LITEON

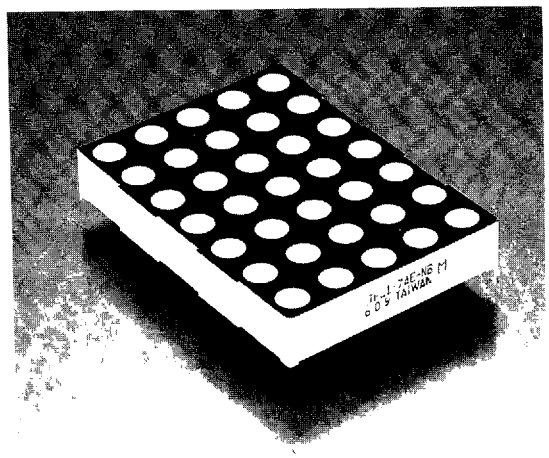
LTP- 2057A/2157A 2657AA/2757AA SERIES

2.0" 5 x 7 SINGLE COLOR & MULTICOLOR DOT MATRIX DISPLAYS

T-41-35

FEATURES

- 2.0" INCH (50.8 mm) MATRIX HEIGHT.
- LOW POWER REQUIREMENT.
- HIGH CONTRAST.
- HIGH BRIGHTNESS.
- SINGLE PLANE, WIDE VIEWING ANGLE.
- SOLID STATE RELIABILITY.
- 5 x 7 ARRAY WITH X-Y SELECT.
- COMPATIBLE WITH USASCII AND EBCDIC CODES.
- STACKABLE 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 57A series are 2.0 inch (50.80mm) matrix-height 5 x 7 dot matrix displays.

The LTP-2657AA/2757AA are multicolor applicable displays. The multicolor displays have gray face and white dot color.

The LTP-2057/2157A 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 utilized LED chips which are made from GaP on a transparent GaP substrate.

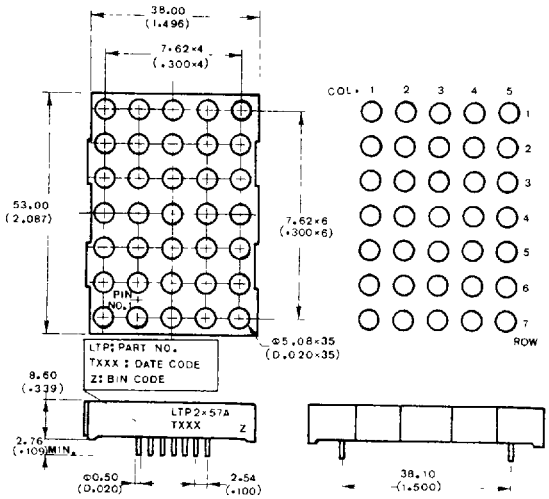
The yellow, orange and high efficiency red series devices utilize LED chips which are made from GaAsP on a transparent GaP substrate

DEVICES

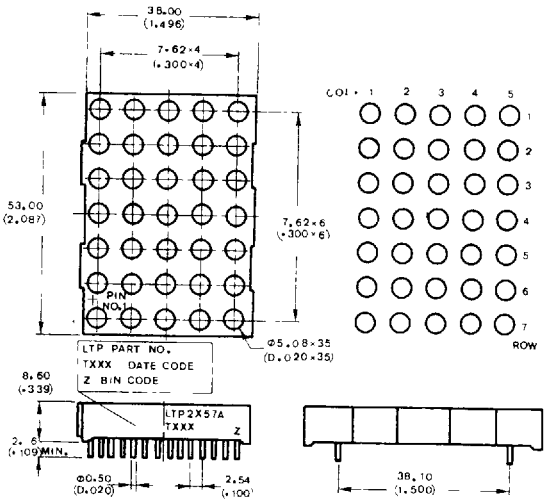
PART NO. LTP–					DESCRIPTION	PACKAGE DIMENSION	INTERNAL CIRCUIT DIAGRAM
GREEN	YELLOW	ORANGE	HI.-EFF. RED	MULTI-COLOR			
2057AG	2057AY	2057AE	2057AHR	—	Anode Column, Cathode Row	A	A
2157AG	2157AY	2157AE	2157AHR	—	Cathode Column, Anode Row	A	B
—	—	—	—	2657AA	Anode Column, Cathode Row	B	C
—	—	—	—	2757AA	Cathode Column, Anode Row	B	D

PACKAGE DIMENSIONS

A. LTP-2057A/2157A



B. LTP-2657AA/2757AA



NOTE: All dimensions are in $\frac{\text{millimeters}}{(\text{inches})}$ tolerance are:

1. Lead length (from seating plane) minimum value $\frac{+1.00}{-0.00}$ mm ($\frac{+0.040''}{-0.000''}$) 2. $\frac{\pm 0.25\text{mm}}{(0.010'')}$ unless otherwise noted.

PIN CONNECTION

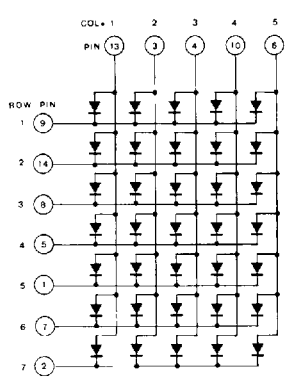
PIN NO.	CONNECTION	
	A. LTP-2057A	B. LTP-2157A
1	Cathode Row 5	Anode Row 5
2	Cathode Row 7	Anode Row 7
3	Anode Column 2	Cathode Column 2
4	Anode Column 3*1	Cathode Column 3*1
5	Cathode Row 4*2	Anode Row 4*2
6	Anode Column 5	Cathode Column 5
7	Cathode Row 6	Anode Row 6
8	Cathode Row 3	Anode Row 3
9	Cathode 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*2	Anodr Row 4*2
13	Anode Column 1	Cathode Column 1
14	Cathode Row 2	Anode Row 2

NOTES 1 Pin 4 & 11 are internally connected
2 Pin 5 & 12 are internally connected

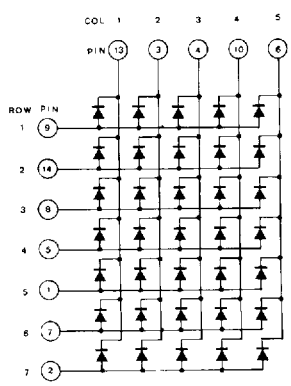
PIN NO.	CONNECTION	
	C. LTP-2657AA	D. LTP-2757AA
1	Anode Column 1 Green	Cathode Column 1 Green
2	Anode Column 1 Orange 1	Cathode Column 1 Orange
3	Cathode Row 7 Green	Anode Row 7 Green
4	Cathode Row 7 Orange	Anode Row 7 Orange
5	Anode Column 2 Green	Cathode Column 2 Green
6	Anode Column 2 Orange	Cathode Column 2 Orange
7	Anode Column 3 Green	Cathode Column 3 Green
8	Anode Colunn 3 Orange	Cathode Column 3 Orange
9	Cathode Row 5 Green	Anode Row 5 Green
10	Cathode Row 5 Orange	Anode Row 5 Orange
11	Cathode Row 4 Green	Anode Row 4 Green
12	Cathode Row 4 Orange	Anode Row 4 Orange
13	Cathode Row 6 Green	Anode Row 6 Green
14	Cathode Row 6 Orange	Anode Row 6 Orange
15	Anode Column 5 Green	Cathode Column 5 Green
16	Anode Column 5 Orange	Cathode Column 5 Orange
17	Cathode Row 1 Green	Anode Row 1 Green
18	Cathode Row 1 Orange	Anode Row 1 Orange
19	Anode Column 4 Green	Cathode Column 4 Green
20	Anode Column 4 Orange	Cathode Column 4 Orange
21	Anode Column 3 Green	Cathode Column 3 Green
22	Anode Column 3 Orange	Cathode Column 3 Orange
23	Cathode Row 3 Green	Anode Row 3 Green
24	Cathode Row 3 Orange	Anode Row 3 Orange
25	Cathode Row 4 Green	Anode Row 4 Green
26	Cathode Row 4 Orange	Anode Row 4 Orange
27	Cathode Row 2 Green	Anode Row 2 Green
28	Cathode Row 2 Orange	Anode Row 2 Orange

INTERNAL CIRCUIT DIAGRAM

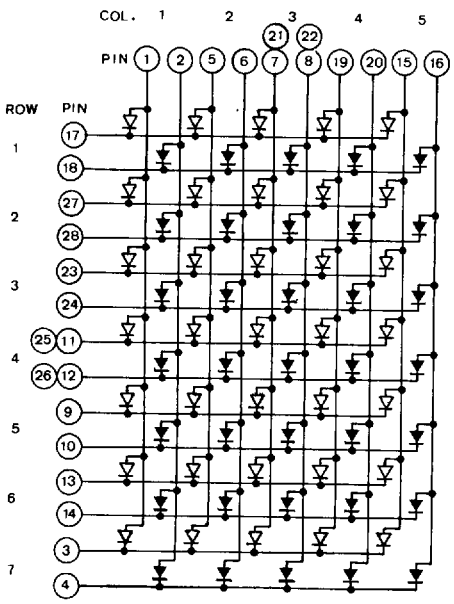
A. LTP-2057A



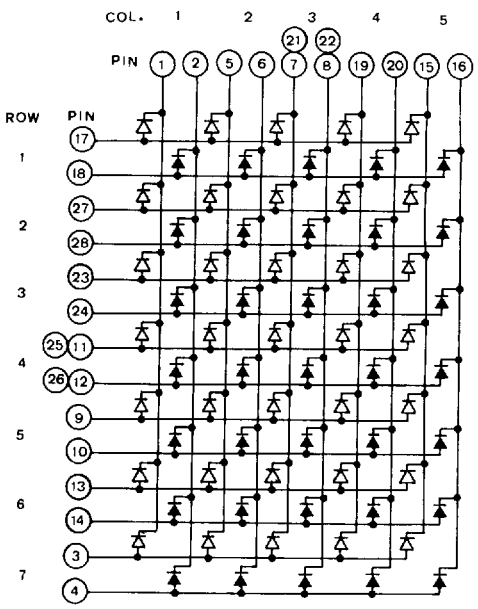
B. LTP-2157A



C. LTP-2657AA



D. LTP-2757AA



NOTES 1. The sign "⊣▷⊢" stands for GREEN color chips.
2. The sign "⊣▶⊢" stands for ORANGE color chips.

ABSOLUTE MAXIMUM RATINGS AT T_A = 25°C

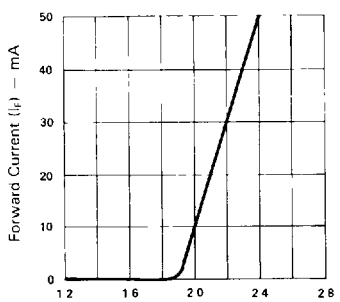
PARAMETER	GREEN	YELLOW	ORANGE	HI-EFF RED	UNIT
Power Dissipation Per Dot	75	60	75	75	mW
Peak Forward Current Per Dot (1/10 Duty Cycle, 0.1ms Pulse Width)	100	80	100	100	mA
Continuous Forward Current Per Dot	25	20	25	25	mA
Derating Linear From 25°C Per Dot	0.3	0.24	0.3	0.3	mA/°C
Reverse Voltage Per Dot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

ELECTRICAL/OPTICAL CHARACTERISTICS AT T_A = 25°C
LTP-2057AG/2157AG & LTP-2657AA/2757AA (GREEN)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous Intensity	Iv	1500	4000		μcd	I_P = 48 mA 1/8 DUTY
Peak Emission Wavelength	λp		565		nm	I_F = 20 mA
Spectral Line Half-Width	Δλ		30		nm	I_F = 20 mA
Forward Voltage, any Dot	V_F		2.1	2.8	V	I_F = 20 mA
Reverse Current, any Dot	I_R			100	μA	V_R = 5V
Luminous Intensity Matching Ratio	Iv-m			2:1		I_F = 20 mA

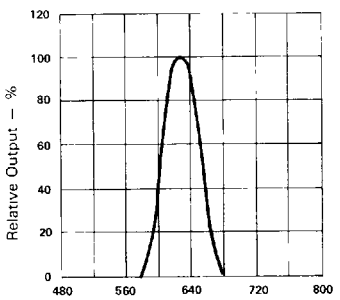
TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES

(25° C Ambient Temperature Unless Otherwise Noted)



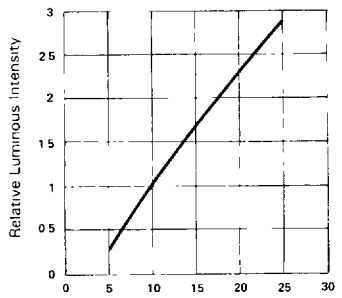
Forward Voltage (V_F) – Volts

Fig 1 FORWARD CURRENT Vs FORWARD VOLTAGE



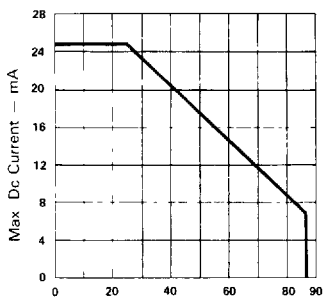
Wavelength (λ) – nm

Fig 2 SPECTRAL RESPONSE



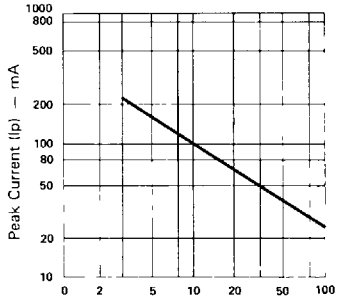
Forward Current (I_F) – mA

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



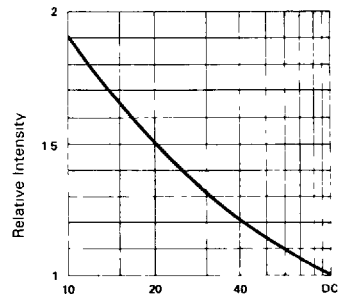
Ambient Temperature (Ta) – °C

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 KHz)



Duty Cycle %

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

ELECTRICAL/OPTICAL CHARACTERISTICS AT $T_A = 25°C$
LTP-2057AY/2157AY

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous Intensity	Iv	1200	4000		μcd	Ip = 48 mA 1/8 DUTY
Peak Emission Wavelength	λp		585		nm	IF = 20 mA
Spectral Line Half-Width	Δλ		35		nm	IF = 20 mA
Forward Voltage, any Dot	VF		2.1	2.8	V	IF = 20 mA
Reverse Current, any Dot	IR			100	μA	VR = 5V
Luminous Intensity Matching Ratio	Iv-m			2:1		IF = 20 mA

TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES

(25°C Ambient Temperature Unless Otherwise Noted)

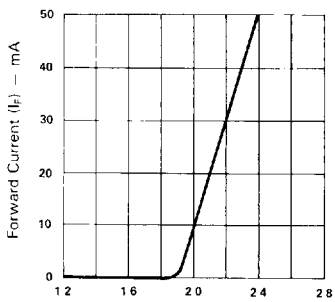


Fig 1 FORWARD CURRENT Vs FORWARD VOLTAGE

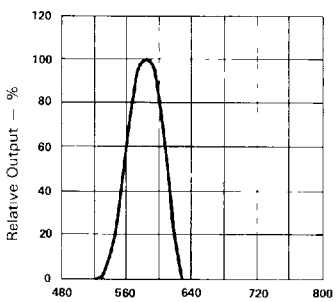


Fig 2 SPECTRAL RESPONSE

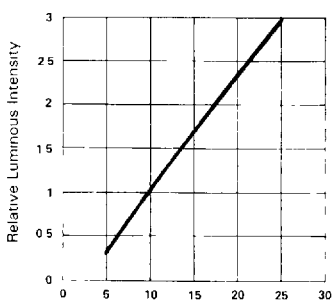


Fig 3 RELATIVE LUMINOUS INTENSITY Vs FORWARD CURRENT (PER SEGMENT)

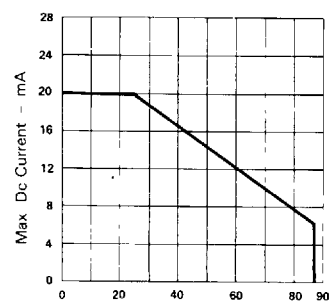


Fig 4 MAX. ALLOWABLE DC CURRENT PER SEG Vs AMBIENT TEMPERATURE

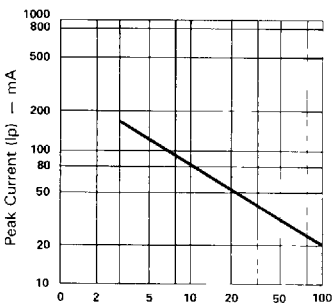


Fig 5 MAX. PEAK CURRENT Vs DUTY CYCLE % (REFRESH RATE F 1 KHz)

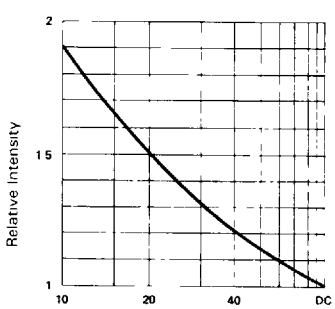


Fig 6 LUMINOUS INTENSITY Vs DUTY CYCLE % (AVERAGE I_f – 10mA PER SEG.)

DOT MATRIX DISPLAYS

ELECTRICAL/OPTICAL CHARACTERISTICS AT T_A = 25°C
LTP-2057AE/2157AE & LTP-2657AA/2757AA (ORANGE)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous Intensity	Iv	1500	4000		μcd	Ip = 48 mA 1/8 DUTY
Peak Emission Wavelength	λp		630		nm	I_F = 20 mA
Spectral Line Half-Width	Δλ		40		nm	I_F = 20 mA
Forward Voltage, any Dot	V_F		2.1	2.8	V	I_F = 20 mA
Reverse Current, any Dot	I_R			100	μA	V_R = 5V
Luminous Intensity Matching Ratio	Iv-m			2:1		I_F = 20 mA

TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES

(25° C Ambient Temperature Unless Otherwise Noted)

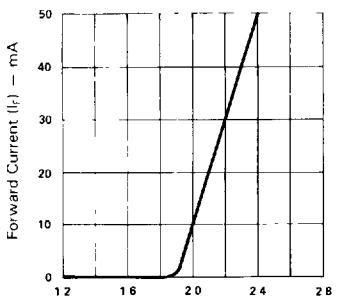


Fig 1 FORWARD CURRENT Vs FORWARD VOLTAGE

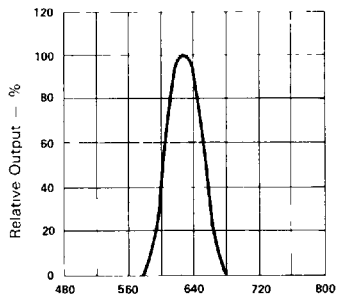


Fig 2 SPECTRAL RESPONSE

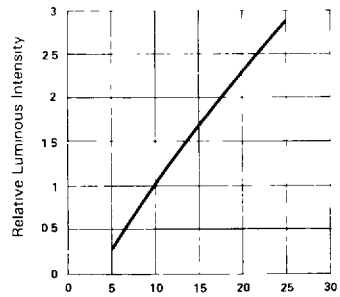


Fig 3 RELATIVE LUMINOUS INTENSITY Vs FORWARD CURRENT (PER SEGMENT)

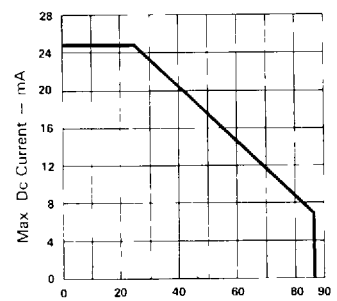


Fig 4 MAX ALLOWABLE DC CURRENT PER SEG Vs AMBIENT TEMPERATURE

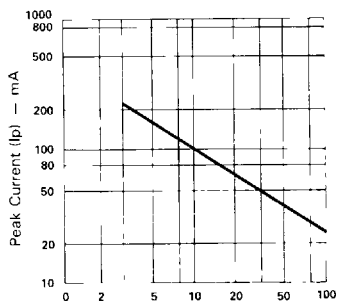


Fig 5 MAX PEAK CURRENT Vs DUTY CYCLE % (REFRESH RATE F = 1 KHz)

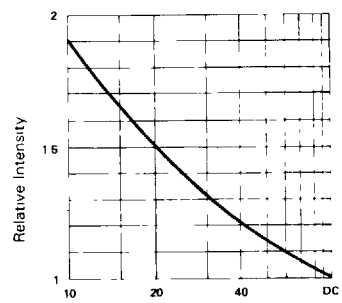


Fig 6 LUMINOUS INTENSITY Vs DUTY CYCLE % (AVERAGE I_F = 10mA PER SEG)

ELECTRICAL/OPTICAL CHARACTERISTICS AT $T_A = 25°C$
LTP-2057AHR/2157AHR

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous Intensity	Iv	1500	4000		μcd	Ip = 48 mA 1/8 DUTY
Peak Emission Wavelength	λp		635		nm	IF = 20 mA
Spectral Line Half-Width	Δλ		40		nm	IF = 20 mA
Forward Voltage, any Dot	VF		2.1	2.8	V	IF = 20 mA
Reverse Current, any Dot	IR			100	μA	VR = 5V
Luminous Intensity Matching Ratio	Iv-m			2:1		IF = 20 mA

TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES

(25°C Ambient Temperature Unless Otherwise Noted)

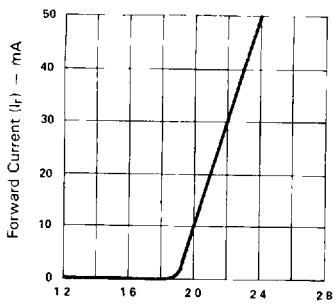


Fig 1 FORWARD CURRENT Vs FORWARD VOLTAGE

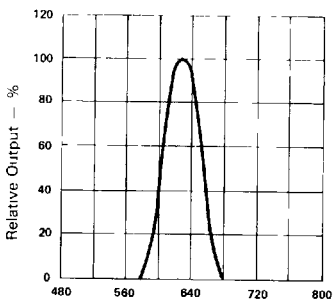


Fig 2 SPECTRAL RESPONSE

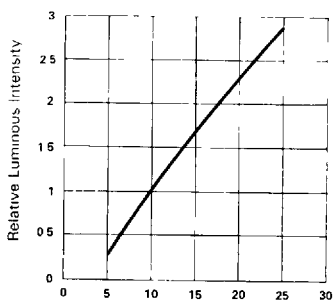


Fig 3 RELATIVE LUMINOUS INTENSITY Vs FORWARD CURRENT (PER SEGMENT)

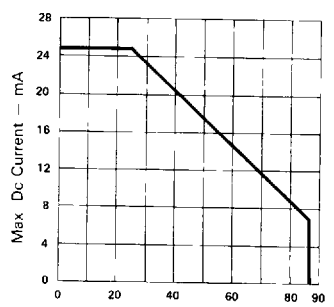


Fig 4 MAX ALLOWABLE DC CURRENT PER SEG Vs AMBIENT TEMPERATURE

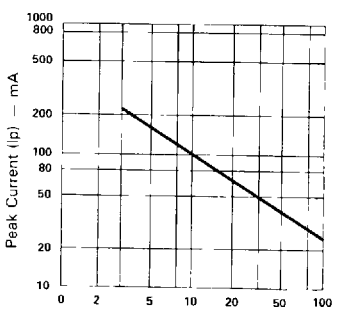


Fig 5 MAX PEAK CURRENT Vs DUTY CYCLE % (REFRESH RATE - F = 1 KHz)

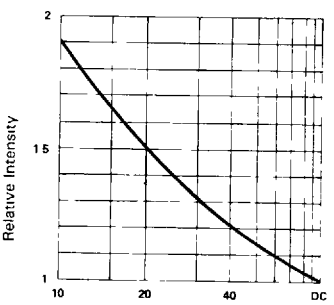


Fig 6 LUMINOUS INTENSITY Vs DUTY CYCLE % (AVERAGE I_F - 10mA PER SEG)

DOT MATRIX DISPLAYS