

0.54" Alphanumeric LED Displays

LTP-3784/3786 Series

Features

- 0.54 inch (13.8mm) digit height.
- Continuous uniform segments.
- Choices of five bright colors-ALGaAs red/bright red/ green/yellow/red orange.
- Low power requirements.
- Excellent character appearance.
- Wide viewing angle.
- Solid state reliability.
- Common anode or common cathode models.
- Categorized for luminous intensity.
- Easy mounting on P.C. board.

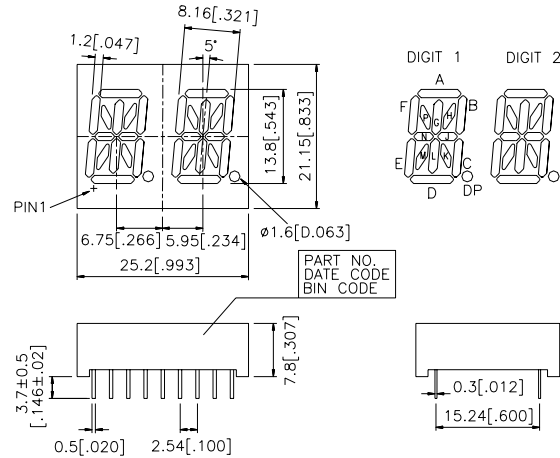
Description

The LTP-3784/3786 series are 0.54 inch (13.8mm) height 14-segment dual digit alphanumeric displays. The Displays have gray face and white segment.

The ALGaAs red alphanumeric display are designed for applications requiring low power consumption. They are tested and selected for their excellent low current characteristics to ensure that the segments are matched at low current. Drive current as low as 1 mA per segment is available.

The ALGaAs red series device utilize LED chips which are made from ALGaAs on a non-transparent GaAs substrate. The bright red and green series devices utilize LED chips which are made from GaP on a transparent GaP substrate. The yellow and red orange series devices utilize LED chips which are made from GaAsP on a transparent GaP substrate.

Package Dimensions



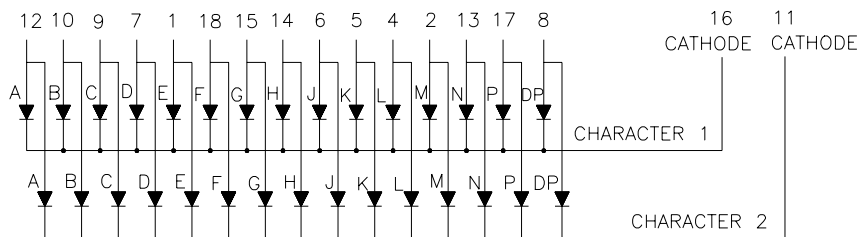
Notes: All dimensions are in millimeters(inches).
Tolerance: $\pm 0.25\text{mm}$ (0.010") unless otherwise noted.

Devices

| Part No. | | | | | Description | Internal Circuit Diagram |
|---------------|--------------|--------------|--------------|--------------|---|--------------------------|
| ALGaAs Red | Bright Red | Green | Yellow | Red Orange | | |
| LTP-3784WC-01 | LTP-3784P-01 | LTP-3784G-01 | LTP-3784Y-01 | LTP-3784E-01 | Duplex Common Cathode, Rt. Hand Decimal | A |
| LTP-3786WC-03 | LTP-3786P-03 | LTP-3786G-03 | LTP-3786Y-03 | LTP-3786E-03 | Duplex Common Anode, Rt. Hand Decimal | B |

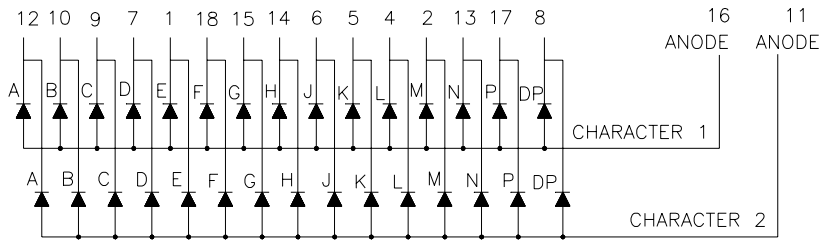
Internal Circuit Diagrams

A. LTP-3784



9-184

B. LTP-3786

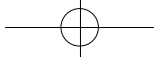


Pin Connection

| Pin No. | Connection | |
|---------|-----------------------------|---------------------------|
| | A. LTP-3784 | B. LTP-3786 |
| 1 | Anode E | Cathode E |
| 2 | Anode M | Cathode M |
| 3 | No Connection | No Connection |
| 4 | Anode L | Cathode L |
| 5 | Anode K | Cathode K |
| 6 | Anode J | Cathode J |
| 7 | Anode D | Cathode D |
| 8 | Anode D.P. | Cathode D.P. |
| 9 | Anode C | Cathode C |
| 10 | Anode B | Cathode B |
| 11 | Common Cathode, Character 2 | Common Anode, Character 2 |
| 12 | Anode A | Cathode A |
| 13 | Anode N | Cathode N |
| 14 | Anode H | Cathode H |
| 15 | Anode G | Cathode G |
| 16 | Common Cathode, Character 1 | Common Anode, Character 1 |
| 17 | Anode P | Cathode P |
| 18 | Anode F | Cathode F |

Absolute Maximum Rating at Ta=25°C

| Parameter | AlGaAs Red | Bright Red | Green | Yellow | Red Orange | Unit |
|---|----------------|------------|-------|--------|------------|-------|
| Average Power Dissipation Per Segment | 75 | 40 | 75 | 60 | 75 | mW |
| Peak Forward Current Per Segment (1/10 Duty Cycle, 0.1 ms Pulse Width) | 125 | 60 | 100 | 80 | 100 | mA |
| Average Forward Current Per Segment | 30 | 15 | 25 | 20 | 25 | mA |
| Derating Linear from 25°C Per Segment | 0.4 | 0.2 | 0.33 | 0.27 | 0.33 | mA/°C |
| Reverse Voltage Per Segment | 5 | 5 | 5 | 5 | 5 | V |
| Operating Temperature Range | -35°C to +85°C | | | | | |
| Storage Temperature Range | -35°C to +85°C | | | | | |
| Solder Temperature 1/16 Inch Below Seating Plane for 3 Seconds at 260°C | | | | | | |



Electrical / Optical Characteristics at Ta=25°C

LTP-3784WC-01/3786WC-03

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Condition |
|-----------------------------------|------------------|------|------|------|------|----------------------|
| Average Luminous Intensity | I _v | 200 | 520 | | μ cd | I _F =1mA |
| | | | 3750 | | | I _F =5mA |
| Peak Emission Wavelength | λ _P | | 660 | | nm | I _F =20mA |
| Spectral Line Half-Width | Δλ | | 35 | | nm | I _F =20mA |
| Dominant Wavelength | λ _d | | 638 | | nm | I _F =20mA |
| Forward Voltage, and Segment | V _F | | 1.6 | 2.4 | V | I _F =1mA |
| | | | 1.7 | | | I _F =5mA |
| | | | 1.8 | | | I _F =20mA |
| Reverse Current, and Segment | I _R | | | 100 | μ A | V _R =5V |
| Luminous Intensity Matching Ratio | I _{v-m} | | | 2:1 | | I _F =1mA |

LTP-3784P-01/3786P-03

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Condition |
|--------------------------------------|------------------|------|------|------|------|----------------------|
| Average Luminous Intensity | I _v | 320 | 650 | | μ cd | I _F =10mA |
| Peak Emission Wavelength | λ _P | | 697 | | nm | I _F =20mA |
| Spectral Line Half-Width | Δλ | | 90 | | nm | I _F =20mA |
| Dominant Wavelength | λ _d | | 657 | | nm | I _F =20mA |
| Forward Voltage, and Segment or D.P. | V _F | | 2.1 | 2.6 | V | I _F =20mA |
| Reverse Current, and Segment or D.P. | I _R | | | 100 | μ A | V _R =5V |
| Luminous Intensity Matching Ratio | I _{v-m} | | | 2:1 | | I _F =10mA |

LTP-3784G-01/3786G-03

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Condition |
|--------------------------------------|------------------|------|------|------|------|----------------------|
| Average Luminous Intensity | I _v | 500 | 1800 | | μ cd | I _F =10mA |
| Peak Emission Wavelength | λ _P | | 565 | | nm | I _F =20mA |
| Spectral Line Half-Width | Δλ | | 30 | | nm | I _F =20mA |
| Dominant Wavelength | λ _d | | 569 | | nm | I _F =20mA |
| Forward Voltage, and Segment or D.P. | V _F | | 2.1 | 2.6 | V | I _F =20mA |
| Reverse Current, and Segment or D.P. | I _R | | | 100 | μ A | V _R =5V |
| Luminous Intensity Matching Ratio | I _{v-m} | | | 2:1 | | I _F =10mA |

LTP-3784Y-01/3786Y-03

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Condition |
|--------------------------------------|------------------|------|------|------|------|----------------------|
| Average Luminous Intensity | I _v | 500 | 1800 | | μ cd | I _F =10mA |
| Peak Emission Wavelength | λ _P | | 585 | | nm | I _F =20mA |
| Spectral Line Half-Width | Δλ | | 35 | | nm | I _F =20mA |
| Dominant Wavelength | λ _d | | 588 | | nm | I _F =20mA |
| Forward Voltage, and Segment or D.P. | V _F | | 2.1 | 2.6 | V | I _F =20mA |
| Reverse Current, and Segment or D.P. | I _R | | | 100 | μ A | V _R =5V |
| Luminous Intensity Matching Ratio | I _{v-m} | | | 2:1 | | I _F =10mA |



LTP-3784E-01/3786E-03

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Condition |
|--------------------------------------|-------------------|------|------|------|------|----------------------|
| Average Luminous Intensity | I _v | 500 | 1800 | | μ cd | I _F =10mA |
| Peak Emission Wavelength | λ _P | | 630 | | nm | I _F =20mA |
| Spectral Line Half-Width | Δλ | | 40 | | nm | I _F =20mA |
| Dominant Wavelength | λ _d | | 621 | | nm | I _F =20mA |
| Forward Voltage, and Segment or D.P. | V _F | | 2.0 | 2.6 | V | I _F =20mA |
| Reverse Current, and Segment or D.P. | I _R | | | 100 | μ A | V _R =5V |
| Luminous Intensity Matching Ratio | I _v -m | | | 2:1 | | I _F =10mA |

Note: Luminous intensity is measured with a light sensor and filter combination that approximates the CIE (Commission Internationale De L'Eclairage) eye-response curve.

Typical Electrical / Optical Characteristic Curves (25°C Ambient Temperature Unless Otherwise Noted)

DISPLAYS

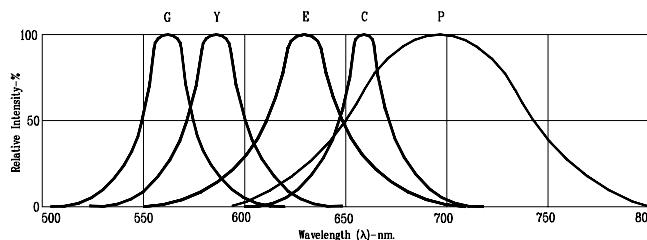


Fig. 1. RELATIVE INTENSITY VS. WAVELENGTH

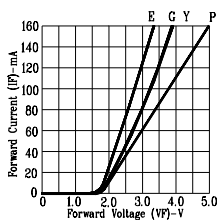


Fig. 2. FORWARD CURRENT VS. FORWARD VOLTAGE

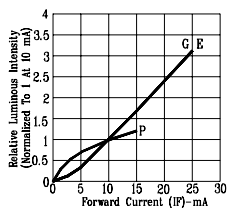


Fig. 3. RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

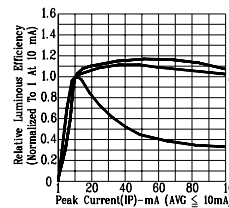


Fig. 4. RELATIVE LUMINOUS EFFICIENCY (LUMINOUS INTENSITY PER UNIT CURRENT) VS. PEAK CURRENT

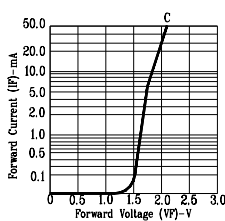


Fig. 5. FORWARD CURRENT VS. FORWARD VOLTAGE

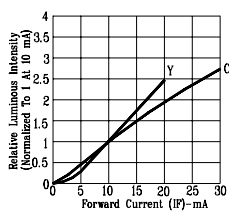


Fig. 6. RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

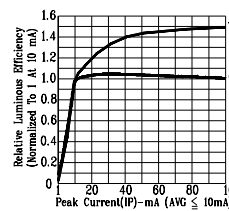


Fig. 7. RELATIVE LUMINOUS EFFICIENCY (LUMINOUS INTENSITY PER UNIT CURRENT) VS. PEAK CURRENT

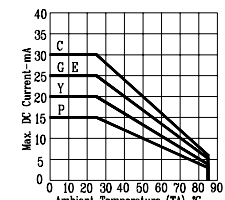


Fig. 8. MAX. ALLOWABLE DC CURRENT VS. AMBIENT TEMPERATURE.

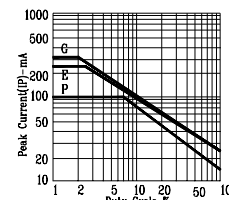


Fig. 9. MAX. PEAK CURRENT VS. DUTY CYCLE % (REFRESH RATE 1KHz)

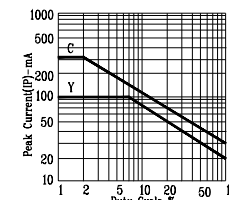


Fig. 10. MAX. PEAK CURRENT VS. DUTY CYCLE % (REFRESH RATE 1KHz)

NOTE: P=BRIGHT RED E=RED ORANGE G=GREEN Y=YELLOW C=AlGaAs RED (REFRESH RATE 1KHz)