



5" Single Color & Multicolor Ultra Large Single Digit LED Numeric LED Displays

LTS-50000 Series

Features

- 5 inch (127.0mm) ultra large digit height.
- Continuous uniform segments.
- Low power requirement.
- Excellent characters appearance.
- High contrast.
- High brightness.
- Wide viewing angle.
- Solid state reliability.
- Categorized for luminous intensity.
- I.C. compatible.
- Easy mounting on P.C. board.
- Single color displays have the choice of two bright color - green/high efficiency red.
- Multicolor displays are applicable to three bright colors - green, orange and yellow (green and orange mixed).

Description

The LTS-50000 series are 5 inch (127.0mm) height ultra large single digit displays.

The LTS-50301/50801 series are singles displays.

The green displays have black face and green segments, the high efficiency red displays have black face and red segments.

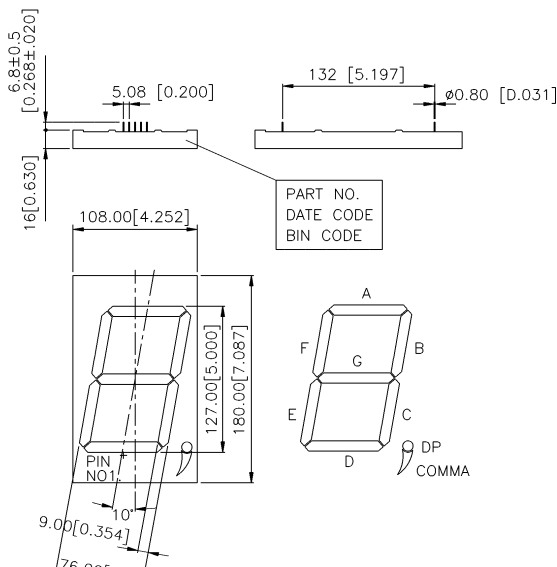
The LTS-50302A/50802A are multicolor displays.

The multicolor displays have black face and white segments.

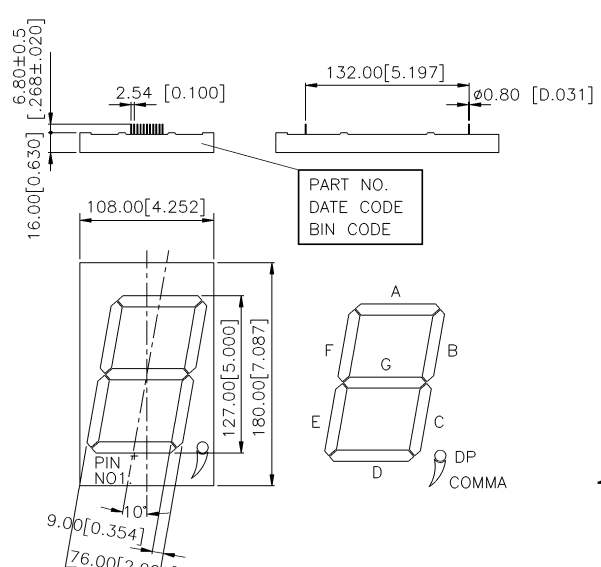
The green series utilize LED chips which are made from GaP on a transparent GaP substrate. The orange series devices utilize LED chips which are made from GaAsP on a transparent GaP substrate.

Package Dimensions

A. LTS-50301/50801



B. LTS-50302A/50802A



SEVEN-SEGMENT
LED DISPLAYS

Devices

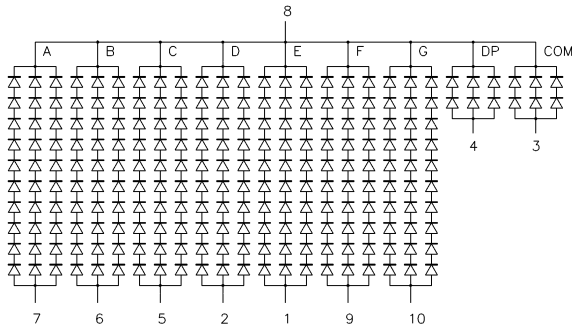
| Part No. LTS- | | | Description | Package Dimension | Internal Circuit Diagram |
|---------------|--------------|--------------|----------------|-------------------|--------------------------|
| GREEN | Hi.-Eff. Red | Multi- Color | | | |
| 50301G | 50301HRB | - | Common Cathode | A | A |
| 50801G | 50801HRB | - | Common Anode | A | B |
| - | - | 50302A | Common Cathode | B | C |
| - | - | 50802A | Common Anode | B | D |

Pin Connection

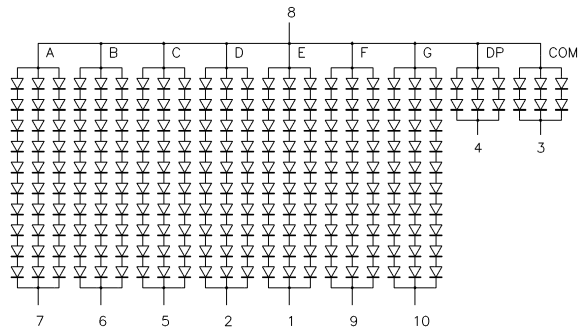
| Pin No. | Connection | | | |
|---------|-----------------|-------------------|------------------------|-----------------------|
| | LTS-50301 | LTS-50801 | LTS-50302A | LTS-50802A |
| 1. | Segment E Anode | Segment E Cathode | Anode E, Green | Cathode E, Green |
| 2. | Segment D Anode | Segment D Cathode | Anode E, Orange | Cathode E, Orange |
| 3. | Comma Anode | Comma Cathode | Anode D, Green | Cathode D, Green |
| 4. | D.P. Anode | D.P. Cathode | Anode D, Orange | Cathode D, Orange |
| 5. | Segment C Anode | Segment C Cathode | Anode Comma, Green | Cathode Comma, Green |
| 6. | Segment B Anode | Segment B Cathode | Anode Comma, Orange | Cathode Comma, Orange |
| 7. | Segment A Anode | Segment A Cathode | Anode DP. Green | Cathode DP. Green |
| 8. | Common Cathode | Common Anode | Anode DP. Orange | Cathode DP. Orange |
| 9. | Segment F Anode | Segment F Cathode | Anode C, Green | Cathode C, Green |
| 10. | Segment G Anode | Segment G Cathode | Anode C, Orange | Cathode C, Orange |
| 11. | | | Anode B, Green | Cathode B, Green |
| 12. | | | Anode B, Orange | Cathode B, Orange |
| 13. | | | Anode A, Green | Cathode A, Green |
| 14. | | | Anode A, Orange | Cathode A, Orange |
| 15. | | | Cathode Common, Green | Anode Common, Green |
| 16. | | | Cathode Common, Orange | Anode Common, Orange |
| 17. | | | Anode G, Green | Cathode G, Green |
| 18. | | | Anode G, Orange | Cathode G, Orange |
| 19. | | | Anode F, Green | Cathode F, Green |
| 20. | | | Anode F, Orange | Cathode F, Orange |

Internal Circuit Diagrams

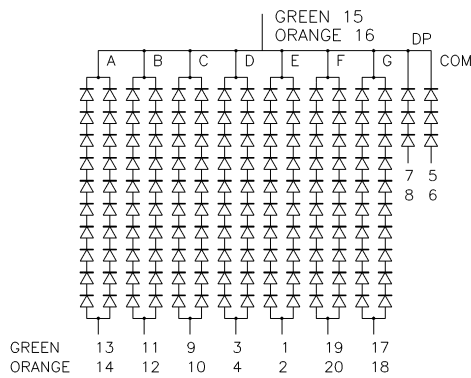
A.LTS-50301



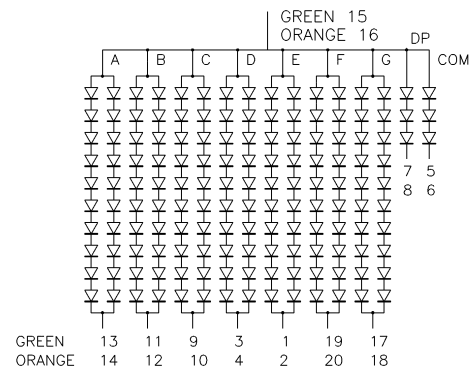
B.LTS-50801



C.LTS-50302A



D.LTS-50802A



SEVEN-SEGMENT LED DISPLAYS

Notes: 20 chips green & 20 chips orange in one segment.

Absolute Maximum Rating at Ta=25 °C

| Parameter | 50x01 | | 50x02A | | Unit |
|--|------------------|-------------|------------|------------|--------------|
| | Green | Hi.-Eff.Red | Green | Orange | |
| Power Dissipation Per Segment | 1200 | 1200 | 900 | 900 | mW |
| Peak Forward Current Per Segment (1/10 Duty Cycle, 0.1ms Pulse Width) | 180 | 180 | 160 | 160 | mA |
| Continuous Forward Current Per Segment Derating Linear from 25 °C Per Segment | 60 0.72 | 60 0.72 | 40 0.48 | 40 0.48 | mA mA/ °C |
| Reverse Voltage Per Segment | 50 | 50 | 50 | 50 | 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 | | | | | |

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Electrical/Optical Characteristics at Ta=25 °C

LTS-50301G/50801G

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Condition |
|--------------------------------------|--------|------|-------------|-------------|------|----------------|
| Average Luminous Intensity | Iv | 21 | 60 | | μ cd | IF=30mA |
| Peak Emission Wavelength | λ P | | 565 | | nm | IF=20mA |
| Spectral Line Half-Width | Δ λ | | 30 | | nm | IF=20mA |
| Dominant Wavelength | λ d | | 569 | | nm | IF=20mA |
| Forward Voltage, per Segment or D.P. | VF | | 21 (4.2) | 28 (5.6) | V | IF=60mA |
| Reverse Current, per Segment or D.P. | IR | | | 300 | μ A | VR=50V |
| Luminous Intensity Matching Ratio | Iv-m | | | 2:1 | | IF=10mA |

LTS-50301HRB/50801HRB

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Condition |
|--------------------------------------|--------|------|-------------|-------------|------|----------------|
| Average Luminous Intensity | Iv | 21 | 60 | | μ cd | IF=30mA |
| Peak Emission Wavelength | λ P | | 635 | | nm | IF=20mA |
| Spectral Line Half-Width | Δ λ | | 40 | | nm | IF=20mA |
| Dominant Wavelength | λ d | | 621 | | nm | IF=20mA |
| Forward Voltage, any Segment or D.P. | VF | | 20 (4.0) | 28 (5.6) | V | IF=60mA |
| Reverse Current, any Segment or D.P. | IR | | | 300 | μ A | VR=50V |
| Luminous Intensity Matching Ratio | Iv-m | | | 2:1 | | IF=10mA |

LTS-50302A/50802A(ORANGE)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Condition |
|--------------------------------------|--------|------|-------------|-------------|------|----------------|
| Average Luminous Intensity | Iv | 13 | 40 | | μ cd | IF=20mA |
| Peak Emission Wavelength | λ P | | 630 | | nm | IF=20mA |
| Spectral Line Half-Width | Δ λ | | 40 | | nm | IF=20mA |
| Dominant Wavelength | λ d | | 621 | | nm | IF=20mA |
| Forward Voltage, per Segment or D.P. | VF | | 20 (4.0) | 28 (5.6) | V | IF=40mA |
| Reverse Current, per Segment or D.P. | IR | | | 200 | μ A | VR=50V |
| Luminous Intensity Matching Ratio | Iv-m | | | 2:1 | | IF=10mA |

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LTS-50302A/50802A(GREEN)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Condition |
|--------------------------------------|------------------|------|-------------|-------------|----------|-------------------|
| Average Luminous Intensity | I_v | 13 | 40 | | μ cd | $I_F=20\text{mA}$ |
| Peak Emission Wavelength | λ_P | | 565 | | nm | $I_F=20\text{mA}$ |
| Spectral Line Half-Width | $\Delta \lambda$ | | 30 | | nm | $I_F=20\text{mA}$ |
| Dominant Wavelength | λ_d | | 569 | | nm | $I_F=20\text{mA}$ |
| Forward Voltage, any Segment or D.P. | V_F | | 21 (6.3) | 28 (8.4) | V | $I_F=40\text{mA}$ |
| Reverse Current, any Segment or D.P. | I_R | | | 200 | μ A | $V_R=50\text{V}$ |
| Luminous Intensity Matching Ratio | $I_v\text{-m}$ | | | 2:1 | | $I_F=10\text{mA}$ |

SEVEN-SEGMENT
LED DISPLAYS

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

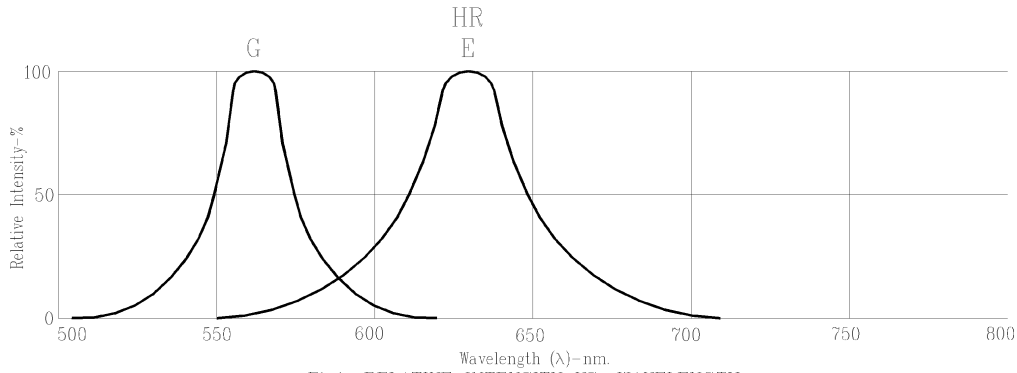


Fig1. RELATIVE INTENSITY VS. WAVELENGTH

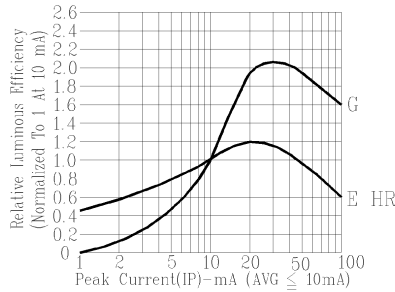


Fig2. RELATIVE LUMINOUS EFFICIENCY (LUMINOUS INTENSITY PER UNIT CURRENT) VS. PEAK CURRENT

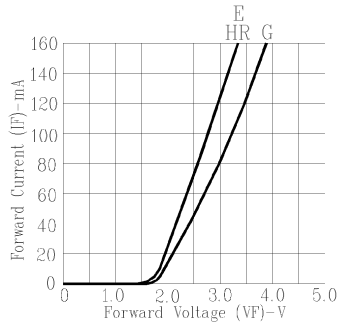


Fig3. FORWARD CURRENT VS. FORWARD VOLTAGE

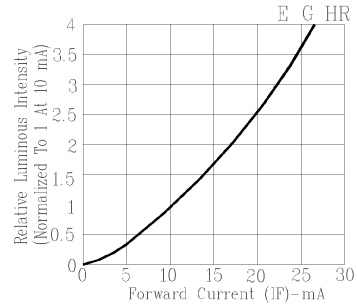


Fig4. RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

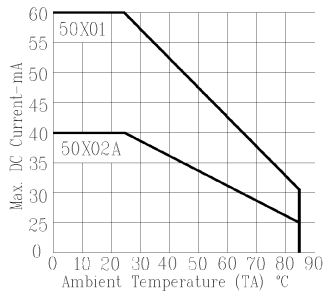


Fig5. MAX. ALLOWABLE DC CURRENT VS. AMBIENT TEMPERATURE.

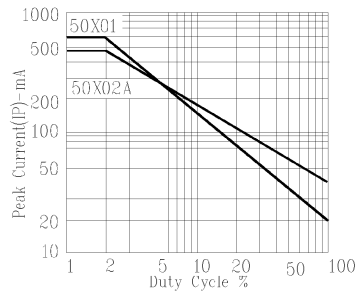


Fig6. MAX. PEAK CURRENT VS. DUTY CYCLE % (REFRESH RATE 1KHz)

NOTE: G=GREEN E=ORANGE HR=HI.EFF.RED (REFRESH RATE 1KHz)