mm. **Housing:** Black Nylon **Anode (+):** Red Lead

Color	I_V mcd	Current mA	V_F (V)	Digi-Key Part No.	Pricing 1	25	100	Mfg. Part No.
Red	12.5	20	3.5	L20691-ND	2.70	54.64	158.10	5100H1FL
Green	8.0	20	3.5	L20695-ND	2.70	54.64	158.10	5100H5FL
Yellow	12.5	20	3.5	L20697-ND	2.70	54.64	158.10	5100H7FL
Yellow	20	20	2.1	L20687-ND	2.00	40.54	117.30	5120F7

LED Lenses

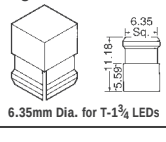
These LED lenses provide quick, economical panel mounting as well as ESD protection. Molded in Fresnel rings provide a wide viewing angle.

Fig. 1



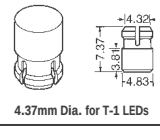
6.35mm Dia. for T-1 3/4 LEDs

Fig. 2



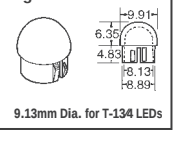
6.35mm Dia. for T-1 3/4 LEDs

Fig. 3



4.37mm Dia. for T-1 LEDs

Fig. 4



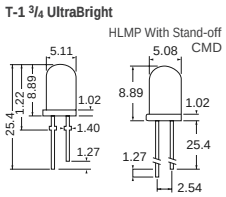
9.13mm Dia. for T-134 LEDs

Fig.	Digi-Key Part No.	Pricing 1	25	100	250	Mfg. Part No.
1	L3000□-ND	.35	7.05	20.40	45.00	431 □
2	L3001□-ND	.44	8.81	25.50	56.25	432 □
3	L3002□-ND	.35	7.05	20.40	45.00	433 □
4	L3003□-ND	.44	8.81	25.50	56.25	434 □

For □ in Digi-Key Part No., choose one of the following: **1**=Red; **2**=Clear; **3**=Amber; **5**=Green; **6**=Blue; **7**=Yellow

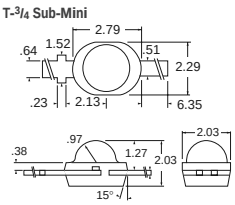
LEDs

T-1 3/4 UltraBright



FEATURES: • Min. 80 mcd. • Pale tint avoids mix problems. • With or without stand-off.

T-3/4 Sub-Mini



FEATURES: These subminiature LED lamps are intended for high volume, low-cost status indication on PC boards.

Lens Color	Source Color	P_D (mW)	Min. I_V mcd	Max. V_F (V)	Typ. I_P (nm)	View Angle	Digi-Key Part No.	Pricing 1	10	100	Chicago Miniature Part No.
T-1 3/4 Ultra Bright											
Clear †	Hi. Eff. Red	135	80	2.2	635	24°	HLMP3750A-ND	.60	4.77	43.21	HLMP-3750A
Clear	Hi. Eff. Red	135	80	2.2	635	24°	CMD3750-ND	.62	4.94	44.81	CMD3750
Clear †	Hi. Eff. Green	135	80	2.2	565	24°	HLMP3950A-ND	.62	4.94	44.81	HLMP-3950A
Clear	Hi. Eff. Green	135	80	2.2	565	24°	CMD3450-ND	.62	4.94	44.81	CMD3450
Clear †	Yellow	85	80	2.2	585	24°	HLMP3850A-ND	.62	4.94	44.81	HLMP-3850A
Clear	Yellow	85	80	2.2	585	24°	CMD3350-ND	.62	4.94	44.81	CMD3350
T-3/4 Sub Mini											
Clear	Std. Red	105	0.5	2.0	660	80°	CMD50B-ND	.43	3.41	30.89	CMD50B
Diff. Red	Hi. Eff. Red	105	1.0	3.0	635	80°	CMD57B-ND	.49	3.94	35.67	CMD57B
Diff. Yellow	Yellow	105	1.0	3.0	585	80°	CMD53B-ND	.49	3.94	35.67	CMD53B
Diff. Green	Hi. Eff. Green	105	1.0	3.0	565	80°	CMD64B-ND	.51	4.10	37.12	CMD64B

Luminous intensity is measured at at 2mA. † With Stand-off

CHICAGO MINIATURE LAMP, INC.
WHERE INNOVATION COMES TO LIGHT

PC Board Mounted LEDs

9118B-ND Chicago Miniature Data Book **$4.98**

Fig.	Color	Rated Current (mA)	Forward Voltage Typ. (V)	Digi-Key Part No.	Pricing 1	25	100	250	Chicago Miniature Part No.
				T1					
1	Red	10	2.0	L20261-ND	1.10	22.33	64.60	142.50	5310F1
	Green	20	2.2	L20265-ND	1.10	22.33	64.60	142.50	5310F5
	Yellow	20	2.1	L20267-ND	1.10	22.33	64.60	142.50	5310F7
	Red	10	2.0	L20271-ND	1.10	22.33	64.60	142.50	5312F1
	Green	20	2.2	L20275-ND	1.10	22.33	64.60	142.50	5312F5
	Yellow	20	2.1	L20277-ND	1.10	22.33	64.60	142.50	5312F7
	Red	10	2.0	L20281-ND	1.10	22.33	64.60	142.50	5315F1
	Green	20	2.2	L20285-ND	1.10	22.33	64.60	142.50	5315F5
	Yellow	20	2.1	L20287-ND	1.10	22.33	64.60	142.50	5315F7
1	Green	20	2.2	L20725-ND	1.19	24.09	69.70	153.75	5313F5
	Yellow	20	2.1	L20727-ND	1.19	24.09	69.70	153.75	5313F7
2	Red	10	2.0	L20151-ND	2.23	45.24	130.90	288.75	5360F1
	Green	20	2.2	L20155-ND	2.23	45.24	130.90	288.75	5360F5
	Yellow	20	2.1	L20157-ND	2.23	45.24	130.90	288.75	5360F7
3	Red	10	2.0	L20321-ND	.61	12.34	35.70	78.75	5600F1
	Green	20	2.2	L20325-ND	.61	12.34	35.70	78.75	5600F5
	Yellow	20	2.1	L20327-ND	.61	12.34	35.70	78.75	5600F7
	Red	10	5.0	L20331-ND	.84	17.04	49.30	108.75	5602F1-5V
	Amber	10	5.0	L20333-ND	.84	17.04	49.30	108.75	5602F3-5V
	Green	12	5.0	L20335-ND	.84	17.04	49.30	108.75	5602F5-5V
4	Red	20	1.8	L20191-ND	1.02	20.56	59.50	131.25	5608F1
	Green	20	2.3	L20195-ND	.93	18.80	54.40	120.00	5608F5
	Yellow	20	2.2	L20197-ND	.93	18.80	54.40	120.00	5608F7
5	Red	10	2.0	L20361-ND	.61	12.34	35.70	78.75	5650F1
	Green	20	2.2	L20365-ND	.61	12.34	35.70	78.75	5650F5
	Yellow	20	2.1	L20367-ND	.61	12.34	35.70	78.75	5650F7
	Red	2.0	1.8	L20371-ND	.78	15.86	45.90	101.25	5650F1LC
	Yellow	2.0	1.9	L20377-ND	.78	15.86	45.90	101.25	5650F7LC
	Red	13	5.0	L20381-ND	.84	17.04	49.30	108.75	5652F1-5V
	Amber	10	5.0	L20383-ND	.84	17.04	49.30	108.75	5652F3-5V
	Green	12	5.0	L20385-ND	.84	17.04	49.30	108.75	5652F5-5V
6	Red	10	2.0	L20401-ND	1.39	28.20	81.60	180.00	5680F1;1
	Green	20	2.2	L20405-ND	1.39	28.20	81.60	180.00	5680F5;5
	Yellow	20	2.1	L20407-ND	1.39	28.20	81.60	180.00	5680F7;7
7	Red	10	2.2	L20411-ND	.90	18.21	52.70	116.25	6321F1
	Green	10	2.3	L20415-ND	.90	18.21	52.70	116.25	6321F5
	Yellow	10	2.2	L20417-ND	.90	18.21	52.70	116.25	6321F7
8	Red	10	2.0	L20421-ND	1.10	22.33	64.60	142.50	5322F1
	Green	20	2.2	L20425-ND	1.10	22.33	64.60	142.50	5322F5
	Yellow	20	2.1	L20427-ND	1.10	22.33	64.60	142.50	5322F7
	Red	10	2.0	L20431-ND	1.10	22.33	64.60	142.50	5320F1
	Green	20	2.2	L20435-ND	1.10	22.33	64.60	142.50	5320F5
	Yellow	20	2.1	L20437-ND	1.10	22.33	64.60	142.50	5320F7
	Red	10	2.0	L20441-ND	1.10	22.33	64.60	142.50	5321F1
	Green	20	2.2	L20445-ND	1.10	22.33	64.60	142.50	5321F5
	Yellow	20	2.1	L20447-ND	1.10	22.33	64.60	142.50	5321F7
9	Red	10	2.2	L2045111-ND	3.45	69.91	202.30	446.25	5693F1;1;1-A
	Green	10	2.3	L2045555-ND	3.45	69.91	202.30	446.25	5693F5;5;5-A
	Yellow	10	2.2	L2045777-ND	3.45	69.91	202.30	446.25	5693F7;7;7-A
10	Red	10	2.2	L20461111-ND	4.81	97.53	282.20	622.50	5694F1;1;1;1-A
	Green	10	2.3	L20465555-ND	4.81	97.53	282.20	622.50	5694F5;5;5;5-A
	Yellow	10	2.2	L20467777-ND	4.81	97.53	282.20	622.50	5694F7;7;7;-A
				T 1 3/4					
11	Red	20	1.7	L20001-ND	.61	12.34	35.70	78.75	5300E1
	Red	20	2.0	L20011-ND	.61	12.34	35.70	78.75	5300H1
	Green	20	2.2	L20015-ND	.61	12.34	35.70	78.75	5300H5
	Yellow	20	2.1	L20017-ND	.61	12.34	35.70	78.75	5300H7
	Red	10	5.0	L20021-ND	.84	17.04	49.30	108.75	5302H1-5V
	Amber	10	5.0	L20023-ND	.84	17.04	49.30	108.75	5302H3-5V
	Green	20	5.0	L20025-ND	.84	17.04	49.30	108.75	5302H5-5V
	Red	2	1.8	L20031-ND	.78	15.86	45.90	101.25	5300H1LC
	Green	2	1.8	L20035-ND	.78	15.86	45.90	101.25	5300H5LC
	Yellow	2	1.9	L20037-ND	.78	15.86	45.90	101.25	5300H7LC
	Red	35	3.0	L20041-ND	.75	15.28	44.20	97.50	5308H1
	Green	20	2.5	L20045-ND	.75	15.28	44.20	97.50	5308H5
	Yellow	20	2.1	L20047-ND	.75	15.28	44.20	97.50	5308H7
11	Red/Green	10	2.2	L20048-ND	1.45	29.38	85.00	187.50	5300H1/5
12	Green	20	3.5	L20585-ND	1.77	35.84	103.70	228.75	5300H5FL
	Yellow	20	3.5	L20587-ND	1.77	35.84	103.70	228.75	5300H7FL
13	Red	20	2.0	L20171-ND	.78	15.86	45.90	101.25	5306H1
	Amber	20	2.0	L20173-ND	.78	15.86	45.90	101.25	5306H3
	Green	20	2.2	L20175-ND	.78	15.86	45.90	101.25	5306H5
	Yellow	20	2.1	L20177-ND	.78	15.86	45.90	101.25	5306H7
14	Red	20	2.0	L20051-ND	.78	15.86	45.90	101.25	5307H1
	Green	20	2.2	L20055-ND	.78	15.86	45.90	101.25	5307H5
	Yellow	20	2.1	L20057-ND	.78	15.86	45.90	101.25	5307H7
15	Red	20	2.0	L20061-ND	.78	15.86	45.90	101.25	5330H1
	Green	20	2.2	L20065-ND	.78	15.86	45.90	101.25	5330H5
	Yellow	20	2.2	L20067-ND	.78	15.86	45.90	101.25	5330H7
15	Red	20	2.0	L20731-ND	.78	15.86	45.90	101.25	5331H1
	Green	20	2.1	L20735-ND	.78	15.86	45.90	101.25	5331H5
	Yellow	20	2.1	L20737-ND	.78	15.86	45.90	101.25	5331H7
16	Red	20	2.0	L20251-ND	1.19	24.09	69.70	153.75	5341H1
	Green	20	2.1	L20255-ND	1.19	24.09	69.70	153.75	5341H5
	Yellow	20	2.1	L20257-ND	1.19	24.09	69.70	153.75	5341H7
17	Red	20	1.7	L20301-ND	.61	12.34	35.70	78.75	5380E1
	Red	20	2.0	L20311-ND	.61	12.34	35.70	78.75	5380H1
	Green	20	2.2	L20315-ND	.61	12.34	35.70	78.75	5380H5
	Yellow	20	2.1	L20317-ND	.61	12.34	35.70	78.75	5380H7
18	Red	20	2.0	L20161-ND	.67	13.51	39.10	86.25	5381H1
	Green	20	2.2	L20165-ND	.67	13.51	39.10	86.25	5381H5
	Yellow	20	2.1	L20167-ND	.67	13.51	39.10	86.25	5381H7
19	Red	20	1.7	L20341-ND	2.52	51.11	147.90	326.25	5640E1
	Red	20	2.0	L20351-ND	2.52	51.11	147.90	326.25	5640H1
	Green	20	2.2	L20355-ND	2.52	51.11	147.90	326.25	5640H5
	Yellow	20	2.1	L20357-ND	2.52	51.11	147.90	326.25	5640H7
20	Red	20	2.0	L20391-ND	1.39	28.20	81.60	180.00	5670H1;1
	Green	20	2.2	L20395-ND	1.39	28.20	81.60	180.00	5670H5;5
	Yellow	20	2.1	L20397-ND	1.39	28.20	81.60	180.00	5670H7;7

NOTE: Figures 1-10 are T1's; Figures 11-23 are T1 3/4's

Fig. 1

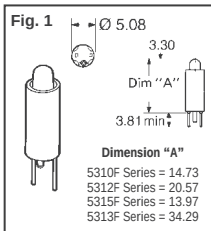


Fig. 2

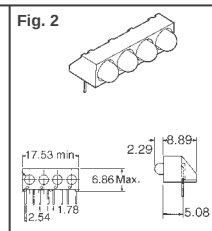


Fig. 3

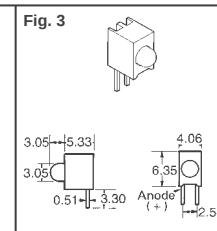
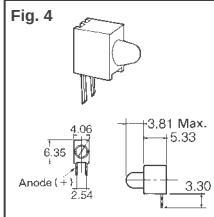


Fig. 4



Clear Lens

Fig. 5

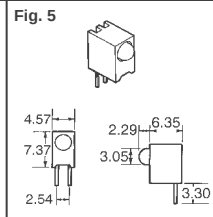
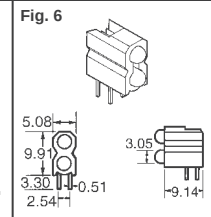


Fig. 6



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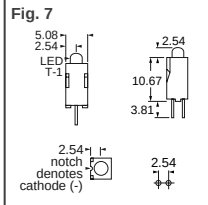


"Stackable"

Fig. 8

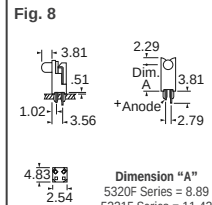


Fig. 9

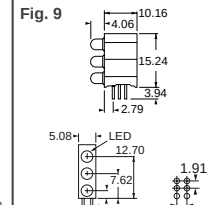


Fig. 10

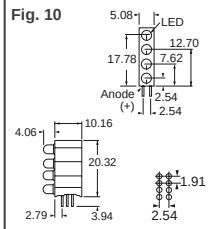
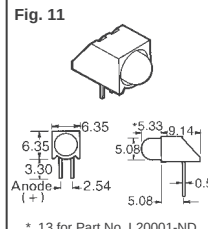
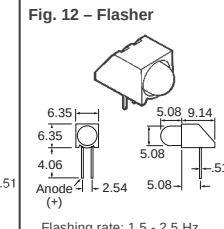


Fig. 11



* .13 for Part No. L20001-ND

Fig. 12 – Flasher



Flashing rate: 1.5 - 2.5 Hz

Fig. 13

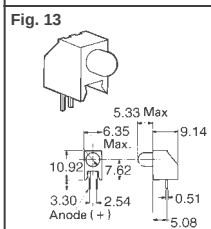


Fig. 14

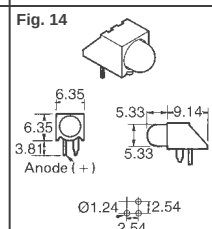


Fig. 15

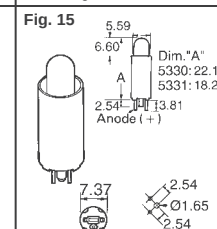


Fig. 16

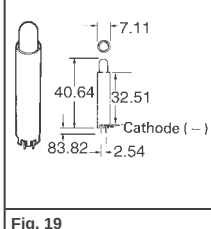


Fig. 17

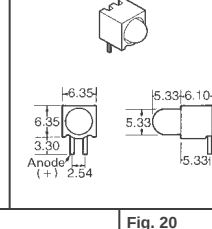


Fig. 18

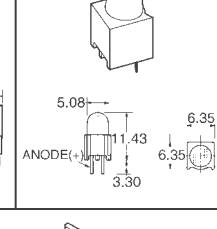


Fig. 19

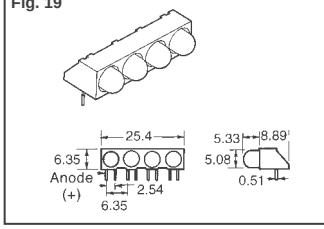
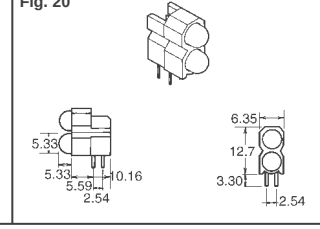


Fig. 20



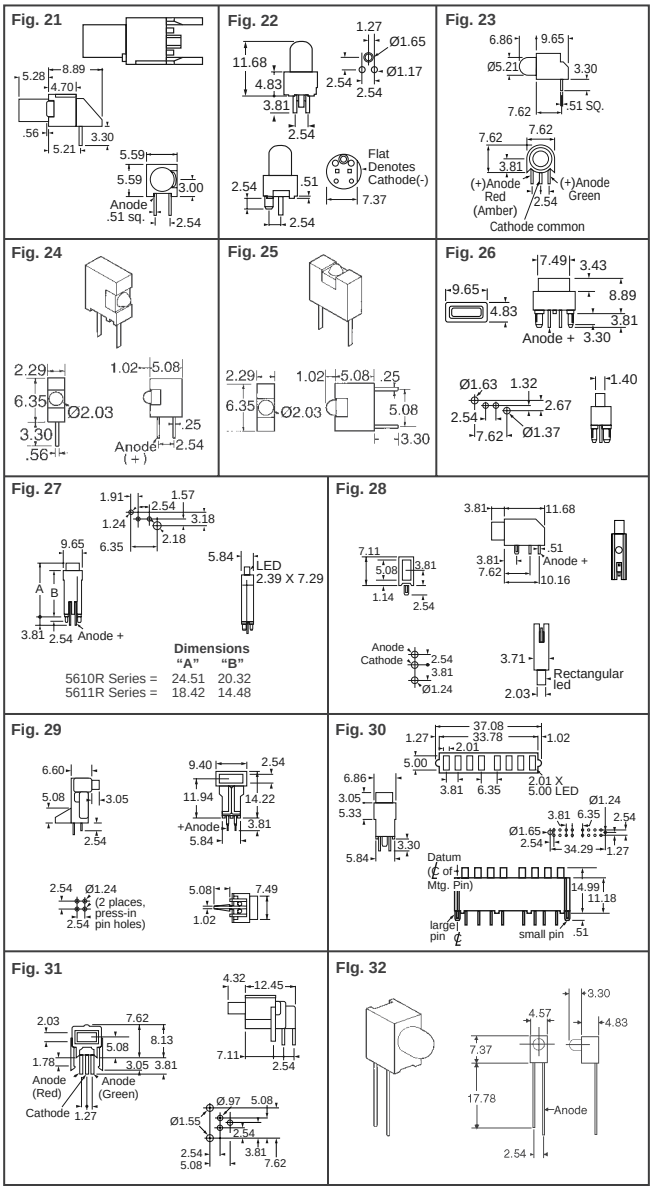
CHICAGO MINIATURE LAMP, INC.
WHERE INNOVATION COMES TO LIGHT

PC Board Mounted LEDs

Fig.	Color	Rated Current (mA)	Forward Voltage Typ. (V)	Digi-Key Part No.	Pricing 1	25	100	250	Chicago Miniature Part No.
				T 1 3/4					
21	Red	20	2.2	L20471-ND	.99	19.98	57.80	127.50	5309K1
22	Red	20	2.0	L20491-ND	.78	15.86	45.90	101.25	5332H1
	Green	20	2.1	L20495-ND	.78	15.86	45.90	101.25	5332H5
	Yellow	20	2.1	L20497-ND	.78	15.86	45.90	101.25	5332H7
23	Red/Green	15	2.1	L20488-ND	1.94	39.36	113.90	251.25	5305H1/5
	Amber/Green	15	2.1	L205935-ND	1.94	39.36	113.90	251.25	5305H3/5
				2mm					
24	Red	10	2.2	L20081-ND	.93	18.80	54.40	120.00	5350T1
	Green	10	2.3	L20085-ND	.93	18.80	54.40	120.00	5350T5
	Yellow	10	2.2	L20087-ND	.93	18.80	54.40	120.00	5350T7
	Red	9.6	5.0	L20091-ND	1.04	21.15	61.20	135.00	5352T1-5V
	Amber	10	5.0	L20093-ND	1.04	21.15	61.20	135.00	5352T3-5V
	Green	10	5.0	L20095-ND	1.04	21.15	61.20	135.00	5352T5-5V
	Red	2	1.8	L20101-ND	1.10	22.33	64.60	142.50	5350T1LC
	Green	2	1.8	L20105-ND	1.10	22.33	64.60	142.50	5350T5LC
	Yellow	2	1.9	L20107-ND	1.10	22.33	64.60	142.50	5350T7LC
	Red	3.5	5.0	L20111-ND	1.10	22.33	64.60	142.50	5352T1-5VLC
	Amber	3.5	5.0	L20113-ND	1.10	22.33	64.60	142.50	5352T3-5VLC
	Green	3.5	5.0	L20115-ND	1.10	22.33	64.60	142.50	5352T5-5VLC
25	Red	10	2.2	L20121-ND	1.57	31.73	91.80	202.50	5370T1
	Green	10	2.3	L20125-ND	1.57	31.73	91.80	202.50	5370T5
	Yellow	10	2.2	L20127-ND	1.57	31.73	91.80	202.50	5370T7
	Red	9.5	5.0	L20131-ND	1.71	34.66	100.30	221.25	5372T1-5V
	Amber	10	5.0	L20133-ND	1.71	34.66	100.30	221.25	5372T3-5V
	Green	10	5.0	L20135-ND	1.71	34.66	100.30	221.25	5372T5-5V
	Red	2	1.8	L20141-ND	1.74	35.25	102.00	225.00	5370T1LC
	Green	2	1.8	L20145-ND	1.74	35.25	102.00	225.00	5370T5LC
	Yellow	2	1.9	L20147-ND	1.74	35.25	102.00	225.00	5370T7LC
	Red	3.5	5.0	L20291-ND	1.74	35.25	102.00	225.00	5372T1-5VLC
	Amber	3.5	5.0	L20293-ND	1.74	35.25	102.00	225.00	5372T3-5VLC
	Green	3.5	5.0	L20295-ND	1.74	35.25	102.00	225.00	5372T5-5VLC
				Rectangular					
26	Red	20	2.2	L20501-ND	1.31	26.44	76.50	168.75	5612R1
	Green	20	2.3	L20505-ND	1.31	26.44	76.50	168.75	5612R5
	Yellow	20	2.2	L20507-ND	1.31	26.44	76.50	168.75	5612R7
27	Red	25	2.2	L20511-ND	1.19	24.09	69.70	153.75	5610R1
	Green	20	2.3	L20515-ND	1.19	24.09	69.70	153.75	5610R5
	Yellow	20	2.2	L20517-ND	1.19	24.09	69.70	153.75	5610R7
	Red	25	2.2	L20521-ND	1.31	26.44	76.50	168.75	5611R1
	Green	20	2.3	L20525-ND	1.31	26.44	76.50	168.75	5611R5
	Yellow	20	2.2	L20527-ND	1.31	26.44	76.50	168.75	5611R7
28	Red	20	2.1	L20541-ND	1.31	26.44	76.50	168.75	5636D1
	Green	20	2.1	L20545-ND	1.31	26.44	76.50	168.75	5636D5
	Yellow	20	2.2	L20547-ND	1.31	26.44	76.50	168.75	5636D7
29	Red	25	2.1	L20561-ND	1.19	24.09	69.70	153.75	5620R1
	Green	20	2.3	L20565-ND	1.19	24.09	69.70	153.75	5620R5
	Yellow	20	2.2	L20567-ND	1.19	24.09	69.70	153.75	5620R7
30	Red	10	2.1	L20571-ND	6.26	126.90	367.20	810.00	5638D1
31	Red/Green	20	2.1/2.3	L20558-ND	2.03	41.13	119.00	262.50	5639D1/5

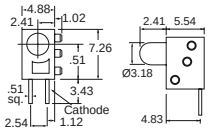
Fig.	Color	Rated Current (mA)	Forward Voltage Typ. (V)	Digi-Key Part No.	Cut Tape Pricing 1	10	100	Digi-Key Part No.	Tape & Reel Pricing 750	Chicago Miniature Part No.
				PC Board Mount on Tape and Reel						
32	Red	10	2.0	L60011CT-ND	1.09	9.30	77.50	L60011TR-ND	348.75	5655F1
	Amber	10	2.0	L60013CT-ND	1.09	9.30	77.50	L60013TR-ND	348.75	5655F3
	Green	20	2.2	L60015CT-ND	1.09	9.30	77.50	L60015TR-ND	348.75	5655F5
	Yellow	20	2.1	L60017CT-ND	1.09	9.30	77.50	L60017TR-ND	348.75	5655F7

NOTE: Figures 24-25 are 2mm Diameter LED's; Figure 32 is Tape & Reel.



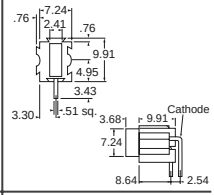
Modular LEDs

T1

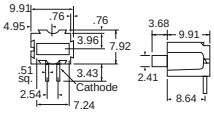


Mount from 1 to 12 circuit board indicators, as a single unit. Unique snap-together feature.

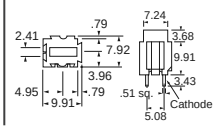
Right Angle-Vertical



Right Angle-Horizontal



Straight Vertical Mount



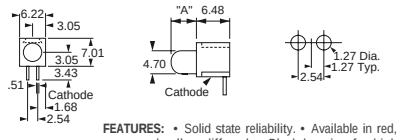
FEATURES: • Mount up to 12 LEDs in one operation. • Unitized, vibration resistant package. • Black housing for high contrast background. • Wide viewing angle. • Vertical or horizontal positioning. • Interlocking construction. • Hi brite diffused LEDs. • Speeds mounting for increased productivity and reduced cost.

9221B-ND Chicago Miniature Data Book **$2.95**

LED/Lens	Forward Voltage Typ.	If=(mA)	Min. V_R	Max. I_F (mA)	Typ. I_V	View Angle	Digi-Key Part No.	Pricing 1	10	C.M. Part No.
					T1					
Red/Clear	2.2	20	5.0	30	60.0	40°	CMC01R-ND	.87	6.99	CMC01R
Yellow/Clear	2.2	20	5.0	20	60.0	40°	CMC01Y-ND	.87	6.99	CMC01Y
Green/Clear	2.2	20	5.0	30	60.0	40°	CMC01G-ND	.87	6.99	CMC01G
Red/Diff.	2.0	20	5.0	30	7.0	90°	CMW01R-ND	.87	6.99	CMW01R
Yellow/Diff.	2.1	20	5.0	30	6.0	90°	CMW01Y-ND	.87	6.99	CMW01Y
Green/Diff.	2.2	20	5.0	30	5.0	90°	CMW01G-ND	.87	6.99	CMW01G
					Right Angle Vertical					
Red/Diff.	2.0	20	5.0	30	5.0	100°	CMV01R-ND	.85	6.82	CMV01R
Yellow/Diff.	2.0	20	5.0	30	5.0	100°	CMV01Y-ND	.85	6.82	CMV01Y
Green/Diff.	2.1	20	5.0	30	5.0	100°	CMV01G-ND	.85	6.82	CMV01G
					Right Angle Horizontal					
Red/Diff.	2.0	20	5.0	30	5.0	100°	CMR01R-ND	.85	6.82	CMR01R
Yellow/Diff.	2.0	20	5.0	30	5.0	100°	CMR01Y-ND	.85	6.82	CMR01Y
Green/Diff.	2.1	20	5.0	30	5.0	100°	CMR01G-ND	.85	6.82	CMR01G
					Straight Vertical Mount					
Red/Diff.	2.0	20	5.0	30	5.0	100°	CMS01R-ND	.85	6.82	CMS01R
Yellow/Diff.	2.0	20	5.0	30	5.0	100°	CMS01Y-ND	.85	6.82	CMS01Y
Green/Diff.	2.1	20	5.0	30	5.0	100°	CMS01G-ND	.85	6.82	CMS01G

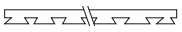
Circuit Board Indicators, T-1 3/4 Lens Size

CM-SERIES — Stackable Using Tie Bar



FEATURES: • Solid state reliability. • Available in red, green and yellow diffused. • Black housing for high contrast background. • Wide viewing angle.

12 Position Tie Bar



Typ. VF (V)	mcd If @ 20mA	View Angle	Diffused Lens Color(s)	Dim "A" (mm)	Digi-Key Part No.	Pricing 1	10	C.M. Part No.
2.2	5.0	70°	Green	3.18	CMI01G-ND	.90	7.17	CMI01G
2.1	6.0	70°	Yellow	3.18	CMI01Y-ND	.90	7.17	CMI01Y
2.1	6.0	70°	Yellow	4.75	CMO01Y-ND	1.02	8.19	CMO01Y
2.0	7.0	70°	Orange	4.75	CMO01O-ND	1.02	8.19	CMO01O
Breakable Tie Bar		(12 Positions)			CMT12-ND	.36	2.90	CMT12

* Measured at 10mA; all rest at 20mA.

CHICAGO MINIATURE LAMP, INC.
WHERE INNOVATION COMES TO LIGHT

Optical Light Pipes for RJ-Style Jacks

Optical Light Pipes provide a cost effective solution to the problem of getting the light from SMD LEDs up and over your RJ-Style jacks while allowing the LED to be mounted away from the jack to prevent interference.

Fig. 1

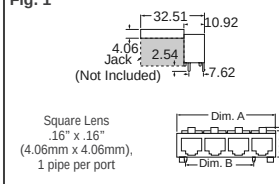


Fig. 2

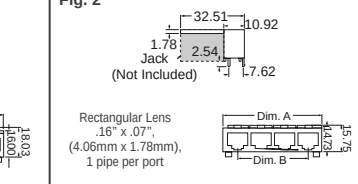


Fig. 3

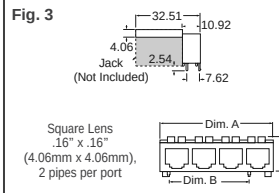


Fig. 4

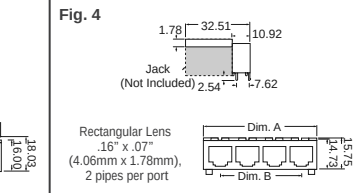


Fig.	No. of Ports	Dimensions (mm) A	Dimensions (mm) B	Digi-Key Part No.	Pricing 1	25	100	250	C.M.L. Part No.
1	2	27.94	13.97	L70012-ND	2.93	59.34	171.70	378.75	7101P2-M
	3	41.91	27.94	L70013-ND	3.86	78.14	226.10	498.75	7101P3-M
	4	55.88	41.91	L70014-ND	4.81	97.53	282.20	622.50	7101P4-M
2	1	13.97	—	L70021-ND	1.97	39.95	115.60	255.00	7101R1-M
	4	55.88	41.91	L70024-ND	4.81	97.53	282.20	622.50	7101R4-M
3	2	27.94	13.97	L70032-ND	3.89	78.73	227.80	502.50	7102P2-M
	3	41.91	27.94	L70033-ND	5.34	108.28	313.31	691.13	7102P3-M
	4	55.88	41.91	L70034-ND	6.76	136.89	396.10	873.75	7102P4-M
4	1	13.97	—	L70041-ND	2.47	49.94	144.50	318.75	7102R1-M
	2	27.94	13.97	L70042-ND	3.89	78.73	227.80	502.50	7102R2-M

Optical Light Pipes for SMD-Style LED

Fig. 1

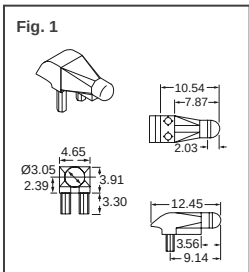


Fig. 2

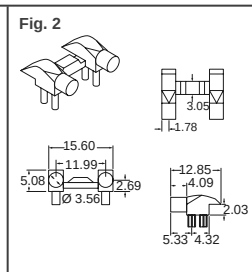


Fig. 3

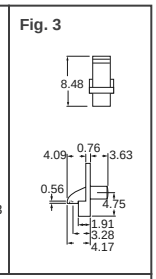


Fig. 4

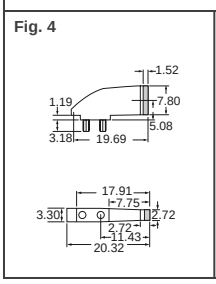


Fig. 5

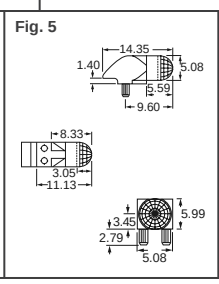


Fig. 6

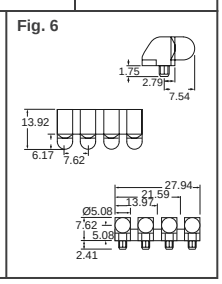
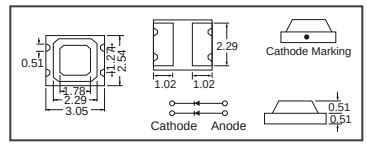


Fig.	Color	Digi-Key Part No.	Pricing 1	25	100	250	500	C.M.L. Part No.
1	Red	L71001-ND	.93	18.80	54.40	120.00	230.40	7511C1
1	Green	L71005-ND	.93	18.80	54.40	120.00	230.40	7511C5
1	Yellow	L71007-ND	.93	18.80	54.40	120.00	230.40	7511C7
2	Red	L71101-ND	1.04	21.15	61.20	135.00	259.20	7512D1
2	Green	L71105-ND	1.04	21.15	61.20	135.00	259.20	7512D5
2	Yellow	L71107-ND	1.04	21.15	61.20	135.00	259.20	7512D7
3	Clear	L71200-ND	2.32	47.00	136.00	300.00	576.00	7640D2
4	Clear	L71300-ND	.49	9.99	28.90	63.75	122.40	7610D2
5	Clear	L71400-ND	.70	14.10	40.80	90.00	172.80	7511G2
6	Clear	L71500-ND	1.62	32.90	95.20	210.00	403.20	7514B2-4

Dual Chip-Surface Mount LED for Use with Light Pipes

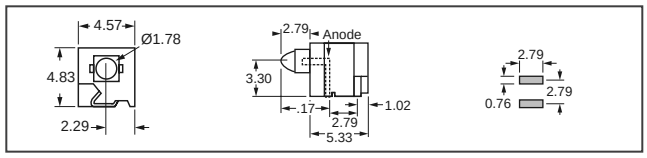
FEATURES:

• Compatible with automated placement equipment • Compatible with infrared and vapor phase reflow soldering process • Low power consumption • View angle 100° • Lens color Clear.



Source Color	Typ. mcd	Forward Voltage Typ. (V)	@ mA	Digi-Key Part No.	Cut Tape Pricing 1	10	Digi-Key Part No.	Tape & Reel Pricing 3,000
Yellow	14.0	2.1	20	CMD11304YCT-ND	1.25	11.08	CMD11304YTR-ND	701.00/M
Green	22.0	2.0	20	CMD11304GCT-ND	1.25	11.08	CMD11304GTR-ND	701.00/M
Hi. Eff. Red	14.0	1.7	10	CMD11304URCT-ND	1.25	11.08	CMD11304URTR-ND	701.00/M
Amber/Green	8.0/12.0	2.1/2.0	20/20	CMD11354AGCT-ND	1.25	11.08	CMD11354AGTR-ND	701.00/M
Hi. Eff. Red/Grn	8.0/12.0	1.7/2.0	20/10	CMD11354URGCT-ND	1.25	11.08	CMD11354URGTR-ND	701.00/M

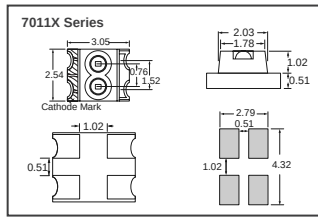
Sub-Miniature Surface Mount LED Assemblies



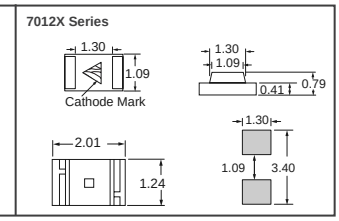
Color	Typ. mcd	Forward Voltage Typ. (V)	mA	Digi-Key Part No.	Cut Tape Pricing 1	10	100	Digi-Key Part No.	Tape & Reel 750	Chicago Miniature Model No.
Red	5.0	2.2	10	L60041CT-ND	1.37	11.70	97.50	L60041TR-ND	438.75	6255T1
Green	4.0	2.3	10	L60045CT-ND	1.37	11.70	97.50	L60045TR-ND	438.75	6255T5
Yellow	3.8	2.2	10	L60047CT-ND	1.37	11.70	97.50	L60047TR-ND	438.75	6255T7
Red	5.0	5.0	9.6	L60061CT-ND	1.51	12.90	107.50	L60061TR-ND	483.75	6255T1-5V
Amber	5.0	5.0	10	L60063CT-ND	1.51	12.90	107.50	L60063TR-ND	483.75	6255T3-5V
Green	5.0	5.0	10	L60065CT-ND	1.51	12.90	107.50	L60065TR-ND	483.75	6255T5-5V
Red	0.5	1.8	2.0	L60051CT-ND	1.58	13.50	112.50	L60051TR-ND	506.25	6255T1LC
Green	1.2	1.8	2.0	L60055CT-ND	1.58	13.50	112.50	L60055TR-ND	506.25	6255T5LC
Yellow	0.5	1.9	2.0	L60057CT-ND	1.58	13.50	112.50	L60057TR-ND	506.25	6255G7LC
Red	2.0	5.0	3.5	L60071CT-ND	1.58	13.50	112.50	L60071TR-ND	506.25	6255T1-5VLC
Amber	4.0	5.0	3.5	L60073CT-ND	2.10	18.00	150.00	L60073TR-ND	675.00	6255T3-5VLC
Green	2.0	5.0	3.5	L60075CT-ND	1.58	13.50	112.50	L60075TR-ND	506.25	6255T5-5VLC

Surface Mount LEDs

7011X Series

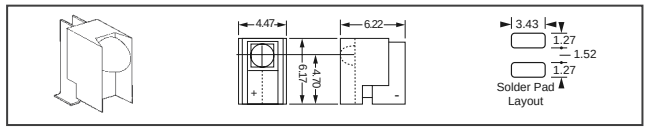


7012X Series



Source (Dice)	Typ. mcd	Forward Voltage Typ. (V)	mA	Digi-Key Part No.	Cut Tape Pricing 1	10	100	Digi-Key Part No.	Tape & Reel Pricing	Chicago Miniature Model No.
Red/Grn	17.0	1.7	20	L61015CT-ND	1.02	8.70	72.50	L61015TR-ND	1087.50/2500	7011X1/5
Red/Yel	17.0	1.7	20	L61017CT-ND	1.02	8.70	72.50	L61017TR-ND	1087.50/2500	7011X1/7
Grn/Yel	7.5	2.1	20	L61057CT-ND	1.02	8.70	72.50	L61057TR-ND	1087.50/2500	7011X5/7
Red	9.0	1.7	25	L61101CT-ND	.56	4.80	40.00	L61101TR-ND	960.00/4000	7012X1
Green	6.8	2.1	25	L61105CT-ND	.56	4.80	40.00	L61105TR-ND	960.00/4000	7012X5
Yellow	6.8	2.1	25	L61107CT-ND	.56	4.80	40.00	L61107TR-ND	960.00/4000	7012X7

Right Angle Surface Mount LEDs



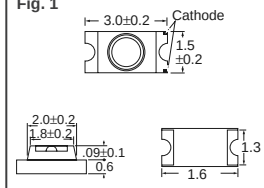
Color	Wave-length	Rated Current (mA)	Forward Voltage Typ. (V)	Digi-Key Part No.	Cut Tape Pricing 1	10	100	Tape & Reel Pricing* 1,000	Chicago Miniature Part No.
Red	—	10	2.2	L60001CT-ND	1.35	11.61	96.75	615.00	6200T1
Amber	—	10	2.0	L60003CT-ND	1.35	11.61	96.75	615.00	6200T3
Green	—	10	2.3	L60005CT-ND	1.35	11.61	96.75	615.00	6200T5
Yellow	—	10	2.2	L60007CT-ND	1.35	11.61	96.75	615.00	6200T7
Red	635	2	1.8	L60101CT-ND	1.65	14.10	117.50	705.00	6200T1LC
Green	565	2	1.8	L60105CT-ND	1.47	12.60	105.00	630.00	6200T5LC
Yellow	583	2	1.9	L60107CT-ND	1.47	12.60	105.00	630.00	6200T7LC
Red	635	9.6	5.0	L60201CT-ND	1.75	15.00	125.00	750.00	6202T1-5V
Amber	583	10	5.0	L60203CT-ND	1.75	15.00	125.00	750.00	6202T3-5V
Green	565	10	5.0	L60205CT-ND	1.75	15.00	125.00	750.00	6202T5-5V
Red	635	3.5	5.0	L60301CT-ND	1.75	15.00	125.00	750.00	6202T1-5VLC
Amber	583	3.5	5.0	L60303CT-ND	1.75	15.00	125.00	750.00	6202T3-5VLC
Green	565	3.5	5.0	L60305CT-ND	1.75	15.00	125.00	750.00	6202T5-5VLC

* For Tape & Reel Part No., change CT to TR.

Surface Mount LEDs

Fig.	Wave-length	Color	Lens Color	TYP mcd	Forward Voltage TYP @ mA		Digi-Key Part No.	Cut Tape Pricing 1	10	100	Tape & Reel Pricing*	Chicago Miniature Part No.
CMD11-21 Series												
1	640	Red	Clear	6	2.0	20	L62001CT-ND	.41	3.47	28.95	347.40/2000	CMD11-21VRC/TR8
	570	Green	Clear	7.5	2.1	20	L62005CT-ND	.41	3.47	28.95	347.40/2000	CMD11-21VGC/TR8
	585	Yellow	Clear	6	2.0	20	L62007CT-ND	.41	3.47	28.95	347.40/2000	CMD11-21VYC/TR8
	660	Super Red	Clear	17	1.7	20	L62011CT-ND	.48	4.13	34.38	412.50/2000	CMD11-21SRC/TR8
CMD12-21 Series												
2	640	Red	Clear	5	2.0	20	L62101CT-ND	.46	3.91	32.58	390.90/2000	CMD12-21VRC/TR8
	570	Green	Clear	8.8	2.1	20	L62105CT-ND	.46	3.91	32.58	390.90/2000	CMD12-21VGC/TR8
	585	Yellow	Clear	3	2.0	20	L62107CT-ND	.46	3.91	32.58	390.90/2000	CMD12-21VYC/TR8
	660	Super Red	Clear	12.4	1.7	20	L62111CT-ND	.59	5.02	41.80	501.60/2000	CMD12-21SRC/TR8
	570	Ultra Green	Clear	14.9	2.1	20	L62115CT-ND	.48	4.15	34.55	414.60/2000	CMD12-21UGC/TR8
CMD15-21 Series												
3	640	Red	Clear	6	2.0	20	L62201CT-ND	.35	3.04	25.33	303.90/2000	CMD15-21VRC/TR8
	570	Green	Clear	10	2.1	20	L62205CT-ND	.35	3.04	25.33	303.90/2000	CMD15-21VGC/TR8
	430	Ultra Blue	Clear	45	4.9	20	L62206CT-ND	5.01	42.92	357.69	4292.31/2000	CMD15-21UBC/TR8
	581	Yellow	Clear	6	2.0	20	L62207CT-ND	.35	3.04	25.33	303.90/2000	CMD15-21VYC/TR8
	660	Super Red	Clear	15	1.7	20	L62211CT-ND	.43	3.71	30.95	371.40/2000	CMD15-21SRC/TR8
	565	Ultra Green	Clear	12	2.1	20	L62215CT-ND	.43	3.71	30.95	371.40/2000	CMD15-21UGC/TR8
	640	Red	Diff	4	2.0	20	L62301CT-ND	.35	3.04	25.33	303.90/2000	CMD15-21VRD/TR8
	570	Green	Diff	5.6	2.1	20	L62305CT-ND	.35	3.04	25.33	303.90/2000	CMD15-21VGD/TR8
	585	Yellow	Diff	4	2.0	20	L62307CT-ND	.35	3.04	25.33	303.90/2000	CMD15-21VYD/TR8
CMD15-22 Series												
4	640/570	Red/Grn.	Clear	6.0/10.0	2.0/2.1	20	L622015CT-ND	.68	5.82	48.53	582.30/2000	CMD15-22VRVGC/TR8
	660/565	Red/Grn.	Clear	15.0/12.0	1.7/2.1	20	L62211115CT-ND	.85	7.30	60.80	729.60/2000	CMD15-22RUGC/TR8
CMD17-21 Series												
5	640	Red	Clear	13	2.0	20	L62401CT-ND	.35	3.04	25.33	455.85/3000	CMD17-21VRC/TR8
	570	Green	Clear	35	2.1	20	L62405CT-ND	.35	3.04	25.33	455.85/3000	CMD17-21VGC/TR8
	585	Yellow	Clear	12	2.0	20	L62407CT-ND	.35	3.04	25.33	455.85/3000	CMD17-21VYC/TR8
	660	Super Red	Clear	45	1.7	20	L62411CT-ND	.43	3.71	30.95	557.10/3000	CMD17-21SRC/TR8
	570	Ultra Green	Clear	50	2.1	20	L62415CT-ND	.43	3.71	30.95	557.10/3000	CMD17-21UGC/TR8
	640	Red	Diff	3	2.0	20	L62501CT-ND	.35	3.04	25.33	455.85/3000	CMD17-21VRD/TR8
	570	Green	Diff	5	2.1	20	L62505CT-ND	.35	3.04	25.33	455.85/3000	CMD17-21VGD/TR8
	585	Yellow	Diff	4	2.0	20	L62507CT-ND	.35	3.04	25.33	455.85/3000	CMD17-21VYD/TR8
CMD28-21 Series												
6	640	Red	Clear	3	2.0	20	L62601CT-ND	.43	3.67	30.58	366.90/2000	CMD28-21VRC/TR8
	570	Green	Clear	5.5	2.1	20	L62605CT-ND	.43	3.67	30.58	366.90/2000	CMD28-21VGC/TR8
	585	Yellow	Clear	6	2.0	20	L62607CT-ND	.43	3.67	30.58	366.90/2000	CMD28-21VYC/TR8
	660	Super Red	Clear	17	1.7	20	L62611CT-ND	.56	4.78	39.80	477.60/2000	CMD28-21SRC/TR8
	640	Red	Clear	0.16	2.0	1	L62701CT-ND	.41	3.54	29.53	354.30/2000	CMD28-21VRC/TR8/T1
	570	Green	Clear	0.16	2.1	1	L62705CT-ND	.41	3.54	29.53	354.30/2000	CMD28-21VGC/TR8/T1
	585	Yellow	Clear	0.4	2.1	1	L62707CT-ND	.41	3.54	29.53	354.30/2000	CMD28-21VYC/TR8/T1
	660	Super Red	Clear	1.6	1.7	1	L62711CT-ND	.53	4.56	38.03	456.30/2000	CMD28-21SRC/TR8/T1
CMD67-21 Series												
7	640	Red	Clear	10	2.0	20	L62801CT-ND	.51	4.34	36.20	434.40/2000	CMD67-21VRC/TR8
	570	Green	Clear	25	2.1	20	L62805CT-ND	.51	4.34	36.20	434.40/2000	CMD67-21VGC/TR8
	585	Yellow	Clear	10	2.0	20	L62807CT-ND	.51	4.34	36.20	434.40/2000	CMD67-21VYC/TR8
	660	Super Red	Clear	40	1.7	20	L62811CT-ND	.61	5.21	43.43	521.10/2000	CMD67-21SRC/TR8
	660	Ultra Red	Clear	62	1.7	20	L628111CT-ND†	.96	8.25	68.78	825.30/2000	CMD67-21URC/TR8
CMD67-22 Series												
8	640/570	Red/Grn.	Clear	10.0/25.0	2.0/2.1	20	L628015CT-ND	.85	7.25	60.39	724.62/2000	CMD67-22VRVGC/TR8
	660/565	Red/Grn.	Clear	40.0/25.0	1.7/2.1	20	L6281115CT-ND	1.03	8.82	73.46	881.55/2000	CMD67-22SRUGC/TR8
CMD91-21/TR7 Series												
9	640	Red	Clear	80	2.0	20	L62901CT-ND	.46	3.91	32.58	195.45/1000	CMD91-21VRC/TR7
	565	Green	Clear	50	2.1	20	L62905CT-ND	.46	3.91	32.58	195.45/1000	CMD91-21VGC/TR7
	585	Yellow	Clear	30	2.0	20	L62907CT-ND	.46	3.91	32.58	195.45/1000	CMD91-21VYC/TR7
	660	Super Red	Clear	170	1.7	20	L62911CT-ND	.58	4.93	41.08	246.45/1000	CMD91-21SRC/TR7
CMD91-21/TR9 Series												
10	640	Red	Clear	80	2.0	20	L63001CT-ND	.46	3.91	32.58	195.45/1000	CMD91-21VRC/TR9
	565	Green	Clear	50	2.1	20	L63005CT-ND	.46	3.91	32.58	195.45/1000	CMD91-21VGC/TR9
	585	Yellow	Clear	30	2.0	20	L63007CT-ND	.46	3.91	32.58	195.45/1000	CMD91-21VYC/TR9
	660	Super Red	Clear	170	1.7	20	L63011CT-ND	.58	4.93	41.08	246.45/1000	CMD91-21SRC/TR9
CMD91-21/TR10 Series												
11	640	Red	Clear	80	2.0	20	L63101CT-ND	.46	3.91	32.58	195.45/1000	CMD91-21VRC/TR10
	565	Green	Clear	50	2.1	20	L63105CT-ND	.46	3.91	32.58	195.45/1000	CMD91-21VGC/TR10
	585	Yellow	Clear	30	2.0	20	L63107CT-ND	.46	3.91	32.58	195.45/1000	CMD91-21VYC/TR10
	660	Super Red	Clear	170	1.7	20	L63111CT-ND	.58	4.93	41.08	246.45/1000	CMD91-21SRC/TR10
CMD93-21/F8 Series												
12	640	Red	Clear	12	2.0	20	L63201CT-ND	.61	5.19	43.28	519.30/2000	CMD93-21VRC/TR8
	570	Green	Clear	25	2.1	20	L63205CT-ND	.61	5.19	43.28	519.30/2000	CMD93-21VGC/TR8
	585	Yellow	Clear	12	2.0	20	L63207CT-ND	.61	5.19	43.28	519.30/2000	CMD93-21VYC/TR8
	660	Super Red	Clear	40	1.7	20	L63211CT-ND	.78	6.71	55.93	671.10/2000	CMD93-21SRC//TR8
CMD93-22/F8 Series												
13	660/570	Red/Grn.	Clear	40.0/20.0	1.7/2.1	20	L632115CT-ND	1.15	9.86	82.15	492.90/1000	CMD93-22SRVGC/TR8
CMD95-21/TR7 Series												
14	640	Red	Clear	25	2.0	20	L63301CT-ND	.46	3.91	32.58	195.45/1000	CMD95-21VRC/TR7
	570	Green	Clear	19.5	2.1	20	L63305CT-ND	.46	3.91	32.58	195.45/1000	CMD95-21VGC/TR7
	585	Yellow	Clear	25	2.0	20	L63307CT-ND	.46	3.91	32.58	195.45/1000	CMD95-21VYC/TR7
	660	Super Red	Clear	100	1.7	20	L63311CT-ND	.58	4.93	41.08	246.45/1000	CMD95-21SRC/TR7
CMD95-21/TR9 Series												
15	640	Red	Clear	25	2.0	20	L63401CT-ND	.46	3.91	32.58	195.45/1000	CMD95-21VRC/TR9
	570	Green	Clear	19.5	2.1	20	L63405CT-ND	.46	3.91	32.58	195.45/1000	CMD95-21VGC/TR9
	585	Yellow	Clear	25	2.0	20	L63407CT-ND	.46	3.91	32.58	195.45/1000	CMD95-21VYC/TR9
	660	Super Red	Clear	100	1.7	20	L63411CT-ND	.58	4.93	41.08	246.45/1000	CMD95-21SRC/TR9
CMD95-21/TR10 Series												
16	640	Red	Clear	25	2.0	20	L63501CT-ND	.46	3.91	32.58	195.45/1000	CMD95-21VRC/TR10
	570	Green	Clear	19.5	2.1	20	L63505CT-ND	.46	3.91	32.58	195.45/1000	CMD95-21VGC/TR10
	585	Yellow	Clear	25	2.0	20	L63507CT-ND	.46	3.91	32.58	195.45/1000	CMD95-21VYC/TR10
	660	Super Red	Clear	100	1.7	20	L63511CT-ND	.58	4.93	41.08	246.45/1000	CMD95-21SRC/TR10

*For Tape & Reel Part No., change CT to TR.

Fig. 1


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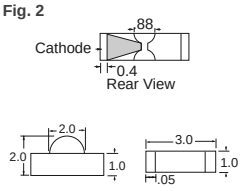

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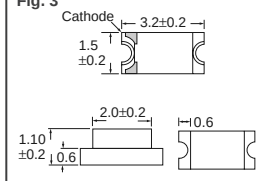

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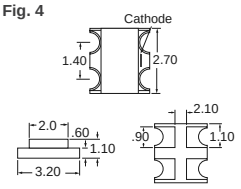

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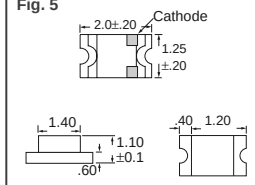

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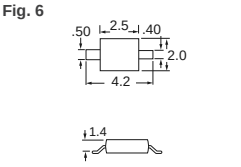

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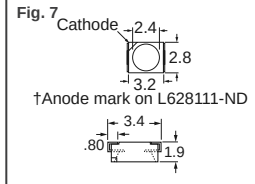

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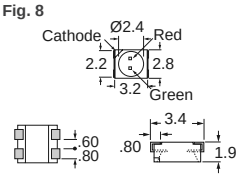

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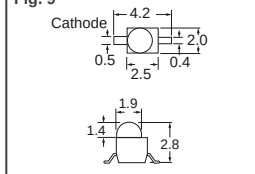

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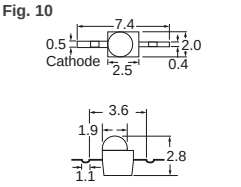

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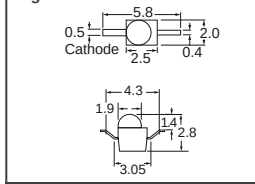

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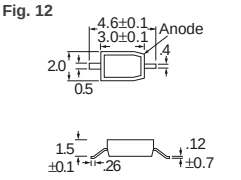

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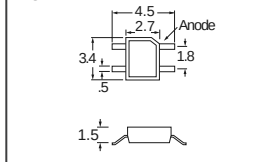

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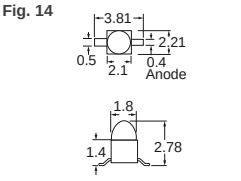

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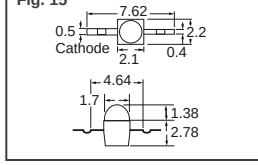

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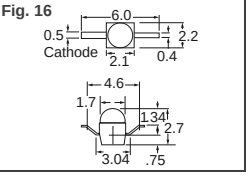


CHICAGO MINIATURE LAMP, INC.
WHERE INNOVATION COMES TO LIGHT

PC Board Mount T-1 LEDs

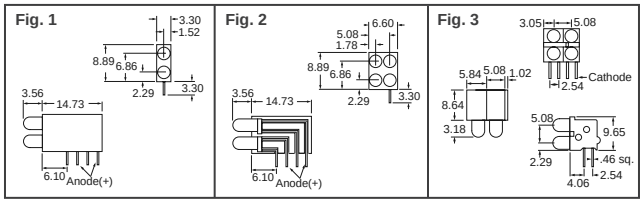
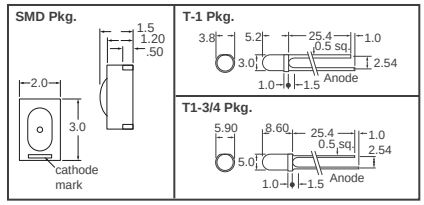


Fig.	Color	Typ. mcd	Forward Voltage mA	Forward Voltage Typ. (V)	Digi-Key Part No.	Pricing 1	Pricing 25	Pricing 100	Chicago Miniature Model No.
1	Red	10.0	10	2.2	L206011-ND	2.58	52.29	151.30	5682F1;1
	Green	8.5	10	2.3	L206055-ND	2.58	52.29	151.30	5682F5;5
	Yellow	10.0	10	2.2	L206077-ND	2.58	52.29	151.30	5682F7;7
2	Red	10.0	10	2.2	L206111-ND	4.81	97.53	282.20	5684F1;1;1;1
	Green	8.5	10	2.3	L206555-ND	4.81	97.53	282.20	5684F5;5;5;5
	Yellow	10.0	10	2.2	L206777-ND	4.81	97.53	282.20	5684F7;7;7;7
3	Red	10.0	10	2.2	L206211-ND	2.61	52.88	153.00	5690F11
	Green	8.5	10	2.3	L206255-ND	2.61	52.88	153.00	5690F55
	Yellow	10.0	10	2.2	L206277-ND	2.61	52.88	153.00	5690F77

Bright•White™ LEDs

- Peak Forward Current: 80mA
- Continuous Forward Current: 25mA
- Emitted Color: White
- Lens Color: Water Clear



Pkg. Type	V_f Typ.	mcd Typ.	I_f Typ.	View Angle	Digi-Key Part No.	Pricing 1	Pricing 10	Pricing 100	Chicago Miniature Part No.
SMD	3.6	75	20	130°	CMD1424WCNCT-ND†	5.64	52.17	468.12	CMD1424WCN
T-1	3.70	1000	20	20°	CMD204UWC-ND *NEW!*	4.02	37.19	333.66	CMD204UWC
T1-3/4	3.75	2300	20	20°	CMD333UWC-ND *NEW!*	4.02	37.19	333.66	CMD333UWC

† Cut Tape Pricing

Circuit Board Indicator

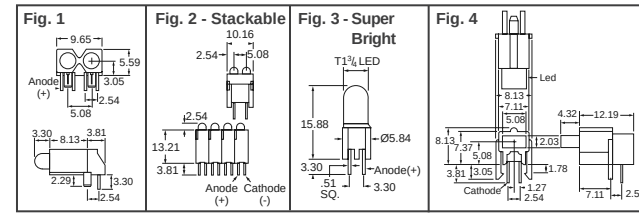


Fig.	Color	Typ. mcd	Forward Voltage mA	Forward Voltage Typ. (V)	Digi-Key Part No.	Pricing 1	Pricing 25	Pricing 100	Chicago Mini. Model No.
1	Red/Red	6.0	10	2.0	L206311-ND	1.74	35.25	102.00	5365F1;1
	Green/Green	12.0	20	2.2	L206355-ND	1.74	35.25	102.00	5365F5;5
	Yellow/Yellow	20.0	20	2.1	L206377-ND	1.74	35.25	102.00	5365F7;7
2	Green/Green	8.5	10	2.3	L206455-ND	1.51	30.55	88.40	6322F55
	Yellow/Yellow	10.0	10	2.2	L206477-ND	1.51	30.55	88.40	6322F77
3	Red	30.0	20	2.0	L20651-ND	.90	18.21	52.70	5340H1
	Green	30.0	20	2.2	L20655-ND	.90	18.21	52.70	5340H5
	Yellow	25.0	20	2.2	L20657-ND	.90	18.21	52.70	5340H7
	Red	2.0	2	1.8	L20661-ND	.99	19.98	57.80	5340H1LC
	Green	2.5	2	1.8	L20665-ND	.99	19.98	57.80	5340H5LC
	Yellow	2.0	2	1.9	L20667-ND	.99	19.98	57.80	5340H7LC
	Red	6.0	10	5.0	L20671-ND	1.10	22.33	64.60	5340H1-5V
	Amber	7.0	10	5.0	L20673-ND	1.10	22.33	64.60	5340H3-5V
	Green	10.0	10	5.0	L20675-ND	1.10	22.33	64.60	5340H5-5V
4	Red	4.0	20	2.0	L20701-ND	1.02	20.56	59.50	5635D1
	Green	4.0	20	2.2	L20705-ND	1.02	20.56	59.50	5635D5
	Yellow	4.0	20	2.1	L20707-ND	1.02	20.56	59.50	5635D7

High Brightness LEDs

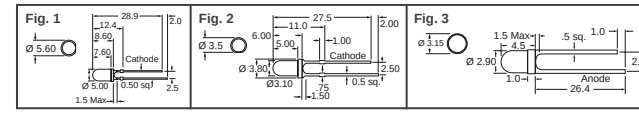


Fig.	Dia. (mm)	Color	Wave-length (nm)	V_f Typ (V)	I_f Typ (mA)	I_V Typ (mcd)	Digi-Key Part No.	Pricing 1	Pricing 10	Pricing 100	Chicago Miniature Part No.
1	5	Blue	470	3.6	20	2000	L12006-ND	5.37	48.80	390.40	CMD1393BCN
1	5	Green	525	3.5	20	6000	L12005-ND	5.37	48.80	390.40	CMD1393GCN
2	3	Blue	470	3.6	20	1000	L13006-ND	5.37	48.80	390.40	CMD1224BCN
2	3	Green	525	3.5	20	3400	L13005-ND	5.37	48.80	390.40	CMD1224GCN
3	3	Blue	430	5	20	250	L14006-ND*	4.14	37.60	300.80	CMD264-UBD

* Blue Diffused Lens

Panasonic®

Designer LEDs

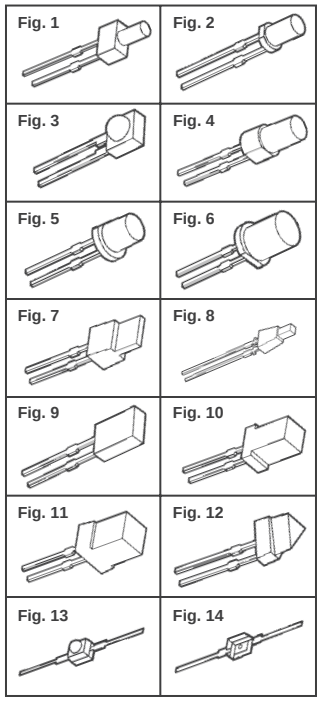


Fig.	Lens Size	Color	Electro-Optical Characteristics (Ta=25°C) P_D (mW)	I_F (mA)	V_R (V)	I_O (mcd)	I_P (nm)	Dimensions (mm) Lens Height	Lead Length	Lead Spacing	Digi-Key Part No.	Pricing 10	Pricing 200	Pricing 1,000	Pricing 5,000	Panasonic Part No.
1	Ø2.0	Red Diffused	70	20	4	1.0	700	8.0	14, 15.5	2.54	P424-ND	2.15	34.51	127.83	118.32/M	LN222RP
	Ø2.0	Green Diffused	90	20	4	1.0	565	8.0	14, 15.5	2.54	P425-ND	2.36	37.91	140.43	129.99/M	LN322GP
	Ø2.0	Amber Diffused	90	20	4	2.5	590	8.0	14, 15.5	2.54	P426-ND	2.75	44.23	163.83	151.65/M	LN422YP
2	Ø2.8	†Red Clear	70	25	4	0.6	700	5.5	15.5, 17.0	2.54	P376-ND	2.15	34.51	127.83	118.32/M	LN263CPP
	Ø2.8	Green Clear	90	30	4	0.8	565	5.5	15.5, 17.0	2.54	P377-ND	2.36	37.91	140.43	129.99/M	LN363GCPP
	Ø2.8	Amber Clear	90	30	4	0.8	590	5.5	15.5, 17.0	2.54	P378-ND	2.75	44.23	163.83	151.65/M	LN463YCPP
	Ø2.8	Orange Clear	90	30	3	1.0	630	5.5	15.5, 17.0	2.54	P379-ND	2.75	44.23	163.83	151.65/M	LN863RCPP
3	Ø3.5	Red Diffused	70	25	4	0.7	700	2.3	12.5, 12.5	2.54	P441-ND	3.14	50.54	187.24	173.31/M	LN25RP
	Ø3.5	Green Diffused	90	30	4	1.2	565	2.3	12.5, 12.5	2.54	P442-ND	3.93	63.18	234.05	216.64/M	LN35GP
	Ø3.5	Amber Diffused	90	30	4	0.8	590	2.3	12.5, 12.5	2.54	P443-ND	3.93	63.18	234.05	216.64/M	LN45YP
	Ø3.5	Orange Diffused	90	30	3	1.5	630	2.3	12.5, 12.5	2.54	P444-ND	3.93	63.18	234.05	216.64/M	LN85RP
4	Ø3.7	Red Diffused	70	25	4	1.0	700	8.65	13.0, 14.5	2.54	P428-ND	2.15	34.51	127.83	118.32/M	LN253RP
	Ø3.7	Green Diffused	90	30	4	3.0	565	8.65	13.0, 14.5	2.54	P429-ND	2.36	37.91	140.43	129.99/M	LN353GP
	Ø3.7	Amber Diffused	90	30	4	3.0	590	8.65	13.0, 14.5	2.54	P430-ND	2.75	44.23	163.83	151.65/M	LN453YP
5	Ø4.4	†Red Clear	70	25	4	2.0	700	5.0	14.5, 16.0	2.54	P431-ND	2.15	34.51	127.83	118.32/M	LN240CP
	Ø4.4	†Green Clear	90	30	4	10.0	565	5.0	14.5, 16.0	2.54	P432-ND	2.36	37.91	140.43	129.99/M	LN340CP
	Ø4.4	Orange/Pink Tint	90	30	3	6.0	630	5.0	14.5, 16.0	2.54	P434-ND	2.75	44.23	163.83	151.65/M	LN840RCP
6	Ø5.0	†Red Clear	70	25	4	0.6	700	6.7	13.3, 14.8	2.54	P380-ND	2.15	34.51	127.83	118.32/M	LN264CP
	Ø5.0	Green Clear	90	30	4	2.0	565	6.7	13.3, 14.8	2.54	P381-ND	2.36	37.91	140.43	129.99/M	LN364GCP
	Ø5.0	Amber Clear	90	30	4	1.0	590	6.7	13.3, 14.8	2.54	P382-ND	2.75	44.23	163.83	151.65/M	LN464YCP
	Ø5.0	Orange Clear	90	30	3	1.0	630	6.7	13.3, 14.8	2.54	P383-ND	2.88	46.35	171.70	158.93/M	LN864RCP
7	□ 1.0x5.0	Red Diffused	70	25	4	0.6	700	8.5	13.0, 14.5	2.54	P315-ND*	2.15	34.51	127.83	118.32/M	LN224RP
	□ 1.0x5.0	Green Diffused	90	30	4	2.5	565	8.5	13.0, 14.5	2.54	P316-ND*	2.36	37.91	140.43	129.99/M	LN324GP
	□ 1.0x5.0	Amber Diffused	90	30	4	2.0	590	8.5	13.0, 14.5	2.54	P317-ND	2.75	44.23	163.83	151.65/M	LN424YP
8	□ 1.8x1.8	Red Diffused	80	25	4	0.5	700	10.0	25.5, 27.0	2.54	P385-ND	2.15	34.51	127.83	118.32/M	LN265RPH
	□ 1.8x1.8	Green Diffused	90	30	4	1.0	565	10.0	25.5, 27.0	2.54	P386-ND	2.36	37.91	140.43	129.99/M	LN365GPH
	□ 1.8x1.8	Amber Diffused	90	30	4	2.5	590	10.0	25.5, 27.0	2.54	P387-ND	2.75	44.23	163.83	151.65/M	LN465YP
9	□ 2.0x5.0	Red Diffused	70	20	4	0.4	700	7.5	14.5, 16.0	2.54	P437-ND	2.15	34.51	127.83	118.32/M	LN242RP
	□ 2.0x5.0	Green Diffused	70	20	4	1.0	565	7.5	14.5, 16.0	2.54	P438-ND	2.36	37.91	140.43	129.99/M	LN342GP
	□ 2.0x5.0	Amber Diffused	90	20	4	2.0	590	7.5	14.5, 16.0	2.54	P439-ND	2.75	44.23	163.83	151.65/M	LN442YP
	□ 2.0x5.0	Orange Diffused	90	30	3	2.5	630	7.5	14.5, 16.0	2.54	P440-ND	3.18	51.03	189.04	174.98/M	LN842RP
10	□ 4.0x4.0	Red Diffused	70	20	4	0.6	700	8.5	13.3, 14.8	2.54	P445-ND	2.15	34.51	127.83	118.32/M	LN252RP
	□ 4.0x4.0	Green Diffused	90	30	4	1.0	565	8.5	13.3, 14.8	2.54	P446-ND	2.36	37.91	140.43	129.99/M	LN352GP
	□ 4.0x4.0	Amber Diffused	90	40	4	1.0	590	8.5	13.3, 14.8	2.54	P447-ND	2.75	44.23	163.83	151.65/M	LN452YP
11	□ 5.0x5.0	Red Diffused	70	30	4	2.0	565	9.0	13.6, 15.1	2.54	P448-ND	2.15	34.51	127.83	118.32/M	LN250RP
	□ 5.0x5.0	Green Diffused	90	30	4	2.0	545	9.0	13.6, 15.1	2.54	P449-ND	2.36	37.91	140.43	129.99/M	LN350GP
	□ 5.0x5.0	Amber Diffused	90	30	4	1.5	590	9.0	13.6, 15.1	2.54	P450-ND	2.75	44.23	163.83	151.65/M	LN450YP
12	Δ 4.0x4.5	Red Diffused	70	25	4	0.4	700	5.5	15.0, 16.5	2.54	P318-ND*	2.15	34.51	127.83	118.32/M	LN212RP
	Δ 4.0x4.5	Green Diffused	90	30	4	1.0	565	5.5	15.0, 16.5	2.54	P319-ND*	2.36	37.91	140.43	129.99/M	LN312GP
13	Ø1.8	Red Diffused	70	25	4	0.7	700	2.8	8.6, 8.6	—	P421-ND	3.72	59.78	221.44	204.98/M	LN247RP
	Ø1.8	Green Diffused	90	30	4	4.5	565	2.8	8.6, 8.6	—	P422-ND	4.23	68.04	252.05	233.31/M	LN347GP
	Ø1.8	Amber Diffused	90	30	4	4.0	590	2.8	8.6, 8.6	—	P423-ND	4.78	76.79	284.46	263.30/M	LN447YP
14	□ 1.7x2.5	†Red Clear	60	20	4	1.5	700	—	8.5 Typ.	—	P417-ND	2.81	45.20	167.43	154.98/M	LN01201C
	□ 1.7x2.5	†Green Clear	60	20	4	10.0	700	—	8.5 Typ.	—	P418-ND	3.21	51.52	190.84	176.65/M	LN01301C
	□ 1.7x2.5	†Amber Clear	60	20	4	5.0	590	—	8.5 Typ.	—	P419-ND	3.42	54.92	203.44	188.31/M	LN01401C
	□ 1.7x2.5	†Orange Clear	60	20	4	8.0	630	—	8.5 Typ.	—	P420-ND	3.42	54.92	203.44	188.31/M	LN01801C

† Water Clear Lens when off

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Fig. 1

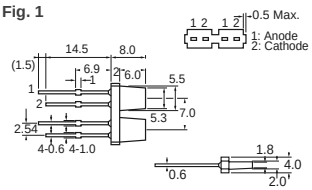


Fig. 2 – 1.75 x 7.0 rectangular

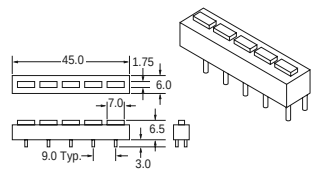


Fig. 3 – 2.8mm round

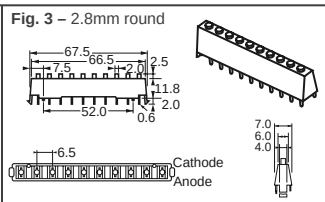


Fig. 4 – T-1 3mm dia.

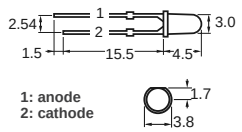


Fig. 5 – T-1¾ 5mm dia.

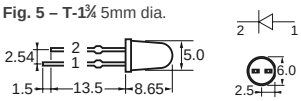


Fig. 6 – T-1¾ 5mm dia.

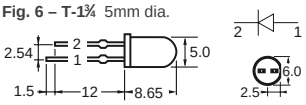


Fig. 7 – T-1¾ 5mm dia.

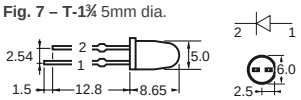


Fig. 8 – T-1¾ 5mm dia.

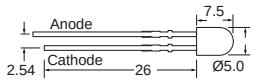


Fig.	Package	Color (Diffused)	IO (mcd @5mA)	PD (mW)	VR (V)	IF (mA)	IO (mcd)	λp (nm)	Lens Size	Lens Height	Dimensions Lead Length	Digi-Key Part No.	Pricing 1	10	200	Panasonic Part No.
			Electro-Optical Characteristics (Ta=25°C)													
1	2 Elements	Red	—	70	4	25	0.6	700	□1.8x5.3	6.0	14.5, 16.0	P516-ND	.50	4.56	78.48	LN02202P
1	2 Elements	Green	—	90	4	30	1.5	565	□1.8x5.3	6.0	14.5, 16.0	P517-ND	.66	5.97	102.63	LN02302P
1	3 Elements	Red	—	70	4	25	0.6	700	□1.8x5.3	6.0	14.5, 16.0	P519-ND	.75	6.83	117.49	LN03202P
1	3 Elements	Green	—	90	4	30	1.5	565	□1.8x5.3	6.0	14.5, 16.0	P520-ND	.98	8.94	153.72	LN03302P
1	3 Elements	Amber	—	90	4	30	1.5	590	□1.8x5.3	6.0	14.5, 16.0	P521-ND	.98	8.94	153.72	LN03402P
1	4 Elements	Red	—	70	4	25	0.6	700	□1.8x5.3	6.0	14.5, 16.0	P522-ND	.91	8.32	143.04	LN04202P
1	4 Elements	Green	—	90	4	30	1.5	565	□1.8x5.3	6.0	14.5, 16.0	P523-ND	1.31	11.91	204.80	LN04302P
1	5 Elements	Red	—	70	4	25	0.6	700	□1.8x5.3	6.0	14.5, 16.0	P525-ND	1.25	11.39	195.98	LN05202P
1	5 Elements	Green	—	90	4	30	1.5	565	□1.8x5.3	6.0	14.5, 16.0	P526-ND	1.64	14.88	255.88	LN05302P
1	5 Elements	Amber	—	90	4	30	1.5	590	□1.8x5.3	6.0	14.5, 16.0	P527-ND	1.64	14.88	255.88	LN05402P
1	6 Elements	Red	—	70	4	25	0.6	700	□1.8x5.3	6.0	14.5, 16.0	P528-ND	1.50	13.66	234.99	LN06202P
1	6 Elements	Green	—	90	4	30	1.5	565	□1.8x5.3	6.0	14.5, 16.0	P529-ND	1.97	17.87	307.43	LN06302P
1	6 Elements	Amber	—	90	4	30	1.5	590	□1.8x5.3	6.0	14.5, 16.0	P530-ND	1.97	17.87	307.43	LN06402P
1	7 Elements	Red	—	70	4	25	0.6	700	□1.8x5.3	6.0	14.5, 16.0	P531-ND	1.75	15.93	274.00	LN07202P
1	7 Elements	Green	—	90	4	30	1.5	565	□1.8x5.3	6.0	14.5, 16.0	P532-ND	2.29	20.84	358.52	LN07302P
1	7 Elements	Amber	—	90	4	30	1.5	590	□1.8x5.3	6.0	14.5, 16.0	P533-ND	2.45	22.25	382.70	LN07402P
2	—	Red	—	70	4	25	0.4	700	□1.75x7.0	7.65	24.1, 25.6, 27.1	P397-ND	1.45	13.15	226.16	LN05201P
2	—	Green	—	90	4	30	1.2	565	□1.75x7.0	7.65	24.1, 25.6, 27.1	P398-ND	2.39	21.75	374.10	LN05301P
3	—	Red	—	70	4	25	1.0	700	Ø2.0	2.5	2.0	P321-ND	3.55	32.25	554.70	LN10204P
3	—	Green	—	90	4	30	1.0	565	Ø2.0	2.5	2.0	P401-ND	3.85	35.00	602.00	LN10304P
							HIGH BRIGHTNESS LEDs									
4	—	Red	6	70	3	30	50	665	Ø3.0	5.0	15.0, 16.5	P403-ND	.39	3.51	60.37	LN28RAL(US)
4	—	Red (White)	14	70	3	30	50	665	Ø3.0	5.0	15.0, 16.5	P404-ND	.39	3.51	60.37	LN28WAL(US)
4	—	† Red	20	70	3	30	85	665	Ø3.0	5.0	15.0, 16.5	P405-ND	.39	3.51	60.37	LN28CAL(US)
5	—	† Red	110	70	3	30	300	665	Ø5.0	8.65	12.0, 13.5	P406-ND	.39	3.51	60.37	LN21CAL(US)-2
6	—	† Red	190	70	3	30	1000	665	Ø5.0	8.65	12.0, 13.5	P407-ND	.69	6.32	108.67	LN21CAL(URS)
6	—	† Red	470	70	3	30	2000	665	Ø5.0	8.65	12.0, 13.5	P408-ND	.96	8.75	150.47	LN261CAL(UR)
7	—	Red	20	70	3	30	200	660	Ø5.0	8.65	12.0, 13.5	P458-ND	.69	6.32	108.67	LN21RUQ
7	—	† Red	20	70	3	30	85	665	Ø5.0	8.65	12.0, 13.5	P410-ND	.39	3.51	60.37	LN21CAL(U)
8	—	Green	—	90	4	30	120	565	Ø5.0	7.5	26, 27.5	P461-ND	.31	2.84	48.76	LNG305CFT

† Nondiffused lens. Water clear lens when off.

Panasonic® Optoelectronics LEDs — Two Color

Fig. 1

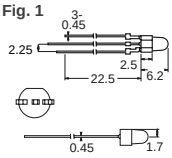


Fig. 2

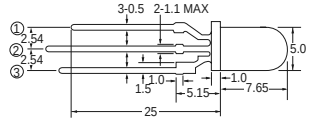


Fig. 3

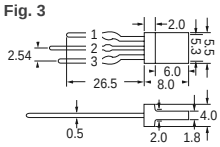


Fig. 4

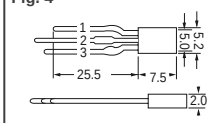


Fig. 5

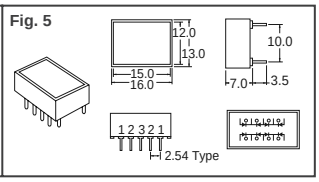
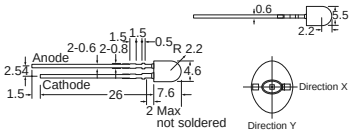


Fig.	Radiation Color/ Lens Color	PD (mW)	IF (mA)	VR (V)	IO (mcd)	λp (nm)	Lens Size	Lead Length	Digi-Key Part No.	Pricing 1	10	200	1,000	Panasonic Part No.
		Electro-Optical Characteristics (Ta=25°C)					Dimensions							
1	*1. Green/3. Orange/White Diffused	90/90	30/30	4/3	8.0/8.0	565/630	Ø3.0	22.5, 24.5, 26.5	P509-ND	.67	6.10	104.95	451.70	LN086WP38
2	*1. Green/3. Red/White Diffused	70	25	4	3.0	700	Ø5.0	24.1, 25.6, 27.1	P391-ND	.59	5.40	92.88	399.74	LN11WP23
	*1. Green/3. Red/Clear	70	25	4	3.0	700	Ø5.0	24.1, 25.6, 27.1	P392-ND	.59	5.40	92.88	399.74	LN11CP23
	*1. Amber/3. Red/White Diffused	70	25	4	3.0	700	Ø5.0	24.1, 25.6, 27.1	P393-ND	.67	6.10	104.95	451.70	LN11WP24
	*1. Amber/3. Green/White Diffused	90	30	4	15.0	565	Ø5.0	24.1, 25.6, 27.1	P395-ND	.67	6.10	104.95	451.70	LN11WP34
	*1. Orange/3. Green/White Diffused	90	30	4	15.0	565	Ø5.0	24.1, 25.6, 27.1	P399-ND	.67	6.10	104.95	451.70	LN11WP38
3	*1. Green/3. Red/White Diffused	70/90	25/30	4/4	.6/4.5	700/565	□1.8x5.3	26.5, 28.0, 29.5	P435-ND	.59	5.40	92.88	399.74	LN117WP23
4	*1. Orange/3. Green/White Diffused	90/90	30/30	4/3	3/2.5	565/630	□2.0x5.0	25.5, 27.0, 28.5	P436-ND	.67	6.10	104.95	451.70	LN142WP38
5	*1. Orange/3. Green/White Diffused	60	20	3	8.0	565	□12.0x15.0	3.5 typ.	P396-ND	3.22	29.24	502.95	2164.57	LN0801WP38

* Common Cathode

Panasonic® Wide Angle LEDs



Color	Io mcd Typ	Io mcd Min	(mA) I_F	VF (V) Max	VF (V) Typ	λp Typ	Δλ Typ	(mA) I_F	IR (μA) Max	IR (V) V_R	Viewing Angle (deg) x	Viewing Angle (deg) y	IFDC Max	IFP* Max	Digi-Key Part No.	Pricing 1	10	200	Panasonic Part No.
Blue	300	120	20	4.0	3.6	450	70	20	10	5	15	35	30	100	P464-ND	3.98	38.12	717.60	LNG995PF9
Red	300	120	20	2.6	1.8	660	20	20	100	3	15	35	30	150	P462-ND	.59	5.40	92.88	LNG295LFCP2U
Green	120	75	20	2.8	2.2	565	30	20	10	4	17	35	30	150	P463-ND	.31	2.84	48.76	LNG395MFTP5U
Blue	370	145	20	4.0	3.5	470	30	20	10	5	15	35	30	100	P468-ND	4.31	40.22	746.94	LNG995PFBW

* The condition of IFP is duty 10%, pulse width 1ms.

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- Super bright and high reliability
- Surface mount technology available
- Wide product range

PRECAUTIONS IN HANDLING:

Soldering condition:
Temperature of pre-heat is 120°C - 150°C, 2-3 minutes. Reflow solder is 235±5 within 5 seconds. (measure the temperature on the surface of PWB).

Cleaning:
The surface of the LED may change when organic solvents such as trichloroethylene and acetone comes in contact with the surface of the LED. Avoid using organic solvents.

Fig. 1 — Leadless-Side View

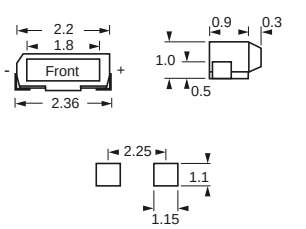

Fig. 2 — Leadless-SS Type

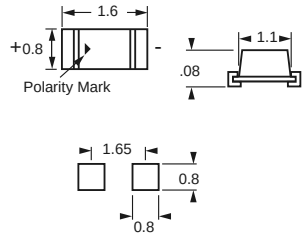

Fig. 3 — Gull Wing-S Type

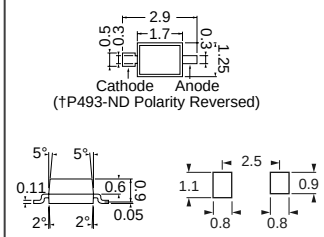

Fig. 4 — Gull Wing-GW Type

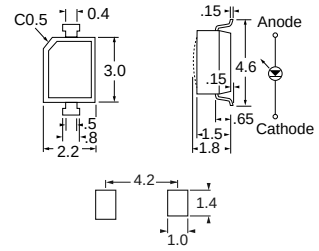

Fig. 5 — J-Lead-S type

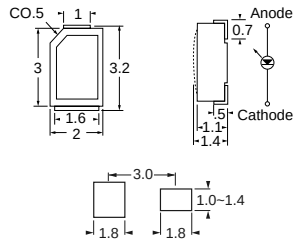

Fig. 6 — Gull Wing-S Type (Bi-Color)

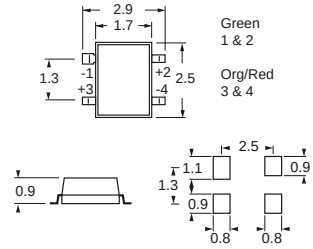

Fig. 7 — Gull Wing-GW Type (Bi-Color)

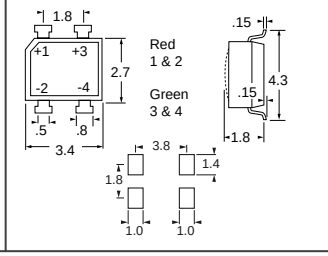

Fig. 8 — Thru-Board Type

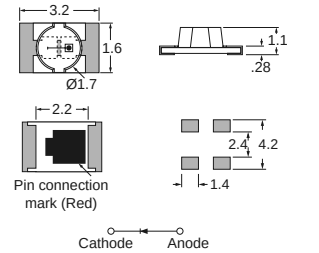

Fig.	Lighting Color	Absolute Maximum Ratings (mW) PD	(mA) IF	(V) VR	(°C) Topr	Io (mcd) Typ.	(mcd) Min.	(mA) IF	VF(V) Typ.	VF(V) Max.	λP Typ.	Cut Tape Digi-Key Part No.	Pricing 1	10	100	Tape & Reel Digi-Key Part No.	Pricing 1,000	2,000	3,000	4,000	6,000	Panasonic Part No.
1	Orange	60	20	3	-25~+80	2.5	.8	10	1.93	2.6	630	P519CT-ND	.40	3.65	33.15	P519TR-ND	—	—	232.00/M	—	212.00/M	LNJ810L6DRA
	High Bright Green	60	20	4	-25~+85	8.0	3.00	10	2.03	2.6	565	P520CT-ND	.40	3.65	33.15	P520TR-ND	—	—	232.00/M	—	212.00/M	LNJ310M6URA
2	Amber	30	10	4	-25~+85	0.9	0.40	5	1.90	2.4	590	P522CT-ND*	.33	3.04	27.62	P522TR-ND	—	—	—	193.00/M	—	LNJ408K8ZRA
	Green	30	10	4	-25~+85	2.1	0.70	5	1.90	2.4	565	P521CT-ND*	.33	3.04	27.62	P521TR-ND	—	—	—	193.00/M	—	LNJ308G8LRA
	Green	50	20	4	-25~+85	5.0	1.80	10	2.03	2.6	565	P525CT-ND	.38	3.47	31.59	P525TR-ND	—	—	—	193.00/M	—	LNJ308G8TRA
	Orange	30	10	3	-25~+85	1.1	0.40	5	1.80	2.4	630	P523CT-ND*	.33	3.04	27.62	P523TR-ND	—	—	—	193.00/M	—	LNJ808R8ERA
	Ultra Bright Red	50	20	3	-25~+85	6.7	2.2	10	1.72	2.5	660	P524CT-ND	.33	3.04	27.62	P524TR-ND	—	—	—	193.00/M	—	LNJ208R8ARA
3	Red	60	20	4	-25~+85	0.4	0.15	10	2.03	2.6	700	P490CT-ND	—	3.09	28.08	P490TR-ND	—	—	—	—	180.00/M	LN1271R-(TR)
	Amber	30	10	4	-30~+85	1.0	.4	5	1.9	2.4	590	P517CT-ND*	.34	3.09	28.08	P517TR-ND	—	—	—	—	197.00/M	LN1471SY-(TR)
	Green	30	10	4	-30~+85	2.0	.7	5	1.9	2.4	565	P516CT-ND*	.34	3.09	28.08	P516TR-ND	—	—	—	—	197.00/M	LN1371SG-(TR)
	Green	60	20	4	-25~+85	2.6	0.90	10	2.03	2.6	565	P491CT-ND	—	3.09	28.08	P491TR-ND	—	—	—	—	180.00/M	LN1371G-(TR)
	Orange	30	10	3	-30~+85	1.0	.4	5	1.8	2.4	630	P518CT-ND*	.34	3.09	28.08	P518TR-ND	—	—	—	—	197.00/M	LN1871SR-(TR)
	Ultra Bright Red	60	20	3	-25~+85	5.0	1.70	10	1.72	2.5	660	P493CT-ND†	—	4.05	36.83	P493TR-ND	—	—	—	—	236.00/M	LN1271RAL-(TR)
	High Bright Green	60	20	4	-25~+85	5.0	3.00	10	2.03	2.6	565	P494CT-ND	—	3.24	29.47	P494TR-ND	—	—	—	—	189.00/M	LN1371-G(H)-6U(TR)
	Soft Orange	60	20	3	-25~+85	0.8	0.30	10	1.93	2.6	610	P492CT-ND	—	3.27	29.70	P492TR-ND	—	—	—	—	190.00/M	LN1871Y5-(TR)
4	Red	60	20	4	-25~+80	1.4	0.50	15	2.20	2.8	700	P503CT-ND	.34	3.09	28.08	P503TR-ND	—	197.00/M	—	—	180.00/M	LN1261C-(TR)
	Amber	60	20	4	-25~+80	4.5	1.60	20	2.20	2.8	590	P512CT-ND	.34	3.09	28.08	P512TR-ND	—	197.00/M	—	—	180.00/M	LN1461C-(TR)
	Green	60	20	4	-25~+80	7.5	2.80	20	2.20	2.8	565	P504CT-ND	.34	3.09	28.08	P504TR-ND	—	197.00/M	—	—	180.00/M	LN1361C-(TR)
	Green	60	20	4	-25~+80	15	8	20	2.2	2.8	565	P514CT-ND	.38	3.47	31.59	P514TR-ND	—	221.00/M	—	—	202.00/M	LN1361C(UY)-(TR)
	Orange	60	20	3	-25~+80	5.0	1.90	20	2.10	2.8	630	P505CT-ND	.34	3.09	28.08	P505TR-ND	—	197.00/M	—	—	180.00/M	LN1861C-(TR)
	Ultra Bright Red	50	20	3	-25~+80	12.0	5.00	20	1.80	2.6	660	P513CT-ND	.44	4.05	36.83	P513TR-ND	—	258.00/M	—	—	236.00/M	LN1261CAL-(TR)
5	Red	45	15	4	-25~+80	1.2	0.45	10	2.10	2.8	700	P500CT-ND	.34	3.09	28.08	P500TR-ND	—	—	197.00/M	—	180.00/M	LN1251C-(TR)
	Amber	45	15	4	-25~+80	2.2	0.80	10	2.10	2.8	590	P511CT-ND	.34	3.09	28.08	P511TR-ND	—	—	197.00/M	—	180.00/M	LN1451C-(TR)
	Green	45	15	4	-25~+80	5.0	1.90	10	2.10	2.8	565	P501CT-ND	.34	3.09	28.08	P501TR-ND	—	—	197.00/M	—	180.00/M	LN1351C-(TR)
	Orange	45	15	3	-25~+80	3.5	1.30	10	.05	2.8	630	P502CT-ND	.34	3.09	28.08	P502TR-ND	—	—	197.00/M	—	180.00/M	LN1851C-(TR)
6	Ultra Bright Red	60	20	3	-25~+85	5.0	1.70	10	1.72	2.5	660	P526CT-ND	.76	6.95	63.18	P526TR-ND	—	—	442.00/M	—	404.00/M	LNJ107W5PRW
	High Bright Green	60	20	4	-25~+85	5.0	3.00	10	2.03	2.6	565											
6	Green	60	20	4	-25~+85	2.6	0.90	10	2.03	2.6	565	P515CT-ND	.76	6.95	63.18	P515TR-ND	—	—	442.00/M	—	404.00/M	LNJ107W5ARA1
	Orange	60	20	3	-25~+85	1.0	0.40	10	1.93	2.6	630											
7	Red	45	15	3	-25~+80	1.8	0.65	10	2.00	2.8	650	P507CT-ND	.76	6.95	63.18	P507TR-ND	442.00	—	—	—	—	LN2162C13-(TR)
	Green	45	15	4	-25~+80	4.0	1.50	10	2.05	2.8	565											
8	High Bright Green	60	20	4	-30~+85	5.5	1.8	10	2.03	2.6	565	P540CT-ND	.33	3.04	27.62	P540TR-ND	—	—	193.00/M	—	177.00/M	LNJ311G8TRU
	High Bright Red	60	20	3	-30~+85	7.0	2.3	10	1.72	2.5	660	P541CT-ND	.33	3.04	27.62	P541TR-ND	—	—	193.00/M	—	177.00/M	LNJ211R8ARU

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April - June, 1999

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Fax: 218-681-3380
Email: webmaster@digikey.com