



# **LED Display**

## **Product Data Sheet**

### **LTC-4727JG**

Spec No.: DS30-2001-398

Effective Date: 12/24/2009

Revision: C

**LITE-ON DCC**

**RELEASE**

**BNS-OD-FC001/A4**

**LITE-ON Technology Corp. / Optoelectronics**

No.90,Chien 1 Road, Chung Ho, New Taipei City 23585, Taiwan, R.O.C.

Tel: 886-2-2222-6181 Fax: 886-2-2221-1948 / 886-2-2221-0660

<http://www.liteon.com/opto>

## **FEATURES**

- \* 0.4 inch (10.0 mm) DIGIT HEIGHT.
- \* CONTINUOUS UNIFORM SEGMENTS.
- \* LOW POWER REQUIREMENT.
- \* EXCELLENT CHARACTERS APPEARANCE.
- \* HIGH BRIGHTNESS & HIGH CONTRAST.
- \* WIDE VIEWING ANGLE.
- \* SOLID STATE RELIABILITY.
- \* CATEGORIZED FOR LUMINOUS INTENSITY.
- \* **LEAD-FREE PACKAGE (ACCORDING TO ROHS)**

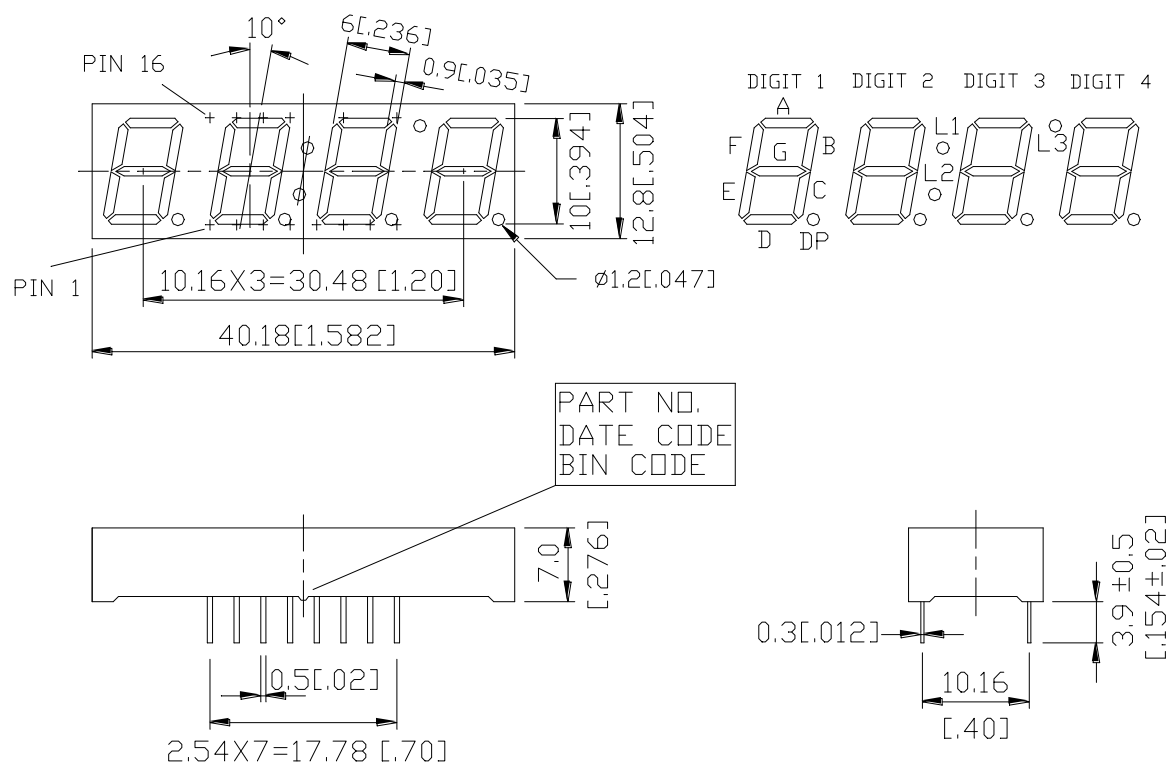
## **DESCRIPTION**

The LTC-4727JG is a 0.4 inch (10.0 mm) digit height quadruple digit seven-segment display. This device utilizes AlInGaP Green LED chips, which are made from AlInGaP on a non-transparent GaAs substrate, and has a gray face and white segments..

## **DEVICE**

| <b>PART NO.</b> | <b>DESCRIPTION</b>                           |
|-----------------|----------------------------------------------|
| AlInGaP Green   | Multiplex Common Cathode<br>Rt. Hand Decimal |
| LTC-4727JG      |                                              |

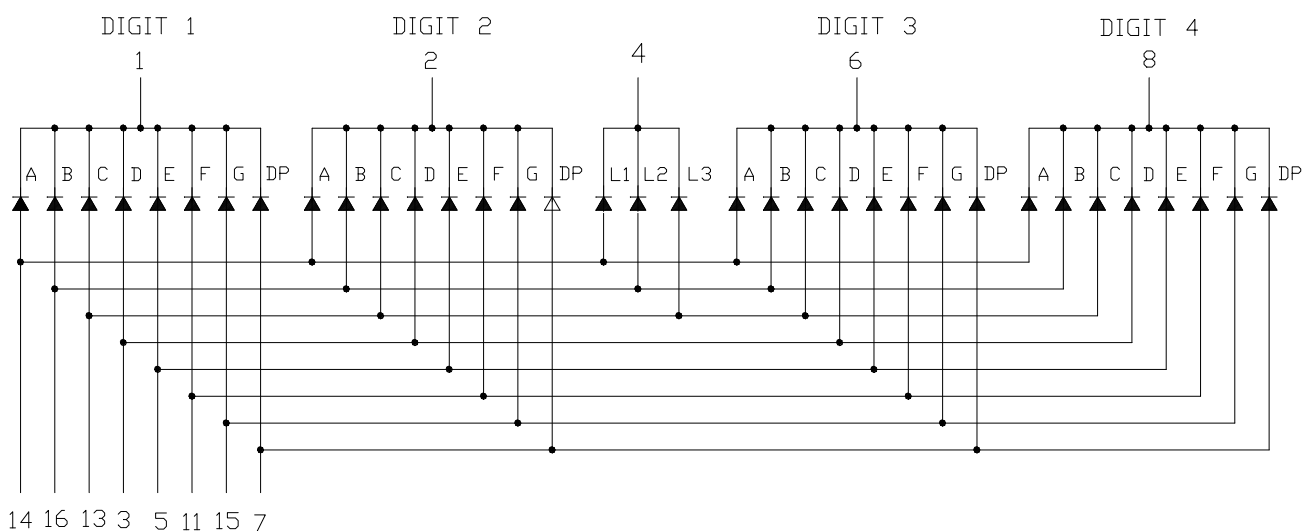
## PACKAGE DIMENSIONS



NOTES: 1.All dimensions are in millimeters. Tolerances are  $\pm 0.25$  mm (0.01") unless otherwise noted.

2. Pin tip's shift tolerance is  $\pm 0.4$  mm.

## INTERNAL CIRCUIT DIAGRAM



**PIN CONNECTION**

| <b>NO</b> | <b>CONNECTION</b>       |
|-----------|-------------------------|
| 1         | COMMON CATHODE DIGIT 1  |
| 2         | COMMON CATHODE DIGIT 2  |
| 3         | ANODE D                 |
| 4         | COMMON CATHODE L1,L2,L3 |
| 5         | ANODE E                 |
| 6         | COMMON CATHODE DIGIT 3  |
| 7         | ANODE DP                |
| 8         | COMMON CATHODE DIGIT 4  |
| 9         | NO CONNECTION           |
| 10        | NO PIN                  |
| 11        | ANODE F                 |
| 12        | NO PIN                  |
| 13        | ANODE C,L3              |
| 14        | ANODE A,L1              |
| 15        | ANODE G                 |
| 16        | ANODE B,L2              |

## ABSOLUTE MAXIMUM RATING AT Ta=25°C

| PARAMETER                                                                                                                                                    | MAXIMUM RATING  | UNIT  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------|
| Power Dissipation Per Segment                                                                                                                                | 70              | mW    |
| Peak Forward Current Per Segment<br>( 1/10 Duty Cycle, 0.1ms Pulse Width )                                                                                   | 60              | mA    |
| Continuous Forward Current Per Segment                                                                                                                       | 25              | mA    |
| Derating Linear From 25°C Per Segment                                                                                                                        | 0.28            | mA/°C |
| Reverse Voltage Per Segment                                                                                                                                  | 5               | V     |
| Operating Temperature Range                                                                                                                                  | -35°C to +105°C |       |
| Storage Temperature Range                                                                                                                                    | -35°C to +105°C |       |
| Solder Conditions: 1/16 inch below seating plane for 3 seconds at 260°C.,<br>or temperature of unit (during assembly) not over max. temperature rating above |                 |       |

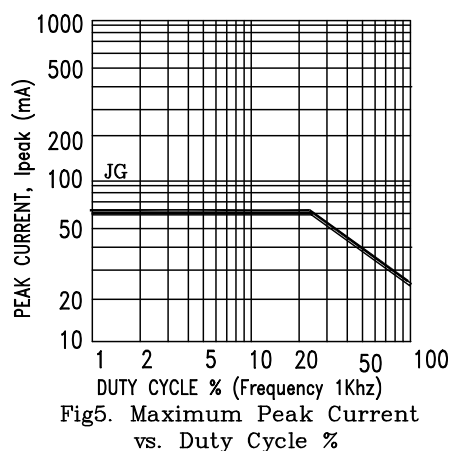
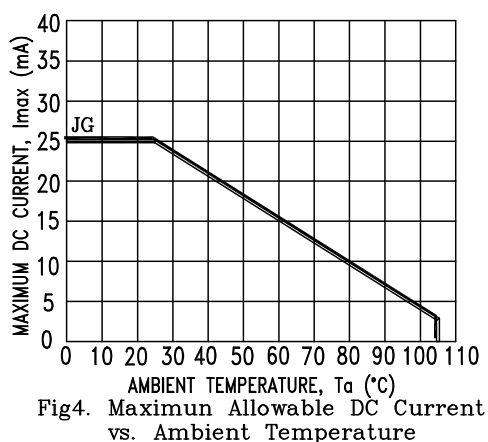
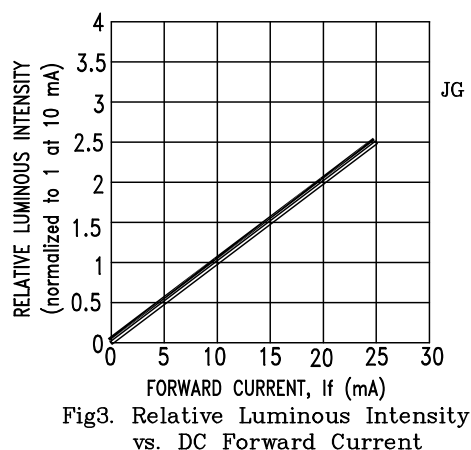
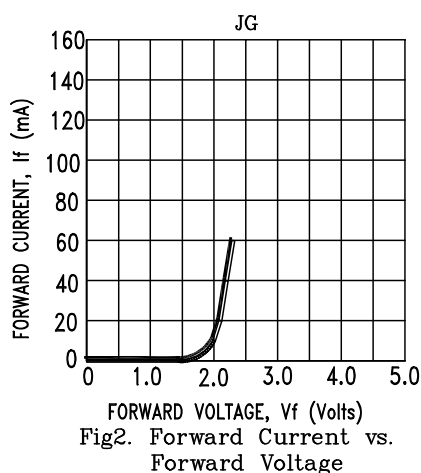
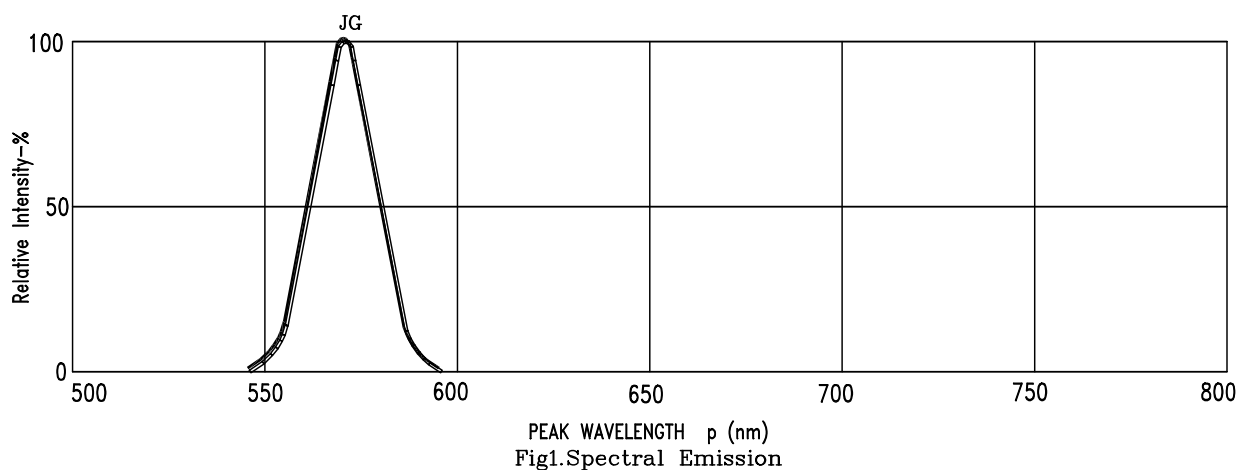
## ELECTRICAL / OPTICAL CHARACTERISTICS AT Ta=25°C

| PARAMETER                                                 | SYMBOL            | MIN. | TYP. | MAX. | UNIT | TEST CONDITION       |
|-----------------------------------------------------------|-------------------|------|------|------|------|----------------------|
| Average Luminous Intensity                                | I <sub>v</sub>    | 200  | 585  | 2100 | μcd  | I <sub>F</sub> =1mA  |
|                                                           |                   |      | 6435 |      |      | I <sub>F</sub> =10mA |
| Peak Emission Wavelength                                  | λ <sub>p</sub>    | 567  | 571  | 575  | nm   | I <sub>F</sub> =20mA |
| Spectral Line Half-Width                                  | Δλ                |      | 15   |      | nm   | I <sub>F</sub> =20mA |
| Dominant Wavelength                                       | λ <sub>d</sub>    | 568  | 572  | 576  | nm   | I <sub>F</sub> =20mA |
| Forward Voltage Per Segment                               | V <sub>F</sub>    | 1.5  | 2.05 | 2.6  | V    | I <sub>F</sub> =20mA |
| Reverse Current Per Segment                               | I <sub>R</sub>    |      |      | 100  | μA   | V <sub>R</sub> =5V   |
| Luminous Intensity Matching Ratio<br>(Similar Light Area) | I <sub>v</sub> -m |      |      | 2:1  |      | I <sub>F</sub> =1mA  |

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

## TYPICAL ELECTRICAL / OPTICAL CHARACTERISTIC CURVES

(25°C Ambient Temperature Unless Otherwise Noted)



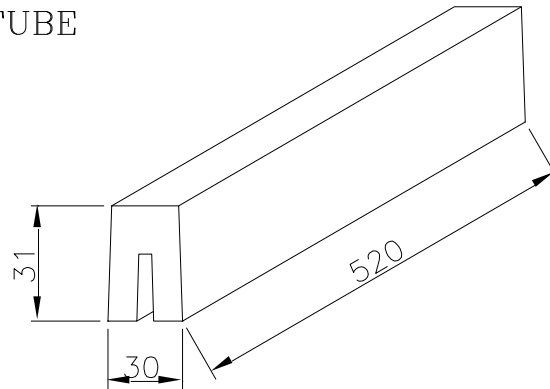
NOTE : JG=AlInGaP Green

### Reliability Test For LED Display

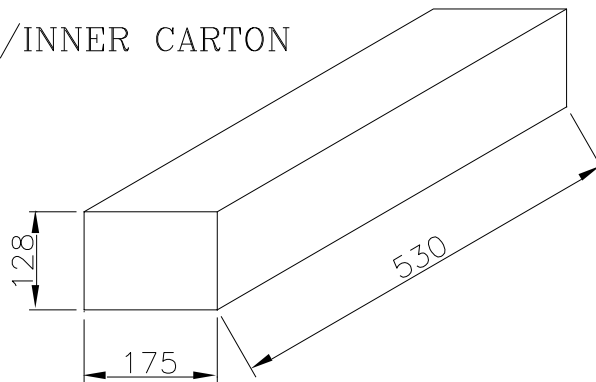
| Classification            | Test Item                                         | Description and Test Condition                                                                                                                                                                                                              | Reference standard                                                                 |
|---------------------------|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| <b>Endurance Test</b>     | Operation Life                                    | Evaluates resistance of the device when operated at electrical stress<br>Ta=under room temperature<br>If=12mA~25mA per segment or<br>Ip=80mA/duty =1/8, PW=1.25ms<br>Ip=160mA/duty =1/16,PW=1ms(dot)<br>Test Time = 1000hrs (-24hrs,+72hrs) | MIL-STD-750:1026<br>MIL-STD-883:1005<br>JIS C 7021 : B-1                           |
|                           | High Temperature<br>High Humidity<br>Storage      | Evaluates moisture resistance of the device when stored for a long term at high temperature and humidity<br>Ta=65 ± 5℃<br>Rh=90~95% Rh<br>Test Time = 240hrs ± 2hrs                                                                         | MIL-STD-202 : 103B<br>JIS C 7021 : B-11                                            |
|                           | High Temperature<br>High Humidity<br>Reverse Bias | Evaluates resistance of leakage current against long term thermal , humidity , and electrical stresses<br>Ta=65 ± 5℃<br>Rh=90~95% Rh                      Vr = 5V<br>Test time = 500hrs (-24hrs, +48hrs)                                    |                                                                                    |
|                           | High Temperature<br>Storage                       | Evaluates device durability for long term storage in high temperature<br>Ta=85 ± 5℃<br>Test Time = 1000hrs(-24hrs, +72hrs)                                                                                                                  | MIL-STD-883 : 1008<br>JIS C 7021 : B-10                                            |
|                           | Low Temperature<br>Storage                        | Evaluates device durability for long term storage in low temperature<br>Ta=-35 ± 5℃<br>Test Time = 1000hrs(-24hrs, +72hrs)                                                                                                                  | JIS C 7021 : B-12                                                                  |
| <b>Environmental Test</b> | Temperature<br>Cycling                            | Evaluates resistance of device at thermal stresses or expansion and contraction<br>85℃ ~ 25℃ ~ -35℃ ~ 25℃<br>30min    5min    30min    5min<br>10 Cycles(Cob : Thot = 65℃ Tcold = -25℃)                                                     | MIL-STD-202 : 107D<br>MIL-STD-750 : 1051<br>MIL-STD-883 : 1010<br>JIS C 7021 : A-4 |
|                           | Thermal Shock                                     | Evaluates device's structure and mechanical resistance when suddenly exposed at severe changes<br>85±5℃    ~    -35±5℃<br>30min            30min<br>10 Cycles (Cob:Thot = 65℃ Tcold = -25℃)                                                 | MIL-STD-202 : 107D<br>MIL-STD-750 : 1051<br>MIL-STD-883 : 1011                     |
|                           | Solder Resistance                                 | Evaluates resistance to thermal stress caused by soldering<br>T.Sol = 260 ± 5℃<br>Dwell Time = 10 ± 1 sec                                                                                                                                   | MIL-STD-202 : 210A<br>MIL-STD-750 : 2031<br>JIS C 7021 : A-1                       |
|                           | Solderability                                     | Evaluates solderability on leads of device<br>T.Sol = 230 ±5℃<br>Dwell Time = 5 ± 1sec                                                                                                                                                      | MIL-STD-202 : 208D<br>MIL-STD-750 : 2026<br>MIL-STD-883 : 2003<br>JIS C 7021 : A-2 |
| PART NO.: LTC-4727JG      |                                                   |                                                                                                                                                                                                                                             |                                                                                    |
| PAGE: 6 of 7              |                                                   |                                                                                                                                                                                                                                             |                                                                                    |

## THE PACKING SPEC. FOR LTC-4727JG

12 PCS/PACKING TUBE



88 PACKING TUBE/INNER CARTON



4 INNER CARTON/OUTER CARTON  
4224 PCS/OUTER CARTON

