

LED DISPLAY**LTP-12088M-03**
DATA SHEET

| Rev | Description | By |
|------------|--|------------------------------------|
| 01 | RDR Original Spec | Phanomkorn J. July 31, 2008 |
| 02 | Change the test condition on page 4-6 to Ip=80mA, 2msec 1/8 Duty | Phanomkorn J. August 19, 2008 |
| 03 | Paper Correction | Phanomkorn J. October 15, 2008 |
| - | NPPR Original Spec | Phanomkorn J. December 03, 2008 |
| A | Add pin ϕ on page 2 of 8 | Phanomkorn J. January 29, 2009 |
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| | | |
| | | |

SPEC. NO.: DS30-2008-0184D A T E : January 29, 2009REV. NO. : APAGE NO. : 0 OF 8

FEATURES

- * 1.22 inch (31.0 mm) MATRIX HEIGHT.
- * LOW POWER REQUIREMENT.
- * SINGLE PLANE, WIDE VIEWING ANGLE.
- * SOLID STATE RELIABILITY.
- * 8x8 ARRAY WITH X-Y SELECT.
- * COMPATIBLE WITH USASCII AND EBCDIC CODES.
- * STACKABLE HORIZONTALLY.
- * CATEGORIZED FOR LUMINOUS INTENSITY.
- * **LEAD-FREE PACKAGE (ACCORDING TO ROHS)**

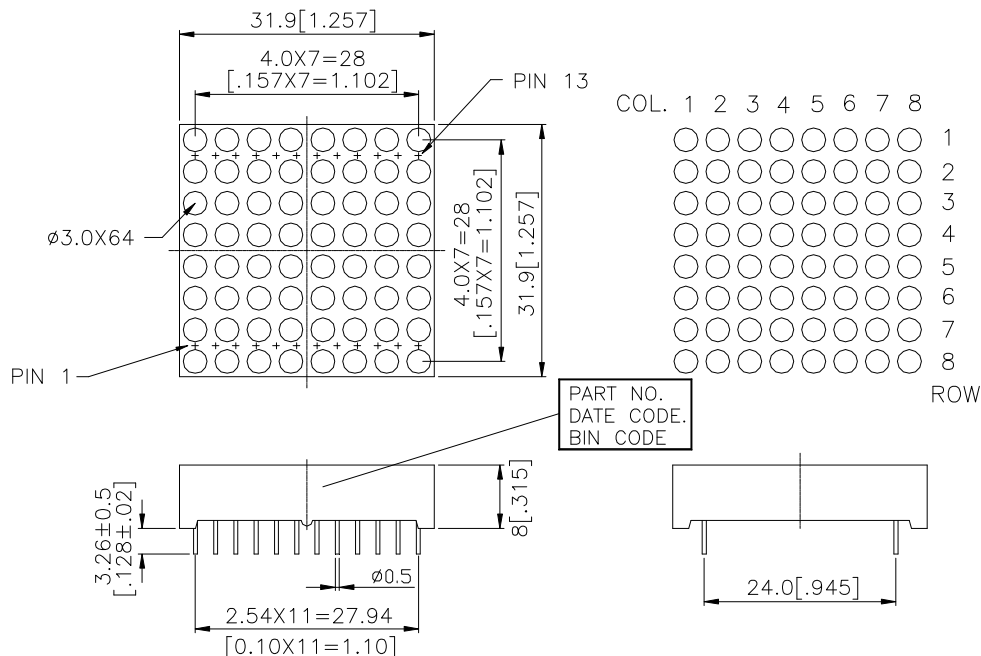
DESCRIPTION

The LTP-12088M-03 is a 1.22 inch (31.0 mm) matrix height 8 x8 dot matrix display. This device is multi-color applicable display. The AlInGaP Green LED chips, which are made from AlInGaP on GaAs substrate. The AlInGaP Hyper Red LED chips, which are made from AlInGaP on GaAs substrate. The device has black face and white dot color. The product is binned by luminous intensity and dominant wavelength in the red mode of operation.

DEVICE

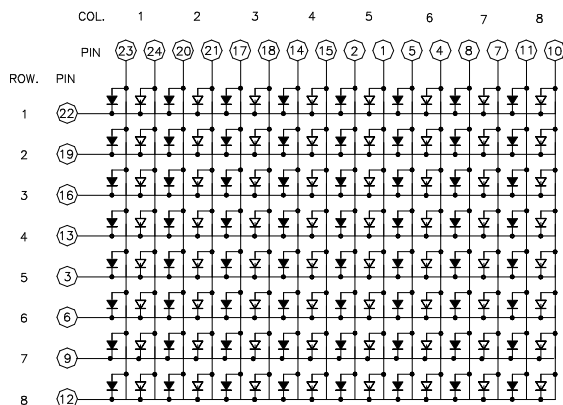
| PART NO. | DESCRIPTION |
|-----------------|--------------------|
| MULTI-COLOR | Anode Column |
| LTP-12088M-03 | Cathode Row |



PACKAGE DIMENSIONS



- NOTES: 1. All dimensions are in millimeters. Tolerances are ± 0.25 mm (0.01") unless otherwise noted.
 2. Pin tip's shift tolerance is ± 0.4 mm.
 3. Foreign material on segment ≤ 10 mils
 4. Ink contamination (surface) ≤ 20 mils
 5. Bending $\leq 1/100$
 6. Bubble in segment ≤ 10 mils

INTERNAL CIRCUIT DIAGRAM



The sign "  "stands for AllnGaP Hyper Red chips.
 The sign "  "stands for AllnGaP Green chips.

PIN CONNECTION

| NO | CONNECTION | NO | CONNECTION |
|----|----------------------------------|----|----------------------------------|
| 1 | ANODE COLUMN 5 AlInGaP GREEN | 13 | CATHODE ROW 4 |
| 2 | ANODE COLUMN 5 AlInGaP HYPER RED | 14 | ANODE COLUMN 4 AlInGaP HYPER RED |
| 3 | CATHODE ROW 5 | 15 | ANODE COLUMN 4 AlInGaP GREEN |
| 4 | ANODE COLUMN 6 AlInGaP GREEN | 16 | CATHODE ROW 3 |
| 5 | ANODE COLUMN 6 AlInGaP HYPER RED | 17 | ANODE COLUMN 3 AlInGaP HYPER RED |
| 6 | CATHODE ROW 6 | 18 | ANODE COLUMN 3 AlInGaP GREEN |
| 7 | ANODE COLUMN 7 AlInGaP GREEN | 19 | CATHODE ROW 2 |
| 8 | ANODE COLUMN 7 AlInGaP HYPER RED | 20 | ANODE COLUMN 2 AlInGaP HYPER RED |
| 9 | CATHODE ROW 7 | 21 | ANODE COLUMN 2 AlInGaP GREEN |
| 10 | ANODE COLUMN 8 AlInGaP GREEN | 22 | CATHODE ROW 1 |
| 11 | ANODE COLUMN 8 AlInGaP HYPER RED | 23 | ANODE COLUMN 1 AlInGaP HYPER RED |
| 12 | CATHODE ROW 8 | 24 | ANODE COLUMN 1 AlInGaP GREEN |

ABSOLUTE MAXIMUM RATING AT Ta=25°C

| PARAMETER | AlInGaP GREEN | UNIT |
|--|-----------------|-------|
| Average Power Dissipation Per Dot | 70 | mW |
| Peak Forward Current Per Dot | 60 | mA |
| Average Forward Current Per Dot | 25 | mA |
| Derating Linear From 25°C Per Dot | 0.28 | mA/°C |
| Reverse Voltage Per Dot | 5 | V |
| Operating Temperature Range | -35°C to +105°C | |
| Storage Temperature Range | -35°C to +105°C | |
| Soldering Conditions: 1/16 inch below seating plane for 3 seconds at 260°C or of temperature unit (during assembly) not over max. temperature rating above. | | |

ELECTRICAL / OPTICAL CHARACTERISTICS AT Ta=25°C

AlInGaP GREEN

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | TEST CONDITION |
|---|------------------|------|-------|------|------|---|
| Average Luminous Intensity | I _v | 9000 | 22000 | | μcd | I _p =80mA, T _p =2 ms, 1/8 Duty |
| Peak Emission Wavelength | λ _p | | 571 | | nm | I _F =20mA |
| Spectral Line Half-Width | Δλ | | 15 | | nm | I _F =20mA |
| Dominant Wavelength | λ _d | | 572 | | nm | I _F =20mA |
| Forward Voltage any Dot | V _F | | 2.05 | 2.6 | V | I _F =20mA |
| | | | 2.3 | 2.8 | | I _F =80mA |
| Reverse Current any Dot | I _R | | | 100 | μA | V _R =5V |
| Luminous Intensity Matching Ratio (Similar Light Area) | I _{v-m} | | | 2:1 | | I _p =80mA T _p =2 ms, 1/8 Duty |

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

ABSOLUTE MAXIMUM RATING AT Ta=25°C

| PARAMETER | AlInGaP HYPER RED | UNIT |
|--|-------------------|-------|
| Average Power Dissipation Per Dot | 70 | mW |
| Peak Forward Current Per Dot | 90 | mA |
| Average Forward Current Per Dot | 25 | mA |
| Derating Linear From 25°C Per Dot | 0.28 | mA/°C |
| Reverse Voltage Per Dot | 5 | V |
| Operating Temperature Range | -35°C to +105°C | |
| Storage Temperature Range | -35°C to +105°C | |
| Soldering Conditions: 1/16 inch below seating plane for 3 seconds at 260°C or of temperature unit (during assembly) not over max. temperature rating above. | | |

ELECTRICAL / OPTICAL CHARACTERISTICS AT Ta=25°C

AlInGaP HYPER RED

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | TEST CONDITION |
|---|------------------|-------|-------|------|------|--|
| Average Luminous Intensity | I _v | 17000 | 24000 | | μcd | I _p =80mA T _p =2 ms, 1/8 Duty |
| Peak Emission Wavelength | λ _p | | 650 | | nm | I _F =20mA |
| Spectral Line Half-Width | Δλ | | 20 | | nm | I _F =20mA |
| Dominant Wavelength | λ _d | | 639 | | nm | I _F =20mA |
| Forward Voltage any Dot | V _F | | 2.1 | 2.6 | V | I _F =20mA |
| | | | 2.3 | 2.8 | | I _F =80mA |
| Reverse Current any Dot | I _R | | | 100 | μA | V _R =5V |
| Luminous Intensity Matching Ratio (Similar Light Area) | I _{v-m} | | | 2:1 | | I _p =80mA T _p =2 ms, 1/8 Duty |

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

ELECTRICAL / OPTICAL CHARACTERISTICS AT Ta=25°C

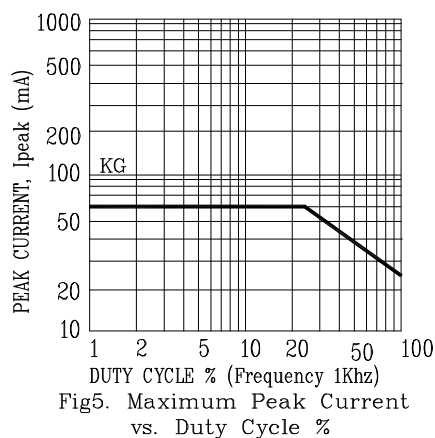
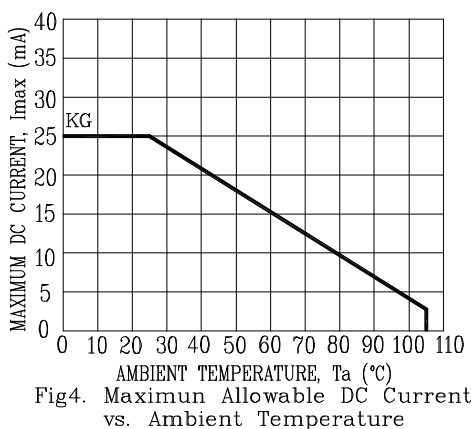
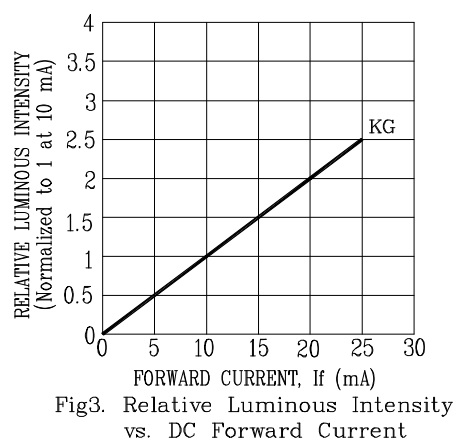
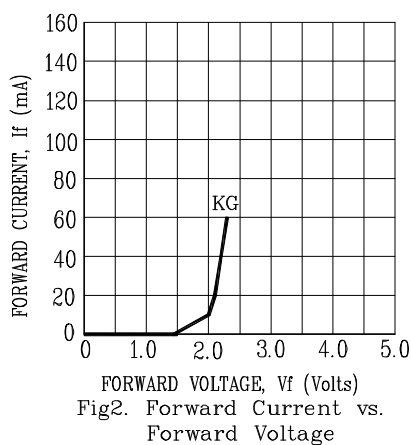
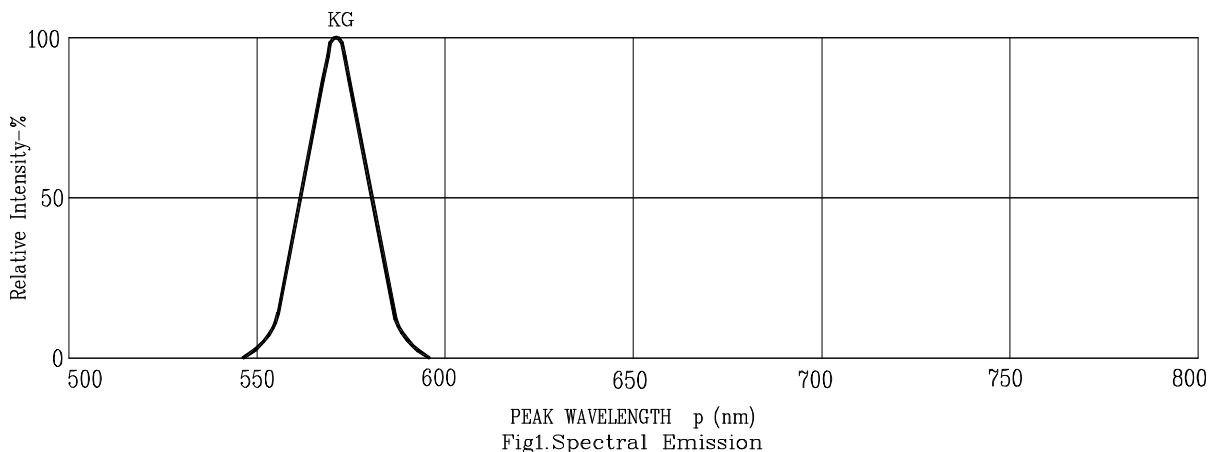
Amber = AlInGaP HYPER RED + AlInGaP GREEN

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | TEST CONDITION |
|---|------------------|-----------|-------|------|------|--|
| Average Luminous Intensity | I _v | 2800 0 | 32000 | | μcd | I _p =80mA T _p =2 ms, 1/8 Duty |
| Peak Emission Wavelength | λ _p | | 611 | | nm | I _F =20mA |
| Spectral Line Half-Width | Δλ | | 17 | | nm | I _F =20mA |
| Dominant Wavelength | λ _d | | 605 | | nm | I _F =20mA |
| Forward Voltage any Dot (AlInGaP Green) | V _F | | 2.05 | 2.6 | V | I _F =20mA |
| Forward Voltage any Dot (AlInGaP Hyper Red) | | | 2.1 | 2.6 | | I _F =20mA |
| Reverse Current any Dot | I _R | | | 100 | μA | V _R =5V |
| Luminous Intensity Matching Ratio (Similar Light Area) | I _{v-m} | | | 2:1 | | I _p =80mA T _p =2 ms, 1/8 Duty |

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

TYPICAL ELECTRICAL / OPTICAL CHARACTERISTIC CURVES

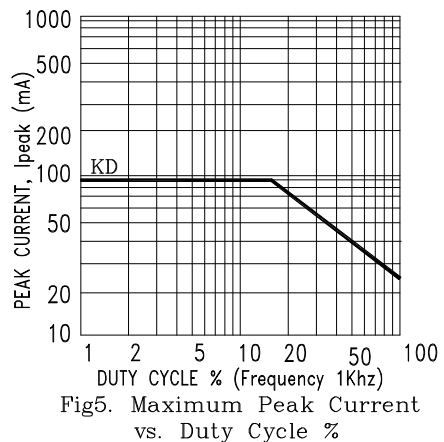
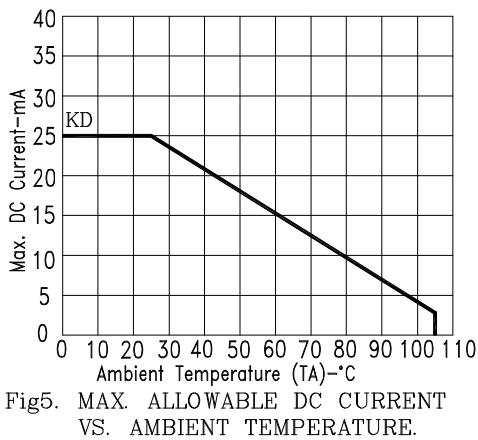
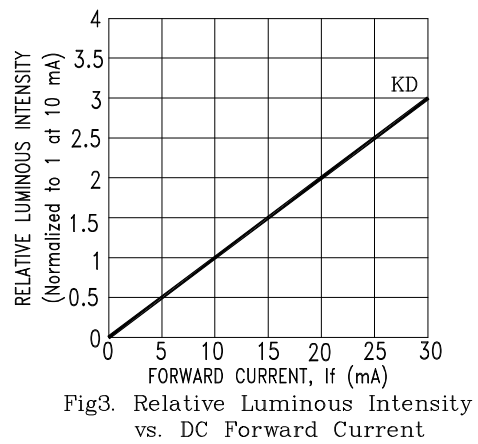
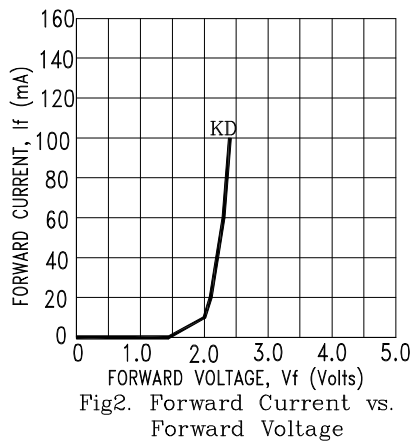
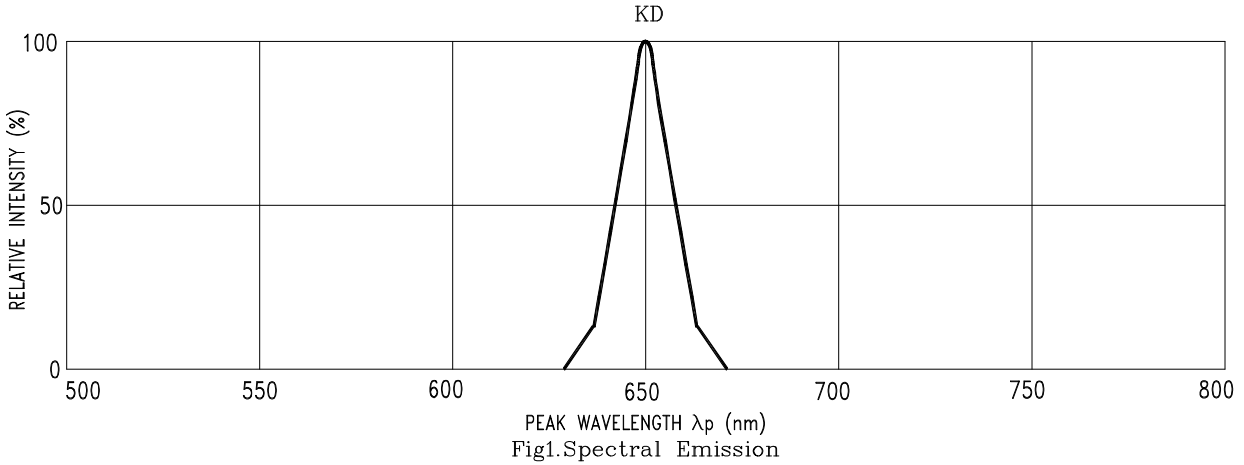
(25°C Ambient Temperature Unless Otherwise Noted)



NOTE : KG=AlInGaP Green

TYPICAL ELECTRICAL / OPTICAL CHARACTERISTIC CURVES

(25°C Ambient Temperature Unless Otherwise Noted)



NOTE : KD=AlInGaP HYPER RED