



**QLSP04PCRU**  
(3030 PC Red)



## Product Outline:

This is the high power LED with reflector type. EMC 3030 Single color is a surface-mount LED which with heat sink to enhance operating performance. With special binning technology, these LEDs are ideal for architecture lighting and special lighting needs.

## Features:

- PC Red color
- High brightness output @ 350mA,
- High driving current to 500mA.
- Package Dimension = 3.2mmX3.0mmX0.6mm
- RoHS compliant
- Custom Bin available upon special request
- View angel >110°

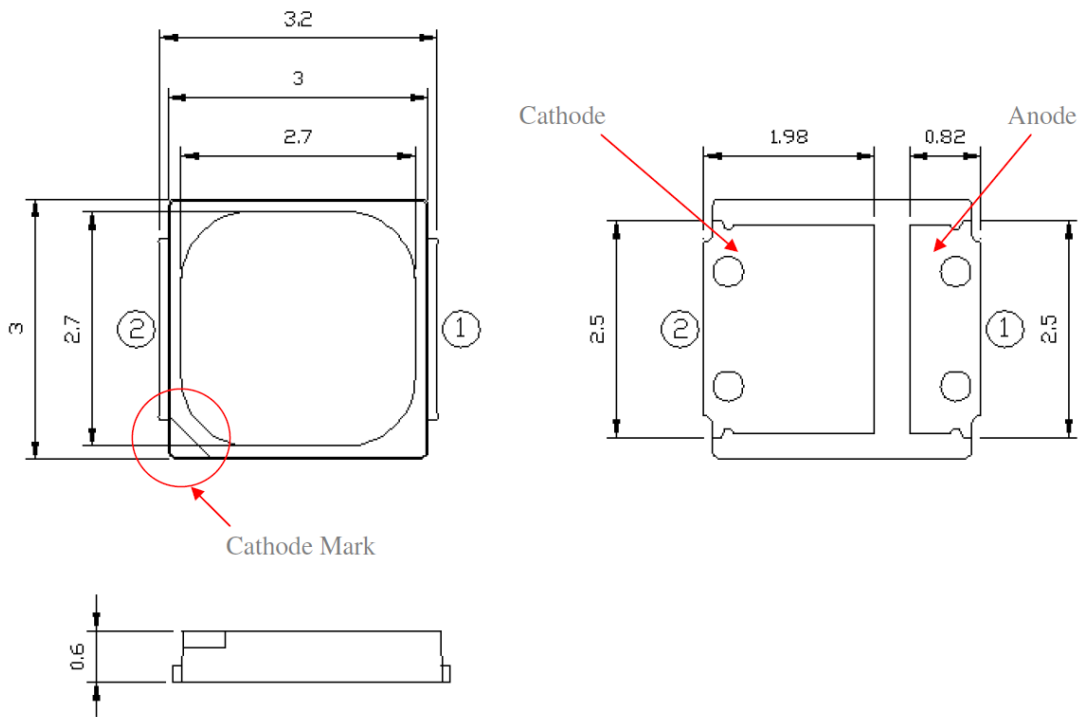
## Application:

- Warning lamp
- Horticulture
- Decoration lamp
- Architecture Lighting
- Garden Lighting
- Horticulture Light

## Compliance and Certification:

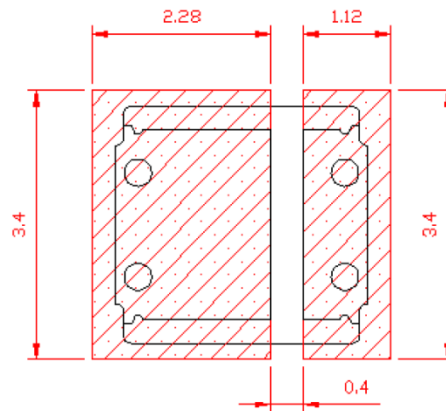


## Mechanical Property: (Dimension)



- \* All dimensions are in millimeters,
- \* Tolerances are  $\pm 0.10\text{mm}$ .

## Recommended Solder footprint:



- \* All dimensions are in millimeters.
- \* The LEDs is designed to be reflow soldered on to a PCB. IF dip soldered that QL cannot guarantee its reliability.
- \* Reflow soldering must not be performed more than twice.



## Characteristics

### ■ Absolute Maximum Ratings

(Ta=25°C)

Parameter	Symbol	Rating	Unit
DC Forward Current	If	500	mA
Leakage Current	Ir	1.0	μA
Power Dissipation	Pd	1.8	W
Pulse Forward Current	Ifp	700	mA
LED Junction Temperature	TJ	125	°C
Storage Temperature	Tstg	-40 ~ 100	°C
Operation Temperature	Topr	-40 ~ 85	°C
Soldering Temperature	Tsol	260 < 10 sec	°C

- (1) Proper current rating must be observed to maintain junction temperature below maximum at all time  
 (2) IFP Condition: Duty 1/10, Pulse within 10msec

### ■ Electrical / Optical Characteristic

(Ta=25 oC)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage	Vf	350mA	3.0		3.5	V
View Angle	$\theta$			120		deg
ESD Sensitivity(HBM)	KV			8.0		
Thermal Resistance	Rth			11.3		°C/W

- (1) Tolerance of measurement: VF=+/- 0.1V

### ■ Specification

Product	Color	Vf(V) IF=350mA	Dominant Wavelength(nm)	Luminous Flux IF=350mA	
				Min.	Typ.
QLSP04PCRU	PC Red	3.2	615~625	24.5	27.5

\*Tolerance = +/- 10%



■ **Groups**

**Forward Voltage (V<sub>F</sub>) Bin:**

VF Rank @ 350mA			
Code name	Min.	Max.	Units
2	3	3.1	V
3	3.1	3.2	
4	3.2	3.3	
5	3.3	3.4	
6	3.4	3.5	

The forward voltage tolerance is  $\pm 0.1V$

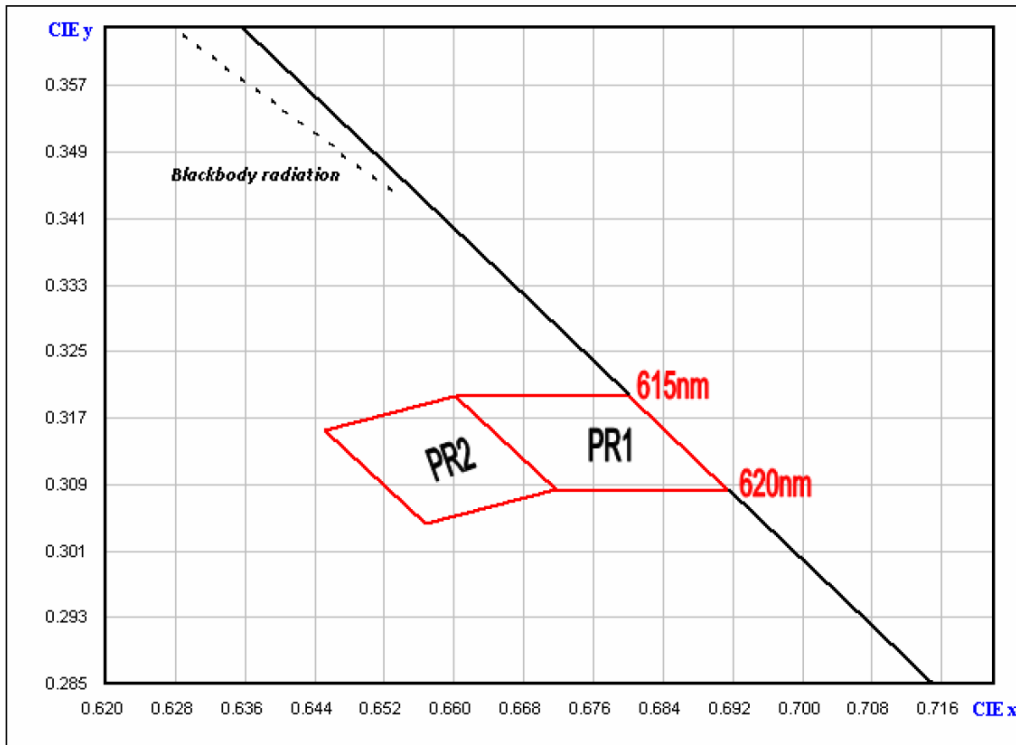
**Luminous Flux Bin:**

Im Rank (Im) @ 350mA			
Code name	Min.	Max.	Units
QL	25	28	lm
QM	28	31.5	

Luminous flux tolerance is  $\pm 7\%$



## CIE bin table

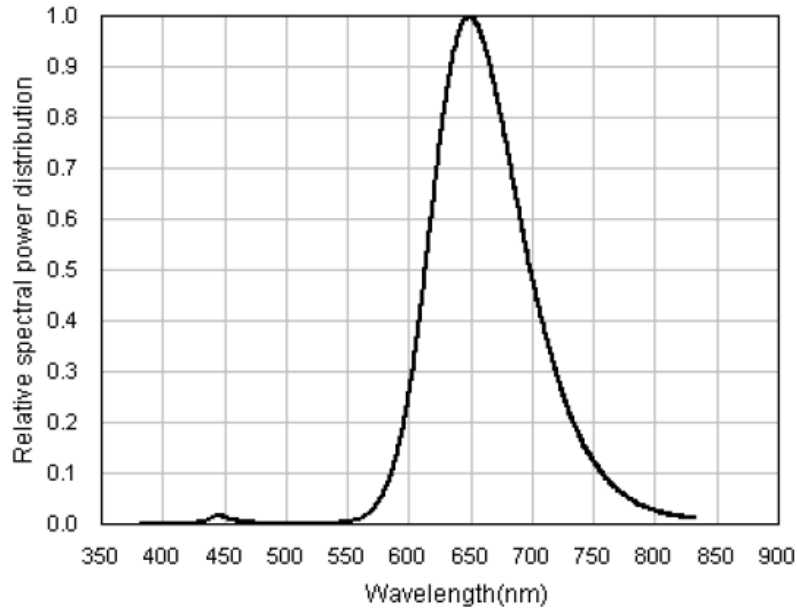


Color (CCT)	Bin Code	P1_x	P1_y	P2_x	P2_y	P3_x	P3_y	P4_x	P4_y
PC Red	PR1	0.6718	0.3084	0.6602	0.3197	0.6801	0.3197	0.6915	0.3083
	PR2	0.6718	0.3084	0.6568	0.3042	0.6452	0.3156	0.6602	0.3197

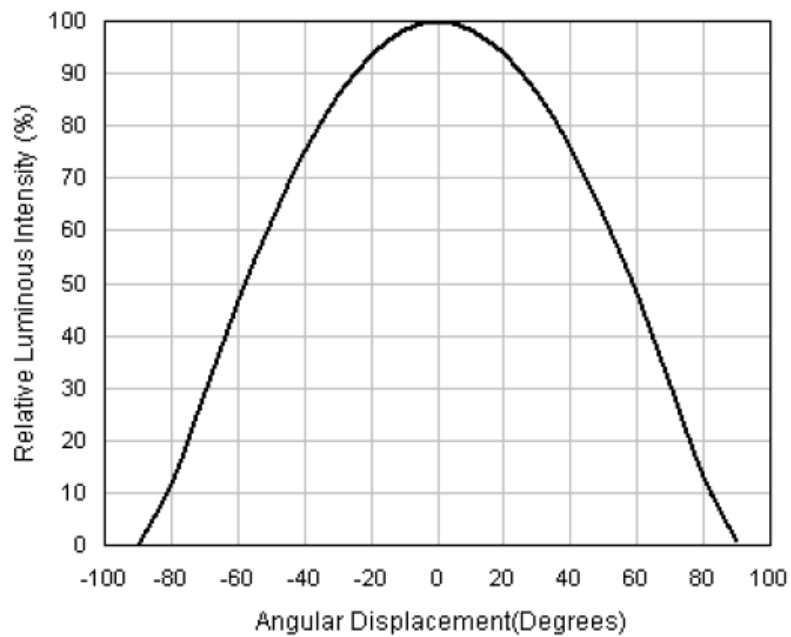


## ■ Characteristic Curves

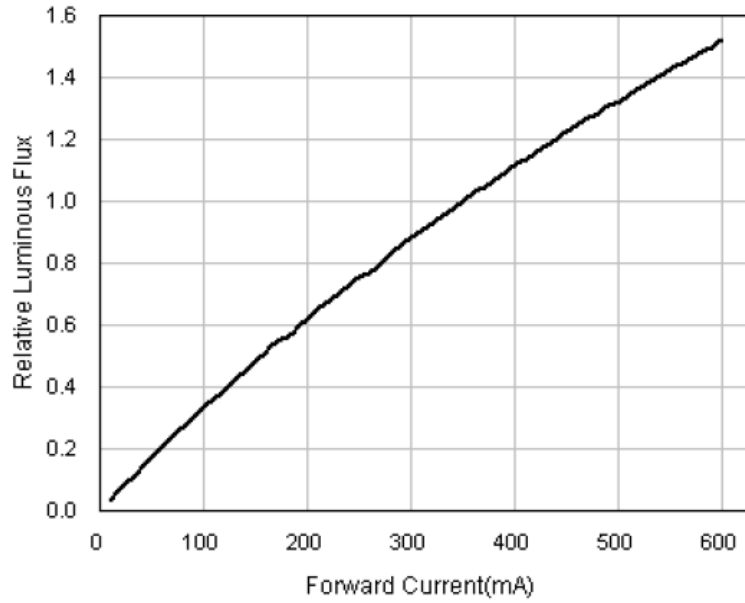
### (1) Color Spectrum



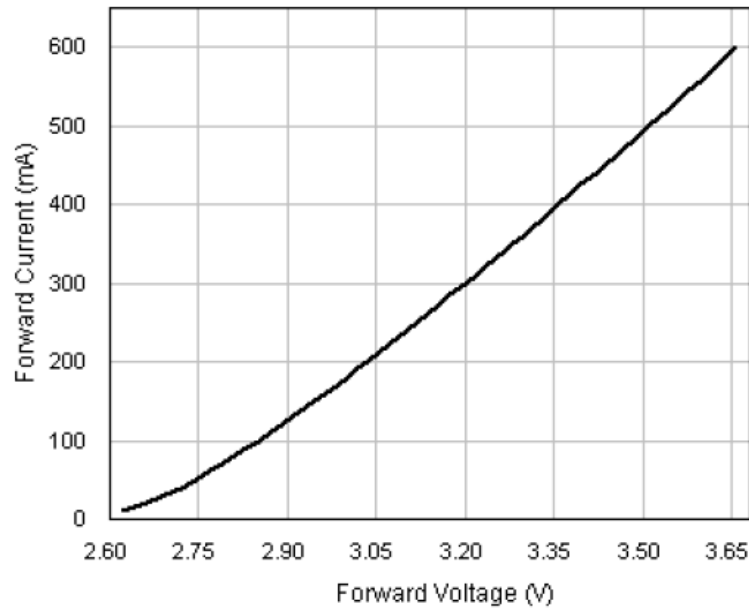
### (2). Typical Representative Spatial Radiation Pattern



### (3). Forward Current Characteristics



### (4). Forward Current vs Forward Voltage





## ■ Reliability test:

No	Item	Condition	Time/Cycle	Sample size
1	Steady State Operating Life of Room Temperature	25°C Operating	1000 Hrs	20 pcs
2	Steady State Operating Life of Low Temperature -40°C	-40°C Operating	1000 Hrs	20 pcs
3	Steady State Operating Life of Low Temperature 60°C	60°C Operating	1000 Hrs	20 pcs
4	Steady State Operating Life of Low Temperature 85°C	85°C Operating	1000 Hrs	20 pcs
5	Low temperature storage -40°C	-40°C Storage	1000 Hrs	20 pcs
6	High temperature storage 100°C	100°C Storage	1000 Hrs	20 pcs
7	Steady State Operating Life of High Humidity Heat 60°C 90%	60°C/90% Operating	1000 Hrs	20 pcs
8	Steady State Pulse Operating Life Condition	25°C 10Hz duty=1/10 Operating	200 Cycle	20 pcs
9	Resistance to soldering heat on PCB (JEDEC MSL3)	pre-store@60°C, 60%RH for 52hrs T <sub>sld</sub> max.=260 10sec	3 Times	20 pcs
10	Heat Cycle Test (JEDEC MRC)	25°C~65°C~-10°C, 90%RH, 24hr/1cycle	10 Cycle	20 pcs
11	Thermal shock	-40°C/ 20minr~ 5minr~100°C /20min	300 Cycle	20 pcs

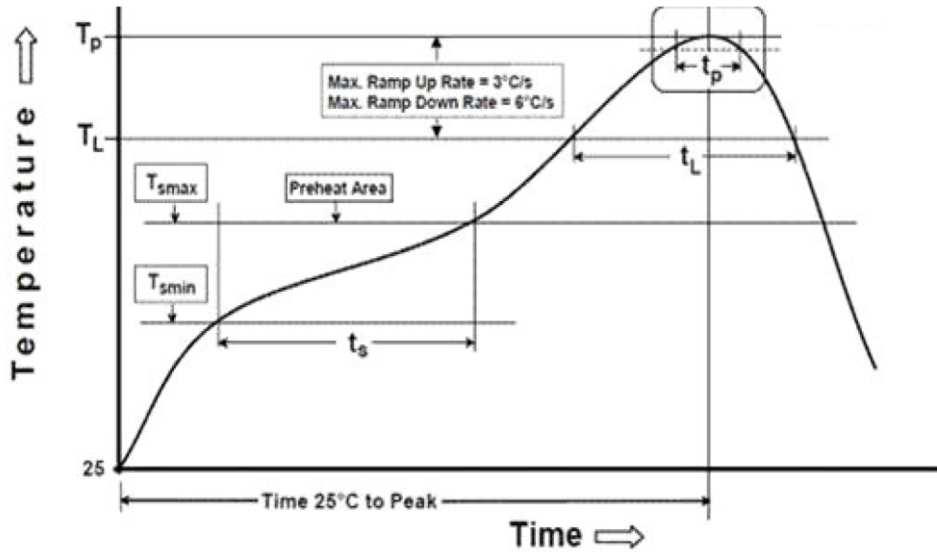
## ■ Judgment Criteria:

Item	Symbol	Test Condition	Judgment Criteria
Forward Voltage	V <sub>f</sub>	350 mA	ΔV <sub>f</sub> < 10%
Luminous Flux	I <sub>v</sub>	350 mA	ΔI <sub>v</sub> < 30%



■ **Solder Profile:**

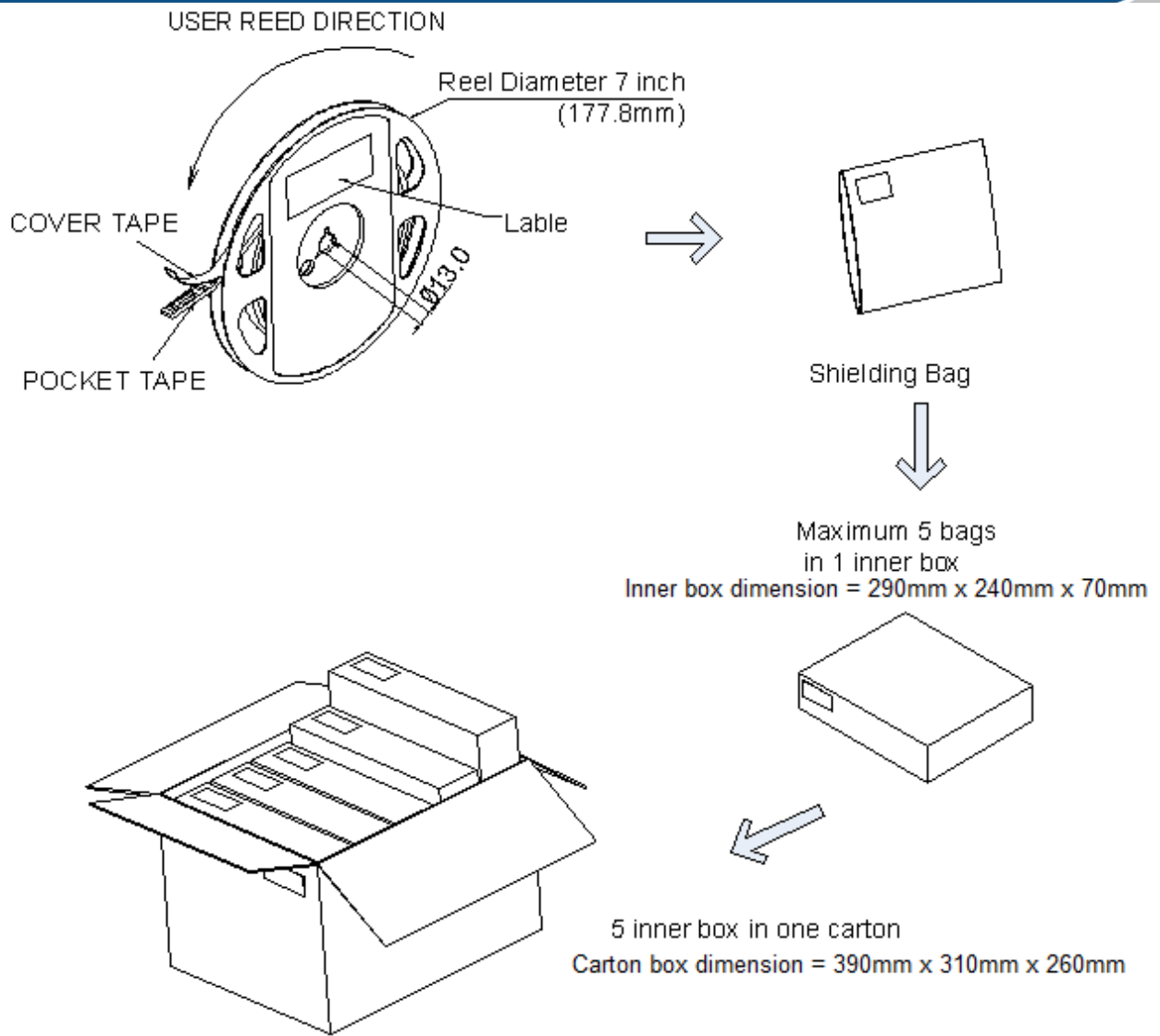
-The recommended reflow soldering profile is as follows (temperatures indicated are as measured on the surface of the LED resin):



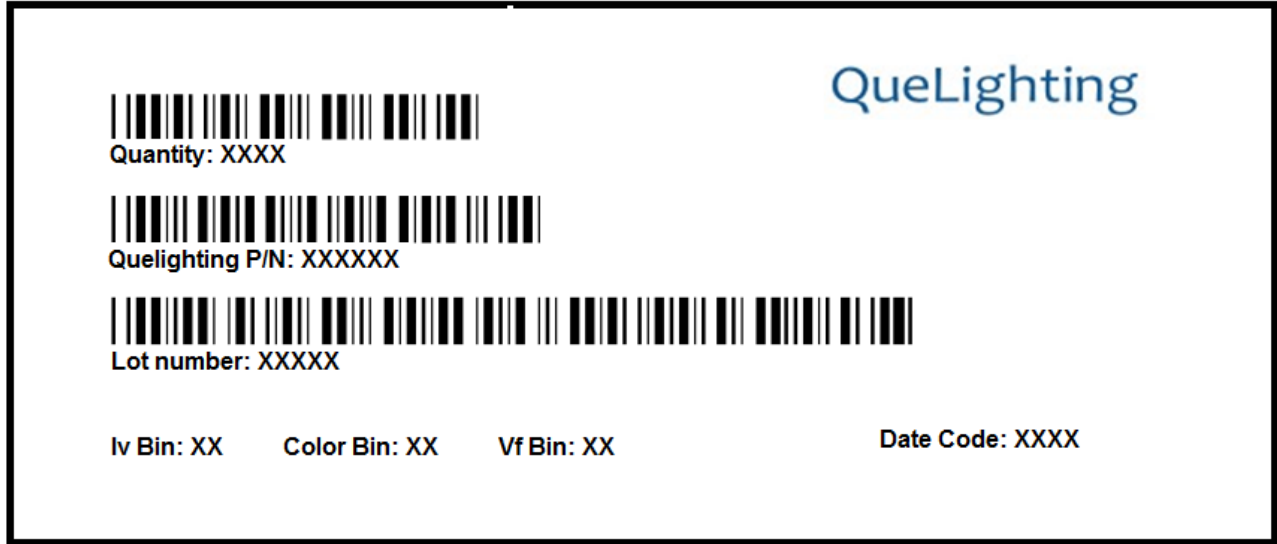
Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Temperature Min( $T_{smin}$ )	100°C	150°C
Temperature Max( $T_{smax}$ )	150°C	200°C
Time( $t_a$ ) from ( $T_{smin}$ to $T_{smax}$ )	60-120 seconds	60-120 seconds
Ramp-up rate( $T_L$ to $T_p$ )	3°C/second max.	3°C/second max.
Liquidous Temperature( $T_L$ )	183°C	217°C
Time( $t_L$ ) maintained above $T_L$	60-150 seconds	60-150 seconds
Peak package body temperature( $T_p$ )	235°C	260°C
Time within 5°C of Actual Peak temperature ( $t_p$ )	20seconds*	30 seconds*
Ramp-down rate( $T_p$ to $T_L$ )	6°C/second max.	6°C/second max.
Time 25°C to peak temperature	6 minutes max.	8 minutes max.
* Tolerance for peak profile temperature ( $T_p$ ) is defined as a supplier minimum and a user maximum.		







## ■ Labeling



## ■ Ordering Information:

Part #	Multiple Quantities	Quantity per Reel
QLSP04PCRU		1000pcs / 2000 pcs



■ **Revision History:**

<b>Revision Date:</b>	<b>Changes:</b>	<b>Version #:</b>
08-11-2016	Initial release	1.0
10-25-2021	Update performance	1.1

