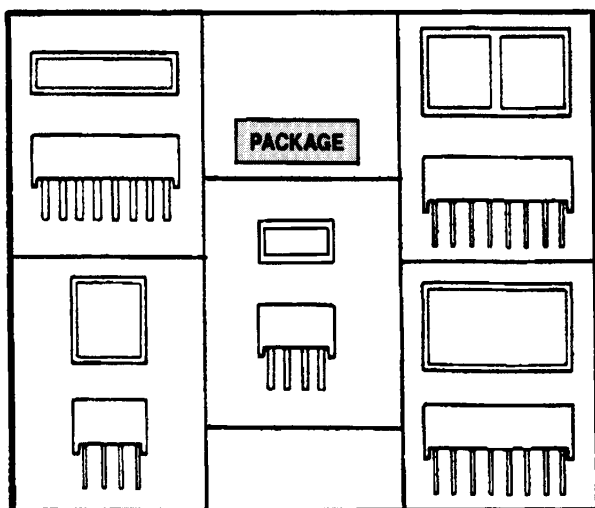


**HIGH EFFICIENCY RED HLMP-2300/2600 SERIES  
YELLOW HLMP-2400/2700 SERIES  
HIGH EFFICIENCY GREEN HLMP-2500/2800 SERIES**



**DESCRIPTION**

These LED Light Bar series are bright, large emitting area, rectangular devices that are designed for backlighting legend/message annunciators.

These devices are offered in single-in-line and dual-in-line packages that contain single or segmented light-emitting area. Each package style is offered in High Efficiency Red, Yellow, or Green emission color.

**FEATURES**

- Large area, uniform, bright light-emitting surfaces
- Select from six package styles
- Choice of three colors
- Categorized for intensity and color
- X-Y stackable
- Easily driven with I.C.s
- Alternate source for popular backlighting components

**MODEL NUMBERS**

PART NO.	COLOR	DESCRIPTION		PACKAGE	PIN OUT
HLMP-2300 HLMP-2400 HLMP-2500	High Efficiency Red Yellow High Efficiency Green	2 LED Single-in-line 0.35 in. x 0.15 in. Area		A	A
HLMP-2350 HLMP-2450 HLMP-2550	High Efficiency Red Yellow High Efficiency Green	4 LED Single-in-line 0.75 in. x 0.15 in. Area		B	B
HLMP-2655 HLMP-2755 HLMP-2855	High Efficiency Red Yellow High Efficiency Green	4 LED Dual-in-line 0.35 in. x 0.35 in. Area		C	C
HLMP-2670 HLMP-2770 HLMP-2870	High Efficiency Red Yellow High Efficiency Green	Dual 0.35 in. x 0.35 in. Area Dual-in-line package		D	D
HLMP-2685 HLMP-2785 HLMP-2885	High Efficiency Red Yellow High Efficiency Green	8 LED 0.35 in. x 0.75 in. Area Dual-in-line package		E	D

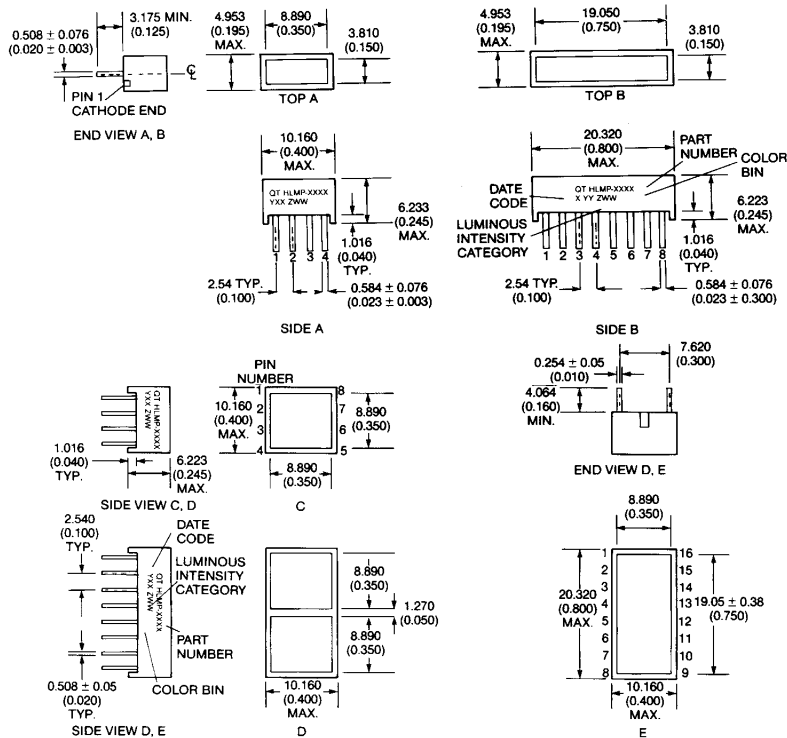
### ABSOLUTE MAXIMUM RATINGS $T_A=25^\circ\text{C}$ (Unless Otherwise Stated)

	HIGH EFFICIENCY RED HIGH EFFICIENCY GREEN HLMP-2300/-2500 -2600/-2800 SERIES	YELLOW HLMP-2400/ -2700 SERIES
Power dissipation per LED chip (See Note 1)	135 mW	85 mW
Peak forward current per LED chip, $T_A=50^\circ\text{C}$ (max. pulse width=2 ms) (See Notes 1 and 2)	90 mA	60 mA
Average forward per LED chip pulsed conditions, $T_A=50^\circ\text{C}$ (See Note 2)	25 mA	20 mA
DC forward current per LED chip, $T_A=50^\circ\text{C}$ (See Note 3)	30 mA	25 mA
Reverse voltage per LED chip	6V	6V
Storage and operating temperature range	$-40^\circ\text{C}$ to $+85^\circ\text{C}$	$-40^\circ\text{C}$ to $+85^\circ\text{C}$
Soldering time at $260^\circ\text{C}$ (See Note 4)	$260^\circ\text{C}$ for 3 sec.	$260^\circ\text{C}$ for 3 sec.

### NOTES

- For HLMP-2300/-2500/-2600/-2800 Series, derate above  $T_A=25^\circ\text{C}$  at  $1.8\text{ mW}/^\circ\text{C}$  per LED chip. For HLMP-2400/-2700 Series, derate above  $T_A=50^\circ\text{C}$  at  $1.8\text{ mW}/^\circ\text{C}$  per LED chip.
- See Figure 1/2 to establish pulse operating conditions.
- For HLMP-2300/-2500/-2600/-2800 Series, derate above  $T_A=50^\circ\text{C}$  at  $0.5\text{ mA}/^\circ\text{C}$  per LED chip. For HLMP-2400/-2700 Series derate above  $T_A=60^\circ\text{C}$  at  $9.5\text{ mA}/^\circ\text{C}$  per LED chip.
- Lead immersed to 1/16 in. from body of the device. Maximum unit surface temperature is  $140^\circ\text{C}$ .

### PACKAGE DIMENSIONS



NOTE: DIMENSIONS IN MILLIMETERS (INCHES). TOLERANCES  $\pm 0.25$  ( $\pm 0.010$ ) UNLESS OTHERWISE INDICATED

<b>ELECTRO-OPTICAL CHARACTERISTICS (T<sub>A</sub>=25°C)</b>									
<b>HIGH EFFICIENCY RED</b>									
PARAMETER	SYMBOL	HLMP					UNIT	TEST CONDITIONS	
		-2300	-2350	-2655	-2670	-2685			
Luminous Intensity	min.		6.0	13	13	13	22	mcd	I <sub>F</sub> =20 mA
	typ.	I <sub>V</sub>	23	45	43	45	80	mcd	I <sub>F</sub> =20 mA
Forward voltage	typ.		30	50	50	50	100	mcd	I <sub>F</sub> =60 mA pK, 1:3 D.F.
	max.	V <sub>F</sub>	2.6	2.6	2.6	2.6	2.6	V	I <sub>F</sub> =20 mA
Peak wavelength	typ.	λ <sub>p</sub>	2.0	2.0	2.0	2.0	2.0	V	I <sub>F</sub> =20 mA
			630	630	630	630	630	nm	
Dominant wavelength	typ.	λ <sub>d</sub>	630	630	630	630	630	nm	
			626	626	626	626	626	nm	
Capacitance	typ.	C	45	45	45	45	45	pF	V <sub>F</sub> =0, f=1 MHz
Reverse voltage	min.	V <sub>R</sub>	6	6	6	6	6	V	I <sub>R</sub> =100 μA
Thermal resistance	typ.	θ <sub>JL</sub>	150	150	150	150	150	°C/W/ LED chip	

<b>ELECTRO-OPTICAL CHARACTERISTICS (T<sub>A</sub>=25°C)</b>									
<b>YELLOW</b>									
PARAMETER	SYMBOL	HLMP					UNIT	TEST CONDITIONS	
		-2400	-2450	-2755	-2770	-2785			
Luminous Intensity	min.		6	13	13	13	26	mcd	I <sub>F</sub> =20 mA
	typ.	I <sub>V</sub>	20	38	35	35	70	mcd	I <sub>F</sub> =20 mA
Forward voltage	typ.		33	60	60	60	115	mcd	I <sub>F</sub> =60 mA pK, 1:3 D.F.
	max.	V <sub>F</sub>	2.6	2.6	2.6	2.6	2.6	V	I <sub>F</sub> =20 mA
Peak wavelength	typ.	λ <sub>p</sub>	2.1	2.1	2.1	2.1	2.1	V	I <sub>F</sub> =20 mA
			585	585	585	585	585	nm	
Dominant wavelength	typ.	λ <sub>d</sub>	585	585	585	585	585	nm	
			588	588	588	588	588	nm	
Capacitance	typ.	C	35	35	35	35	35	pF	V <sub>F</sub> =0, f=1 MHz
Reverse voltage	min.	V <sub>R</sub>	6	6	6	6	6	V	I <sub>R</sub> =100 μA
Thermal resistance	typ.	θ <sub>JL</sub>	150	150	150	150	150	°C/W/ LED chip	

<b>ELECTRO-OPTICAL CHARACTERISTICS (T<sub>A</sub>=25°C)</b>									
<b>HIGH EFFICIENCY GREEN</b>									
PARAMETER	SYMBOL	HLMP					UNIT	TEST CONDITIONS	
		-2500	-2550	-2855	-2870	-2885			
Luminous Intensity	min.		5	11	11	11	22	mcd	I <sub>F</sub> =20 mA
	typ.	I <sub>V</sub>	25	50	50	50	100	mcd	I <sub>F</sub> =20 mA
Forward voltage	typ.		38	75	75	75	150	mcd	I <sub>F</sub> =60 mA pK, 1:3 D.F.
	max.	V <sub>F</sub>	2.6	2.6	2.6	2.6	2.6	V	I <sub>F</sub> =20 mA
Peak wavelength	typ.	λ <sub>p</sub>	2.2	2.2	2.2	2.2	2.2	V	I <sub>F</sub> =20 mA
			565	565	565	565	565	nm	
Dominant wavelength	typ.	λ <sub>d</sub>	565	565	565	565	565	nm	
			567	567	567	567	567	nm	
Capacitance	typ.	C	40	40	40	40	40	pF	V <sub>F</sub> =0, f=1 MHz
Reverse voltage	min.	V <sub>R</sub>	6	6	6	6	6	V	I <sub>R</sub> =100 μA
Thermal resistance	typ.	θ <sub>JL</sub>	150	150	150	150	150	°C/W/ LED chip	

**TYPICAL ELECTRO-OPTICAL CHARACTERISTIC CURVES**  
(25°C Free Air Temperature Unless Otherwise Specified)

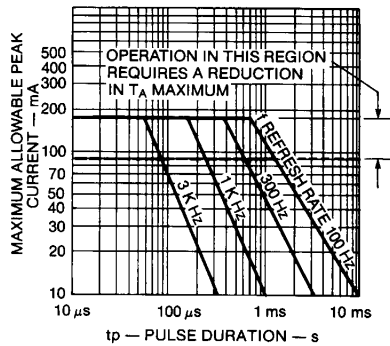


Fig. 1. Maximum Tolerable Peak Current per LED Chip vs. Pulse Duration for HLMP-23X0/-26XX/-25X0/-28XX

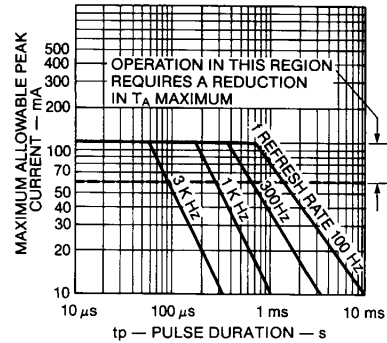


Fig. 2. Maximum Tolerable Peak Current per LED Chip vs. Pulse Duration for HLMP-24X0/-27XX Devices

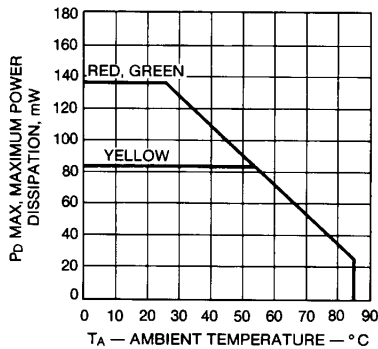


Fig. 3. Maximum Power Dissipation per LED vs. Ambient Temperature

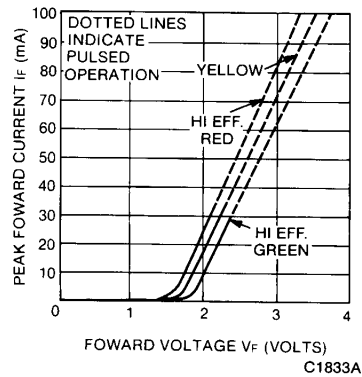


Fig. 4. Forward Current vs. Forward Voltage

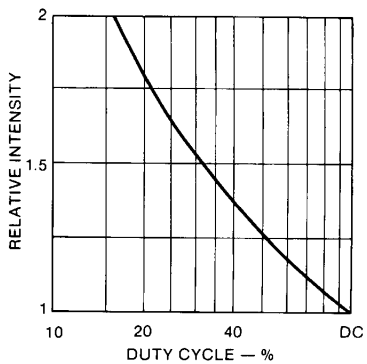


Fig. 5. Luminous Intensity vs. Duty Cycle

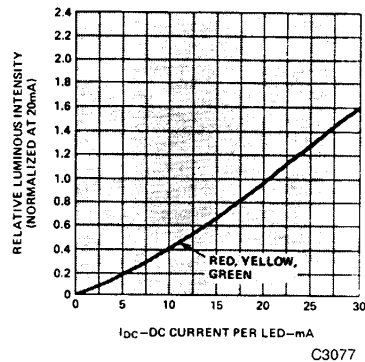
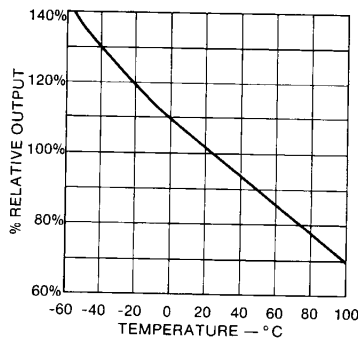


Fig. 6. Luminous Intensity vs. Forward Current

**TYPICAL ELECTRO-OPTICAL CHARACTERISTIC CURVES**  
(25°C Free Air Temperature Unless Otherwise Specified) (Cont'd)



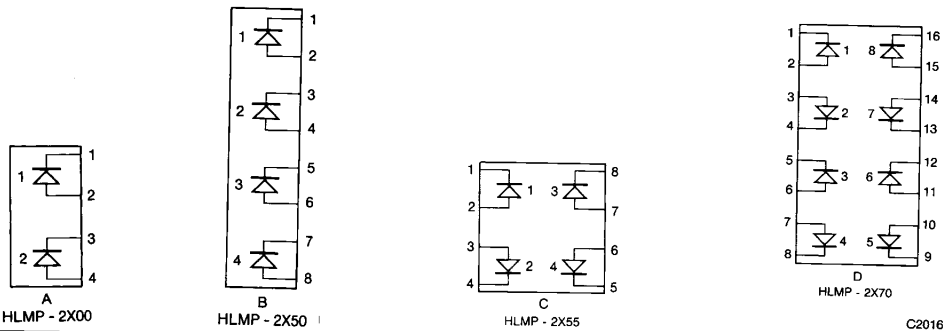
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Fig. 7. Output vs. Temperature

**PIN CONNECTIONS TO ELECTRICAL SCHEMATIC**

PIN	ELECTRICAL CONNECTION			
	HLMP-2X00	HLMP-2X50	HLMP-2X55	HLMP-2X70/-2X85
1	1 Cathode	1 Cathode	1 Cathode	1 Cathode
2	1 Anode	1 Anode	1 Anode	1 Anode
3	2 Cathode	2 Cathode	2 Cathode	2 Cathode
4	2 Anode	2 Anode	2 Anode	2 Cathode
5		3 Cathode	3 Cathode	3 Cathode
6		3 Anode	3 Anode	3 Anode
7		4 Cathode	4 Anode	4 Anode
8		4 Anode	4 Cathode	4 Cathode
9				5 Cathode
10				5 Anode
11				6 Anode
12				6 Cathode
13				7 Cathode
14				7 Anode
15				8 Anode
16				8 Cathode

**ELECTRICAL SCHEMATIC**



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2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.