

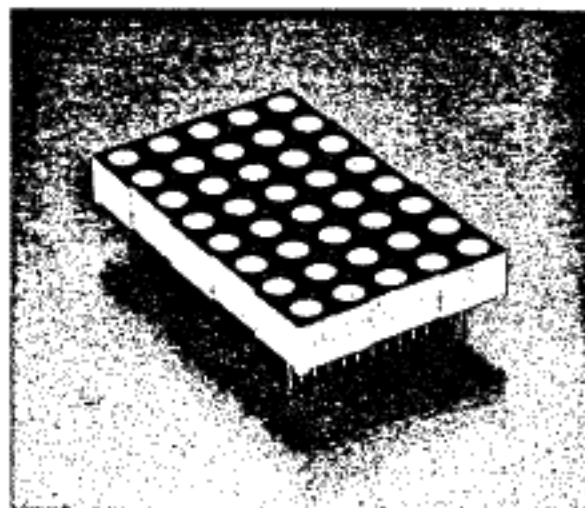


# LTP- 2058A/2158A 2458AA/2558AA SERIES

2.3" 5 x 8 SINGLE COLOR & MULTICOLOR  
DOT MATRIX DISPLAYS

## FEATURES

- 2.3" INCH (58.42mm) MATRIX HEIGHT.
- LOW POWER REQUIREMENT.
- HIGH CONTRAST.
- HIGH BRIGHTNESS.
- SINGLE PLANE, WIDE VIEWING ANGLE.
- 5 x 7 ARRAY WITH X-Y SELECT.
- COMPATIBLE WITH USASCII AND EBCDIC CODES.
- STACKABLE VERTICALLY AND HORIZONTALLY.
- CHOICE OF TWO MATRIX ORIENTATION CATHODE ROW OR CATHODE COLUMN.
- EASY MOUNTING ON P.C. BOARD.
- CATEGORIZED FOR LUMINOUS INTENSITY.
- SINGLE COLOR DISPLAYS HAVE THE CHOICE OF FOUR BRIGHT COLORS-GREEN / YELLOW / ORANGE / HIGH EFFICIENCY RED.
- MULTICOLOR DISPLAYS ARE APPLICABLE TO THREE BRIGHT COLORS: GREEN, ORANGE AND YELLOW (GREEN AND ORANGE MIXED)



## DESCRIPTION

The LTP-2 x 58A series are 2.3 inch (30.48mm) matrix-height 5 x 7 dot matrix displays.

The LTP-2458AA/2558AA are multicolor applicable displays. The multicolor displays have gray face and white dot color.

The LTP-2058A / 2158A series are single color displays. The green, yellow and orange displays have gray face and white dot color. The high efficiency red displays have red face and red dot color.

The green series devices utilize LED chips which are made from GaP on a transparent GaP substrate.

The yellow, orange and high efficiency red series devices utilize LED chips which are made from GaAsP on a transparent GaP substrate.

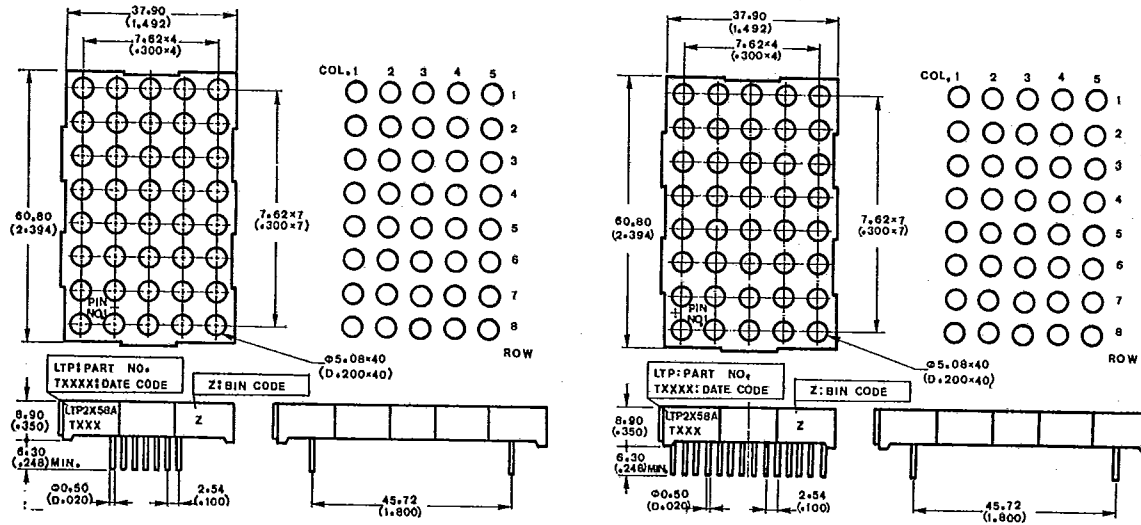
## DEVICES

PART NO. LTP--					DESCRIPTION	PACKAGE DIMENSION	INTERNAL CIRCUIT DIAGRAM
GREEN	YELLOW	ORANGE	HI-EFF. RED	MULTI-COLOR			
2058AG	2058AY	2058AE	2058AHR	—	Anode Column, Cathode Row	A	A
2158AG	2158AY	2158AE	2158AHR	—	Cathode Column, Anode Row	A	B
—	—	—	—	2458AA	Anode Column, Cathode Row	B	C
—	—	—	—	2558AA	Cathode Column, Anode Row	B	C

# PACKAGE DIMENSIONS

A. LTP-2058A/2158A

B. LTP-2458AA/2558AA



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

## PIN CONNECTION

PIN NO.	CONNECTION	
	A. LTP-2058A	B. LTP-2158A
1	Cathode Row 6	Anode Row 6
2	Cathode Row 8	Anode Row 8
3	Anode Column 2	Cathode Column 2
4	Anode Column 3*1	Cathode Column 3*1
5	Cathode Row 5	Anode Row 5
6	Anode Column 5	Cathode Column 5
7	Cathode Row 7	Anode Row 7
8	Cathode Row 3	Anode Row 3
9	Cathode Row 1	Anode Row 1
10	Anode Column 4	Cathode Column 4
11	Anode Column 3*1	Cathode Column 3*1
12	Cathode Row 4	Anode Row 4
13	Anode Column 1	Cathode Column 1
14	Cathode Row 2	Anode Row 2

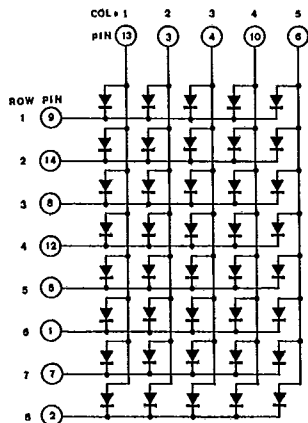
NOTE: 1. Pin 4 & 11 are internally connected.

ALPHANUMERIC DISPLAYS & DOT MATRIX DISPLAYS

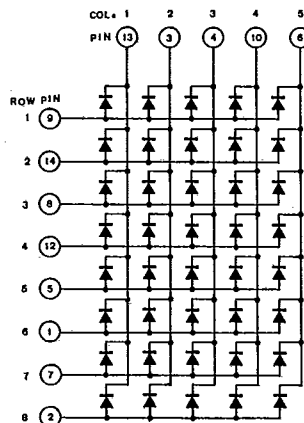
PIN NO.	CONNECTION	
	C. LTP-2458AA	D. LTP-2558AA
1	Cathode Row 6 Green	Anode Row 6 Green
2	Cathode Row 6 Orange	Anode Row 6 Orange
3	Cathode Row 8 Green	Anode Row 8 Green
4	Cathode Row 8 Orange	Anode Row 8 Orange
5	Anode Col. 2 Green	Cathode Col. 2 Green
6	Anode Col. 2 Orange	Cathode Col. 2 Orange
7	Anode Col. 3 Green	Cathode Col. 3 Green
8	Anode Col. 3 Orange	Cathode Col. 3 Orange
9	Cathode Row 5 Green	Anode Row 5 Green
10	Cathode Row 5 Orange	Anode Row 5 Orange
11	Anode Col. 5 Green	Cathode Col. 5 Green
12	Anode Col. 5 Orange	Cathode Col. 5 Orange
13	Cathode Row 7 Green	Anode Row 7 Green
14	Cathode Row 7 Orange	Anode Row 7 Orange
15	Cathode Row 3 Green	Anode Row 3 Green
16	Cathode Row 3 Orange	Anode Row 3 Orange
17	Cathode Row 1 Green	Anode Row 1 Green
18	Cathode Row 1 Orange	Anode Row 1 Orange
19	Anode Col. 4 Green	Cathode Col. 4 Green
20	Anode Col. 4 Orange	Cathode Col. 4 Orange
21	Anode Col. 3 Green	Cathode Col. 3 Green
22	Anode Col. 3 Orange	Cathode Col. 3 Orange
23	Cathode Row 4 Green	Anode Row 4 Green
24	Cathode Row 4 Orange	Anode Row 4 Orange
25	Anode Col. 1 Green	Cathode Col. 1 Green
26	Anode Col. 1 Orange	Cathode Col. 1 Orange
27	Cathode Row 2 Green	Anode Row 2 Green
28	Cathode Row 2 Orange	Anode Row 2 Orange

### INTERNAL CIRCUIT DIAGRAM

A. LTP-2058A

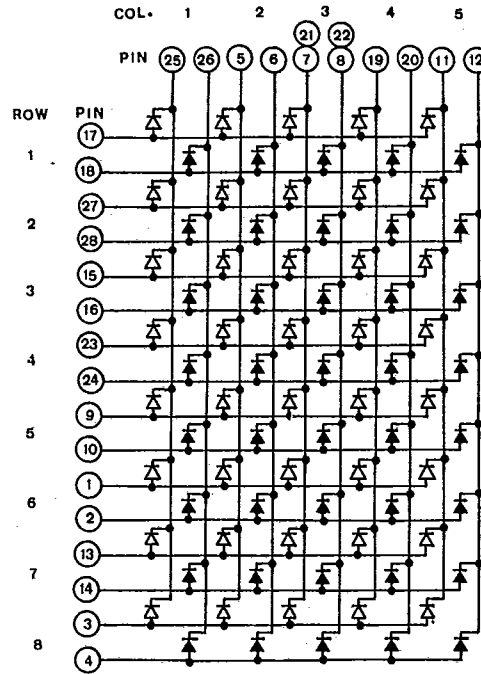
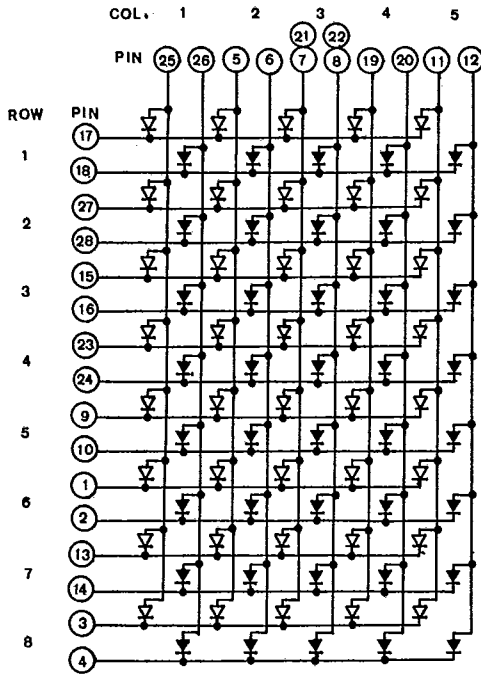


B. LTP-2158A



C. LTP-2458AA

D. LTP-2558AA



NOTES: 1. The sign "  $\triangle$  " stands for ORANGE color chip.  
 2. The sign "  $\triangle$  " stands for GREEN color chip.

ABSOLUTE MAXIMUM RATINGS AT  $T_A = 25^\circ\text{C}$

PARAMETER	GREEN	YELLOW	ORANGE	HI-EFF RED	UNIT
Power Dissipation Per Dot	75	60	75	75	mW
Peak Forward Current Per Dot (1/10 Duty Cycle, 0.1ms Pulse Width)	100	80	100	100	mA
Continuous Forward Current Per Dot	25	20	25	25	mA
Derating Linear From 25°C Per Dot	0.3	0.24	0.3	0.3	mA/°C
Reverse Voltage Per Dot	5	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 Sec. at 260°C					

ALPHANUMERIC DISPLAYS & DOT MATRIX DISPLAYS

**ELECTRICAL/OPTICAL CHARACTERISTICS AT  $T_A = 25^\circ\text{C}$   
LTP-2058AG/2158AG & LTP-2458AA/2558AA (GREEN)**

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous Intensity	$I_v$	900	4000		$\mu\text{cd}$	$I_p = 48 \text{ mA}$ 1/8 DUTY
Peak Emission Wavelength	$\lambda_p$		565		nm	$I_F = 20 \text{ mA}$
Spectral Line Half-Width	$\Delta\lambda$		30		nm	$I_F = 20 \text{ mA}$
Forward Voltage, any Dot	$V_F$		2.1	2.8	V	$I_F = 20 \text{ mA}$
Reverse Current, any Dot	$I_R$			100	$\mu\text{A}$	$V_R = 5 \text{ V}$
Luminous Intensity Matching Ratio	$I_v\text{-m}$			2:1		$I_F = 20 \text{ mA}$

Note: The BIN brightness classification see page 5-70, LTP-2058AG/2158AG categorize D and LTP-2458AA/2558AA categorize D-1.

**TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES**

( $25^\circ\text{C}$  Ambient Temperature Unless Otherwise Noted)

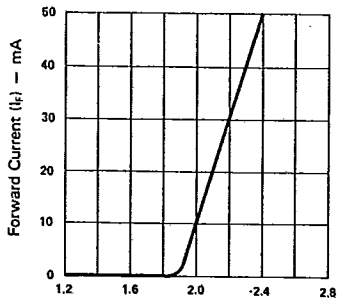


Fig. 1 FORWARD CURRENT Vs. FORWARD VOLTAGE.

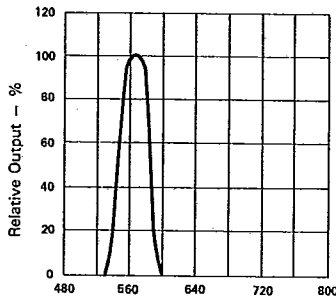


Fig. 2 SPECTRAL RESPONSE.

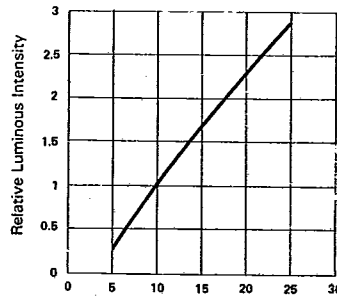


Fig. 3 RELATIVE LUMINOUS INTENSITY Vs. FORWARD CURRENT (PER SEGMENT).

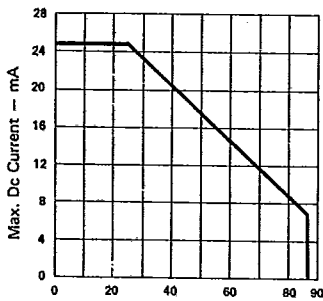


Fig. 4 MAX. ALLOWABLE DC CURRENT PER SEG. Vs AMBIENT TEMPERATURE.

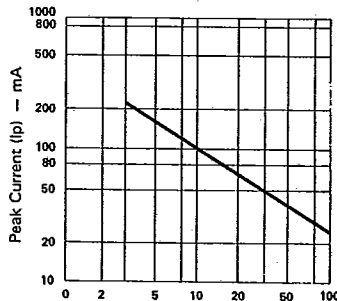


Fig. 5 MAX. PEAK CURRENT Vs. DUTY CYCLE.% (REFRESH RATE - F = 1 KHz)

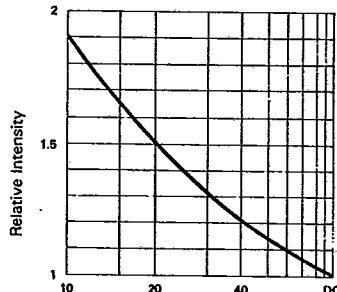


Fig. 6 LUMINOUS INTENSITY Vs. DUTY CYCLE% (AVERAGE  $I_F = 10 \text{ mA}$  PER SEG.)

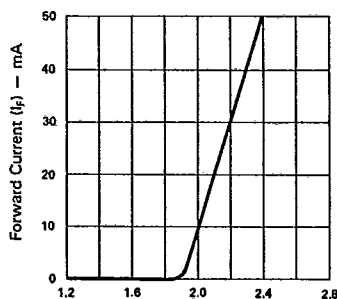
**ELECTRICAL/OPTICAL CHARACTERISTICS AT  $T_A = 25^\circ\text{C}$**   
**LTP-2058AY/2158AY**

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous Intensity	$I_v$	250	4000		$\mu\text{cd}$	$I_F = 48\text{ mA}$ 1/8 DUTY
Peak Emission Wavelength	$\lambda_p$		585		nm	$I_F = 20\text{ mA}$
Spectral Line Half-Width	$\Delta\lambda$		35		nm	$I_F = 20\text{ mA}$
Forward Voltage, any Dot	$V_F$		2.1	2.8	V	$I_F = 20\text{ mA}$
Reverse Current, any Dot	$I_R$			100	$\mu\text{A}$	$V_R = 5\text{V}$
Luminous Intensity Matching Ratio	$I_v\text{-m}$			2:1		$I_F = 20\text{ mA}$

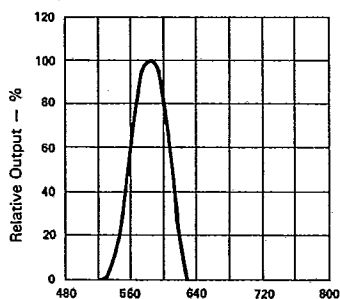
Note: The BIN brightness classification see page 5-70, category D

**TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES**

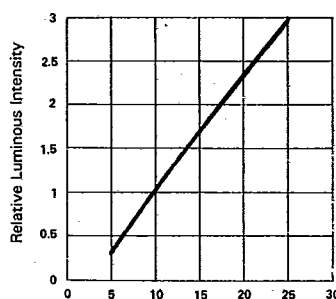
( $25^\circ\text{C}$  Ambient Temperature Unless Otherwise Noted)



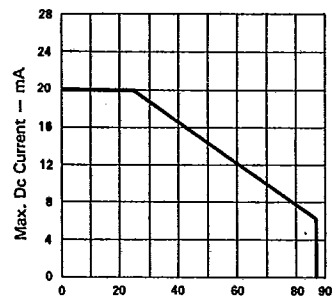
Forward Voltage ( $V_f$ ) - Volts  
 Fig. 1 FORWARD CURRENT Vs. FORWARD VOLTAGE.



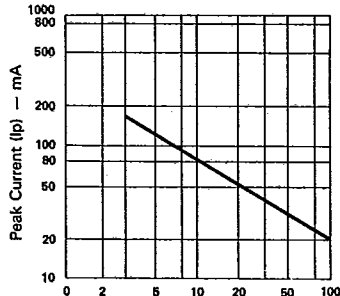
Wavelength ( $\lambda$ ) - nm.  
 Fig. 2 SPECTRAL RESPONSE.



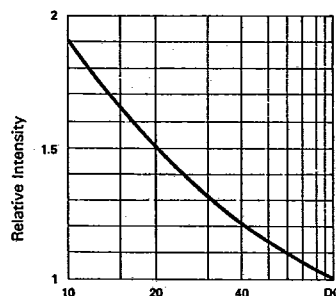
Forward Current ( $I_f$ ) - mA  
 Fig. 3 RELATIVE LUMINOUS INTENSITY Vs. FORWARD CURRENT (PER SEGMENT).



Ambient Temperature ( $T_a$ ) -  $^\circ\text{C}$   
 Fig. 4 MAX. ALLOWABLE DC CURRENT PER SEG. Vs AMBIENT TEMPERATURE.



Duty Cycle %  
 Fig. 5 MAX. PEAK CURRENT Vs. DUTY CYCLE.% (REFRESH RATE -  $F = 1\text{ KHz}$ )



Duty Cycle %  
 Fig. 6 LUMINOUS INTENSITY Vs. DUTY CYCLE% (AVERAGE  $I_f = 10\text{mA}$  PER SEG.)

ALPHANUMERIC DISPLAYS &  
 DOT MATRIX DISPLAYS

**ELECTRICAL/OPTICAL CHARACTERISTICS AT  $T_A = 25^\circ\text{C}$   
LTP-2058AE/2158AE & LTP-2458AA/2558AA (ORANGE)**

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous Intensity	$I_v$	900	4000		$\mu\text{cd}$	$I_F = 48 \text{ mA}$ 1/8 DUTY
Peak Emission Wavelength	$\lambda_p$		630		nm	$I_F = 20 \text{ mA}$
Spectral Line Half-Width	$\Delta\lambda$		40		nm	$I_F = 20 \text{ mA}$
Forward Voltage, any Dot	$V_F$		2.1	2.8	V	$I_F = 20 \text{ mA}$
Reverse Current, any Dot	$I_R$			100	$\mu\text{A}$	$V_R = 5\text{V}$
Luminous Intensity Matching Ratio	$I_v\text{-m}$			2:1		$I_F = 20 \text{ mA}$

Note: The BIN brightness classification see page 5-70, LTP-2058AE/2158AE categorize D and LTP-2458AA

**TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES**

( $25^\circ\text{C}$  Ambient Temperature Unless Otherwise Noted)

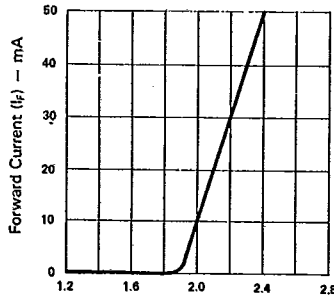


Fig. 1 FORWARD CURRENT VS. FORWARD VOLTAGE.

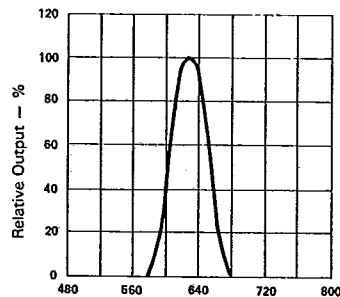


Fig. 2 SPECTRAL RESPONSE.

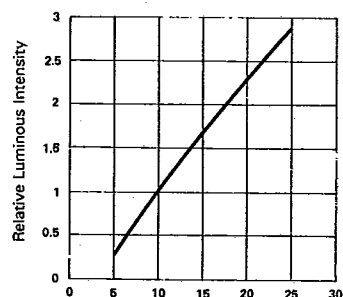


Fig. 3 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT (PER SEGMENT).

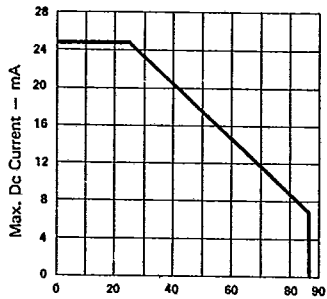


Fig. 4 MAX. ALLOWABLE DC CURRENT PER SEG. VS AMBIENT TEMPERATURE.

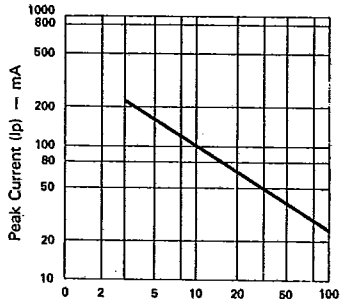


Fig. 5 MAX. PEAK CURRENT VS. DUTY CYCLE.% (REFRESH RATE - F = 1 KHz)

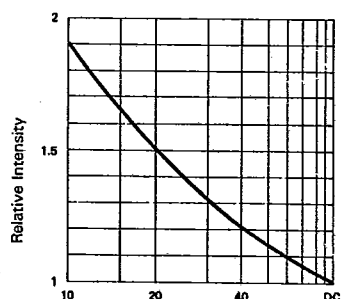


Fig. 6 LUMINOUS INTENSITY VS. DUTY CYCLE% (AVERAGE  $I_F = 10\text{mA}$  PER SEG.)

**ELECTRICAL/OPTICAL CHARACTERISTICS AT  $T_A = 25^\circ\text{C}$**   
**LTP-2058AHR/2158AHR**

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous Intensity	$I_V$	900	4000		$\mu\text{cd}$	$I_P = 48\text{ mA}$ 1/8 DUTY
Peak Emission Wavelength	$\lambda_P$		635		nm	$I_F = 20\text{ mA}$
Spectral Line Half-Width	$\Delta\lambda$		40		nm	$I_F = 20\text{ mA}$
Forward Voltage, any Dot	$V_F$		2.1	2.8	V	$I_F = 20\text{ mA}$
Reverse Current, any Dot	$I_R$			100	$\mu\text{A}$	$V_R = 5\text{V}$
Luminous Intensity Matching Ratio	(v-m)			2:1		$I_F = 20\text{ mA}$

Note: The BIN brightness classification see page 5-70, category D

**TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES**

( $25^\circ\text{C}$  Ambient Temperature Unless Otherwise Noted)

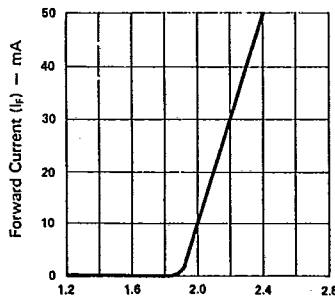


Fig. 1 FORWARD CURRENT Vs. FORWARD VOLTAGE.

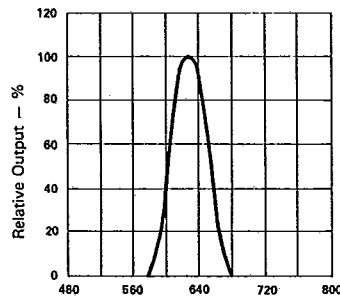


Fig. 2 SPECTRAL RESPONSE.

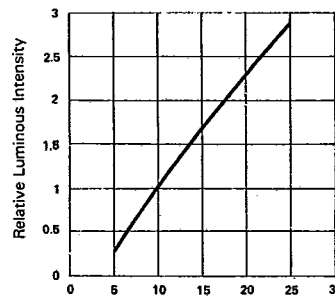


Fig. 3 RELATIVE LUMINOUS INTENSITY Vs. FORWARD CURRENT (PER SEGMENT).

ALPHANUMERIC DISPLAYS & DOT MATRIX DISPLAYS

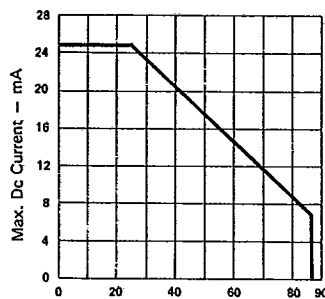


Fig. 4 MAX. ALLOWABLE DC CURRENT PER SEG. Vs AMBIENT TEMPERATURE.

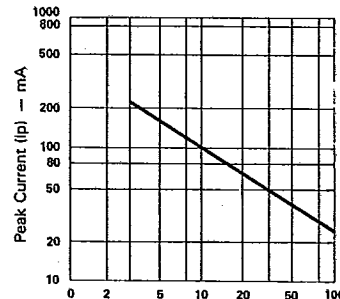


Fig. 5 MAX. PEAK CURRENT Vs. DUTY CYCLE.% (REFRESH RATE - F = 1 KHz)

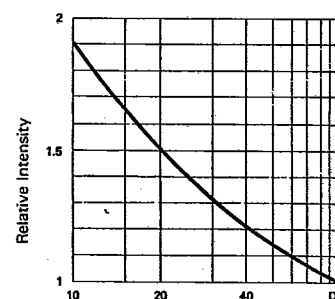


Fig. 6 LUMINOUS INTENSITY Vs. DUTY CYCLE% (AVERAGE  $I_F = 10\text{mA}$  PER SEG.)