

QTLP651C-R Red

QTLP651C-E Orange

QTLP651C-O Yellow-Orange

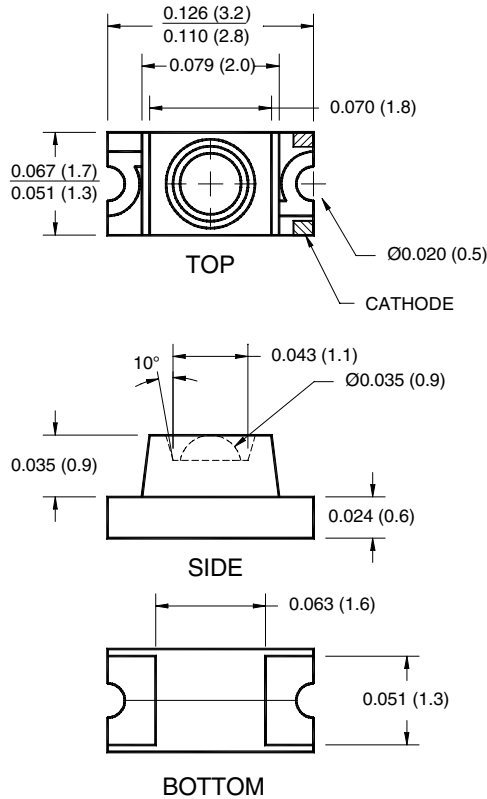
QTLP651C-Y Yellow

QTLP651C-AG Yellow-Green

QTLP651C-IG True Green

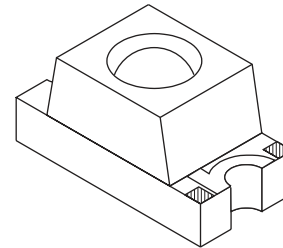
QTLP651C-IB Blue

## 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. The package features a recessed, inner lens that focuses the light output, offering greater luminous intensity for direct viewing.

## FEATURES

- Small footprint - 3.0(L) X 1.5(W) X 1.5(H) mm
- AllInGaP technology for -R, -E, -O, -Y and -AG
- InGaN/SiC technology for -IG and -IB
- Narrow viewing angle of 20°
- Water clear optics
- Moisture-proof packaging
- Available in 0.315" (8mm) width tape on 7" (178mm) diameter reel; 2,000 units per reel

# SURFACE MOUNT LED LAMP

## SUPER BRIGHT 1206 (Inner Lens)

QTLP651C-R Red

QTLP651C-E Orange

QTLP651C-O Yellow-Orange

QTLP651C-Y Yellow

QTLP651C-AG Yellow-Green

QTLP651C-IG True Green

QTLP651C-IB Blue

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

Parameter	Symbol	QTLP651C					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	QTLP651C		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	QTLP651C					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>	20	20	20	20	20	I <sub>F</sub> = 20mA

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

Part Number	Symbol	QTLP651C		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>	20	20	I <sub>F</sub> = 20mA

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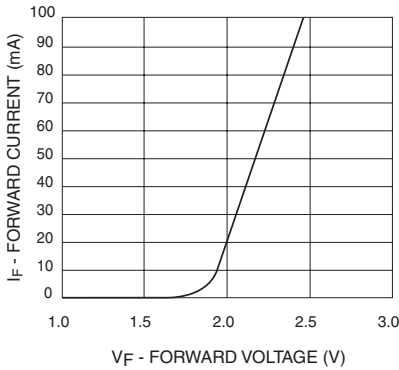
QTLP651C-AG Yellow-Green

QTLP651C-IG True Green

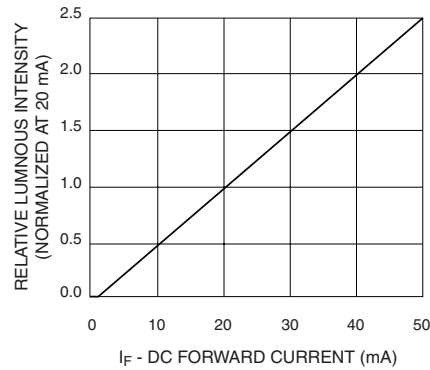
QTLP651C-IB Blue

**TYPICAL PERFORMANCE CURVES (QTLP651C-R, -E, -O, -Y and -AG)**

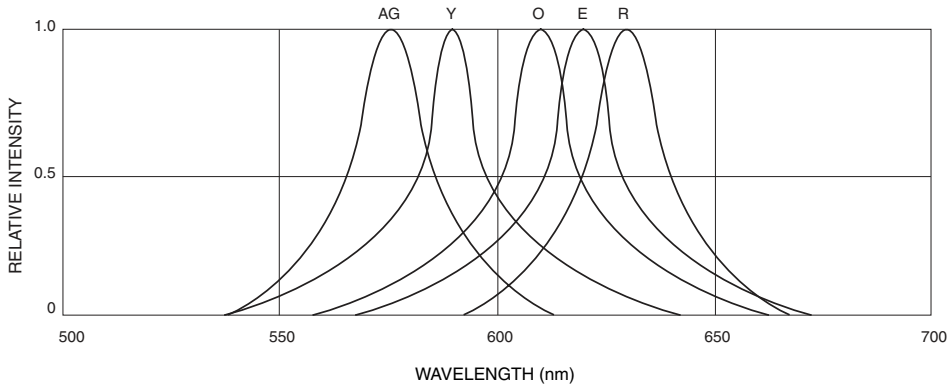
**Fig. 1 Forward Current vs. Forward Voltage**



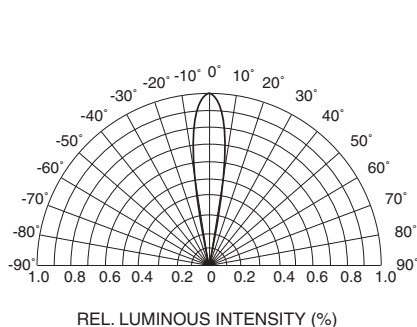
**Fig. 2 Relative Luminous Intensity vs. DC Forward Current**



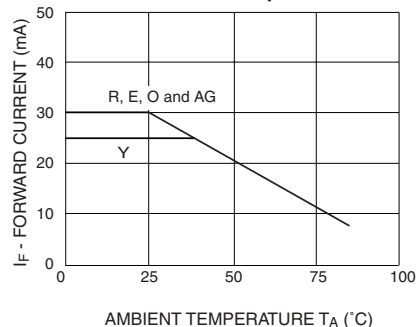
**Fig. 3 Relative Intensity vs. Peak Wavelength**



**Fig.4 Radiation Diagram**



**Fig.5 Maximum Forward Current vs. Ambient Temperature**



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## TYPICAL PERFORMANCE CURVES (QTLP651C-IG and IB)

Fig. 1 Forward Current vs. Forward Voltage

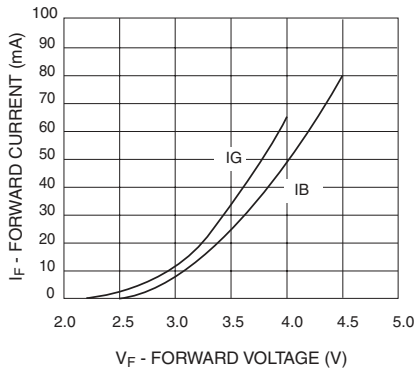


Fig. 2 Relative Luminous Intensity vs. DC Forward Current

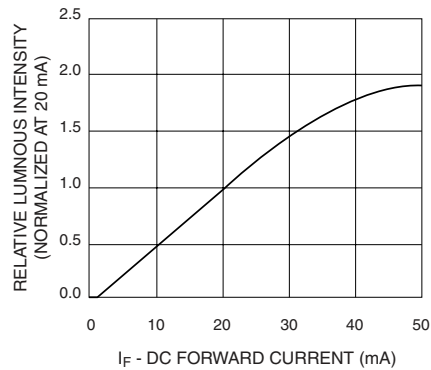


Fig. 3 Relative Intensity vs. Peak Wavelength

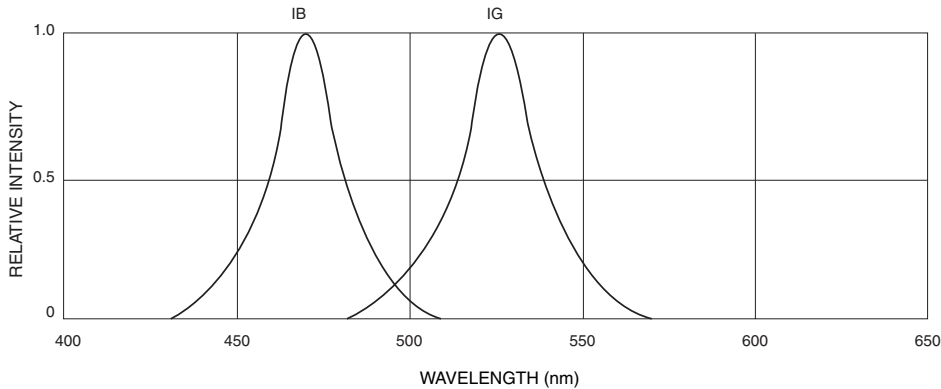


Fig.4 Radiation Diagram

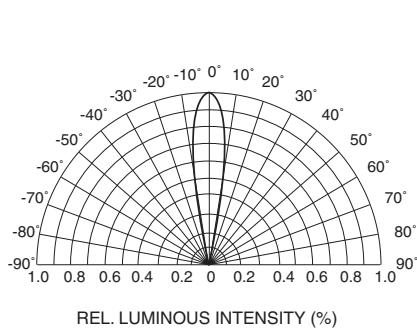
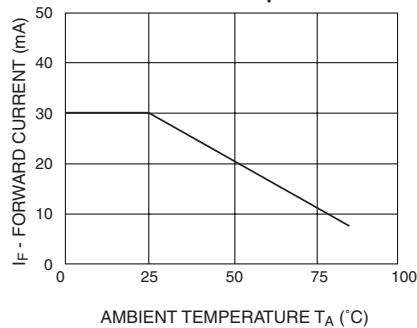


Fig.5 Maximum Forward Current vs. Ambient Temperature



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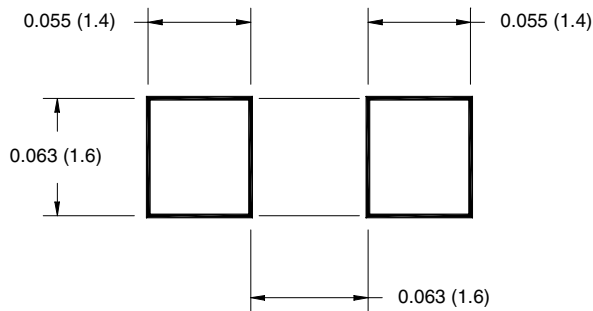
QTLP651C-Y Yellow

QTLP651C-AG Yellow-Green

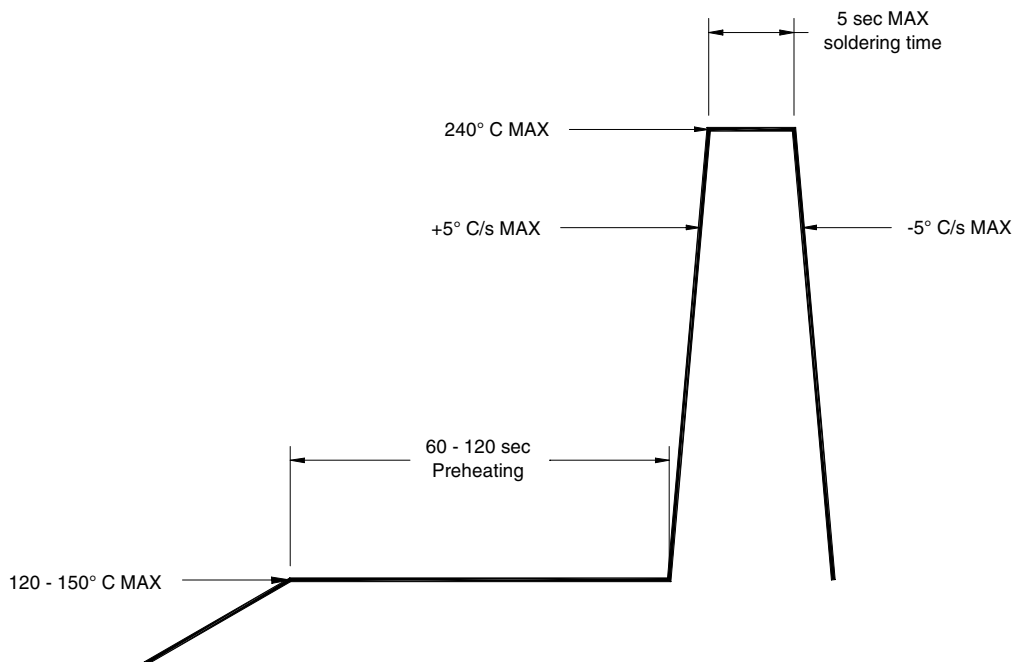
QTLP651C-IG True Green

QTLP651C-IB Blue

## RECOMMENDED PRINTED CIRCUIT BOARD PATTERN



## RECOMMENDED IR REFLOW SOLDERING PROFILE



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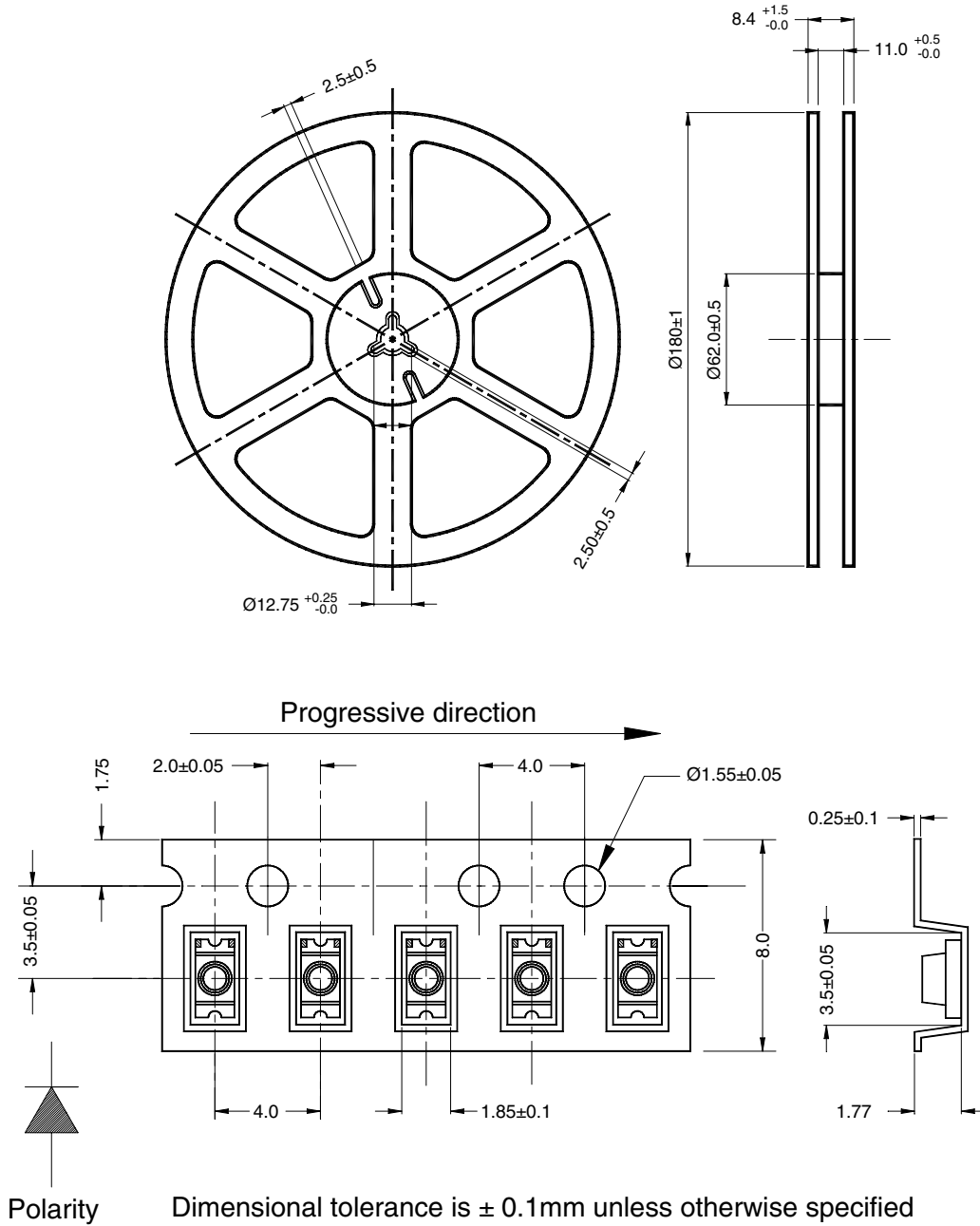
QTLP651C-Y Yellow

QTLP651C-AG Yellow-Green

QTLP651C-IG True Green

QTLP651C-IB 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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