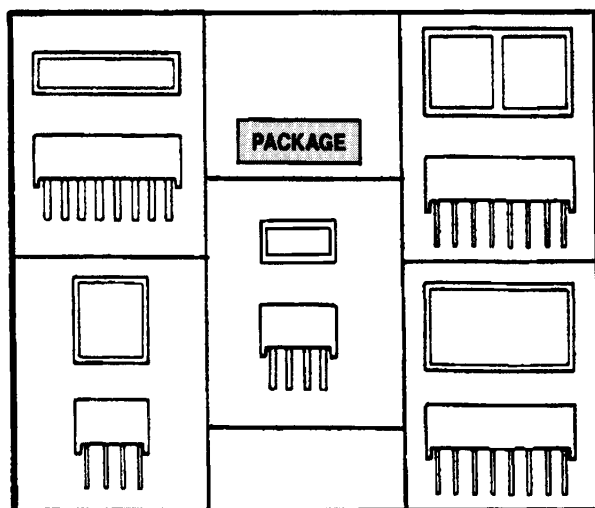


HIGH EFFICIENCY RED HLMP-2300/2600 SERIES
YELLOW HLMP-2400/2700 SERIES
HIGH EFFICIENCY GREEN HLMP-2500/2800 SERIES



DESCRIPTION

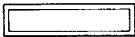
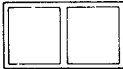
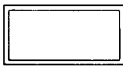
These LED Light Bar series are bright, large emitting area, rectangular devices that are designed for backlighting legend/message annunciators.

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	High Efficiency Red	2 LED Single-in-line 0.35 in. × 0.15 in. Area		A	A
HLMP-2400	Yellow				
HLMP-2500	High Efficiency Green				
HLMP-2350	High Efficiency Red	4 LED Single-in-line 0.75 in. × 0.15 in. Area		B	B
HLMP-2450	Yellow				
HLMP-2550	High Efficiency Green				
HLMP-2655	High Efficiency Red	4 LED Dual-in-line 0.35 in. × 0.35 in. Area		C	C
HLMP-2755	Yellow				
HLMP-2855	High Efficiency Green				
HLMP-2670	High Efficiency Red	Dual 0.35 in. × 0.35 in. Area Dual-in-line package		D	D
HLMP-2770	Yellow				
HLMP-2870	High Efficiency Green				
HLMP-2685	High Efficiency Red	8 LED 0.35 in. × 0.75 in. Area Dual-in-line package		E	D
HLMP-2785	Yellow				
HLMP-2885	High Efficiency Green				

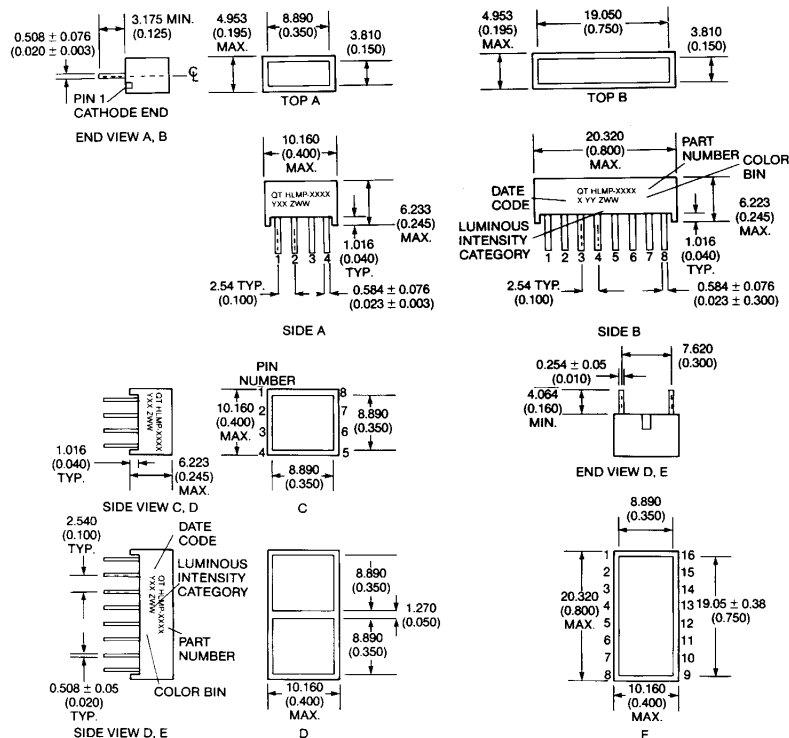
ABSOLUTE MAXIMUM RATINGS $T_A = 25^\circ\text{C}$ (Unless Otherwise Stated)

	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	-40°C to $+85^\circ\text{C}$	-40°C to $+85^\circ\text{C}$
Soldering time at 260°C (See Note 4)	260°C for 3 sec.	260°C for 3 sec.

NOTES

1. 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.
2. See Figure 1/2 to establish pulse operating conditions.
3. 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.
4. Lead immersed to 1/16 in. from body of the device. Maximum unit surface temperature is 140°C .

PACKAGE DIMENSIONS



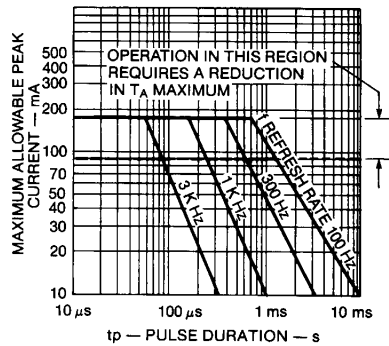
NOTE: DIMENSIONS IN MILLIMETERS (INCHES). TOLERANCES ± 0.25 (± 0.010) UNLESS OTHERWISE INDICATED

ELECTRO-OPTICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$) HIGH EFFICIENCY RED								
PARAMETER	SYMBOL	HLMP					UNIT	TEST CONDITIONS
		-2300	-2350	-2655	-2670	-2685		
Luminous Intensity	min. I_v	6.0	13	13	13	22	mcd	$I_F=20\text{ mA}$
	typ.	23	45	43	45	80	mcd	$I_F=20\text{ mA}$
	typ.	30	50	50	50	100	mcd	$I_F=60\text{ mA pK, 1:3 D.F.}$
Forward voltage	max. V_F	2.6	2.6	2.6	2.6	2.6	V	$I_F=20\text{ mA}$
	typ.	2.0	2.0	2.0	2.0	2.0	V	
Peak wavelength	typ. λ_p	630	630	630	630	630	nm	
Dominant wavelength	typ. λ_d	626	626	626	626	626	nm	
Capacitance	typ. C	45	45	45	45	45	pF	$V_F=0, f=1\text{ MHz}$
Reverse voltage	min. V_R	6	6	6	6	6	V	$I_R=100\text{ }\mu\text{A}$
Thermal resistance	typ. θ_{JA}	150	150	150	150	150	$^{\circ}\text{C/W/LED chip}$	

ELECTRO-OPTICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$) YELLOW								
PARAMETER	SYMBOL	HLMP					UNIT	TEST CONDITIONS
		-2400	-2450	-2755	-2770	-2785		
Luminous Intensity	min. I_v	6	13	13	13	26	mcd	$I_F=20\text{ mA}$
	typ.	20	38	35	35	70	mcd	$I_F=20\text{ mA}$
	typ.	33	60	60	60	115	mcd	$I_F=60\text{ mA pK, 1:3 D.F.}$
Forward voltage	max. V_F	2.6	2.6	2.6	2.6	2.6	V	$I_F=20\text{ mA}$
	typ.	2.1	2.1	2.1	2.1	2.1	V	
Peak wavelength	typ. λ_p	585	585	585	585	585	nm	
Dominant wavelength	typ. λ_d	588	588	588	588	588	nm	
Capacitance	typ. C	35	35	35	35	35	pF	$V_F=0, f=1\text{ MHz}$
Reverse voltage	min. V_R	6	6	6	6	6	V	$I_R=100\text{ }\mu\text{A}$
Thermal resistance	typ. θ_{JA}	150	150	150	150	150	$^{\circ}\text{C/W/LED chip}$	

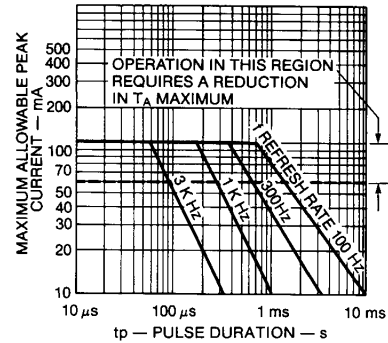
ELECTRO-OPTICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$) HIGH EFFICIENCY GREEN								
PARAMETER	SYMBOL	HLMP					UNIT	TEST CONDITIONS
		-2500	-2550	-2855	-2870	-2885		
Luminous Intensity	min. I_v	5	11	11	11	22	mcd	$I_F=20\text{ mA}$
	typ.	25	50	50	50	100	mcd	$I_F=20\text{ mA}$
	typ.	38	75	75	75	150	mcd	$I_F=60\text{ mA pK, 1:3 D.F.}$
Forward voltage	max. V_F	2.6	2.6	2.6	2.6	2.6	V	$I_F=20\text{ mA}$
	typ.	2.2	2.2	2.2	2.2	2.2	V	
Peak wavelength	typ. λ_p	565	565	565	565	565	nm	
Dominant wavelength	typ. λ_d	567	567	567	567	567	nm	
Capacitance	typ. C	40	40	40	40	40	pF	$V_F=0, f=1\text{ MHz}$
Reverse voltage	min. V_R	6	6	6	6	6	V	$I_R=100\text{ }\mu\text{A}$
Thermal resistance	typ. θ_{JA}	150	150	150	150	150	$^{\circ}\text{C/W/LED chip}$	

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



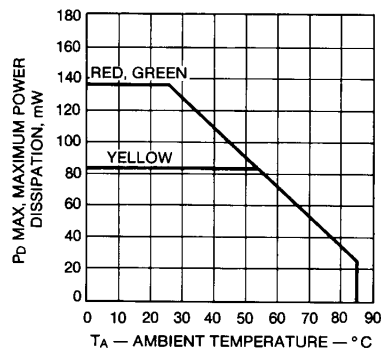
C2013

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



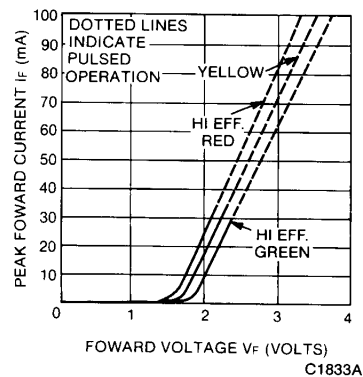
C2014

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



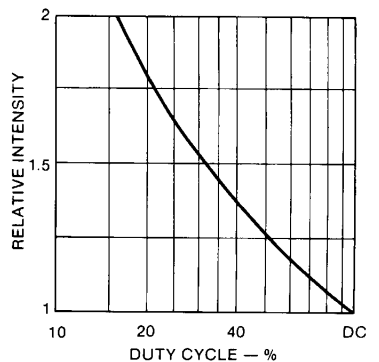
C2025

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



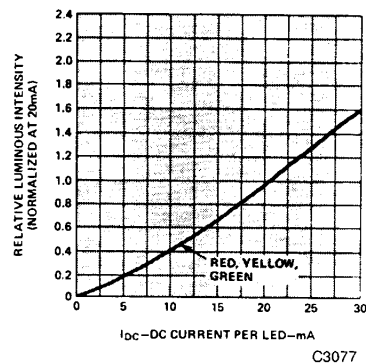
C1833A

Fig. 4. Forward Current vs. Forward Voltage



C1194C

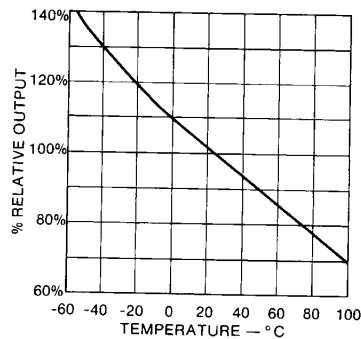
Fig. 5. Luminous Intensity vs. Duty Cycle



C3077

Fig. 6. Luminous Intensity vs. Forward Current

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



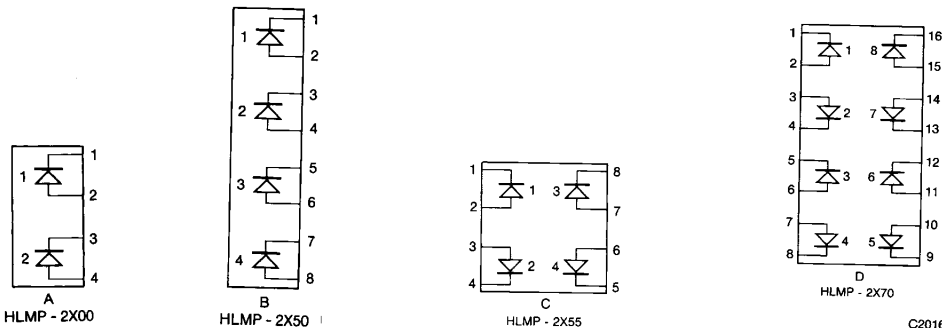
C654B

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 Cathode	3 Cathode
5		3 Cathode	3 Cathode	3 Anode
6		3 Anode	3 Anode	4 Anode
7		4 Cathode	4 Anode	4 Cathode
8		4 Anode	4 Cathode	5 Cathode
9				5 Anode
10				6 Anode
11				6 Cathode
12				7 Cathode
13				7 Anode
14				8 Anode
15				8 Cathode
16				

ELECTRICAL SCHEMATIC



C2016

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