

QTLP650C-R Red

QTLP650C-E Orange

QTLP650C-O Yellow-Orange

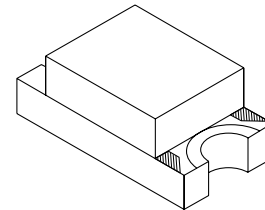
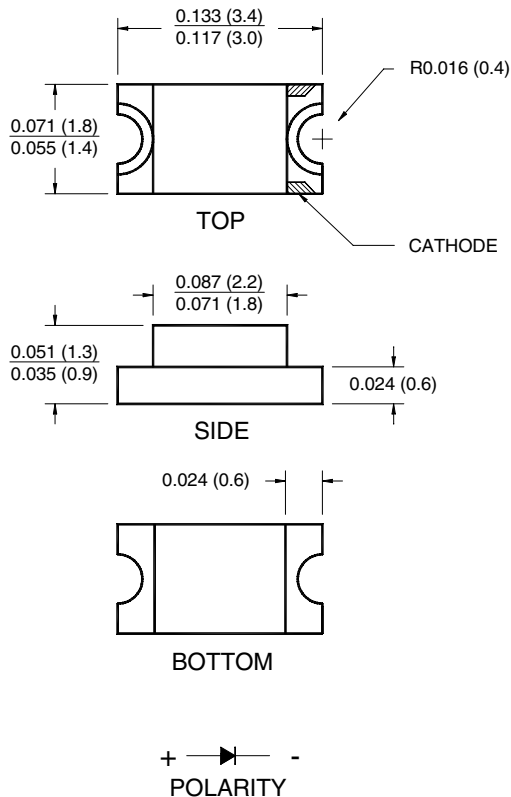
QTLP650C-Y Yellow

QTLP650C-AG Yellow-Green

QTLP650C-IG True Green

QTLP650C-IB Blue

### PACKAGE DIMENSIONS



NOTE:

Dimensions for all drawings are in inches (mm).

### 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
- AllInGaP technology for -R, -E, -O, -Y and -AG
- InGaN/SiC technology for -IG and -IB
- Wide viewing angle of 140°
- Water clear 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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**QTLP650C-Y** Yellow

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**QTLP650C-IB** Blue

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

Parameter	Symbol	QTLP650C					Units
		-R	-E	-O	-Y	-AG	
Continuous Forward Current	I <sub>F</sub>	30	30	30	25	30	mA
Peak Forward Current (f = 1.0 KHz, Duty Factor = 1/10)	I <sub>FM</sub>	160	160	160	120	160	mA
Reverse Voltage	V <sub>R</sub>	5	5	5	5	5	V
Power Dissipation	P <sub>D</sub>	72	72	72	60	72	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

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

Parameter	Symbol	QTLP650C		Units
		-IB	-IG	
Continuous Forward Current	I <sub>F</sub>	30	30	mA
Peak Forward Current (f = 1.0 KHz, Duty Factor = 1/10)	I <sub>FM</sub>	100	100	mA
Reverse Voltage	V <sub>R</sub>	5	5	V
Power Dissipation	P <sub>D</sub>	120	120	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

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

Part Number	Symbol	QTLP650C					Condition
		-R	-E	-O	-Y	-AG	
Luminous Intensity (mcd)	I <sub>V</sub>	25	25	25	25	15	I <sub>F</sub> = 20mA
Minimum		70	70	70	70	30	
Typical							
Forward Voltage (V)	V <sub>F</sub>	2.4	2.4	2.4	2.4	2.4	I <sub>F</sub> = 20mA
Maximum		2.0	2.0	2.0	2.0	2.0	
Typical							
Wavelength (nm)	λ <sub>P</sub>	630	620	610	590	575	I <sub>F</sub> = 20mA
Peak		624	615	605	589	573	
Dominant	λ <sub>D</sub>						
Spectral Line Half Width (nm)	Δλ	20	18	18	15	20	I <sub>F</sub> = 20mA
Viewing Angle (°)	2Θ <sub>1/2</sub>	140	140	140	140	140	I <sub>F</sub> = 20mA

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

Part Number	Symbol	QTLP650C		Condition
		-IB	-IG	
Luminous Intensity (mcd)	I <sub>V</sub>	35	100	I <sub>F</sub> = 20mA
Minimum		45	140	
Typical				
Forward Voltage (V)	V <sub>F</sub>	4.0	4.0	I <sub>F</sub> = 20mA
Maximum		3.5	3.5	
Typical				
Wavelength (nm)	λ <sub>P</sub>	465	520	I <sub>F</sub> = 20mA
Peak		470	525	
Dominant	λ <sub>D</sub>			
Spectral Line Half Width (nm)	Δλ	25	35	I <sub>F</sub> = 20mA
Viewing Angle (°)	2Θ <sub>1/2</sub>	140	140	I <sub>F</sub> = 20mA

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## TYPICAL PERFORMANCE CURVES (QTLP650C-R, -E, -O, -Y and -AG)

Fig. 1 Forward Current vs. Forward Voltage

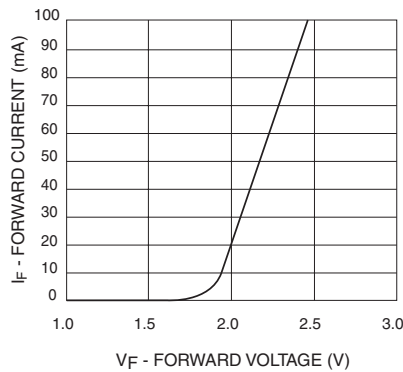


Fig. 2 Relative Luminous Intensity vs. DC Forward Current

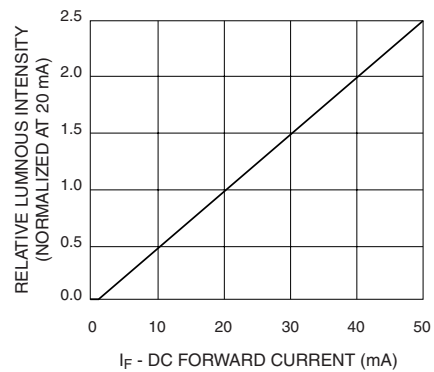


Fig. 3 Relative Intensity vs. Peak Wavelength

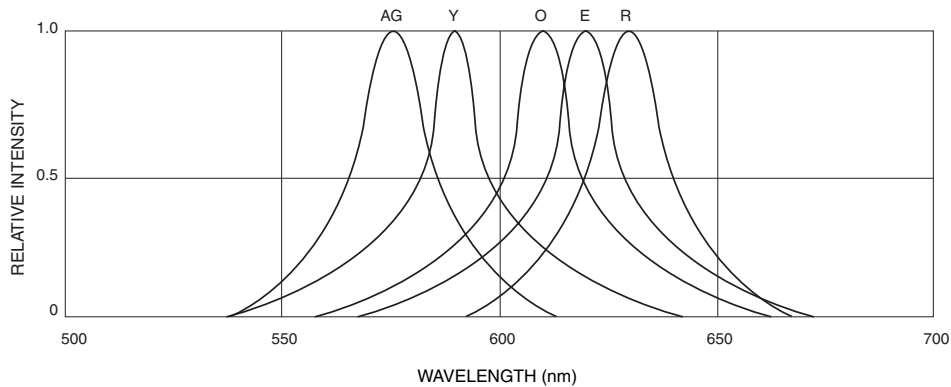


Fig.4 Radiation Diagram

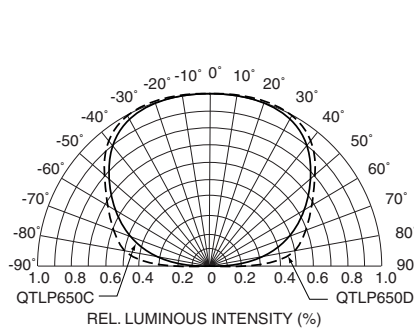
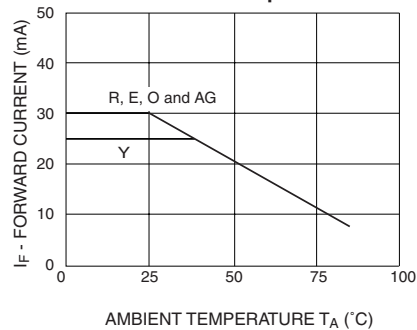


Fig.5 Maximum Forward Current vs. Ambient Temperature



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QTLP650C-O Yellow-Orange

QTLP650C-Y Yellow

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## TYPICAL PERFORMANCE CURVES (QTLP650C-IG and IB)

Fig. 1 Forward Current vs. Forward Voltage

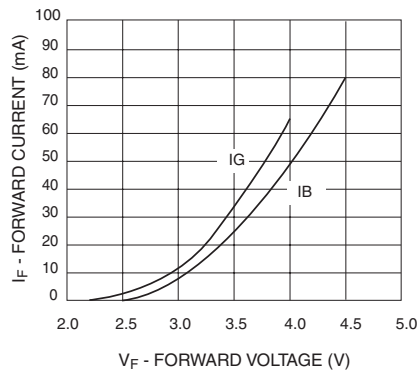


Fig. 2 Relative Luminous Intensity vs. DC Forward Current

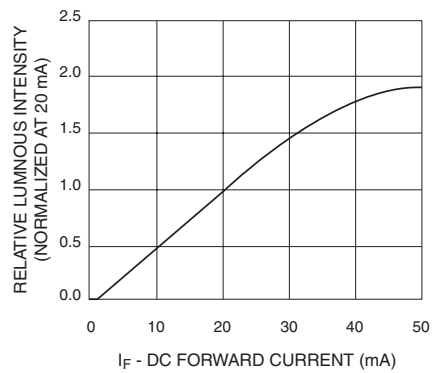


Fig. 3 Relative Intensity vs. Peak Wavelength

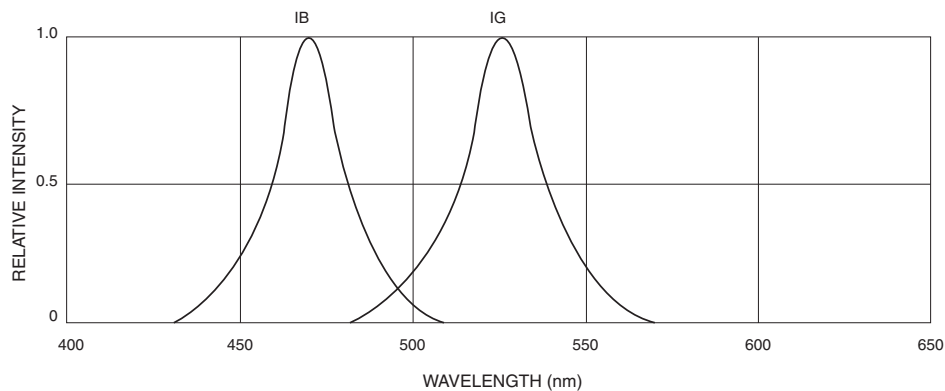


Fig. 4 Radiation Diagram

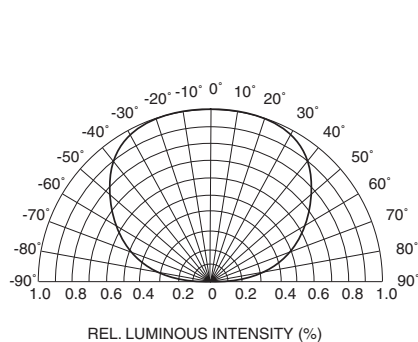
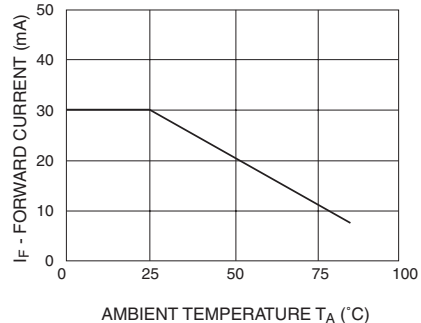


Fig. 5 Maximum Forward Current vs. Ambient Temperature



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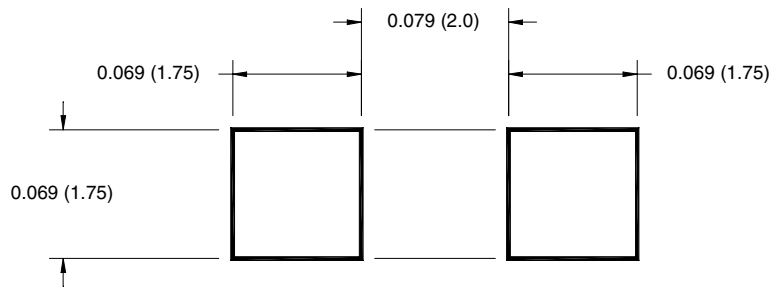
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QTLP650C-AG Yellow-Green

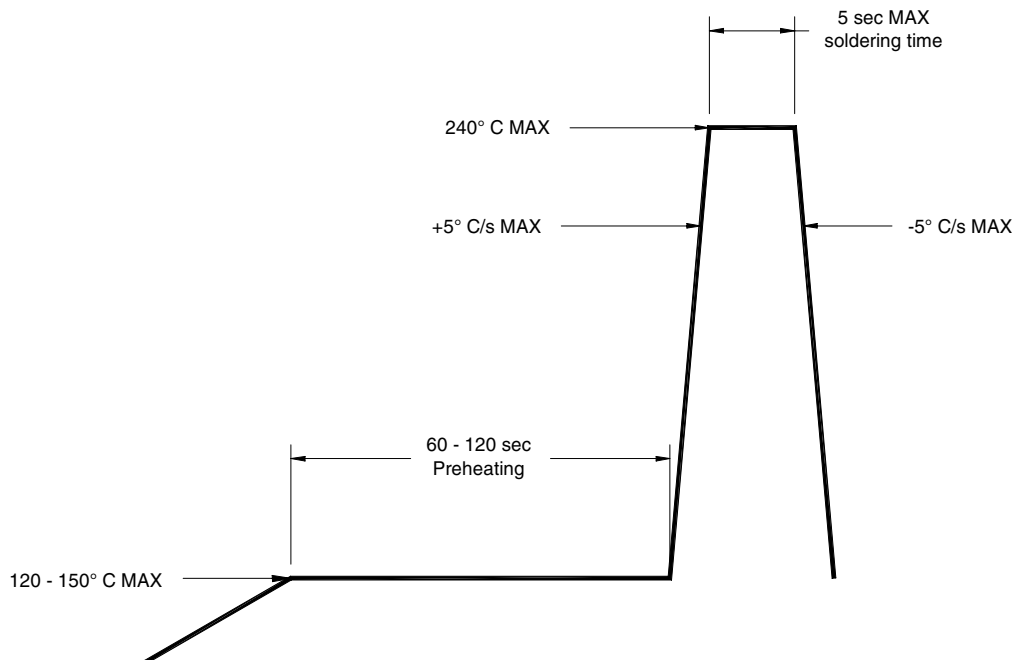
QTLP650C-IG True Green

QTLP650C-IB Blue

## RECOMMENDED PRINTED CIRCUIT BOARD PATTERN



## RECOMMENDED IR REFLOW SOLDERING PROFILE



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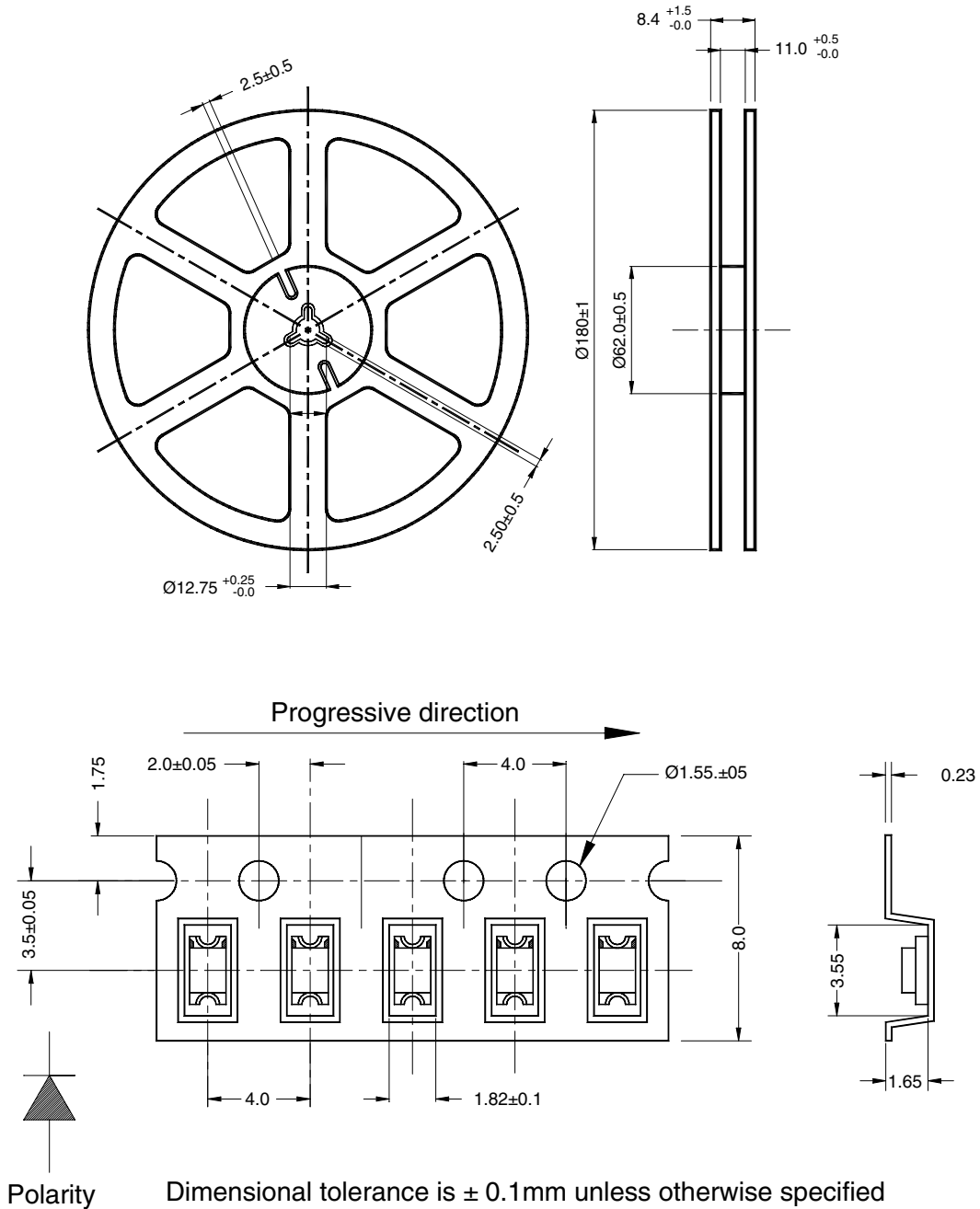
QTLP650C-Y Yellow

QTLP650C-AG Yellow-Green

QTLP650C-IG True Green

QTLP650C-IB Blue

## TAPE AND REEL DIMENSIONS



Dimensional tolerance is  $\pm 0.1$  mm unless otherwise specified

Angle:  $\pm 0.5$

Unit: mm

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2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.