



# **LED Display**

## **Product Data Sheet**

### **LTC-4689W**

Spec No.: DS30-2006-174

Effective Date: 02/18/2012

Revision: B

**LITE-ON DCC**

**RELEASE**

**BNS-OD-FC001/A4**

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**LED DISPLAY****LTC-4689W**  
**DATA SHEET**

| <u>Rev</u>                                            | <u>Description</u>                                 | <u>By</u>                         |
|-------------------------------------------------------|----------------------------------------------------|-----------------------------------|
| -                                                     | Original Spec                                      | <u>Praphan U.</u>                 |
| A                                                     | Revise pin connection.                             | <u>Phanomkorn J.</u>              |
|                                                       |                                                    |                                   |
|                                                       |                                                    |                                   |
| <b>(Above data for PD and Customer tracking only)</b> |                                                    |                                   |
| -                                                     | NPPR Received and Upload on OPNC                   | <u>Praphan U.</u>                 |
| A                                                     | Change dice from LTW-C193TS5<br>To LTW-C193DS5-ND2 | <u>ANON</u><br><u>Jan 31'2012</u> |
|                                                       |                                                    |                                   |

SPEC. NO.: AS-30-883-00002D A T E : 24/AUGUST/'2007REV. NO. : APAGE NO. : 0 OF 6

**FEATURES**

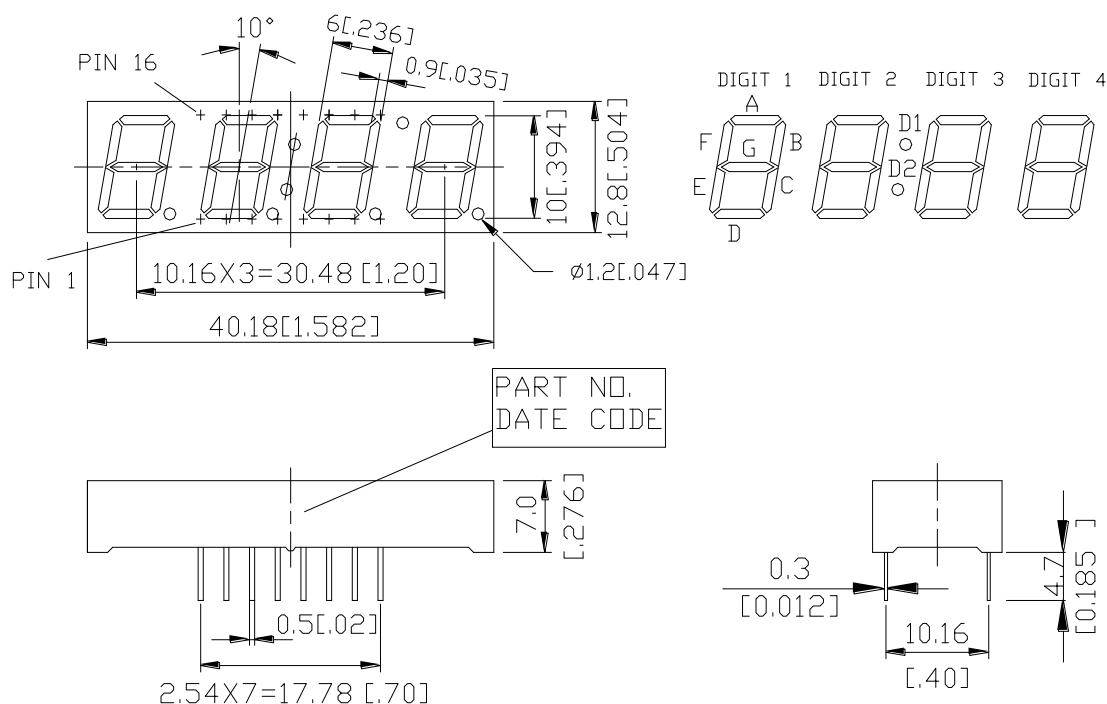
- \* 0.4 inch (10.00 mm) DIGIT HEIGHT
- \* EXCELLENT CHARACTERS APPEARANCE
- \* LOW POWER REQUIREMENT
- \* HIGH BRIGHTNESS & HIGH CONTRAST
- \* WIDE VIEWING ANGLE
- \* SOLID STATE RELIABILITY
- \* **LEAD-FREE PACKAGE (ACCORDING TO ROHS)**

**DESCRIPTION**

The LTC-4689W is 0.4 inch (10.00 mm) digit height quadruple digit seven-segment display. This device is the white-color display uses InGaN White LED chips the display has a black face and white segment

**DEVICE**

| PART NO.    | DESCRIPTION            |
|-------------|------------------------|
| WHITE-COLOR | Multiplex Common Anode |
| LTC-4689W   |                        |

**PACKAGE DIMENSIONS**


- Add protective film in display.

- Protective film specification.

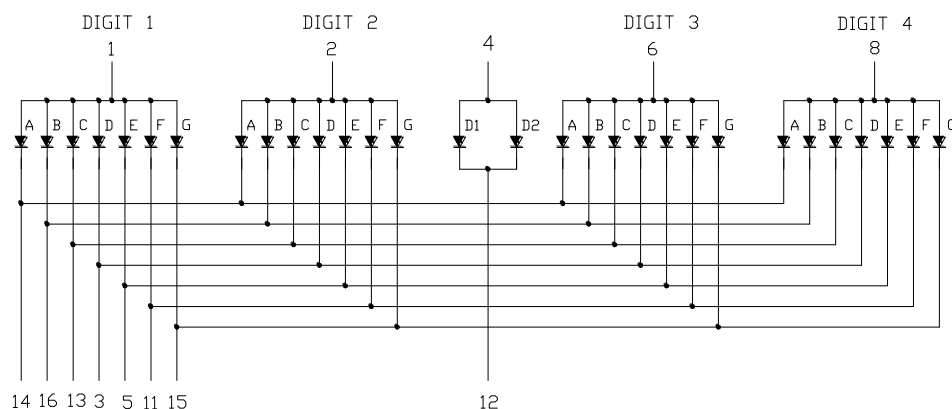
1. Dimensions: 13mm ( $\pm 0.2$  mm.) x 40.18 mm ( $+0 / -0.2$  mm.)

2. Material: PP

3. Temperature Range: -5 ~ 50°C

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 ANODE DIGIT 1 |
| 2          | COMMON ANODE DIGIT 2 |
| 3          | CATHODE D            |
| 4          | ANODE D1, D2         |
| 5          | CATHODE E            |
| 6          | COMMON ANODE DIGIT 3 |
| 7          | NO CONNECTION        |
| 8          | COMMON ANODE DIGIT 4 |
| 9          | NO CONNECTION        |
| 10         | NO CONNECTION        |
| 11         | CATHODE F            |
| 12         | CATHODE D1, D2       |
| 13         | CATHODE C            |
| 14         | CATHODE A            |
| 15         | CATHODE G            |
| 16         | CATHODE B            |

**ABSOLUTE MAXIMUM RATING AT Ta = 25°C**

| PARAMETER                                                                                                                                                 | InGaN WHITE    | UNIT  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------|
| Power Dissipation Per Segment                                                                                                                             | 70             | mW    |
| Peak Forward Current Per Segment<br>( Frequency 1Khz, 10% duty cycle)                                                                                     | 100            | mA    |
| Continuous Forward Current Per Segment                                                                                                                    | 20             | mA    |
| Forward Current De rating from 25 <sup>0</sup> C                                                                                                          | 0.25           | mA/°C |
| Reverse Voltage Per Segment                                                                                                                               | 5              | V     |
| Operating Temperature Range                                                                                                                               | -35°C to +85°C |       |
| Storage Temperature Range                                                                                                                                 | -35°C to +85°C |       |
| Soldering Conditions: 1/16 inch below seating plane for 5 seconds at 260°C or temperature of unit(during assembly) not over max. temperature rating above |                |       |
| Note : max peak current at a multiplex current is 47mA (1ms on / 7ms off) @ 85°C                                                                          |                |       |

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

| PARAMETER                                | SYMBOL         | MIN. | TYP.   | MAX. | UNIT               | TEST<br>CONDITION   |
|------------------------------------------|----------------|------|--------|------|--------------------|---------------------|
| Average Luminous Intensity Per Segment   | I <sub>v</sub> | 5    | 20     | 40   | mcd                | I <sub>F</sub> =5mA |
| View Angle                               | 2 $\phi$ 1/2   |      | 130    |      | deg                | Fig6                |
| Average Luminous Intensity Icon ;Segment |                |      | 1.2; 4 |      | mcd/m <sup>2</sup> | I <sub>F</sub> =5mA |
| Chromaticity coordinates                 | x              |      | 0.309  |      | nm                 | I <sub>F</sub> =5mA |
|                                          | y              |      | 0.308  |      |                    |                     |
| Forward Voltage Per Chip                 | V <sub>F</sub> | 2.70 |        | 3.15 | V                  | I <sub>F</sub> =5mA |
| Reverse Current Per Chip                 | I <sub>R</sub> |      |        | 10   | μA                 | V <sub>R</sub> =5V  |

Note: 1. Luminous intensity is measured with a light sensor and filter combination that approximates the CIE (Commision Internationale De L'Eclairage) eye-response curve.

- The chromaticity coordinates (x,y) is derived from 1931 CEI chromaticity diagram.
- Luminous intensity tolerance +/-15%
- Hue(x,y) tolerance +/-0.01
- Cross talk specification  $\leq$  2.5%

#### TYPICAL ELECTRICAL / OPTICAL CHARACTERISTIC CURVES

(25°C Ambient Temperature Unless Otherwise Noted)

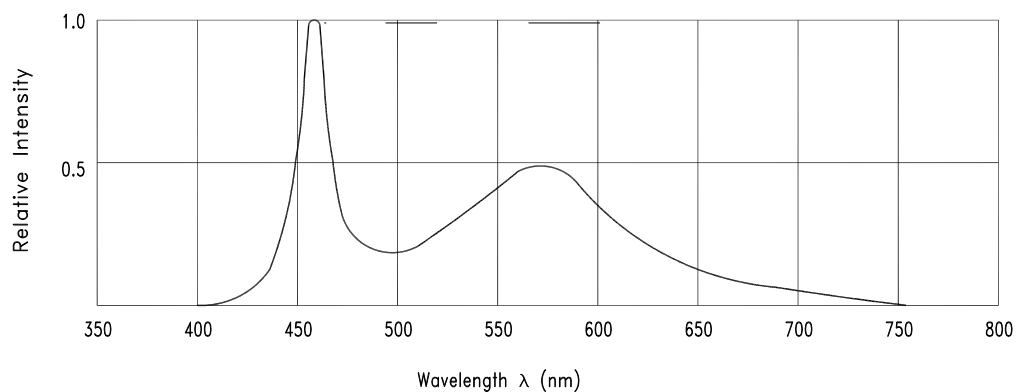


Fig.1 Relative Intensity vs. Wavelength

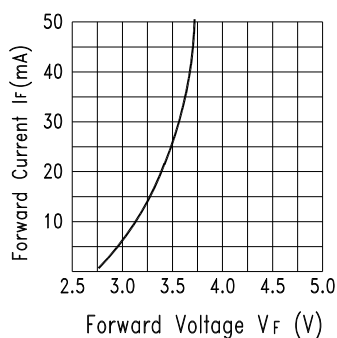


Fig.2 Forward Current vs. Forward Voltage

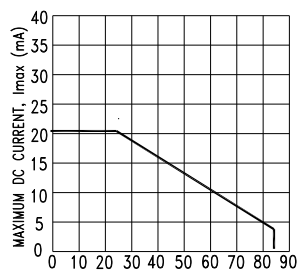


Fig.3 Forward Current Derating Curve

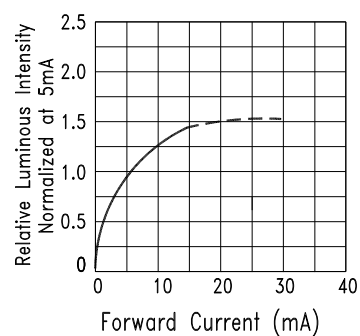


Fig.4 Relative Luminous Intensity vs. Forward Current

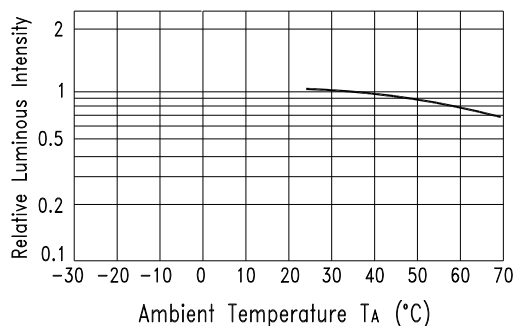


Fig.5 Luminous Intensity vs. Ambient Temperature

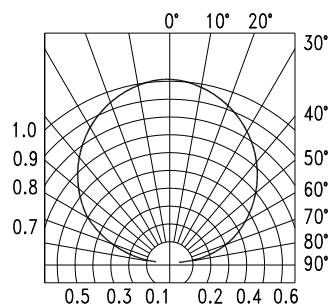


Fig.6 Spatial Distribution

**Bin Code List**

Hue Spec. Table

| Hue Bin | Color bin limits at IF = 5mA      |       |       |       |       |
|---------|-----------------------------------|-------|-------|-------|-------|
|         | CIE 1931 Chromaticity coordinates |       |       |       |       |
| S1-2    | x                                 | 0.284 | 0.284 | 0.294 | 0.294 |
|         | y                                 | 0.240 | 0.272 | 0.286 | 0.254 |
| S2-2    | x                                 | 0.284 | 0.284 | 0.294 | 0.294 |
|         | y                                 | 0.272 | 0.305 | 0.319 | 0.286 |
| S3-1    | x                                 | 0.294 | 0.294 | 0.304 | 0.304 |
|         | y                                 | 0.254 | 0.286 | 0.300 | 0.268 |
| S3-2    | x                                 | 0.304 | 0.304 | 0.314 | 0.314 |
|         | y                                 | 0.268 | 0.300 | 0.315 | 0.282 |
| S4-1    | x                                 | 0.294 | 0.294 | 0.304 | 0.304 |
|         | y                                 | 0.286 | 0.319 | 0.333 | 0.300 |
| S4-2    | x                                 | 0.304 | 0.304 | 0.314 | 0.314 |
|         | y                                 | 0.300 | 0.333 | 0.347 | 0.315 |
| S5-1    | x                                 | 0.314 | 0.314 | 0.324 | 0.324 |
|         | y                                 | 0.282 | 0.315 | 0.329 | 0.296 |
| S6-1    | x                                 | 0.314 | 0.314 | 0.324 | 0.324 |
|         | y                                 | 0.315 | 0.347 | 0.361 | 0.329 |

Tolerance on each Hue (x, y) bin is +/- 0.01.

