

SECTION 19

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In the Transistor Section of the Supplement Catalog 7, you will find the following information:

- Optoelectronic Devices - Application Notes
 - LED Spectrums
 - LED's and Photometry
 - Application to light emitting diodes

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OPTOISOLATORS

Resistance		Source	Detector	Typical Fall Time (ms)	Maximum Voltage (V)	Power Dissipation (mW)	Isolation Steady State (VRMS)	Mfr Number	Part Number	Figure ^a	Codes ^b			Other
On Max	Off Min										ND	Cost	ST	
30 Ω	1 MΩ	Tung.	Photocell	180. Max	100	65	900	CLM 4012A	307-0338-00	1			OB	
100 Ω	400 kΩ	LED	Photocell	1,500. Max	70	100	500	VTL2C4	307-0476-00	5		5.220	CR	
500 Ω	100 MΩ	LED	Photocell	500. Max	100	100	500	VTL2C2	307-1025-00	5		4.870	CS	
140 Ω	400 kΩ	LED	Photocell	700.	70	175	900	21L478	307-0700-00	12		3.450	CR	
Reflective Sensor		LED	Transistor	.01	30	75		OPB706A	156-1217-00	9		1.140	CR	
		LED	Transistor	.002	30	150	1,060	H11AX881	156-0109-00	2A		.380	CR	
		LED	Transistor	.003	30	250	1,500	4N27	156-0399-00	2A		.370	CR	
		LED	Transistor	300. ns	30	200	1,060	MCT-2	156-0109-01	2A			NP	
		LED	Transistor	.011	30	150	1,500	4N26	156-0907-00	2A		.250	CR	
		LED	Transistor	.007	30	150	3,000	H11AX861	156-0885-00	2A		.410	CR	Safety Controlled
		LED	Selected	.007	30	150	3,000	MOC1005	156-0885-01	2A			NP	Safety Controlled
		LED	Transistor	.007	30	300	3,000	H11AX940	156-0885-02	2A		.720	CR	
		LED	Transistor	.02	30	150		H11AX861	156-0885-05			.420	CR	Safety Controlled
		LED	Transistor	.01 Max	30	100		OPB866	156-1237-00	4		10.550	CR	
		LED	Transistor	.01	30	150		H21A2	156-1237-01	4		1.240	CS	
		LED	Darlington	.15	25	50		K2136	156-0417-01	4		3.200	CS	
Switch		LED	Diode	.0008	15	100	1,000	6N136	156-1162-00	3B		1.790	CR	
		LED	Darlington	.600	30	150		MCA7	156-1148-00	8		2.800	CS	
		LED	SCR		400	400	2,500	H11CX604	156-1238-00	2C		1.140	CR	Safety Controlled
		LED	Transistor	.003	35 Min	300		4N22	156-0283-00	15		2.890	CR	
		LED	Triac Dvr		115 AC	300	4,500	MOC3010	156-1317-00	2D		.490	CS	Safety Controlled
		LED	Triac Dvr		115 AC	300	4,500	MOC3020	156-1317-01	2D		.150	CR	
		LED	Transistor		70	300	3,750	H11AVX-535	156-1689-00	2A		1.330	CR	
		LED	Transistor	25.	7	85	3,000	6N137	156-1384-01	3A		6.000	CS	
		LED	Transistor	100. ns	6	100	1,500	H11L3	156-1384-02	2F		1.750	CR	
		LED	Transistor	.05	55	150		H22A5	156-1440-00	10		1.650	CR	
		LED	Transistor	30. ns	7	40	1,000	HCPL2601	156-1522-00	3A		3/0800	CR	Schmitt
		LED	Darlington		30	150	3,750	4N29A	156-1562-00	2E		.450	CR	Safety Controlled
		LED	Transistor	.015 Max	30	300	1,060	H11F1	156-1491-00	2B		1.450	CR	
		LED	Transistor	.006	55	150		CLA605A	156-1977-00	1		5.960	CR	Screened Matched Pair
		LED	Transistor		30	150		CLA605	156-1977-01	1			NP	Safety Controlled
		LED	Transistor		30	50		21L671	156-2219-00	4		2.520	CR	Scrnd Matched Pair
		LED	Transistor		30	50		21L671	156-2219-01	4		2.910	CR	With 15 Inch Leads
		LED	Transistor	1.7 μs	32	120	10 kV	K129P	156-2474-00	2A		2.680	CR	With 22 Inch Leads
		LED	Transistor	.02	30	300		MOC811	156-2627-00	2A			OB	
		LED	Transistor	.003	10 k	50	10 kV	OPI1264	156-0430-00	20		1.460	CS	Safety Controlled
		LED	Transistor		30	50		21L671	156-2219-00	4		2.520	CR	With 15 Inch Leads
		LED	Transistor		30	50		21L671	156-2219-01	4		2.910	CR	With 22 Inch Leads
		LED	Transistor	1.7 μs	32	120	10 kV	K129P	156-2474-00	2A		2.680	CR	With 22 Inch Leads
		LED	Transistor	.02	30	300		MOC811	156-2627-00	2A			OB	
		LED	Transistor	.003	10 k	50	10 kV	OPI1264	156-0430-00	20		1.460	CS	Safety Controlled
		LED	Transistor		30	50		21L671	156-2219-00	4		2.520	CR	With 15 Inch Leads
		LED	Transistor		30	50		21L671	156-2219-01	4		2.910	CR	With 22 Inch Leads
		LED	Transistor	1.7 μs	32	120	10 kV	K129P	156-2474-00	2A		2.680	CR	With 22 Inch Leads
		LED	Transistor	.02	30	300		MOC811	156-2627-00	2A			OB	
		LED	Transistor	.003	10 k	50	10 kV	OPI1264	156-0430-00	20		1.460	CS	Safety Controlled
		LED	Transistor		30	50		21L671	156-2219-00	4		2.520	CR	With 15 Inch Leads
		LED	Transistor		30	50		21L671	156-2219-01	4		2.910	CR	With 22 Inch Leads
		LED	Transistor	1.7 μs	32	120	10 kV	K129P	156-2474-00	2A		2.680	CR	With 22 Inch Leads
		LED	Transistor	.02	30	300		MOC811	156-2627-00	2A			OB	
		LED	Transistor	.003	10 k	50	10 kV	OPI1264	156-0430-00	20		1.460	CS	Safety Controlled
		LED	Transistor		30	50		21L671	156-2219-00	4		2.520	CR	With 15 Inch Leads
		LED	Transistor		30	50		21L671	156-2219-01	4		2.910	CR	With 22 Inch Leads
		LED	Transistor	1.7 μs	32	120	10 kV	K129P	156-2474-00	2A		2.680	CR	With 22 Inch Leads
		LED	Transistor	.02	30	300		MOC811	156-2627-00	2A			OB	
		LED	Transistor	.003	10 k	50	10 kV	OPI1264	156-0430-00	20		1.460	CS	Safety Controlled
		LED	Transistor		30	50		21L671	156-2219-00	4		2.520	CR	With 15 Inch Leads
		LED	Transistor		30	50		21L671	156-2219-01	4		2.910	CR	With 22 Inch Leads
		LED	Transistor	1.7 μs	32	120	10 kV	K129P	156-2474-00	2A		2.680	CR	With 22 Inch Leads
		LED	Transistor	.02	30	300		MOC811	156-2627-00	2A			OB	
		LED	Transistor	.003	10 k	50	10 kV	OPI1264	156-0430-00	20		1.460	CS	Safety Controlled
		LED	Transistor		30	50		21L671	156-2219-00	4		2.520	CR	With 15 Inch Leads
		LED	Transistor		30	50		21L671	156-2219-01	4		2.910	CR	With 22 Inch Leads
		LED	Transistor	1.7 μs	32	120	10 kV	K129P	156-2474-00	2A		2.680	CR	With 22 Inch Leads
		LED	Transistor	.02	30	300		MOC811	156-2627-00	2A			OB	
		LED	Transistor	.003	10 k	50	10 kV	OPI1264	156-0430-00	20		1.460	CS	Safety Controlled
		LED	Transistor		30	50		21L671	156-2219-00	4		2.520	CR	With 15 Inch Leads
		LED	Transistor		30	50		21L671	156-2219-01	4		2.910	CR	With 22 Inch Leads
		LED	Transistor	1.7 μs	32	120	10 kV	K129P	156-2474-00	2A		2.680	CR	With 22 Inch Leads
		LED	Transistor	.02	30	300		MOC811	156-2627-00	2A			OB	
		LED	Transistor	.003	10 k	50	10 kV	OPI1264	156-0430-00	20		1.460	CS	Safety Controlled
		LED	Transistor		30	50		21L671	156-2219-00	4		2.520	CR	With 15 Inch Leads
		LED	Transistor		30	50		21L671	156-2219-01	4		2.910	CR	With 22 Inch Leads
		LED	Transistor	1.7 μs	32	120	10 kV	K129P	156-2474-00	2A		2.680	CR	With 22 Inch Leads
		LED	Transistor	.02	30	300		MOC811	156-2627-00	2A			OB	
		LED	Transistor	.003	10 k	50	10 kV	OPI1264	156-0430-00	20		1.460	CS	Safety Controlled
		LED	Transistor		30	50		21L671	156-2219-00	4		2.520	CR	With 15 Inch Leads
		LED	Transistor		30	50		21L671	156-2219-01	4		2.910	CR	With 22 Inch Leads
		LED	Transistor	1.7 μs	32	120	10 kV	K129P	156-2474-00	2A		2.680	CR	With 22 Inch Leads
		LED	Transistor	.02	30	300		MOC811	156-2627-00	2A			OB	
		LED	Transistor	.003	10 k	50	10 kV	OPI1264	156-0430-00	20		1.460	CS	Safety Controlled
		LED	Transistor		30	50		21L671	156-2219-00	4		2.520	CR	With 15 Inch Leads
		LED	Transistor		30	50		21L671	156-2219-01	4		2.910	CR	With 22 Inch Leads
		LED	Transistor	1.7 μs	32	120	10 kV	K129P	156-2474-00	2A		2.680	CR	With 22 Inch Leads
		LED	Transistor	.02	30	300		MOC811	156-2627-00	2A			OB	
		LED	Transistor	.003	10 k	50	10 kV	OPI1264	156-0430-00	20		1.460	CS	Safety Controlled
		LED	Transistor		30	50		21L671	156-2219-00	4		2.520	CR	With 15 Inch Leads
		LED	Transistor		30	50		21L671	156-2219-01	4		2.910	CR	With 22 Inch Leads
		LED	Transistor	1.7 μs	32	120	10 kV	K129P	156-2474-00	2A		2.680	CR	With 22 Inch Leads
		LED	Transistor	.02	30	300		MOC811	156-2627-00	2A			OB	
		LED	Transistor	.003	10 k	50	10 kV	OPI1264	156-0430-00	20		1.460	CS	Safety Controlled
		LED	Transistor		30	50		21L671	156-2219-00	4		2.520	CR	With 15 Inch Leads
		LED	Transistor		30	50		21L671	156-2219-01	4		2.910	CR	With 22 Inch Leads
		LED	Transistor	1.7 μs	32	120	1							

PHOTODETECTORS

Type	Description	Typical Rise Time	Maximum Voltage (V)	Maximum Power Dissipation (mW)	Case (Similar)	Mfr Number	Part Number	Figure ^a	Codes ^b			Other												
									ND	Cost	ST													
Photoresistor	Resistance		Peak Spectral	430 ms 50 ms	100 100	50 50	TO-18 TO-18	CL1352 CL903L	307-0230-00 307-0268-00	16 16	2.090	CR OB												
	On	Off												6900 ° 7350 °										
	2 kΩ 6 kΩ	1.3 MΩ 40. MΩ																						
Photodiode	Avalanche		.5 ns	225 Typ 40 700 Typ 120	100	TO-18 WS WS	C30921E FPD13R12WS FPD13R12WS	152-0792-00 152-0898-00 152-0888-00	11 19 19	A	65.000 137.000 137.000	CR CR CR	Selected											
	Pin													.45 ns	30 Min 20 Min	TO-52 TO-52	PIN6236 GMP405	152-0965-00 152-1012-00	20 20	22.000 50.507	CR CR	Hi Speed Hi Speed		
	Pin, Germanium		1. ns																					
	Photocurrent												2.8 μs 2.8 μs 18 μs 18 μs	30 30 20 20	200 200 200 200	TO-106 TO-18 TO-18 TO-18	FPT 100A FPT 100B FPT 5122 FPT 5122	151-0252-00 151-0252-01 151-0313-00 151-0313-01	7 7 7 7	U U		.760 1.030 2.350 8.478	CR CR CR CR	w/Holder, Wire & Connector
	.6 mA Min GaAs Source ^c																							
.6 mA Min GaAs Source ^c																								
.6 mA Min GaAs Source ^d																								
Phototransistor	.6 mA Min GaAs Source ^d		18 μs 18 μs 2.8 μs 10 μs 10 μs	20 15 30 30 30	200 200 200 150 100	TO-18 TO-18 TO-18 MRD701 PH108A-T	FPT 220 FPT 120A FPT 110	151-0628-00 151-0648-00 151-0629-00	7 7 7		1.490 1.150 .900	LR LS CR	Tape & Ammo Pack Tape & Ammo Pack Tape & Ammo Pack											
	.7 mA Min GaAs Source ^c																							
	1.1 mA Min GaAs Source ^d																							
	.6 mA Min GaAs Source ^c																							
	.1 mA Min GaAs Source ^c																							
	.3 mA Min GaAs Source ^c																							

INFRARED EMITTERS

Manufacturer Part Number	Main Spectrum Line (nm)	I Max (mA)	Power Out (α = 1)		Figure ^a	Part Number	Codes ^b			Other
			(mW) Min	(mA)			ND	Cost	ST	
LED-56	940	100	1.5	100	6	152-0621-00	A	.920	CR	
TIL38	940	150	6.	100	14	150-1092-00			DL	
SPX3188-004	820	150	1.	100	13	150-1104-00		29.000	CR	Flange Mount Pack Tape & Ammo Pack Taped & Reeled
MLED71	940	50	2.	50	17	150-1153-00			NP	
SE308T	940	50	.5	20	18	150-1168-00		.200	CR	

^a For Optoelectronic Device Illustrations see tab marked OPTOELECTRONIC DEVICE ILLUSTRATIONS in the back of this catalog.

^b The nominal price (at time of printing) is listed in the cost column. For ND Codes (New Design Recommendations) and Status Codes, see tab marked CODES in the back of this catalog.

^c Photocurrent measured with $V_{ce} = 5$ V, 5 mW/cm² source.

^d Photocurrent measured with $V_{ce} = 5$ V, 1 mW/cm² source.

OPTOELECTRIC DEVICES

PHOTO DIODES

Part Number	Codes ^a		JEDEC or Mfr Number	Description
	Cost	ST		
152-0003-00		DL		Diode
152-0273-00		DL		Tab, Lead Spider, Diode
152-0548-00		NP		Ph Si, 200. V
152-0548-01		OB		Ph Si, Potted
152-0548-02		OB		Ph Si, with Filter
152-0548-03		OB		Ph Si, 200. V, Potted
152-0549-00		NP		Ph Si, 200. V, 1%, with Filter
152-0549-01		NP		Ph Si, 200. V, 1%, Potted
152-0549-02	141.611	CR		Ph Si, 200. V, 1%, Potted with Filter
152-0549-03		DL		Ph Si, 200. V, 1%, Potted with Filter
152-0550-00		NP		Ph Si, 200. V, 2%, with Filter
152-0550-01	144.025	CR		Ph Si, 200. V, 2%, Potted
152-0550-02		DL		Ph Si, 200. V, 2%, Potted with Filter
152-0550-04		DL		Ph Si, 200. V, 2%, Potted
152-0550-05		DL		Ph Si, 200. V, 2%, Potted with Filter
152-0550-06		CR		Ph Si, 200. V, 2%, Potted
152-0558-01	82.323	CR		Photo-optic, Potted
152-0558-02		DL		Photo-optic, Potted
152-0564-00	13.480	CR	21D17	Ph, 20. Sq mm
152-0569-00	36.700	CR	100B	Ph Si, 1. Sq cm
152-0569-01		DL		Ph Si, Selected
152-0570-00		DL	100B	Ph Si, 1. Sq cm
152-0588-00		OB		Ph, PD10 with Holder
152-0620-00		NP		Photometric, 1%, CIE Filter
152-0620-01	147.631	CR		Photometric, 1%, CIE Filter
152-0620-02		DL		Photometric, 1%, CIE Filter
152-0632-00	101.289	CR		Ph, 20. Sq mm with Holder
152-0632-01		DL		Ph 20. Sq mm with Holder
152-0677-00		DL		Ph WPN, .1 W

^a The nominal price (at time of printing) is listed in the cost column. For Status Codes, see tab marked CODES in the back of this catalog.

LED LAMPS

Color	Manufacturer Part Number	Main Spectrum Line (nm)	I Max (mA)	Typical Intensity @ I		LED Lamp Illustrations ^a						Lens ^b	Part Number	Codes ^c			Other	
				(mcd)	(mA)	Fig	A Max	B Min	C Max	D Nom	E Nom			ND	Cost	ST		
Red	HLMP-2350	626.	25.	45.	20.	13	.800		.195	.245 Max			150-1232-00	A		EN	Light Bar	
Red	HLMP2300	626.	90.	23.	20.	8	.195	.150	.400	.150	.100	U, C	150-1188-00	X	.790	CR	2 LED's	
Red	MV50	630/660.	40.	1.4	20.	1	.110	.250					150-1000-00		.110	CR	Green Mark Denotes Cathode	
Red	HLMP-6320	635.	20.	3.	10.	7	.115	.450	.075	.080			150-1040-04		4.169	CR	With Holder, Wire, Connector & Housing	
Red	MV5774C	635.	35.	5.	20.	2	.190	.600	.160	.020	.055	R, D	150-1043-00		.130	CR		
Red	HLMP-3316	635.	25.	30.	10.	2	.337	1.000	.240	.030	.100	R, C	150-1059-00		.200	CR		
Red	HLMP-1301	635.	10.	2.	10.	2	.210	.560	.135	.090	.095	R, D	150-1061-00	A	.160	CR		
Red	HLMP-1301	635.	30.	2.5	10.	2	.145	.950	.135	.040	.100	R, D	150-1061-02	A	.160	CR	Hewlett-Packard Only	
Red	HLMP6320	635.	20.	3.	10.	7	.115	.300	.075	.080		R, D	150-1068-00	U	.200	CR		
Red	MV57124	635.	35.	4.	20.	8	.275	.800	.250	.150	.100	R, D	150-1070-00		1.320	CR	Rectangular	
Red	HLMP-5030	635.	25.	6.	10.	9	.247	.145	.185	.355	.100	R, D	150-1090-00	A	.270	CR	Right Angle, PCB Mount	
Red	HLMP-2620	635.	30.	10.	20.	13	.800	.160	.400	.245	.300		150-1112-00		1.550	CR	4 Element Light Bar	
Red	MV57642	635.	30.	3.5	10.	2	.145	1.000	.135	.040	.100	R, D	150-1115-00			DL		
Red	CMD57642-850	635.	30.	3.5	20.	2	.145	1.000	.135	.040	.100	R, D	150-1118-00		.380	CR	With Spacer	
Red	HLMP-0301	635.	30.	5.	20.	14	.315	1.000	.295	.095	.100		150-1126-00	U		DL		
Red	HLMP-3366	635.	25.	18.	10.	2	.195	1.000	.240	.060	.100		150-1133-00		.470	CR	Low Profile	
Red	HLMP-0300	635.	25.	2.5	20.	14	.315	1.000	.295	.095	.100		150-1138-00		.280	CR	Rectangular	
Red	HLMP-1600	635.	15.	4.	5 V	2	.135	.158	.135	.040	.100		150-1152-00		.310	CR	Tape & Reel	
Red	OPT 002																	
Red	HLMP-1302	635.	25.	4.	10.	2	.145		.135	.040	.100	R, D	150-1171-00		.350	CR	Tape & Reel	
Red	HLMP-2620	635.	30.	25.	20.	13		.160	.400		.300		150-1172-00			DL	4 LED's	
Red	HLMP-1350	635.	25.	2.	10.	2		.950	.130		.100		150-1183-00		.210	CS	Low Profile	
Red	L613DR	635.	20.	4.	20.	6	.345			.280	.090		150-1184-00		.510	CR	Right Angle	
Red	PC080-R2	635.	25.	6.	20.	3	.250	1.250	.200	.096	.100		150-1200-00	A	.620	CR	Right Angle	
Red	HLMP-2316	635.	20.	23.	20.	15	.400	.162	.195	.245	.100		150-1210-00	A	.720	CR	4 Element Light Bar	
Red	HLMP-1340	635.	25.	35.	20.	2	.135	.950	.125	.040	.100		150-1238-00	A		PP	Tape & Reel	
Red	ESBR5731	635/660.	50.	30.	20.	2	.338	1.000	.240	.030	.100	R	150-1095-01		.600	CR		
Red	HLMP-3301	635/660.	25.	7.	10.	2	.313	.630	.240	.030	.100	R	150-1095-00			OB		
Red	SP830719	650.	4.	.7 Min	5 V	3	.250	.100	.200	.096	.100	R, D	150-1020-00		.650	CR		
Red	TIL209A	650.	40.	.5 Min	20.	2	.170	.500	.160	.040	.050	R, D	150-1031-00		.210	CR		
Red	LL201R	650.	40.	1.5	20.	2	.170	.500	.160	.040	.100	R, D	150-1077-00	U	.090	CR		
Red	5321F-1	650.	40.	1.5	20.	11	.150	.540	.190	.190			150-1107-00		1.120	CR	With Holder, Right Angle	
Red	HLMP-3200	655.	50.	1.2	20.	2	.195	1.000	.240	.060	.100	R, D	150-1001-01		.190	CR		
Red	HLMP-300	655.	50.	2.	20.	2	.327	.900	.240	.030	.100	R, D	150-1001-02		.220	CR	With Mounting Hardware	
Red	559-0101-824	655.	50.	.8 Min	20.	4	.625	.250	.281	.210	.125	R, D	150-1052-00		.820	CR		
Red	HDSP-4820	655.	25.	.88	20.	13	1.000	.160	.400	.200	.300	R	150-1083-00		1.800	CR	10 Element Bar Graph	
Red	558-0101-808	655.	50.	.8	20.	4	.468	6.000 Typ	.190	.188	.100	R, D	150-1093-00	U	.740	CR	With Connector, Black Lead Cathode	
Red	558-0101-804	655.	50.	.8	20.	4	.695	8.000	.190	.188	.100	R, D	150-1093-01	U	1.000	CR	With 2 Berg Connectors	
Red	558-0101-803	655.	50.	.8	20.	4	.468	6.000 Typ	.190	.188	.100	R, D	150-1093-02		1.970	CR	With Berg Connectors	
Red	249-7868-3731-504	655.	35.	.8	20.	12	.875	.187	.312				150-1108-00			OB	Panel Mount, With Hardware	
Red	5082-7433	655.	50.	.04	5.	10	.605	.150	.160	.250		R	150-1124-00		4.300	CR	3 Digit	
Red	MV5024	660.	100.	3.	20.	2	.300	.530	.230	.040	.100	R, D	150-1001-00		.130	CR		
Red	IV5054-1	660.	100.	2.	10.	2	.300	.750	.230	.040	.100	R, D	150-1014-00		.090	CR	With Mounting Hardware	
Red	TIL209A	660.	50.	2.5	20.	2	.190	.600	.160	.020	.055	R, D	150-1036-00		.150	CR		
Red	SBR3931	660.	30.	3.	10.	2	.177	.630	.150	.039	.098	R, D	150-1061-01		.290	CR	Stanley Electric Only	
Red	MU04-2101	660.	30.	32.	20.	8	.800	.160	.290	.280			150-1170-00		1.190	CR	3 LED's	
Red	MMH321V	660.	70.		20.	2	.175	.950	.135	.040	.100		150-1026-00		.150	LR	DIE Chip	
Red		629.	7.			2	.175	.950	.135	.040	.100		150-1147-00		.370	CR		
Red	LDR-468	665.	35.	.5 Min	20.	10	.820	.118	.087	.087		R, D	150-1106-00		1.390	CR	In-line Package	

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LED LAMPS (cont)

Color	Manufacturer Part Number	Main Spectrum Line (nm)	I Max (mA)	Typical Intensity @ I		LED Lamp Illustrations ^a						Lens ^b	Part Number	Codes ^c			Other
				(mcd)	(mA)	Fig	A Max	B Min	C Max	D Nom	E Nom			ND	Cost	ST	
Red	HLMP6300-101	655.	30.	3.	10.	3	.250	.135	.195	.096	.100	R, D	150-1197-00	U	.450	CR	Right Angle
Red	LLL-7A	690.	40.	1.	5.	2	.125	.450	.125	.030	.050		150-1040-00				
Red	LLL-7A	690.	40.	1.	5.	2	.125		.125		.125	R, D	150-1040-01			NP	With Wire, Connector, Holder & Housing
Red/Grn	XC5491	565/697.	25.	1.8	10.	2	.310	.900	.240	.050	.100	C, D	150-1091-00			OB	Tri-State, Flat Side Green Cathode
Red/Grn	XC5491	565/635.	15.	1.5	15.	5	.154	.610	.201		.100		150-1248-00		.390	EN	
Red/Grn	QEC-220-CRG	565/695.	15/30.	1.5	20.	5	.300	.590	.196	.040	.100	C, D	150-1049-00		.670	CR	Tri-State
Red/Grn	QDSP-8838	626/635.	150.	175.	110.							C	150-1181-00		26.000	CR	10'1 Bar Graph Array
Orange	HLMP-7400	612.	30.	4.8	20.	8	.265	.200	.245	.145	.100		150-1195-00		.520	CR	
Org/Grn	CQX95	630/560.	30.	6.	20.	5	.299	.906	.230	.040		W	150-0755-00	U	.438	CR	Tri-State, Short Lead Orange
Yellow	MU04-4101	570.	30.	32.	20.	8	.800	.160	.290	.280			150-1169-00		1.320	CR	3 LED's
Yellow	550-0305-804	580.	50.	5.	20.	6	.390	.340	.185	.245	.100	Y, D	150-1063-00		.220	CR	
Yellow	558-0301-003	580.	20.	2.5	10.	4	.695	6.000	.190	.188		Y, D	150-1101-00		.880	CS	6 Inch Leads, Red & Black
Yellow	550-2306	580.	50.	5.	20.	9	.248	.135	.185	.350	.100	Y, D	150-1120-00		.400	CR	
Yellow	5082-4150	583.	20.	2.	10.	7	.115	.450	.075	.080		Y, D	150-1096-00			OB	
Yellow	555-2403	583.	6.7	.6	5. V	3	.250	.135	.200	.096	.100		150-1156-00			DL	Right Angle, PCB Mount
Yellow	QLMP-1487	583.	20.	9.2	10.	2	.145	.950	.135	.040	.100		150-1161-00		.135	CR	Tape & Reel
Yellow	HLMP6400-010	583.	20.	3.	10.	3	.250	.135	.200	.097	.100		150-1196-00	U	.450	CR	
Yellow	MV5353	585.	20.	5.	10.	2	.337	.925	.240	.033	.100	Y, D	150-1032-00	U	.160	CR	
Yellow	HLMP-1401	585.	20.	4.	10.	2	.180	.560	.135	.020	.095	Y, D	150-1033-00	U	.160	CR	
Yellow	MV5374C	585.	35.	4.	20.	2	.190	1.000	.160	.020	.059	Y, D	150-1064-00		.130	CR	
Yellow	MV5352	585.	20.	45.	20.	2	.300	.775	.230	.040	.100	Y, C	150-1065-00		.290	CS	
Yellow	MV53124	585.	35.	4.	20.	8	.265	.800	.250	.150	.100	Y, D	150-1073-00		.180	CR	Rectangular
Yellow	HDSP-4840	585.	30.	1.9	10.	13	1.000	.160	.400	.400	.300		150-1225-00	A	3.350	CR	10 Element Bar Graph
Yellow	HLMP-2450	585.	20.	38.	20.	13	.800		.195	.245			150-1231-00	A		EN	Light Bar
Yellow	QLMP-0449	586.	30.	1.6	15.	14	.315	.930	.295	.095	.100	Y	150-1105-00	A	.330	CR	Rectangular
Amber	PC080-A2	583.	20.	6.	20.	3	.250	1.250	.200	.096	.100		150-1198-00	A	.620	PP	Rectangular
Green	558-0201-804	560.	30.	1.5	10.	4	.710	6.000	.200	.188		G, D	150-1054-00		1.190	CR	6 In Leads, Red & Black Cathode
Green	558-0201-802	560.	30.	1.5	10.	4	.468	6.000	.190	.188		G, D	150-1054-01		2.370	CR	Berg Conn Attached to Leads
Green	559-0201-001	560.	35.	.8	20.	4	.625	.250	.281	.210	.125	G, D	150-1055-00		.370	CR	
Green	559-0201-003	560.	35.	5.	20.	4	.625	6.000	.281	.210	.125		150-1089-00			DL	6 In Leads, Red & Black Cathode
Green		560.	20.	1.5	10.	4	.468	3.000	.190	.188			150-1244-00			EN	With Strain Relief
Green	MV54643	562.	30.	5.	20.	2	.145	1.000	.135	.040	.100	G, D	150-1116-00			DL	
Green	CMD54643-850	562.	30.	5.	20.	2	.135	1.000	.125	.040	.100	G, D	150-1119-00		.380	CR	
Green	MV54124A	562.	30.	6.	20.	8	.273	.800	.253	.145	.100		150-1234-00		.390	CR	Rectangular With Reflector
Green	HLMP3910	565.	30.	3.	10.	2	.337	.900	.240	.030	.200	G, D	150-1017-00		.280	CR	With Mounting Hardware
Green	MV5274C	565.	35.	1.	20.	2	.190	1.000	.160	.020	.055	G, D	150-1029-00		.130	CR	
Green	MV5274C	565.	35.	1.	20.	2	.190	.160	.160	.020	.055	G, D	150-1029-01		17.930	CS	With Wires, Connector & Housing
Green	HLMP3910	565.	25.	6.	20.	2	.337	.900	.240	.030	.100	G, D	150-1071-00	U	.280	CR	With Mounting Hardware
Green	Opt 009	565.	20.	6.	20.	2	.337	.900	.240	.030	.100	G, D	150-1071-01		.650	CR	With Wire
Green	HLMP3910	565.	25.	5.	20.	2	.145	.950	.135	.040	.100	G, D	150-1078-00		.220	CR	

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^c The nominal price (at time of printing) is listed in the cost column. For ND Codes (New Design Recommendations) and Status Codes, see tab marked CODES in the back of this catalog.

LED LAMPS (cont)

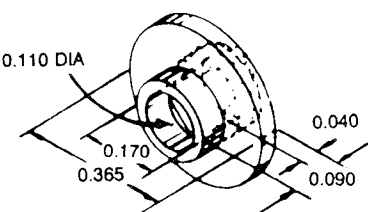
Color	Manufacturer Part Number	Main Spectrum Line (nm)	I Max (mA)	Typical Intensity @ I		LED Lamp Illustrations ^a						Lens ^b	Part Number	Codes ^c			Other
				(mcd)	(mA)	Fig	A Max	B Min	C Max	D Nom	E Nom			ND	Cost	ST	
Green	HLMP-6500	565.	30.	1.5	20.	7	.115	.450	.075	.080		G, D	150-1097-00		.300	CR	Right Angle, PCB Mount Low Profile Low Profile With Spacer 4 LED's
Green	550-2206	565.	35.	3.	20.	9	.245	.135	.187	.355	.100		150-1111-00	U	.470	CR	
Green	HLMP-3568	565.	25.	15.	10.	2	.195	1.000	.240	.060	.100		150-1132-00		.470	CR	
Green	CMD54154-200	565.	30.	3.	10.	2	.195	1.000	.240	.060	.100	G, D	150-1139-00		.570	CR	
Green	HLMP-2550 OPT S22	565.	30.	50.	20.	8	.800	.160	.195	.245	.100		150-1154-00		.990	CR	
Green	555-2303	565.	6.7	.5 Min	5. V	3	.250	.135	.200	.096	.100		150-1157-00		.610	CR	Right Angle, PCB Mount
Green	QLMP-1587	565.	25.	10.6 Min	10.	2	.145	.950	.135	.040	.100		150-1160-00		.135	CR	Tape & Reel
Green	HLMP-1540 OPT 002	565.	25.	35.	20.	2	.145	.950	.135	.040	.100		150-1163-00	A	.290	CR	Tape & Reel
Green	HLMP-2500 OPT S22	565.	25.	25.	20.	8	.400	.150	.195	.245	.100		150-1167-00		.640	CR	2 LED's
Green	HLMP-1550	565.	25.	2.	10.	2	.950	.018		.100	.130		150-1182-00		.240	CS	Low Profile
Green	PC080-G2	565.	25.	6.	20.	3	.250	1.250	.200	.096	.100		150-1199-00	A	.620	CR	Right Angle
Green	L613DG	635.	20.	4.	20.	6	.345		.095	.280	.090		150-1185-00		.850	CR	Right Angle
Green	HLMP2566	635.	20.	23.	20.	15	.400	.162	.195	.245	.100		150-1211-00		.700	CR	4 Element Light Bar
Green	HLMP-0549	572.	30.	1.6 Min	15.	14	.315	.990	.295	.095	.100		150-1212-00	A	1.080	CR	Right Angle
Multi-Red Yellow Green	HDSP-4836	635. 583. 566.	30. 20. 30.	2.28 1.9 1.9	10. 10. 10.	13	1.000	.160	.400	.240	.300		150-1137-00		2.680	CR	10 LED'S Arranged in Groups of Two from Left to Right: 2 Red, 2 Yellow, 2 Green, 2 Yellow, 2 Red

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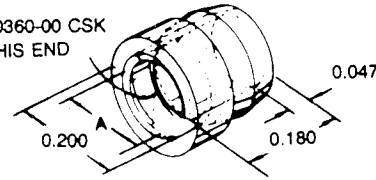
^c The nominal price (at time of printing) is listed in the cost column. For ND Codes (New Design Recommendations) and Status Codes, see tab marked CODES in the back of this catalog.

LED HOLDERS



0.110 DIA
0.170
0.365
0.040
0.090

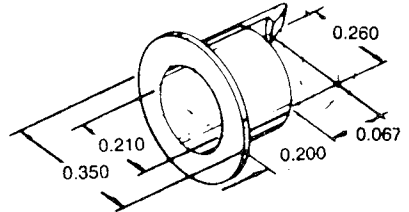
352-0419-00 CC:^a.070 ST:^aCS
Polypropylene, Black (254-0990-00)



352-0360-00 CSK
THIS END
0.200
0.180
0.047

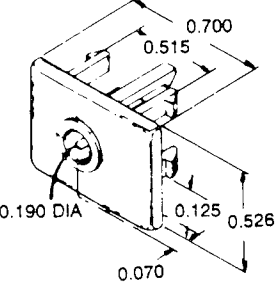
Rubber, Black, Thermoplastic (255-0616-00)

Dim A	Part Number	Codes ^a	
		Cost	ST
.100	352-0360-00	.560	CR
.127	352-0360-01	.161	CR



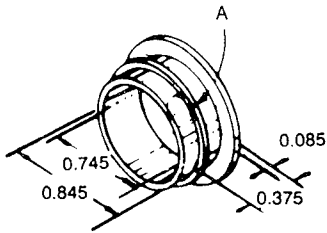
0.260
0.210
0.350
0.200
0.067

352-0477-00 CC:^a.193 ST:^aCR
Polycarbonate, Black (255-0504-00 & 255-0613-00)



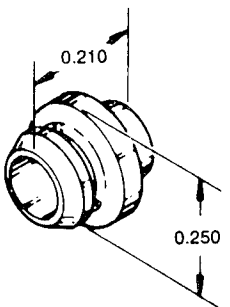
0.700
0.515
0.190 DIA
0.125
0.526
0.070

Polycarbonate, TV Gray (255-0565-01)



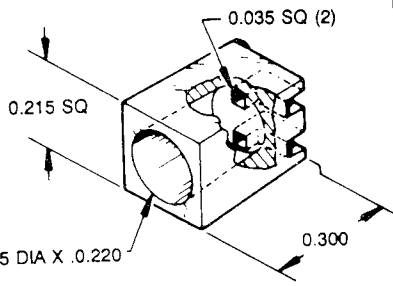
A
0.745
0.845
0.375
0.085

Acetal Resin, Black (255-0010-00)



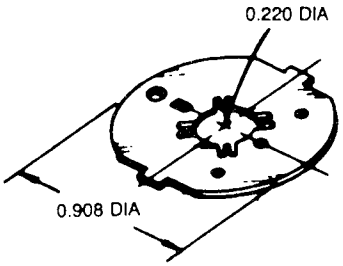
0.210
0.250

352-0451-00 CC:^a.250 ST:^aCR
Rubber, Black, Thermoplastic (255-0616-00)



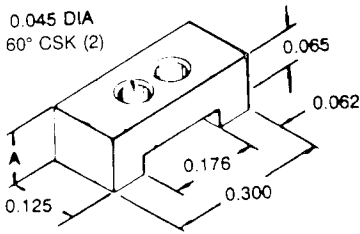
0.035 SQ (2)
0.215 SQ
0.145 DIA X .0220
0.300

352-0631-00 CC:^a.429 ST:^aCR
Polycarbonate, White (255-0156-00)



0.220 DIA
0.908 DIA

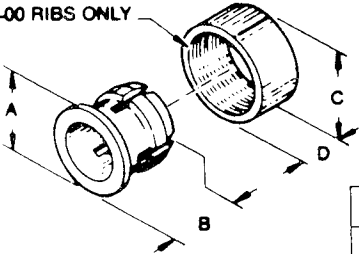
352-0535-00 CC:^a.476 ST:^aCR
.010 Phosphor Bronze (251-0448-00)



0.045 DIA
60° CSK (2)
0.065
0.062
0.176
0.300

Polysulfone, Black (255-0330-00)

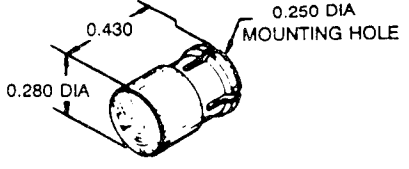
Dim A	Part Number	Codes ^a	
		Cost	ST
.100	352-0522-00	.069	CS
.175	352-0522-01	.069	CS



352-0700-00 RIBS ONLY
A
B
C
D

FOR PANEL THICKNESS 0.125 MAX

Dimensions				Mtg Hole	Part Number	Codes ^a		
A	B	C	D			ND	Cost	ST
.310	.265	.360	.165	.250	352-0700-00	.091	CR	
.312	.250	.350	.050	.265	352-0701-00	.085	CR	
.315	.265	.375	.150	.242	352-0703-00		DL	
.317	.279	.355	.123	.250	352-0723-00	U	DL	



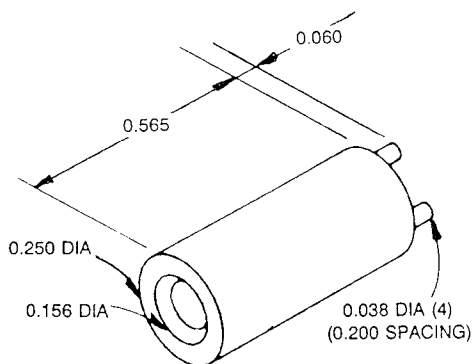
0.430
0.280 DIA
0.250 DIA MOUNTING HOLE

Cellulose Acetate Butyrate

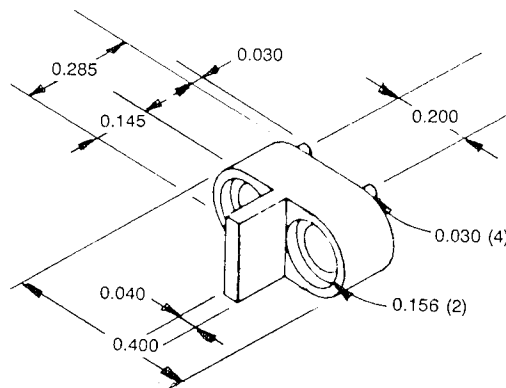
Part Number	Color	Codes ^a	
		Cost	ST
378-0175-00	Red	.180	CR
378-0176-00	Amber	.180	CR
378-0177-00	Green	.180	CR

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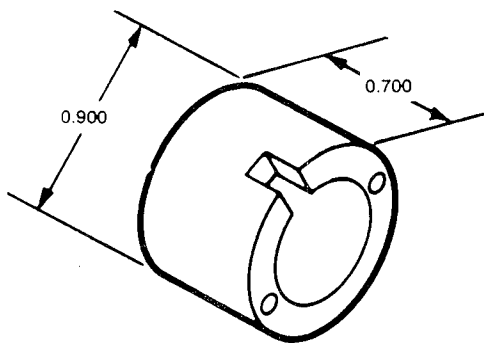
LED HOLDERS (cont)



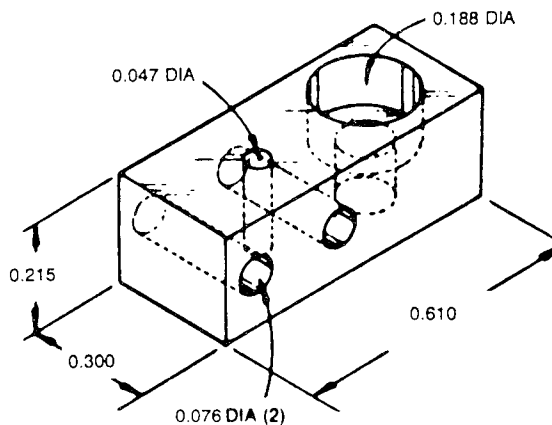
352-0865-00 CC:^a .217 ST:^a CR
ABS (255-0009-00), Black



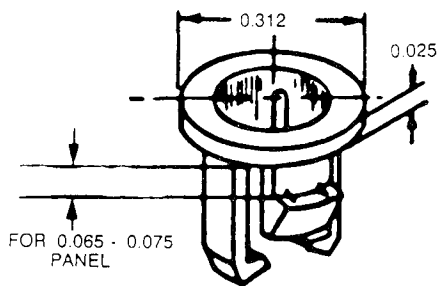
352-0866-00 CC:^a .117 ST:^a CR
ABS (255-0009-00), Black



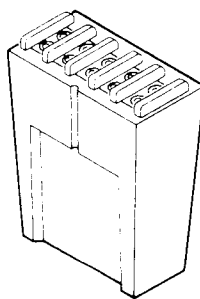
352-0760-00 CC:^a 20.000 ST:^a CR
LED Adaptor
Nylon (255-0421-00), Natural



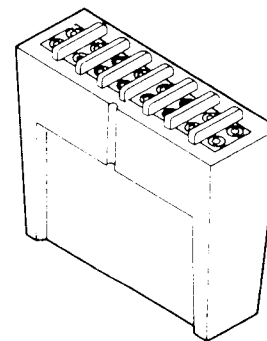
352-0309-00 CC:^a .918 ST:^a CS
Polyamide (255-0303-00), White



352-0864-00 CC:^a .280 ST:^a CR
Thermoplastic



352-0641-00 CC:^a .149 ST:^a CR ND:^a U
Polyamide, Fire Retardant



352-0692-00 CC:^a .398 ST:^a CS
Polyamide, Fire Retardant

^a The nominal price (at time of printing) is listed in the cost column. For ND Codes (New Design Recommendations) and Status Codes, see tab marked CODES in the back of this catalog.

LED DISPLAYS

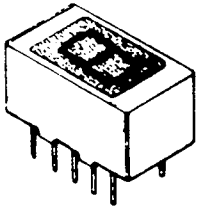


FIGURE 1

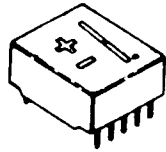


FIGURE 2

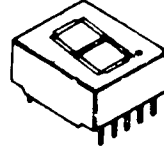


FIGURE 3

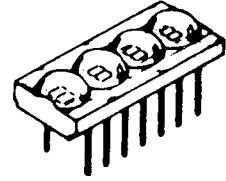


FIGURE 4

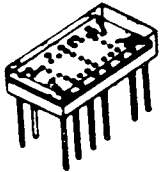


FIGURE 5

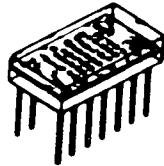


FIGURE 6

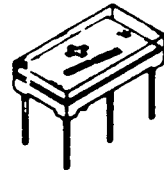


FIGURE 7

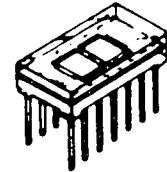
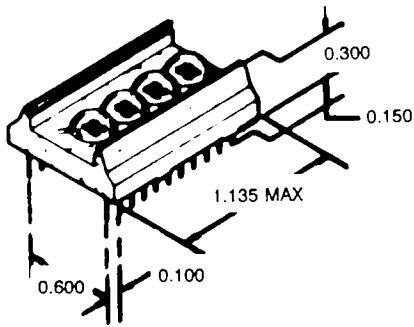
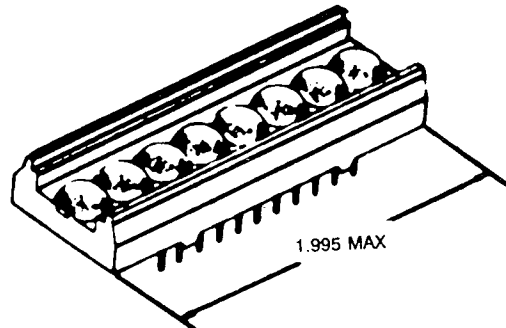


FIGURE 8



150-1114-00



150-1060-00

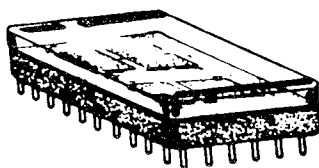
FIGURE 9

LED DISPLAYS (cont)

Color	Character			Decimal Point	Main Spectrum Line (nm)	I Max (mA)	Typical Luminous Intensity @ I		Figure	Manufacturer Number	Part Number	Common	Codes ²		
	Digit	Height	Spacing				(mcd)	(mA)					ND	Cost	ST
Red	1	.294	.400 Max	± 1	660.	30.	.125 Min	10.	7	MAN 73A	150-1069-00			.680	CR
Red	1	.300	.400 Max	Left	660.	30.	.125 Min	10.	8	Man 72A	150-1022-00	Anode		.680	CR
Red	1	.300	.300 Max	Right	635.	30.	.80	5.	1	HDSP-7501	150-1162-00	Anode		1.850	CR
Red	1	.300	.400	Left	660.	10.	.11	10.	6	TIL 305	150-1051-00			4.250	CS
Red	1	.362	.300	Right	655.	25.	3.16 Min	20.	1	FND 357	150-1011-01	Cathode		1.040	CR
Red	1	.362	.300	Right	665.	25.	.90	20.	1	FND 357	150-1011-02		U	1.030	CR
Red	1	.362	.300	Right	665.	25.	.90	20.	1	Selected 150-1011-02	150-1011-03	Cathode		26.353	CS
Red	1	.362	.300	Right	655.	25.	.90	20.	1	Set of 5 (150-1011-02)	150-1011-04			8.543	CS
Red	1	.362	.300	Right	655.	20.	.90	20.	1	FND 360	150-1117-00	Anode		1.050	CR
Red	1	.500	.600	± 1 Right	650.	25.	.60	20.	2	HDSP-307	150-1045-00	Anode		1.150	CS
Red	1	.500	.600	± 1 Right	650.	25.	.60	20.	2	Selected 150-1045-00	150-1045-01	Anode		5.364	CS
Red	1	.500	.600	Right	650.	25.	.60	20.	3	HDSP-5301	150-1046-00	Cathode		1.000	CS
Red	1	.500	.600	Right	650.	25.	.60	20.	3	Matched Set of 5 150-1046-00	150-1046-01	Anode		63.243	CS
Red	4	.110	.200	Right	700.	10.	1.50	5.	4	Selected 150-1012-00	150-1012-04	Cathode			DL
Red	4	.110	.200	Right	700.	10.	1.50	5.	4	150-1012-04 with Frame & Filter	150-1012-06			14.750	CS
Red	4	.110	.200	Right	655.	5.	1.50	5.	4	DL 340M	150-1125-00			5.500	CR
Red	4	.110	.200	Right	655.	5	1.5	5.	4	150-1125-00 with Frame & Filter	150-1130-00			12.704	CS
Red	4	.150	.250	Left	655.	7.	1.567 Min	30, 1/16 DF	9	QDSP-6551	150-1114-00	Cathode		.100	CR
Red	8	.150	.250	Left	655.	7.	.97 Min	30, 1/16 DF	9	QDSP-6552	150-1060-00	Cathode		24.000	CS
Red		.110	.200	Right	655.	5.	1.50	5.	4	150-1125-00 with Frame & Filter	150-1012-07		U	10.130	CR
Red		.390	.200	Right	635.	30.	.98	5.	1		150-1235-00			2.350	CR
Red	Hexa-Decimal with Logic	.300	.450	Right	660.	20.	.10	5. Volt	5	TIL 311	150-1013-00			6.120	CR
Orange	1	.294	.400 Max	± 1	630.	20.	.51	10.	7	Q3410/MAN 3630A	150-1038-00	Anode		1.080	CR
Orange	1	.300	.386	Left	630.	20.	.51 Min	10.	8	Q3409/MAN 3620 A	150-1037-00	Anode		1.080	CR
Orange	1	.400	.400 Max	Right	630.	20.	.51 Min	10.	8	Q3383/MAN 4640A	150-1048-00	Cathode		1.250	CR
Orange	1	.400	.400 Max	Right	630.	20.	.51 Min	10.	8	Q3411/MAN 4610A	150-1053-00	Anode		1.250	CR
Orange	1	.400	.400 Max	± 1 Right	630.	20.	.51	10.	7	Q3384/MAN 4605A	150-1066-00	Anode		.980	CR
Green	1	.300	.400 Max	Right	577.	30.	.4	10.	8	HDSP-3601	150-1164-00			3.230	CR
Green	1	.800	.786 Max	Left	566.	30.	1.960	60, 1/5 EF	8	HDSP-3600	150-1131-00	Anode		3.140	CR
Green	Hexa-Decimal with Logic	.290	.400		568.	7. V	1.1		3	HDSP-0962	150-1155-00			23.350	OT

² The nominal price (at time of printing) is listed in the cost column. For ND Codes (New Design Recommendations) and Status Codes, see tab marked CODES in the back of this catalog.

DIGITAL DISPLAY NEON, 7 SEGMENT, ORANGE



Digits	Character		Oper I _f μA		Striking V Min	Light Output		Socket	Mfr Number	Part Number	Codes ^a	
	Height	Spacing	Min	Max		Nom	@ μA				Cost	ST
1-1/2	.300	.375	70.	250.	160.	210 fl	180.		SP-331-02	150-1039-01 ^b		OB
2	.330	.375	70.	250	160.	210 fl	180.	136-0565-00	SP-332	150-1015-00	3.400	SS
2	.330	.375	70.	250.	160.	210 fl	180.	136-0565-00	SP-332-01	150-1015-01 ^b		OB
3	.330	.375	70.	250.	160.	210 fl	180.	136-0556-00	SP-333	150-1016-00	5.250	LS

All units contain a mixture of Neon & Mercury gases. Major Spectral Lines at 590, 620 & 650 ms. All units are of Common Anode construction.

FLUORESCENT

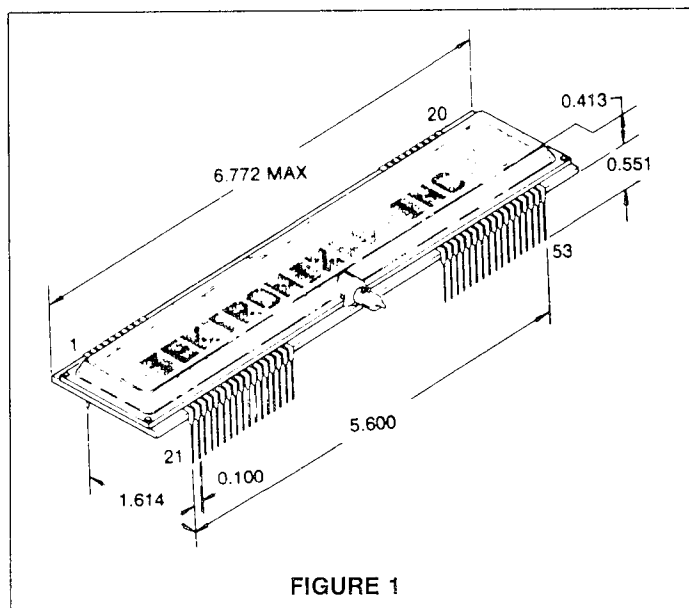


FIGURE 1

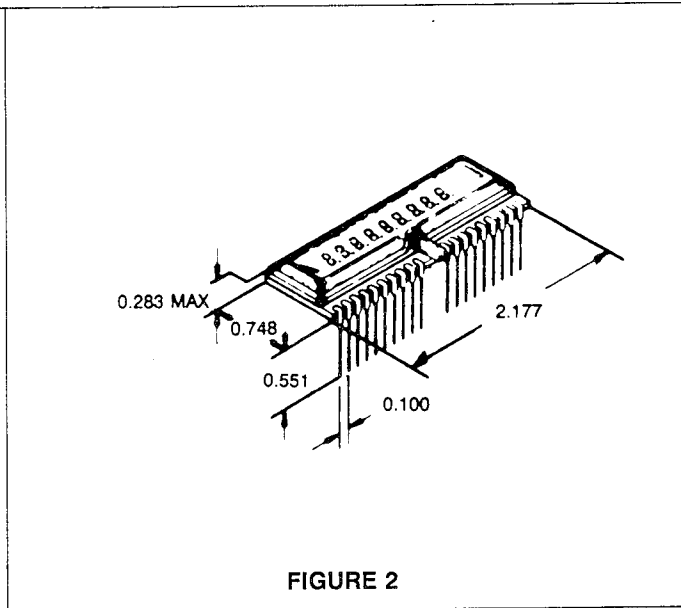


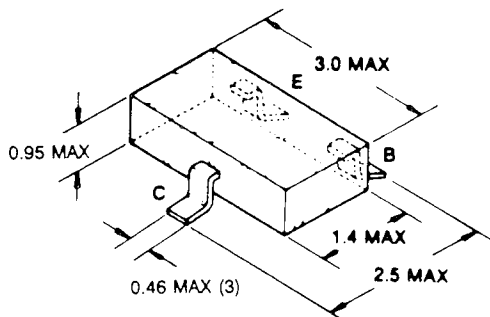
FIGURE 2

Digits	Character		Voltage Maximum			Brightness	Dot Matrix	Part Number	Figure	Codes ^a	
	Height	Spacing	Filament	Grid	Anode					Cost	ST
9 Alphanumeric	.167	.150	34VP-P	34VP-P	3.3 VRMS	90 fL		150-1110-00	2	3.850	CR
16 Alphanumeric	.354	.327	42VP-P	42VP-P	5.3 VRMS	100 fL	5 x 7	150-1084-00	1	32.200	CR

^a The nominal price (at time of printing) is listed in the cost column. For Status Codes, see tab marked CODES in the back of this catalog.

^b These devices contain small amounts of Krypton gas to reduce Initial ionization time to 5 sec. max at 160 V.

SURFACE MOUNTABLE LED LAMPS



SOT-23
FIGURE 1

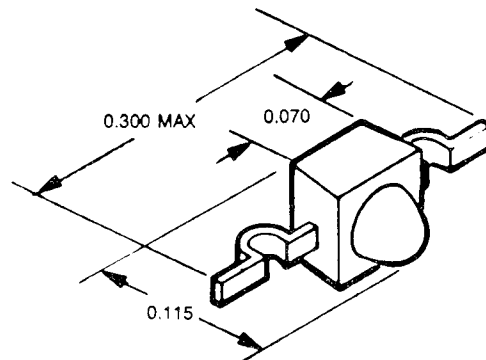


FIGURE 2

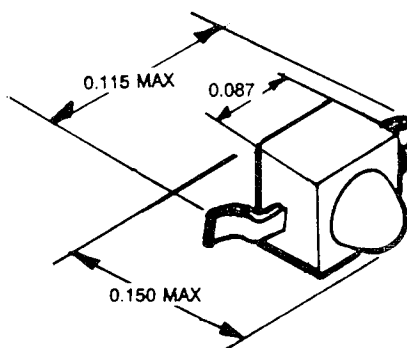


FIGURE 3

Color	Manufacturer Number	Main Spectrum Line (nm)	I Max (mA)	Typical Intensity @ I		Figure	Part Number	Codes ^a		
				(mcd)	(mA)			ND	Cost	ST
Red	LDG2330	560.	12.5	1.8	.1 μ A	1	150-5001-00		.320	CR
Red	6300-021	635.	20.	3.	10.	2	150-5004-00		.320	CR
Red	LDH2310	645.	12.5	1.8	.1 μ A	1	150-5000-00		.270	CR
Red	SLM-13VW	650.	10.			1	150-5002-00		.280	CR
Red/Grn		560/645.	2.5	3.		1	150-5007-00		.320	EN
Yellow		585.	20.	.4	2.	2	150-5006-00		.400	CR
Green	6500-021	565.	60.	3.	10.	2	150-5003-00		.320	CR
Green		565.	30.	12.	10.	2	150-5008-00			CR
Green	HLMP-6505-011	565.	30.	12.	10.	3	150-5008-01		.390	CR

^a The nominal price (at time of printing) is listed in the cost column. For ND Codes (New Design Recommendations) and Status Codes, see tab marked CODES in the back of this catalog.