

QTLP650C-2 / QTLP650D-2 HER

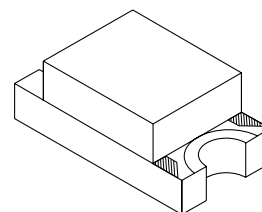
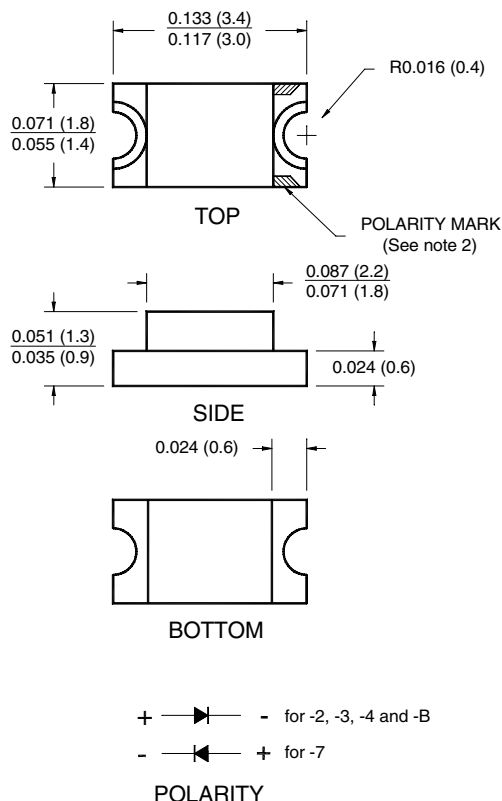
QTLP650C-3 / QTLP650D-3 Yellow

QTLP650C-4 / QTLP650D-4 Green

QTLP650C-7 / QTLP650D-7 AlGaAs Red

QTLP650C-B Blue

### PACKAGE DIMENSIONS



#### NOTE:

1. Dimensions for all drawings are in inches (mm).
2. Cathode for -2, -3, -4 and B. Anode for -7.

### APPLICATIONS

- Keypad backlighting
- Push-button backlighting
- LCD backlighting

### DESCRIPTION

These surface mount chip LEDs are designed to fit industry standard footprint. Low profile and wide viewing angle make these LEDs ideal choices for backlighting applications and panel illumination.

### FEATURES

- Small footprint - 3.2(L) X 1.6(W) X 1.1(H) mm
- Wide viewing angle of 140°(QTLP650C) or 160°(QTLP650D)
- Water clear (QTLP650C) or diffused (QTLP650D) optics
- Moisture-proof packaging
- Available in 0.315" (8mm) width tape on 7" (178mm) diameter reel; 2,000 units per reel

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QTL650C-B Blue

### ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25°C Unless otherwise specified)

| Parameter                                                 | Symbol           | QTL650C / QTL650D |     |     |     |     | Units |
|-----------------------------------------------------------|------------------|-------------------|-----|-----|-----|-----|-------|
|                                                           |                  | -2                | -3  | -4  | -7  | -B* |       |
| Continuous Forward Current                                | I <sub>F</sub>   | 30                | 30  | 30  | 30  | 30  | mA    |
| Peak Forward Current<br>(f = 1.0 KHz, Duty Factor = 1/10) | I <sub>FM</sub>  | 160               | 160 | 160 | 180 | 100 | mA    |
| Reverse Voltage (I <sub>R</sub> = 10 µA)                  | V <sub>R</sub>   | 5                 | 5   | 5   | 5   | 5   | V     |
| Power Dissipation                                         | P <sub>D</sub>   | 84                | 84  | 84  | 72  | 135 | mW    |
| Operating Temperature                                     | T <sub>OPR</sub> | -40 to +85        |     |     |     |     | °C    |
| Storage Temperature                                       | T <sub>STG</sub> | -40 to +90        |     |     |     |     | °C    |
| Lead Soldering Time                                       | T <sub>SOL</sub> | 260 for 5 sec     |     |     |     |     | °C    |

### ELECTRICAL / OPTICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)

| Part Number                   | Symbol            | QTL650C / QTL650D |           |           |           |         | Condition             |
|-------------------------------|-------------------|-------------------|-----------|-----------|-----------|---------|-----------------------|
|                               |                   | -2                | -3        | -4        | -7        | -B*     |                       |
| Luminous Intensity (mcd)      | I <sub>V</sub>    | 4 / 3             | 4 / 3     | 6 / 5     | 10 / 8    | 10 / -  | I <sub>F</sub> = 20mA |
| Minimum                       |                   | 10 / 8            | 10 / 8    | 10 / 8    | 20 / 15   | 20 / -  |                       |
| Typical                       |                   |                   |           |           |           |         |                       |
| Forward Voltage (V)           | V <sub>F</sub>    | 2.8               | 2.8       | 2.8       | 2.4       | 4.5     | I <sub>F</sub> = 20mA |
| Maximum                       |                   | 2.0               | 2.0       | 2.1       | 1.9       | 3.8     |                       |
| Typical                       |                   |                   |           |           |           |         |                       |
| Wavelength (nm)               | λ <sub>P</sub>    | 635               | 585       | 565       | 660       | 430     | I <sub>F</sub> = 20mA |
| Peak                          |                   | 630               | 590       | 570       | 645       | 465     |                       |
| Dominant                      | λ <sub>D</sub>    |                   |           |           |           |         |                       |
| Spectral Line Half Width (nm) | Δλ                | 45                | 35        | 30        | 20        | 65      | I <sub>F</sub> = 20mA |
| Viewing Angle (°)             | 2Θ <sub>1/2</sub> | 140 / 160         | 140 / 160 | 140 / 160 | 140 / 160 | 140 / - | I <sub>F</sub> = 20mA |

\* Available only in QTL650C

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QTLP650C-3 / QTLP650D-3 Yellow

QTLP650C-4 / QTLP650D-4 Green

QTLP650C-7 / QTLP650D-7 AlGaAs Red

QTLP650C-B Blue

### TYPICAL PERFORMANCE CURVES

Fig. 1 Forward Current vs. Forward Voltage

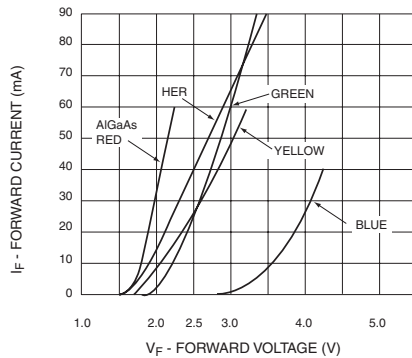


Fig. 2 Relative Luminous Intensity vs. DC Forward Current

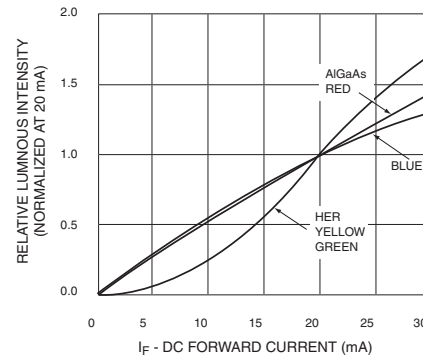


Fig. 3 Relative Intensity vs. Peak Wavelength

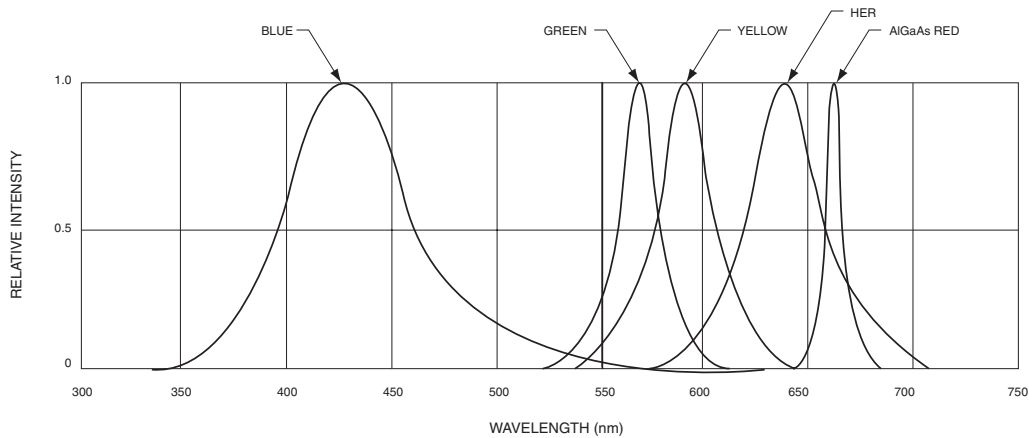


Fig.4 Radiation Diagram

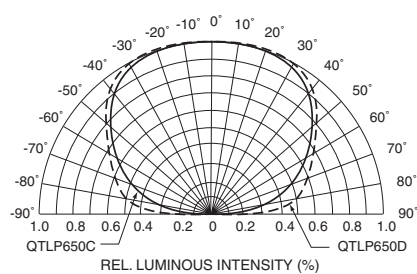
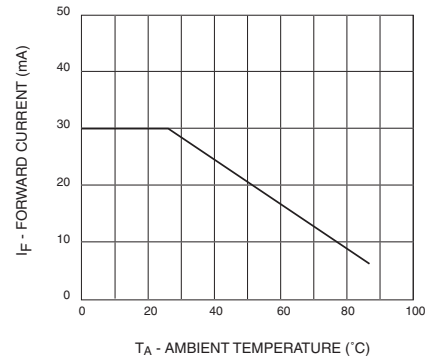


Fig.5 Maximum Forward Current vs. Ambient Temperature



QTLP650C-2 / QTLP650D-2 HER

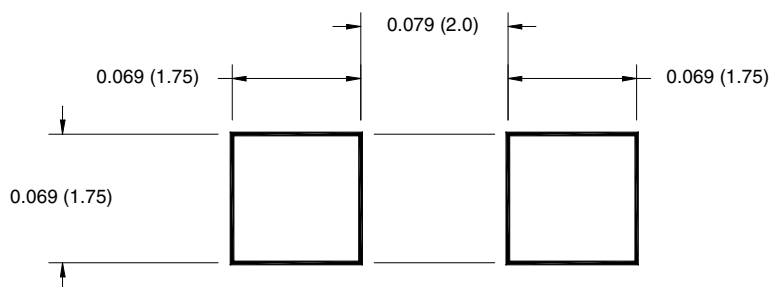
QTLP650C-3 / QTLP650D-3 Yellow

QTLP650C-4 / QTLP650D-4 Green

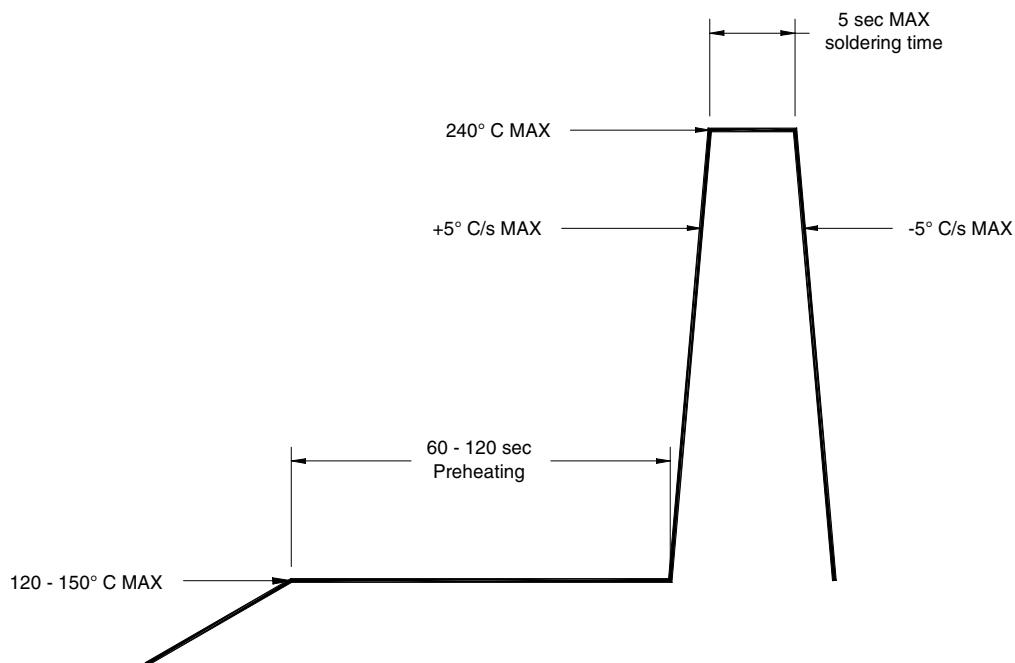
QTLP650C-7 / QTLP650D-7 AlGaAs Red

QTLP650C-B Blue

### RECOMMENDED PRINTED CIRCUIT BOARD PATTERN



### RECOMMENDED IR REFLOW SOLDERING PROFILE



# SURFACE MOUNT LED LAMP

## STANDARD BRIGHT 1206

## QTL P650C-2 / QTL P650D-2 HER

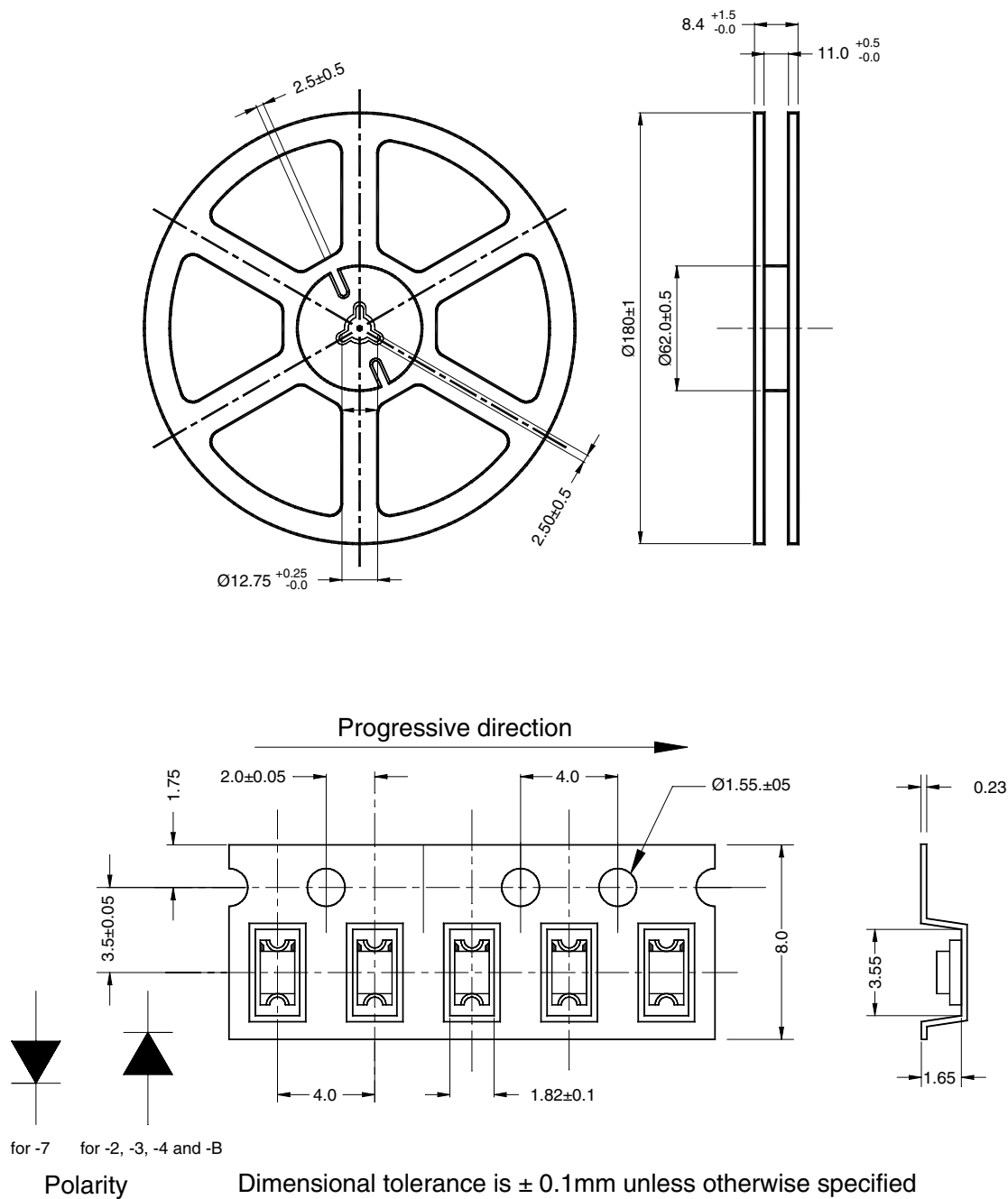
## QTL P650C-3 / QTL P650D-3 Yellow

## QTL P650C-4 / QTL P650D-4 Green

## QTL P650C-7 / QTL P650D-7 AlGaAs Red

## QTLP650C-B Blue

## TAPE AND REEL DIMENSIONS



Dimensional tolerance is  $\pm 0.1\text{mm}$  unless otherwise specified

Angle:  $\pm 0.5$

Unit: mm

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