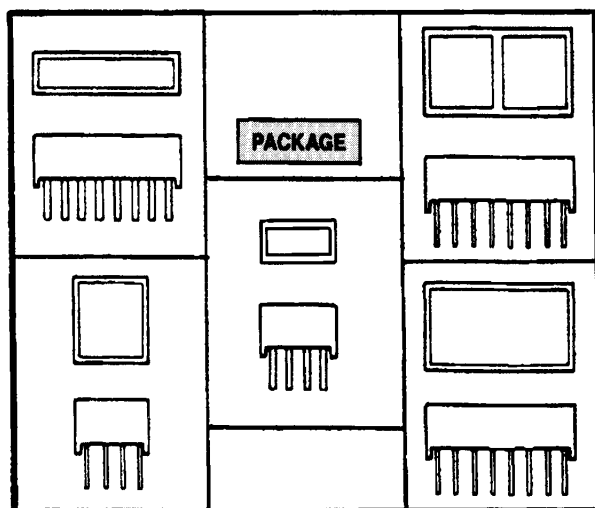


HIGH EFFICIENCY RED HLMP-2300/2600 SERIES
YELLOW HLMP-2400/2700 SERIES
HIGH EFFICIENCY GREEN HLMP-2500/2800 SERIES



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				

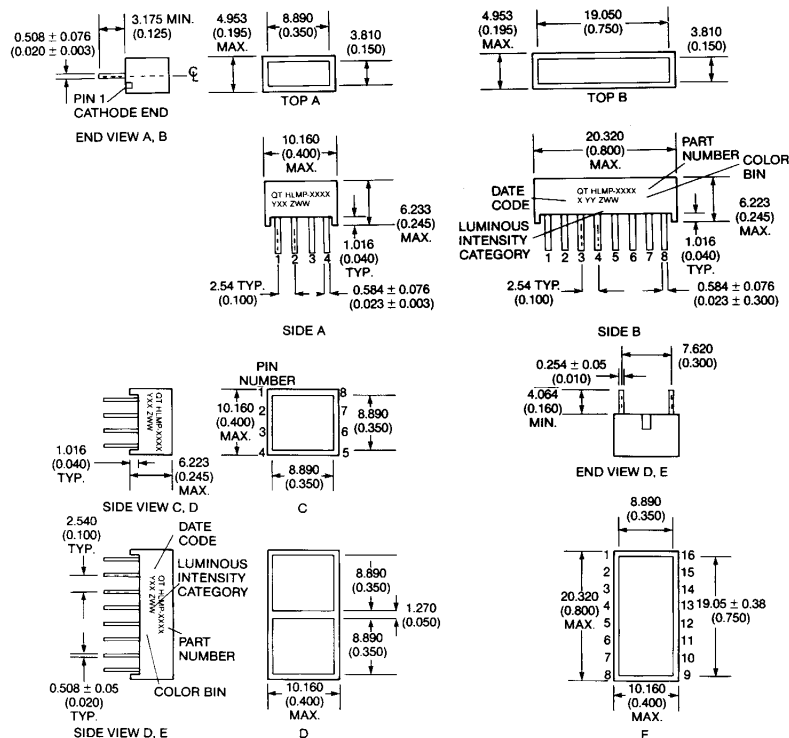
ABSOLUTE MAXIMUM RATINGS $T_A=25^{\circ}\text{C}$ (Unless Otherwise Stated)

	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

- 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°C .

PACKAGE DIMENSIONS



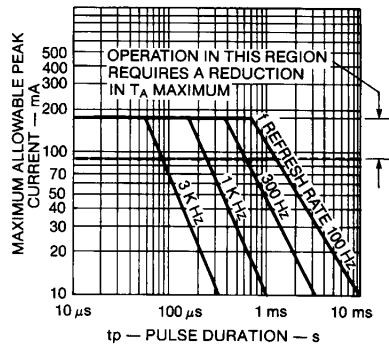
NOTE: DIMENSIONS IN MILLIMETERS (INCHES). TOLERANCES ± 0.25 (± 0.010) UNLESS OTHERWISE INDICATED

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	$^{\circ}\text{C/W/LED chip}$	

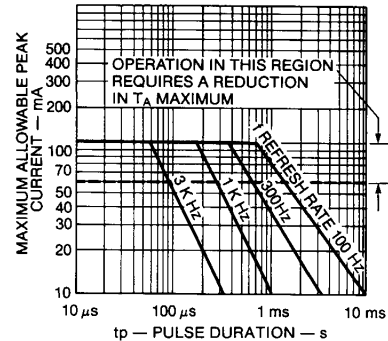
ELECTRO-OPTICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$) HIGH EFFICIENCY GREEN								
PARAMETER	SYMBOL	HLMP					UNIT	TEST CONDITIONS
		-2500	-2550	-2855	-2870	-2885		
Luminous Intensity	min. I_v	5	11	11	11	22	mcd	$I_f=20\text{ mA}$
	typ.	25	50	50	50	100	mcd	$I_f=20\text{ mA}$
	typ.	38	75	75	75	150	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)



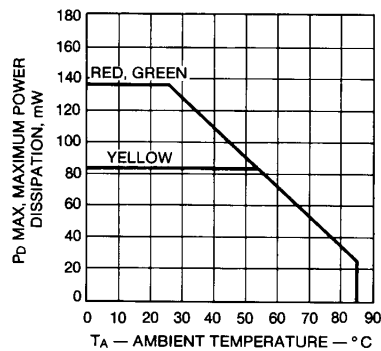
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Fig. 1. Maximum Tolerable Peak Current per LED Chip vs. Pulse Duration for HLMP-23X0/-26XX/-25X0/-28XX



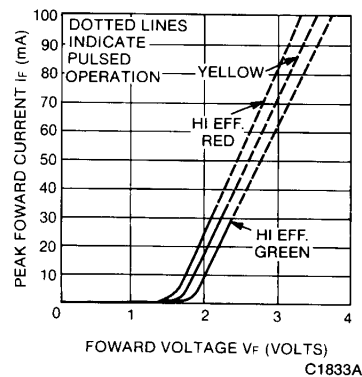
C2014

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



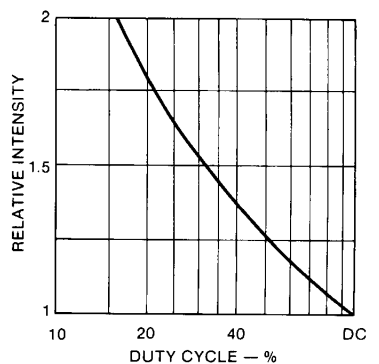
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Fig. 3. Maximum Power Dissipation per LED vs. Ambient Temperature



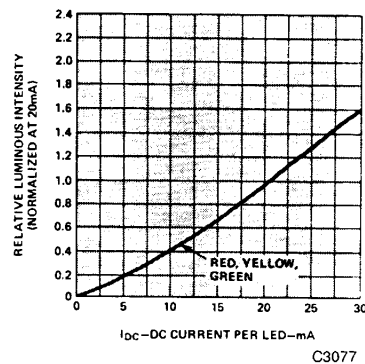
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Fig. 4. Forward Current vs. Forward Voltage



C1194C

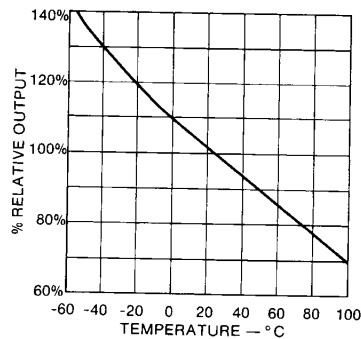
Fig. 5. Luminous Intensity vs. Duty Cycle



C3077

Fig. 6. Luminous Intensity vs. Forward Current

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



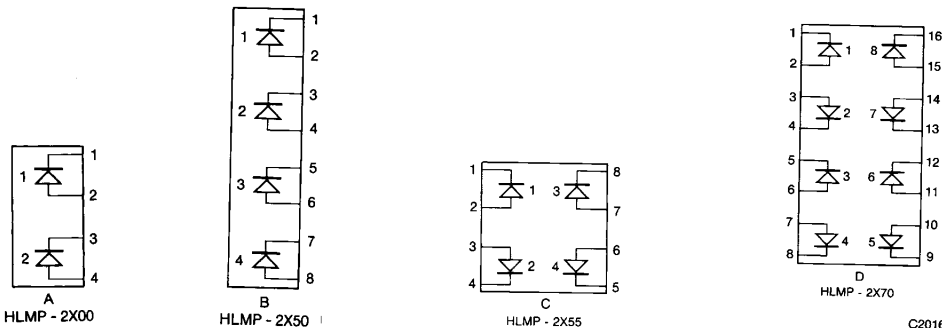
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Fig. 7. Output vs. Temperature

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 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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