

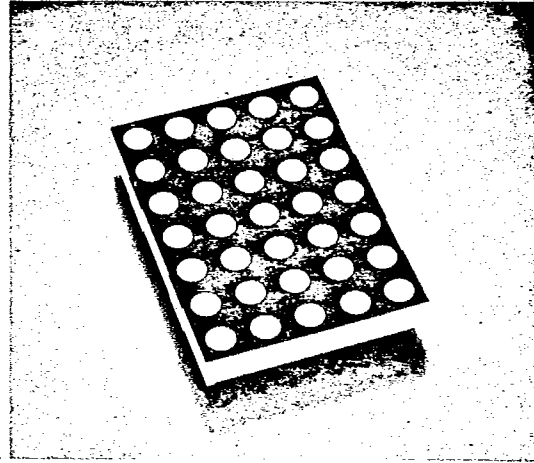


LTP- 4057AX/4157AX SERIES 4257AA/4357AA

4" 5 x 7 SINGLE COLOR & MULTICOLOR
DOT MATRIX DISPLAYS

FEATURES

- 4" INCH (101.6mm) 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-4x57A series are 1.2 inch (30.48 mm) matrix height 5 x 7 dot matrix displays.

The LTP-4257AA/4357AA are multicolor applicable displays. The multicolor displays have gray face and white dot color.

The LTP-4057A/4157A 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 | | | |
| 4057AG | 4057AY | 4057AE | 4057AHR | — | Anode Column, Cathode Row | A | A |
| 4157AG | 4157AY | 4157AE | 4157AHR | — | Cathode Column, Anode Row | A | B |
| — | — | — | — | 4257AA | Anode Column, Cathode Row | B | C |
| — | — | — | — | 4357AA | Cathode Column, Anode Row | B | D |

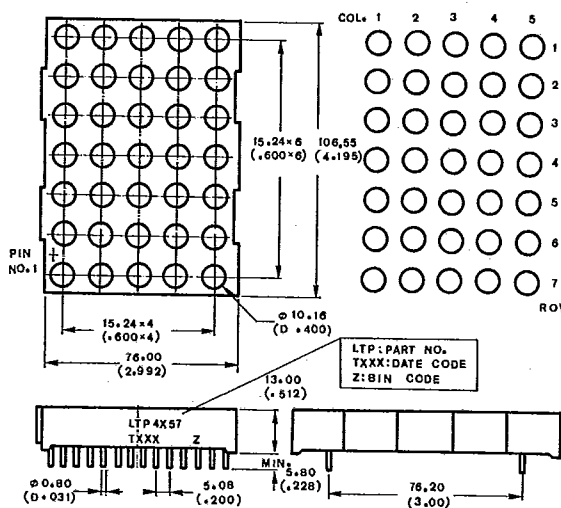
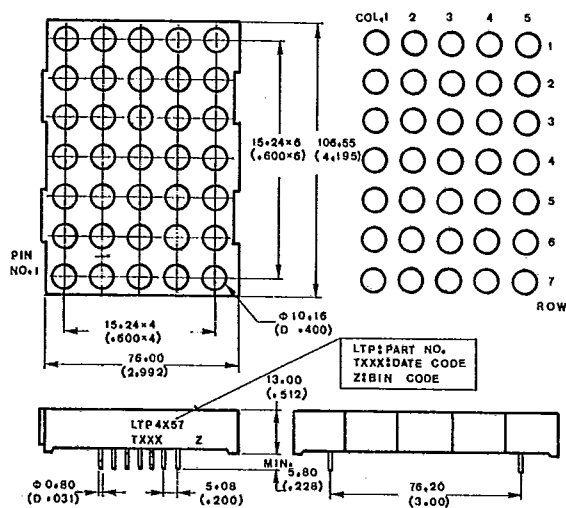
ALPHANUMERIC DISPLAYS &
DOT MATRIX DISPLAYS

5-62
465

PACKAGE DIMENSIONS

A. LTP-4057A/4157A

B. LTP-4257AA/4357AA



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

PIN CONNECTION

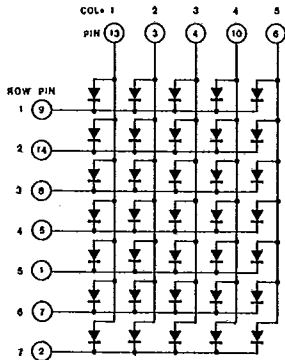
| PIN NO. | CONNECTION | |
|---------|----------------|------------------|
| | A. LTP-4057A | B. LTP-4157A |
| 1 | Cathode Row 5 | Anode Row 5 |
| 2 | Cathode Row 7 | Anode Row 7 |
| 3 | Anode Column 2 | Cathode Column 2 |
| 4 | Anode Column 3 | Cathode Column 3 |
| 5 | Cathode Row 4 | Anode Row 4 |
| 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 | Cathode Column 3 |
| 12 | Cathode Row 4 | Anode Row 4 |
| 13 | Anode Column 1 | Cathode Column 1 |
| 14 | Cathode Row 2 | Anode Row 2 |

| PIN NO. | CONNECTION | |
|---------|-----------------------|-------------------------|
| | C. LTP-4257AA | D. LTP-4357AA |
| 1 | Anode Column 1 Green | Cathode Column 1 Green |
| 2 | Anode Column 1 Orange | 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 Column 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 |

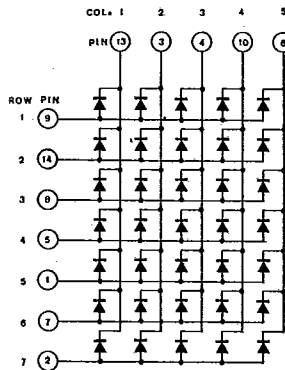
ALPHANUMERIC DISPLAYS &
DOT MATRIX DISPLAYS

INTERNAL CIRCUIT DIAGRAM

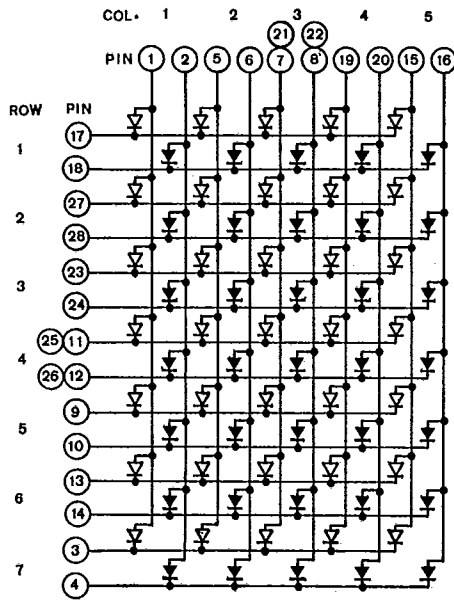
A. LTP-4057A



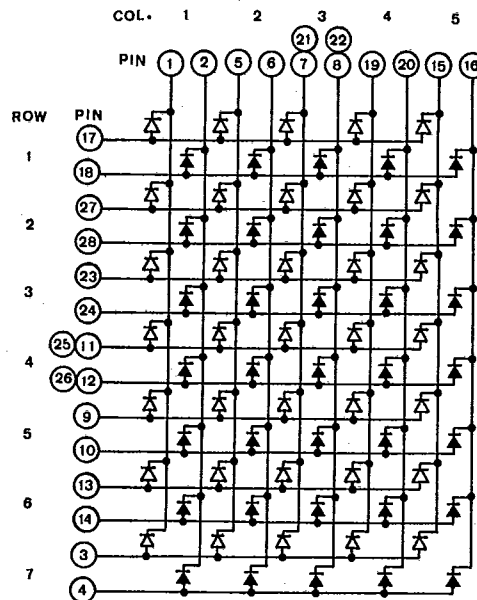
B. LTP-4157A



C. LTP-4257AA



D. LTP-4357AA



NOTE: The sign "→" stands for ORANGE color chips
 The sign "↗" stands for GREEN color chips

ABSOLUTE MAXIMUM RATINGS AT TA = 25°C

| PARAMETER | GREEN | YELLOW | ORANGE | HI-EFF RED | UNIT |
|--|----------------|--------|--------|------------|-------|
| Power Dissipation Per Dot | 120 | 100 | 120 | 120 | mW |
| Peak Forward Current Per Dot (1/10 Duty Cycle, 0.1ms Pulse Width) | 80 | 60 | 80 | 80 | mA |
| Continuous Forward Current Per Dot | 20 | 16 | 20 | 20 | mA |
| Derating Linear From 25°C Per Dot | 0.24 | 0.2 | 0.24 | 0.24 | mA/°C |
| Reverse Voltage Per Dot | 10 | 10 | 10 | 10 | 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 TA = 25°C
LTP-4057AG/4157AG & 4257AA/4357AA (GREEN)

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | TEST COND |
|-----------------------------------|-----------------|------|------|------|----------------|-----------------------------------|
| Average Luminous Intensity | I_v | 2000 | 8000 | | μcd | $I_p = 48 \text{ mA}$ 1/8 DUTY |
| Peak Emission Wavelength | λ_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 | | 4.2 | 5.6 | V | $I_F = 20 \text{ mA}$ |
| Reverse Current, any Dot | I_R | | | 100 | μA | $V_R = 10\text{V}$ |
| 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-4057AG/4157AG categorize D and LTP-4257AA/4357AA categorize D-1.

TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES

(25° Ambient Temperature Unless Otherwise Noted)

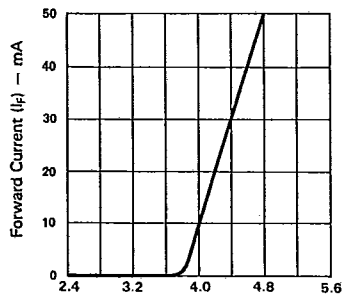


Fig. 1 FORWARD CURRENT Vs. FORWARD VOLTAGE.

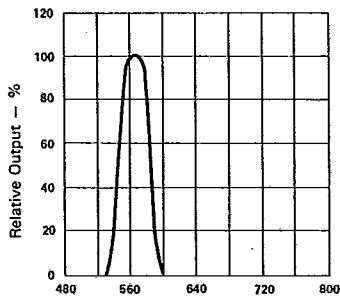


Fig. 2 SPECTRAL RESPONSE.

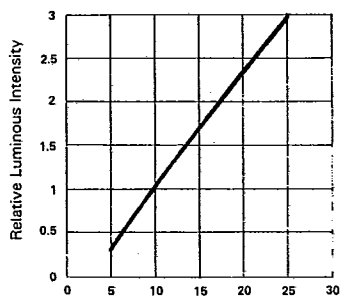


Fig. 3 RELATIVE LUMINOUS INTENSITY Vs. FORWARD CURRENT (PER SEGMENT).

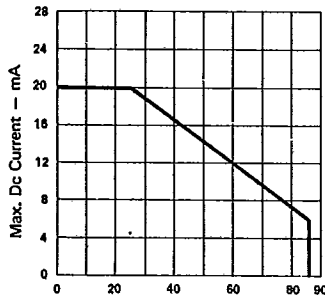


Fig. 4 MAX. ALLOWABLE DC CURRENT PER SEG. Vs AMBIENT TEMPERATURE.

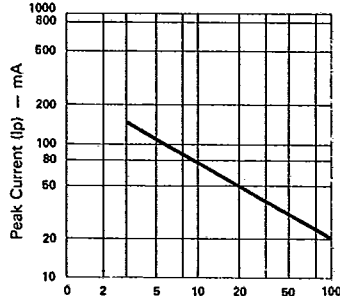


Fig. 5 MAX. PEAK CURRENT Vs. DUTY CYCLE% (REFRESH RATE - F = 1 KHz)

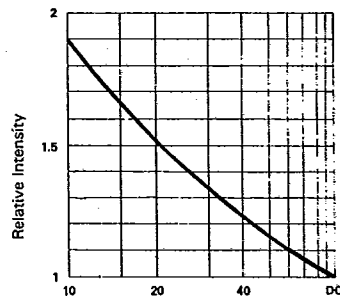


Fig. 6 LUMINOUS INTENSITY Vs. DUTY CYCLE% (AVERAGE $I_F = 10\text{mA}$ PER SEG.)

ALPHANUMERIC DISPLAYS & DOT MATRIX DISPLAYS

ELECTRICAL/OPTICAL CHARACTERISTICS AT $T_A = 25^\circ\text{C}$
LTP-4057AY/4157AY

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | TEST COND |
|-----------------------------------|-----------------|------|------|------|----------------|-----------------------------------|
| Average Luminous Intensity | I_v | 1200 | 8000 | | μcd | $I_p = 48 \text{ mA}$ 1/8 DUTY |
| Peak Emission Wavelength | λ_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 | | 4.2 | 5.6 | V | $I_F = 20 \text{ mA}$ |
| Reverse Current, any Dot | I_R | | | 100 | μA | $V_R = 10\text{V}$ |
| 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°C Ambient Temperature Unless Otherwise Noted)

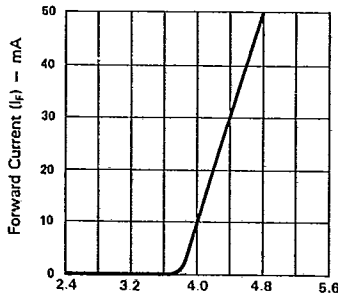


Fig. 1 FORWARD CURRENT Vs. FORWARD VOLTAGE.

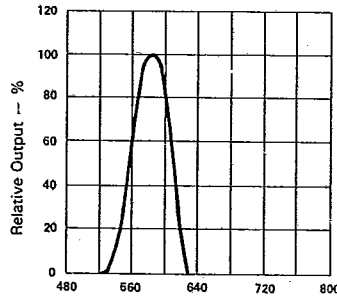


Fig. 2 SPECTRAL RESPONSE.

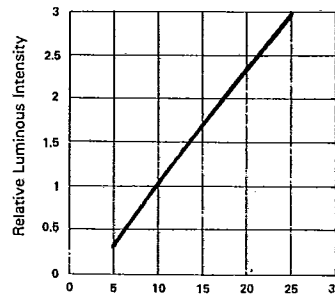


Fig. 3 RELATIVE LUMINOUS INTENSITY Vs. FORWARD CURRENT (PER SEGMENT).

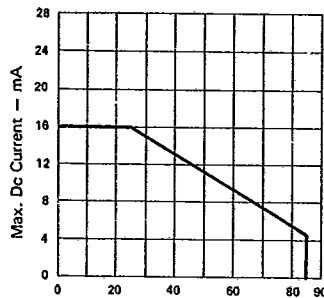


Fig. 4 MAX. ALLOWABLE DC CURRENT PER SEG. Vs AMBIENT TEMPERATURE.

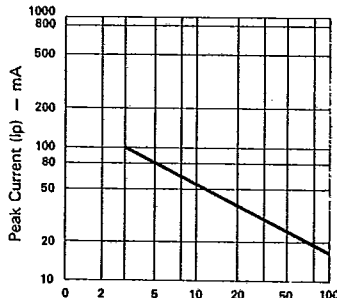


Fig. 5 MAX. PEAK CURRENT Vs. DUTY CYCLE.% (REFRESH RATE - F = 1 KHz)

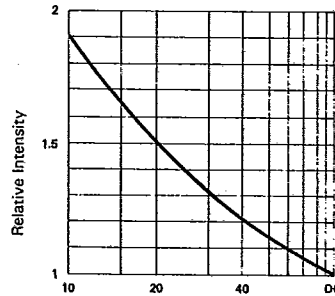


Fig. 6 LUMINOUS INTENSITY Vs. DUTY CYCLE.% (AVERAGE $I_f = 10\text{mA}$ PER SEG.)

ELECTRICAL/OPTICAL CHARACTERISTICS AT TA = 25°C
LTP-4057AE/4157AE & 4257AA/4357AA (ORANGE)

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | TEST COND. |
|-----------------------------------|-----------------|------|------|------|----------------|-----------------------------------|
| Average Luminous Intensity | I_v | 2000 | 8000 | | μcd | $I_p = 48 \text{ mA}$ 1/8 DUTY |
| Peak Emission Wavelength | λ_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 | | 4.2 | 5.6 | V | $I_F = 20 \text{ mA}$ |
| Reverse Current, any Dot | I_R | | | 100 | μA | $V_R = 10\text{V}$ |
| 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-4057AE/4157AE categorize D and LTP-4257AA/4357AA categorize D-1.

TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES

(25°C Ambient Temperature Unless Otherwise Noted)

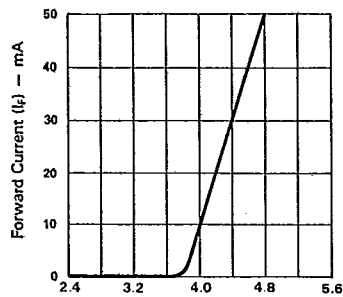


Fig. 1 FORWARD CURRENT Vs. FORWARD VOLTAGE.

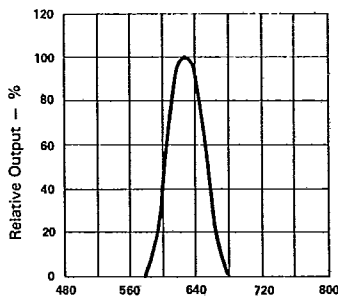


Fig. 2 SPECTRAL RESPONSE.

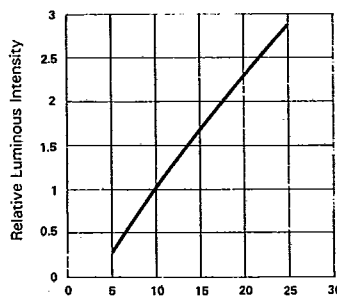


Fig. 3 RELATIVE LUMINOUS INTENSITY Vs. FORWARD CURRENT (PER SEGMENT).

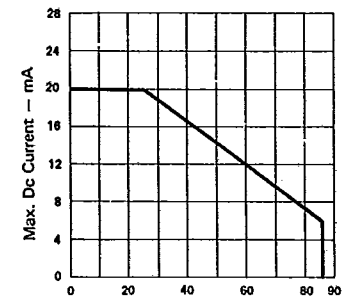


Fig. 4 MAX. ALLOWABLE DC CURRENT PER SEG. Vs AMBIENT TEMPERATURE.

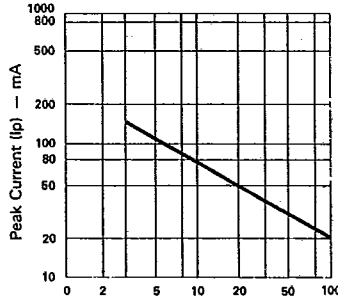


Fig. 5 MAX. PEAK CURRENT Vs. DUTY CYCLE.% (REFRESH RATE - F = 1 KHz)

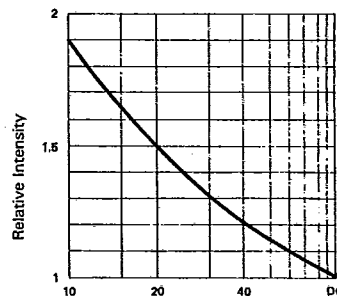


Fig. 6 LUMINOUS INTENSITY Vs. DUTY CYCLE.% (AVERAGE $I_p = 10\text{mA}$ PER SEG.)



ELECTRICAL/OPTICAL CHARACTERISTICS AT T_A = 25°C
LTP-4057AHR/4157AHR

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | TEST COND |
|-----------------------------------|-------------------|------|------|------|------|------------------------------------|
| Average Luminous Intensity | I _v | 2000 | 8000 | | μcd | I _p = 48 mA 1/8 DUTY |
| Peak Emission Wavelength | λ _p | | 635 | | nm | I _F = 20 mA |
| Spectral Line Half-Width | Δλ | | 40 | | nm | I _F = 20 mA |
| Forward Voltage, any Dot | V _F | | 4.2 | 5.6 | V | I _F = 20 mA |
| Reverse Current, any Dot | I _R | | | 100 | μA | V _R = 10V |
| Luminous Intensity Matching Ratio | I _v -m | | | 2:1 | | I _F = 20 mA |

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

TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES

(25°C Ambient Temperature Unless Otherwise Noted)

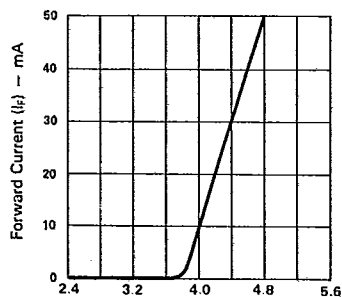


Fig. 1 FORWARD CURRENT Vs. FORWARD VOLTAGE.

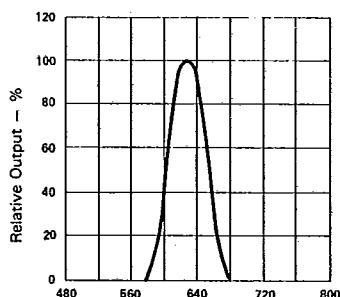


Fig. 2 SPECTRAL RESPONSE.

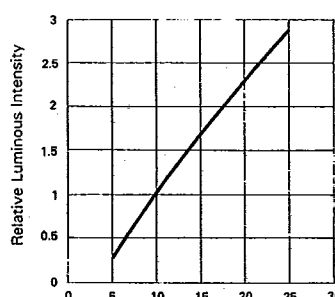


Fig. 3 RELATIVE LUMINOUS INTENSITY Vs. FORWARD CURRENT (PER SEGMENT).

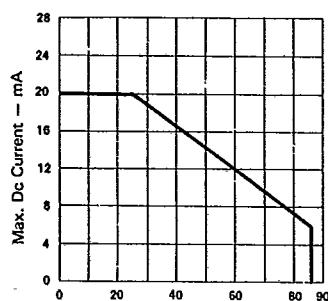


Fig. 4 MAX. ALLOWABLE DC CURRENT PER SEG. Vs AMBIENT TEMPERATURE.

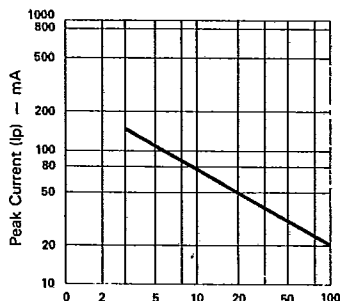


Fig. 5 MAX. PEAK CURRENT Vs. DUTY CYCLE.% (REFRESH RATE - F = 1 KHz)

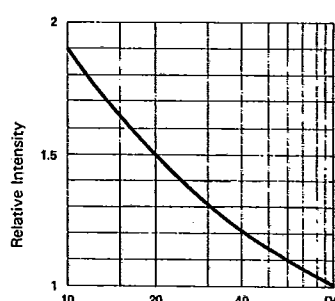


Fig. 6 LUMINOUS INTENSITY Vs. DUTY CYCLE% (AVERAGE I_F = 10mA PER SEG.)

- NOTES: 1. Clean only in water, isopropanol, ethanol, freon TF (or equivalent).
 2. Luminous intensity is measured with a light sensor and filter combination that approximates the CIE (Commission Internationale De L'Eclairage) eye-response curve.
 3. The average luminous intensity is obtained by summing the luminous intensity of each segment and dividing by the total number of segments. The displays are categorized for luminous intensity with the intensity category designated by a letter located on the side of the package. The BIN brightness classification is as follows:

CATEGORY D:

| BIN CODE | A | B | C | D | E | F | G | H | I | J | K |
|-------------------|------------|---------------|---------------|-------------|---------------|---------------|---------------|---------------|----------------|----------------|-----------------|
| RANGE (μ cd) | 80~ 156 | 104.8~ 204 | 136.8~ 264 | 168~ 348 | 232.8~ 444 | 296.8~ 576 | 384.8~ 756 | 504.8~ 984 | 656.8~ 1320 | 880.8~ 1644 | 1096.8~ 2136 |

| BIN CODE | L | M | N | P | Q | R1 | S | T1 | U | V |
|-------------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------|------------------|------------------|-------------------|-----------------|
| RANGE (μ cd) | 1424.8~ 2760 | 1840.8~ 3600 | 2400.8~ 4680 | 3120.8~ 6120 | 4080.8~ 8004 | 5336.8~ 10404 | 6936.8~ 13524 | 9016.8~ 16860 | 11720.8~ 22800 | 15200~ 29568 |

CATEGORY D-1

| BIN CODE | D | E | F | G | H | I | J | K |
|-------------------|---------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|
| RANGE (μ cd) | 568.8~ 984 | 656.8~ 1140 | 760.8~ 1320 | 880.8~ 1524 | 1016.8~ 1764 | 1176.8~ 2040 | 1360.8~ 2352 | 1568.8~ 2712 |

| BIN CODE | L | M | N | P | Q | R | S | T |
|-------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| RANGE (μ cd) | 1808.8~ 3120 | 2080.8~ 3600 | 2400.8~ 4140 | 2760.8~ 4764 | 3176.8~ 5484 | 3656.8~ 6312 | 4208.8~ 7260 | 4840.8~ 8352 |

| BIN CODE | U | V | W | X | Y | Z | Z1 |
|-------------------|-----------------|------------------|------------------|------------------|------------------|-------------------|-----------------|
| RANGE (μ cd) | 5568.8~ 9600 | 6400.8~ 11040 | 7360.8~ 12696 | 8464.8~ 14604 | 9736.8~ 16800 | 11200.8~ 19320 | 12880~ 25392 |

CATEGORY F:

| BIN CODE | 3 | 2 | 1 | A | B | C | D | E | F | G | H |
|----------|---------------|---------------|---------------|---------------|---------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|
| RANGE | 183.3~ 384 | 267.5~ 456 | 317.5~ 540 | 375.8~ 624 | 434.2~ 756 | 525.8~ 1080 | 750.8~ 1500 | 1042.5~ 2100 | 1459.2~ 2940 | 2042.5~ 4116 | 2859.2~ 5340 |

ALPHANUMERIC DISPLAYS & DOT MATRIX DISPLAYS