

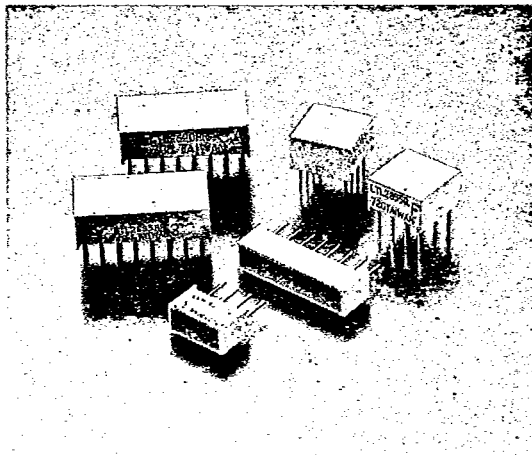


# LTL- 2300/2600 2400/2700 SERIES 2500/2800

## LIGHT BARS

### FEATURES

- RECTANGULAR LIGHT BAR.
- CHOICE OF THREE BRIGHT COLORS-GREEN/ YELLOW/ HIGH EFFICIENCY RED.
- LARGE, BRIGHT, UNIFORM LIGHT EMITTING AREAS.
- LOW POWER REQUIREMENT.
- EXCELLENT ON-OFF CONTRAST.
- CAN BE USED WITH PANEL AND LEGEND MOUNT.
- SUITABLE FOR MULTIPLEX OPERATION.
- I.C. COMPATIBLE.
- EASY MOUNTING ON P.C. BOARDS.



LED LIGHT BARS &  
BAR GRAPH ARRAYS

### DESCRIPTION

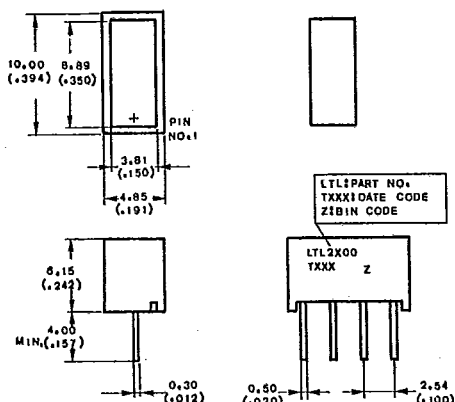
The LTL-2300/2400/2500/2600/2700/2800 series light bars are rectangular light sources designed for a variety of applications where a large bright source of light is required. These light bars are configured in single-in-line and dual-in-line packages. The green series devices utilize LED chips which are made from GaP on a transparent GaP substrate. The yellow and high efficiency red series devices utilize LED chips which are made from GaAsP on transparent GaP substrate. All devices have white bar color.

### DEVICES

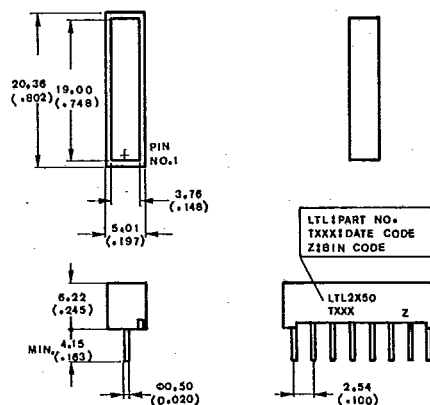
PART NO. LTL--			Size of Light Emitting Areas	PACKAGE DIMENSION		INTERNAL CIRCUIT DIAGRAM
GREEN	YELLOW	HI.-EFF. RED				
2500G	2400Y	2300HR	8.89 mm x 3.81 mm (.350 in x .150 in.)	A		A
2550G	2450Y	2350HR	19.05 mm x 3.81 mm (.750 in x .150 in.)	B		B
2800G	2700Y	2600HR	8.89 mm x 3.81 mm (.350 in x .150 in.)	C		C
2855G	2755Y	2655HR	8.89 mm x 8.89 mm (.350 in x .350 in.)	D		D
2820G	2720Y	2620HR	8.89 mm x 3.81 mm (.350 in x .150 in.)	E		E
2885G	2785Y	2685HR	8.89 mm x 19.05 mm (.350 in x .750 in.)	F		F

PACKAGE DIMENSIONS

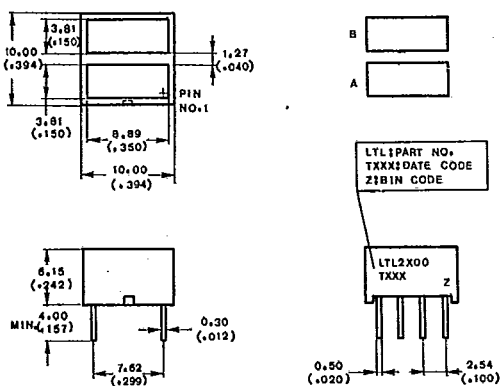
A. LTL-2300/2400/2500



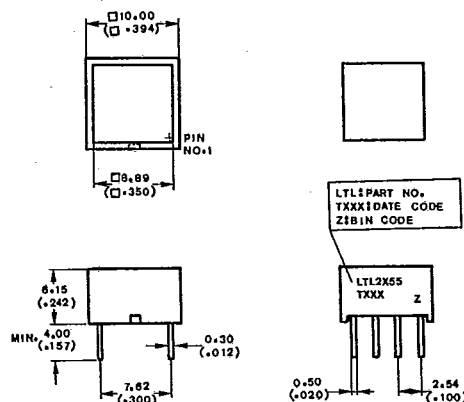
B. LTL-2350/2450/2550



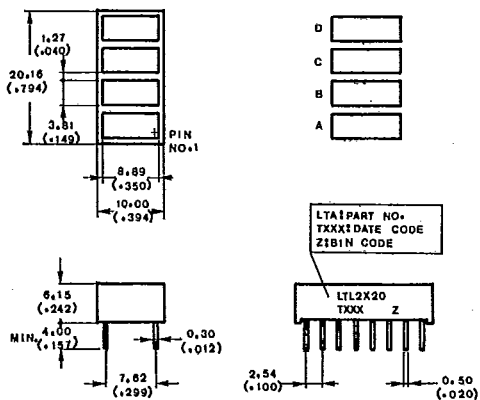
C. LTL-2600H/2700/2800



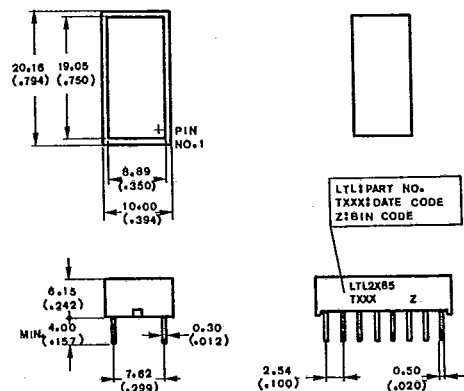
D. LTL-2655/2755/2855



E. LTL-2620/2720/2820



F. LTL-2685/2785/2885



3-9  
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NOTE: All dimensions are in  $\frac{\text{millimeters}}{\text{(inches)}}$ , and tolerance is  $\frac{0.25\text{mm}}{(0.010'')}$  unless otherwise noted.

**PIN CONNECTION**

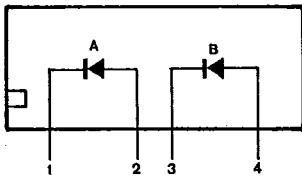
PIN NO.	CONNECTION			
	A LTL-2300/2400/2500	B LTL-2350/2450/2550	C LTL-2600/2700-2800	D LTL-2655/2755/2855
1	Cathode A	Cathode A	Cathode A	Cathode A
2	Anode A	Anode A	Anode A	Anode A
3	Cathode B	Cathode B	Anode B	Anode B
4	Anode B	Anode B	Cathode B	Cathode B
5		Cathode C	Cathode C	Cathode C
6		Anode C	Anode C	Anode C
7		Cathode D	Anode D	Anode D
8		Anode D	Cathode D	Cathode D

LED LIGHT BARS & BAR GRAPH ARRAYS

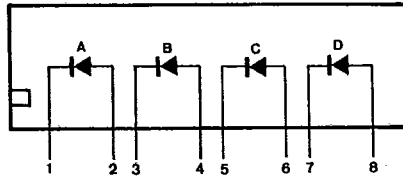
PIN NO.	CONNECTION	
	E. LTL-2620/2720/2820	F. LTL-2685/2785/2885
1	Cathode A	Cathode A
2	Anode A	Anode A
3	Anode B	Anode B
4	Cathode B	Cathode B
5	Cathode C	Cathode C
6	Anode C	Anode C
7	Anode D	Anode D
8	Cathode D	Cathode D
9	Cathode E	Cathode E
10	Anode E	Anode E
11	Anode F	Anode F
12	Cathode F	Cathode F
13	Cathode G	Cathode G
14	Anode G	Anode G
15	Anode H	Anode H
16	Cathode H	Cathode H

INTERNAL CIRCUIT DIAGRAM

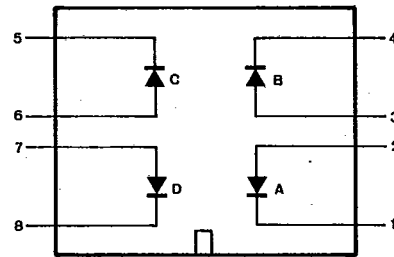
A. LTL-2300/2400/2500



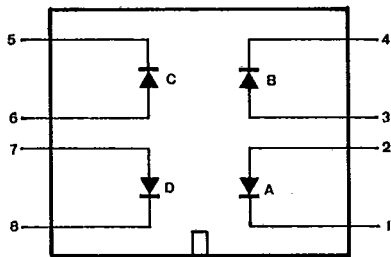
B. LTL-2350/2450/2550



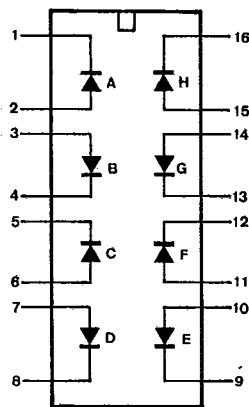
C. LTL-2600/2700/2800



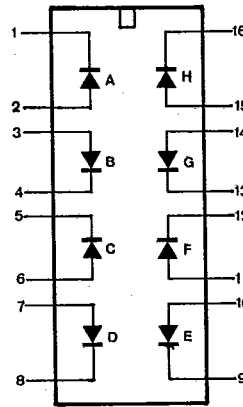
D. LTL-2655/2755/2855



E. LTL-2620/2720/2820



F. LTL-2685/2785/2885



ABSOLUTE MAXIMUM RATINGS AT TA = 25°C

PARAMETER	GREEN	YELLOW	HI-EFF. RED	UNIT
Power Dissipation Per Chip	75	60	75	mW
Peak Forward Current Per Chip (1/10 Duty Cycle, 0.1ms Pulse Width)	100	80	100	mA
Continuous Forward Current Per Chip	25	20	25	mA
Derating Linear From 25°C Per Chip	0.3	0.24	0.3	mA/°C
Reverse Voltage Per Chip	5	5	5	V
Operating Temperature Range	-25°C to +85°C			
Storage Temperature Range	-25°C to +85°C			
Solder Temperature 1/16 inch Below Seating Plane for 3 Seconds at 260°C				

**ELECTRICAL/OPTICAL CHARACTERISTICS AT  $T_A = 25^\circ\text{C}$   
HI-EFF RED LTL-2300HR/2600HR SERIES**

PARAMETER	LTL-	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous Intensity Per Bar	2300	Iv		9.0		mcd	I <sub>F</sub> = 10 mA
	2350		7	17			
	2600		3.2	9.0			
	2620		3.2	9.0			
	2655		7	17			
	2685		14	34			
Peak Emission Wavelength		$\lambda_p$		565		nm	I <sub>F</sub> = 20 mA
Spectral Line Half-Width		$\Delta\lambda$		30		nm	I <sub>F</sub> = 20 mA
Forward Voltage any Chip		V <sub>F</sub>		2.1	2.8	V	I <sub>F</sub> = 20 mA
Reverse Current any Chip		I <sub>R</sub>			100	$\mu\text{A}$	V <sub>R</sub> = 5V

LED LIGHT BARS &  
BAR GRAPH ARRAYS

Note: The BIN brightness classification see page 3-24, category E

**TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES**

(25°C Ambient Temperature Unless Otherwise Noted)

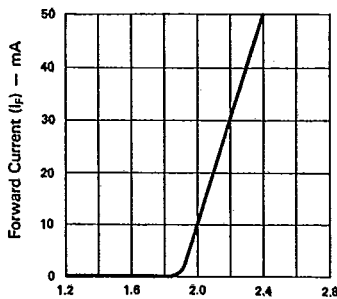


Fig. 1 FORWARD CURRENT Vs. FORWARD VOLTAGE.

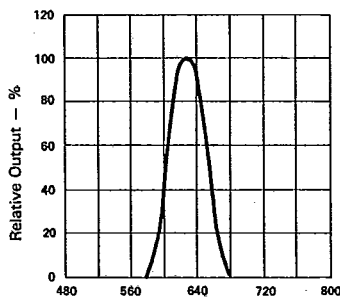


Fig. 2 SPECTRAL RESPONSE.

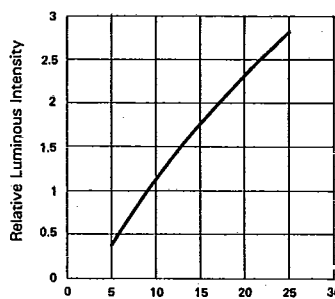


Fig. 3 RELATIVE LUMINOUS INTENSITY Vs. FORWARD CURRENT (PER SEGMENT).

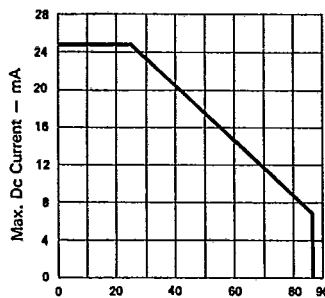


Fig. 4 MAX. ALLOWABLE DC CURRENT PER SEG. Vs AMBIENT TEMPERATURE.

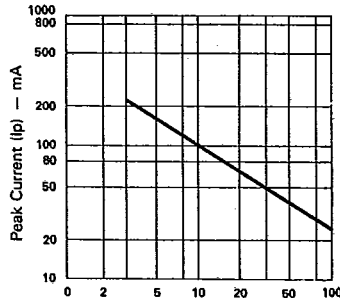


Fig. 5 MAX. PEAK CURRENT Vs. DUTY CYCLE.% (REFRESH RATE - F = 1 KHz)

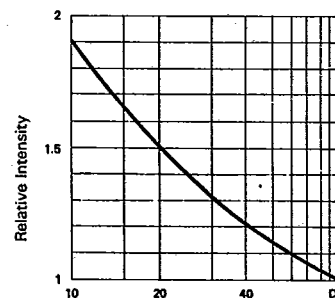


Fig. 6 LUMINOUS INTENSITY Vs. DUTY CYCLE% (AVERAGE I<sub>F</sub> = 10mA PER SEG.)

**ELECTRICAL/OPTICAL CHARACTERISTICS AT TA = 25°C  
YELLOW LTL-2400Y/2700Y SERIES**

PARAMETER	LTL--	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous Intensity Per Bar	2400	Iv	3.2	9.0		mcd	IF = 10 mA
	2450		7	17			
	2700		3.2	9.0			
	2720		3.2	9.0			
	2755		7	17			
	2785		14	34			
Peak Emission Wavelength		$\lambda_p$		585		nm	IF = 20 mA
Spectral Line Half-Width		$\Delta\lambda$		35		nm	IF = 20 mA
Forward Voltage any Chip		VF		2.1	2.8	V	IF = 20 mA
Reverse Current any Chip		IR			100	$\mu$ A	VR = 5V

Note: The BIN brightness classification see page 3-24, category E

**TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES**

(25°C Ambient Temperature Unless Otherwise Noted)

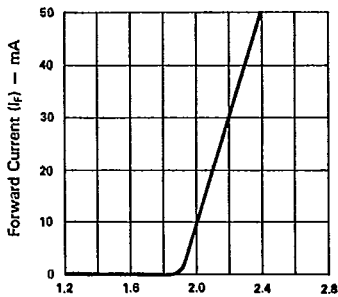


Fig. 1 FORWARD CURRENT Vs. FORWARD VOLTAGE.

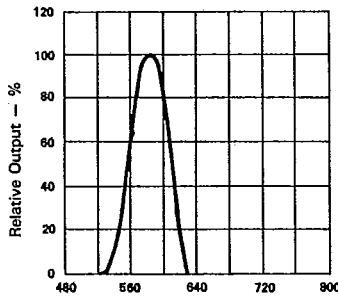


Fig. 2 SPECTRAL RESPONSE.

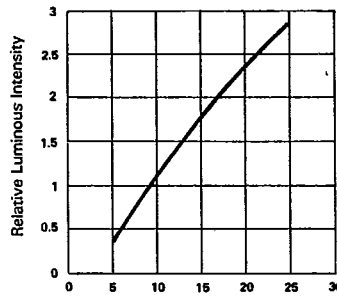


Fig. 3 RELATIVE LUMINOUS INTENSITY Vs. FORWARD CURRENT (PER SEGMENT).

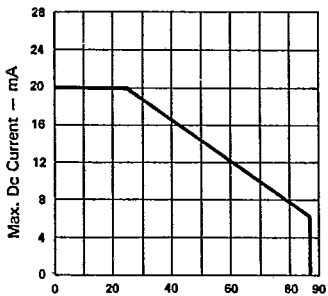


Fig. 4 MAX. ALLOWABLE DC CURRENT PER SEG. Vs AMBIENT TEMPERATURE.

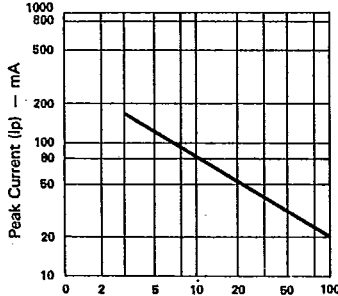


Fig. 5 MAX. PEAK CURRENT Vs. DUTY CYCLE.% (REFRESH RATE - F = 1 KHz)

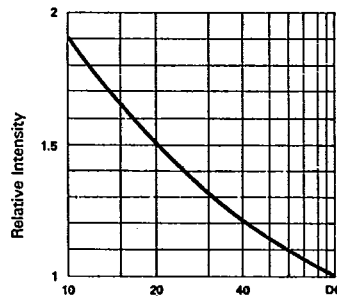


Fig. 6 LUMINOUS INTENSITY Vs. DUTY CYCLE% (AVERAGE If = 10mA PER SEG.)

**ELECTRICAL/OPTICAL CHARACTERISTICS AT TA = 25°C  
GREEN LTL-2500G/2800G SERIES**

PARAMETER	LTL#	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous Intensity Per Bar	2500	Iv	3.2	9.0		mcd	IF = 10 mA
	2550		7	17			
	2800		3.2	9.0			
	2820		3.2	9.0			
	2855		7	17			
	2885		14	34			
Peak Emission Wavelength		$\lambda_p$		565		nm	IF = 20 mA
Spectral Line Half-Width		$\Delta\lambda$		30		nm	IF = 20 mA
Forward Voltage any Chip		VF		2.1	2.8	V	IF = 20 mA
Reverse Current any Chip		IR			100	$\mu$ A	VR = 5V

LED LIGHT BARS & BAR GRAPH ARRAYS

Note: The BIN brightness classification see page 3-24, category E

**TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES**  
(25°C Ambient Temperature Unless Otherwise Noted)

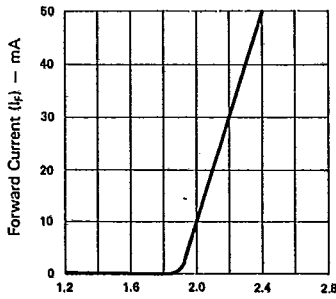


Fig. 1 FORWARD CURRENT VS. FORWARD VOLTAGE.

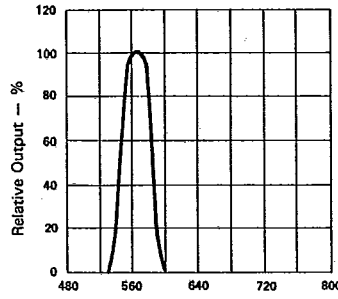


Fig. 2 SPECTRAL RESPONSE.

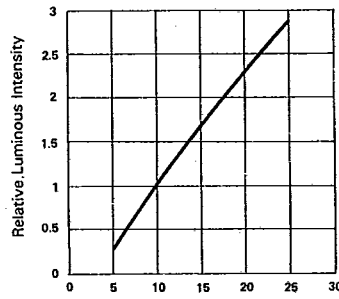


Fig. 3 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT (PER SEGMENT).

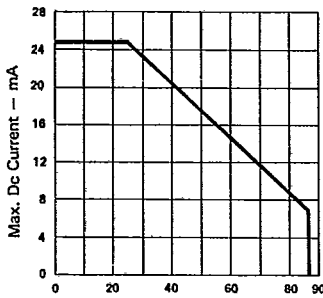


Fig. 4 MAX. ALLOWABLE DC CURRENT PER SEG. VS AMBIENT TEMPERATURE.

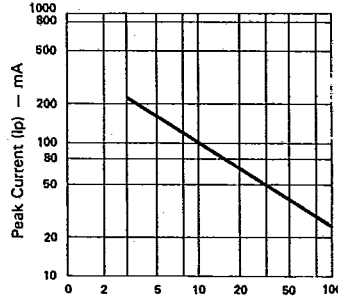


Fig. 5 MAX. PEAK CURRENT VS. DUTY CYCLE.% (REFRESH RATE - F = 1 KHz)

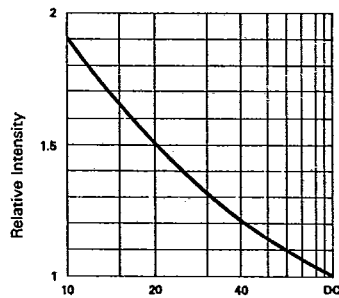


Fig. 6 LUMINOUS INTENSITY VS. DUTY CYCLE.% (AVERAGE If = 10mA PER SEG.)