



**QLSP08RGBW**  
(5050 RGBW Multi-Color LED)



## Product Outline:

This is a multi-color LED that provides high lumen output in the 5050 package. Creating a small optical light source because of the compact design it's ideal for color mixing applications

## Features:

- Multi-Color LED, Red/Green/Blue/White LED
- High brightness output @ 20mA,
- Package Dimension = 5.4mmX5.0mmX1.6mm
- RoHS compliant
- Custom Bin available upon special request
- View angel >120°

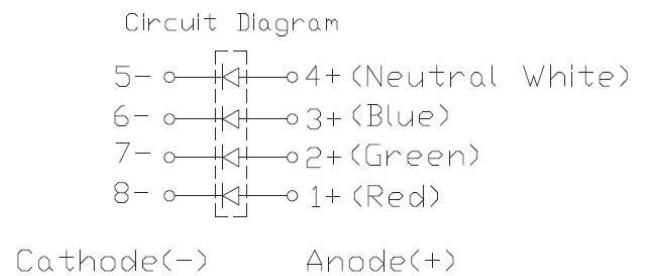
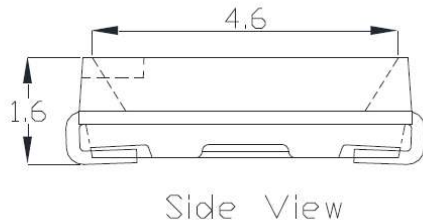
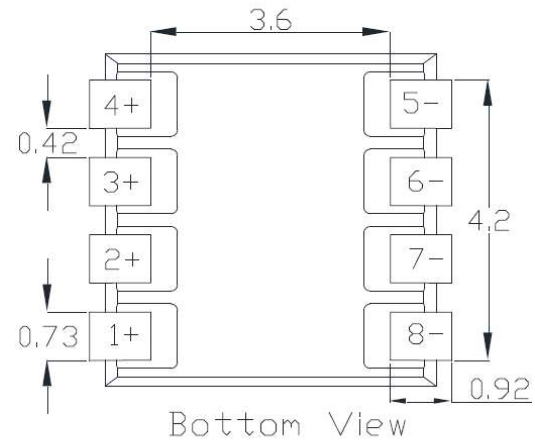
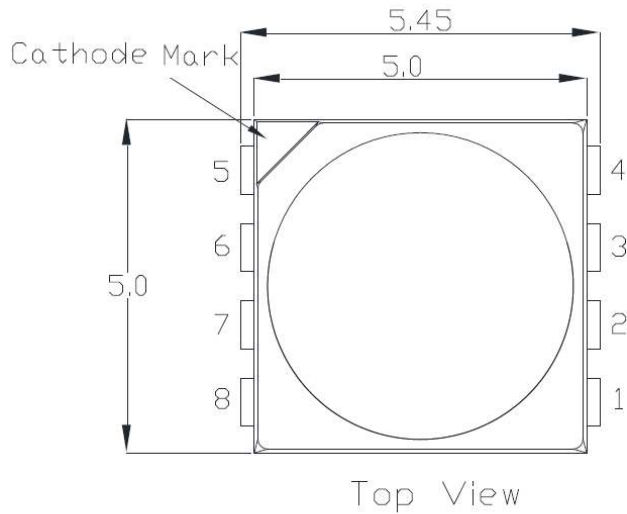
## Application:

- Stage lighting,
- Architecture Lighting
- Garden Lighting
- Indoor and Outdoor display
- Entertainment lighting.

## Compliance and Certification:



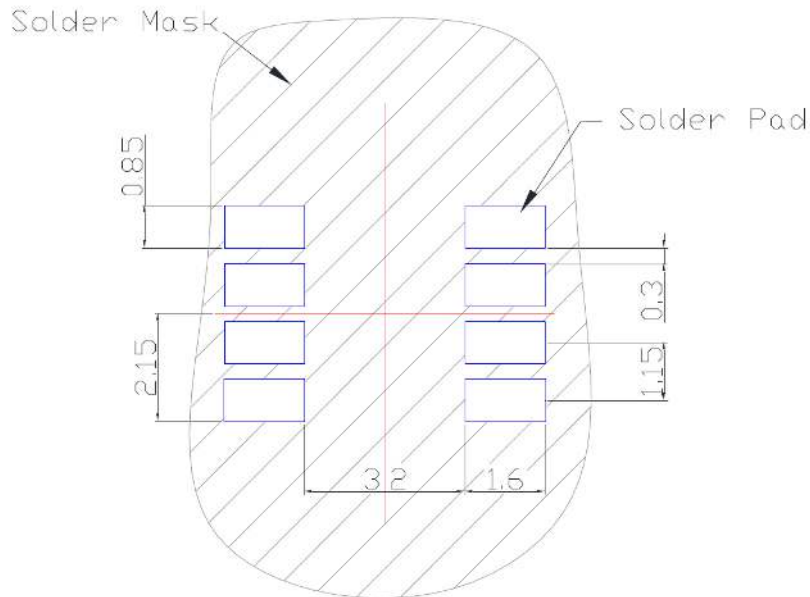
## Mechanical Property: (Dimension)



- \* All dimensions are in millimeters,
- \* Tolerances are  $\pm 0.10\text{mm}$ .
- \* Please do not bend the leads of the LED, otherwise it will damage the LED.
- \* Please do not use a force of over 0.3kgf impact or pressure on the lens of the LED, otherwise it will cause a catastrophic failure.



## 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

( $T_a=25^{\circ}\text{C}$ )

Parameter	Symbol	Rating	Unit
DC Forward Current - R,G,B	$I_f$	20	mA
DC Forward Current – White	$I_f$	60	mA
Leakage Current (5V)	$I_r$	10	$\mu\text{A}$
Total Power Dissipation	$P_d$	360	mW
Pulse Forward Current - R,G,B	$I_{fp}$	30	mA
Pulse Forward Current - White	$I_{fp}$	90	mA
LED Junction Temperature	$T_J$	105	$^{\circ}\text{C}$
Storage Temperature	$T_{stg}$	-40 ~ 85	$^{\circ}\text{C}$
Operation Temperature	$T_{opr}$	-40 ~ 85	$^{\circ}\text{C}$
Soldering Temperature	$T_{sol}$	260 < 10 sec	$^{\circ}\text{C}$

(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
Red	Vf	20mA	2.0		2.4	V
Green	Vf		2.8		3.4	V
Blue	Vf		2.8		3.4	V
White	Vf	60mA	2.8		3.4	V
View Angle	$\theta$			120		deg

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

## ■ Specification

Product	Color	Current	Vf(V) Typ.	Wd / CCT (nm)	Intensity(mcd) or Flux $\Phi_V$ (lm)	
					Min.	Typ.
QLSP08RGBXW	Red	20mA	2.2	620~625	600	700
	Green		3.2	520~525	1400	1500
	Blue		3.2	465~470	400	500
QLSP08RGBWW	Warm White	60mA	3.2	2850~3150K	19	21
QLSP08RGBNW	Netural White	60mA	3.2	3700~4250K	19	21
QLSP08RGBCW	Cold White	60mA	3.2	5640~6970K	19	21

\*Tolerance = +/- 10%



## ■ Groups

### Dominant Wavelength

Wd (nm)				
Color	Code name	Min.	Max.	Condition
Red	A8	620	625	20mA
Green	DN	520	525	
Blue	DD	465	470	

Measurement tolerance is +/- 1nm

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

VF Rank				
Color	Code name	Low	High	Condition
Red	R4	2.0	2.4	20mA
Green	Z6	2.8	3.4	
Blue	Z6	2.8	3.4	
White	Z6	2.8	3.4	60mA

The forward voltage tolerance is  $\pm 0.1V$

### Luminous Intensity Bin:

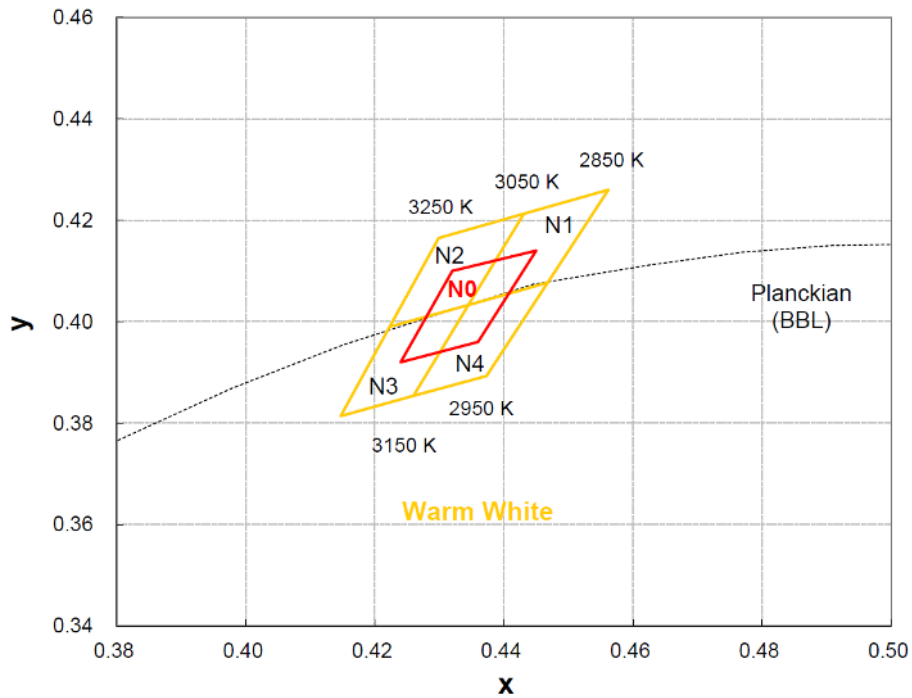
Rank (mcd) or Flux $\Phi_V(lm)$				
Color	Code name	Low	High	Condition
Red	A	770	1000	20mA
	B	1000	1300	
Green	A	1550	2000	
	B	2000	2600	
Blue	A	330	430	
	B	430	560	
White	A	19	24	60mA
	B	24	30	

luminous flux tolerance is  $\pm 7\%$

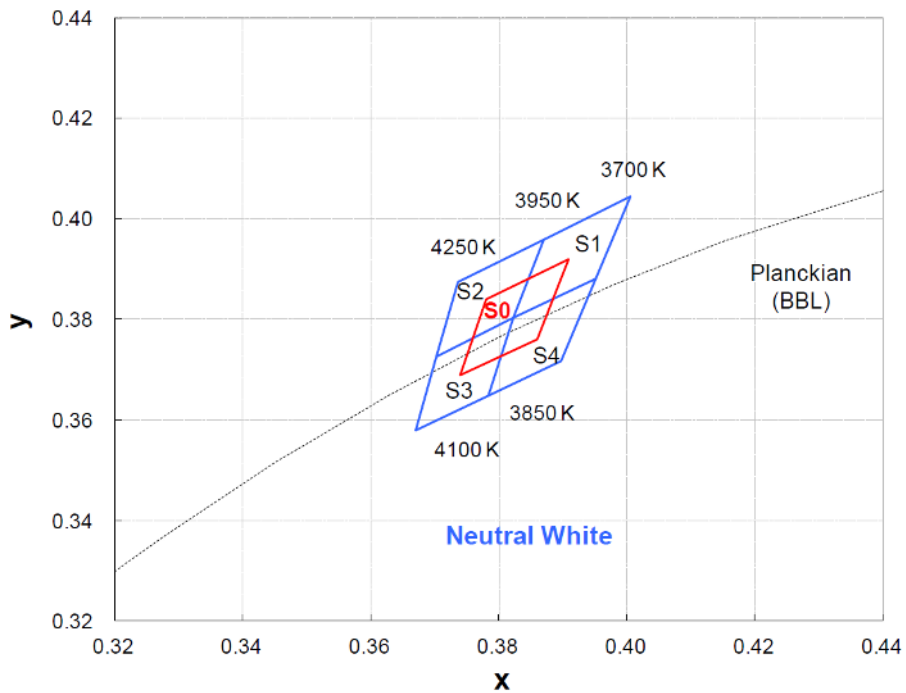


## White Binning

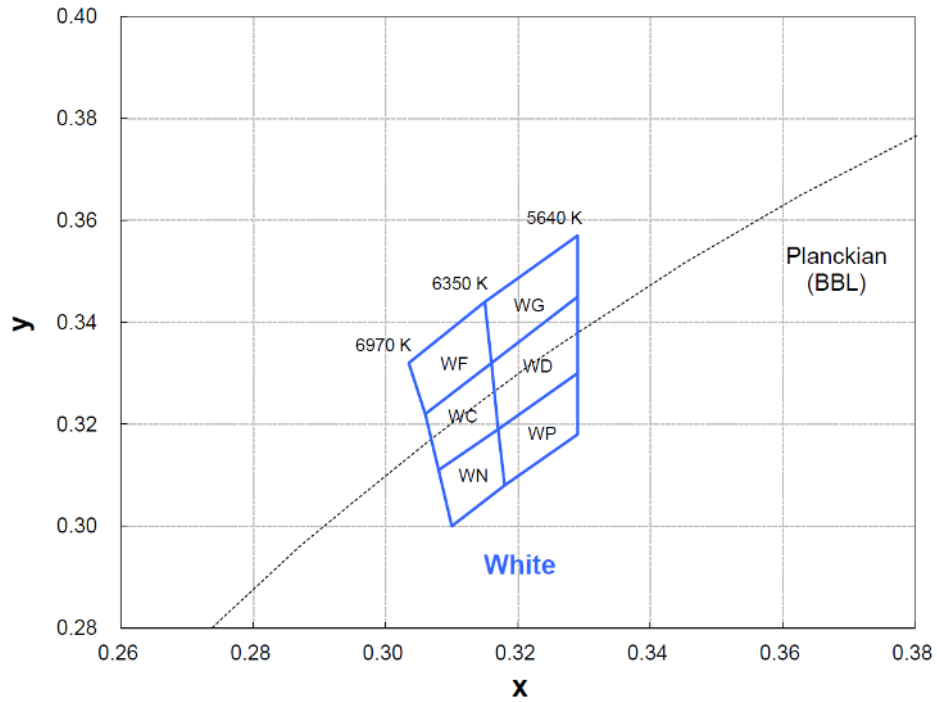
### Warm White Binning:



### Neutral White Binning:

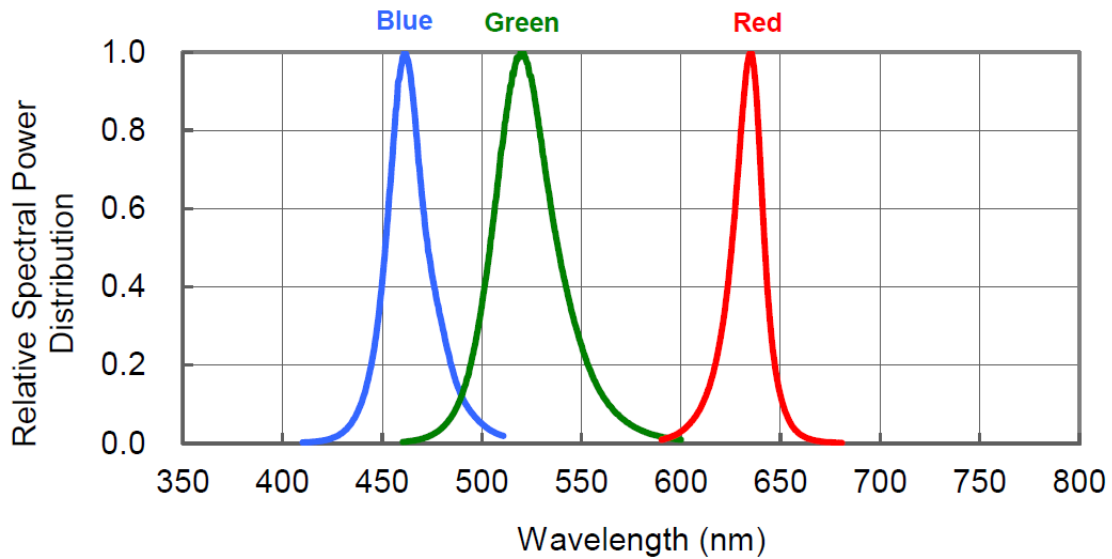


### Cold White Binning:

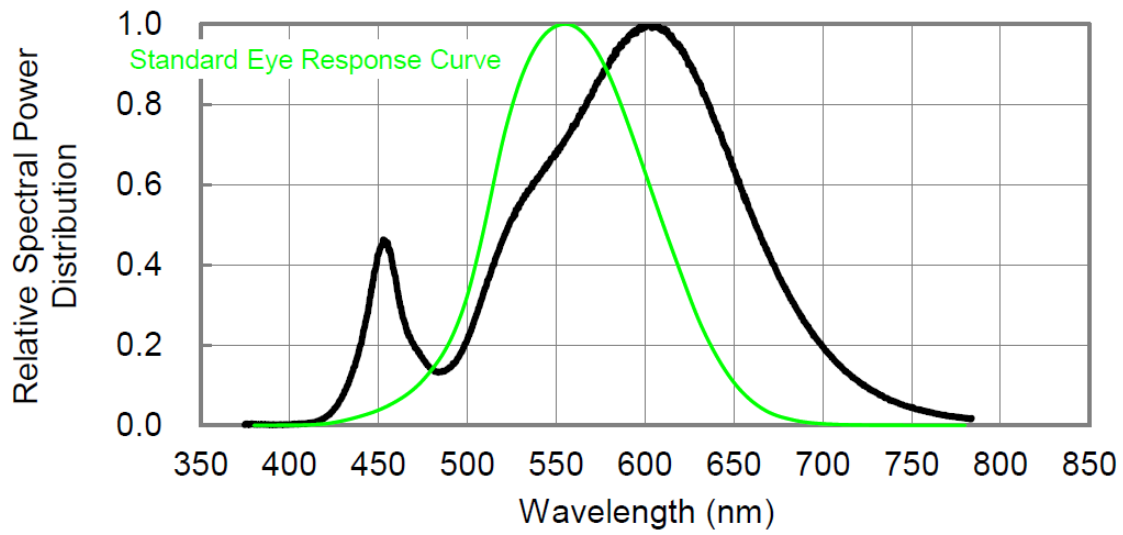


### Characteristic Curves

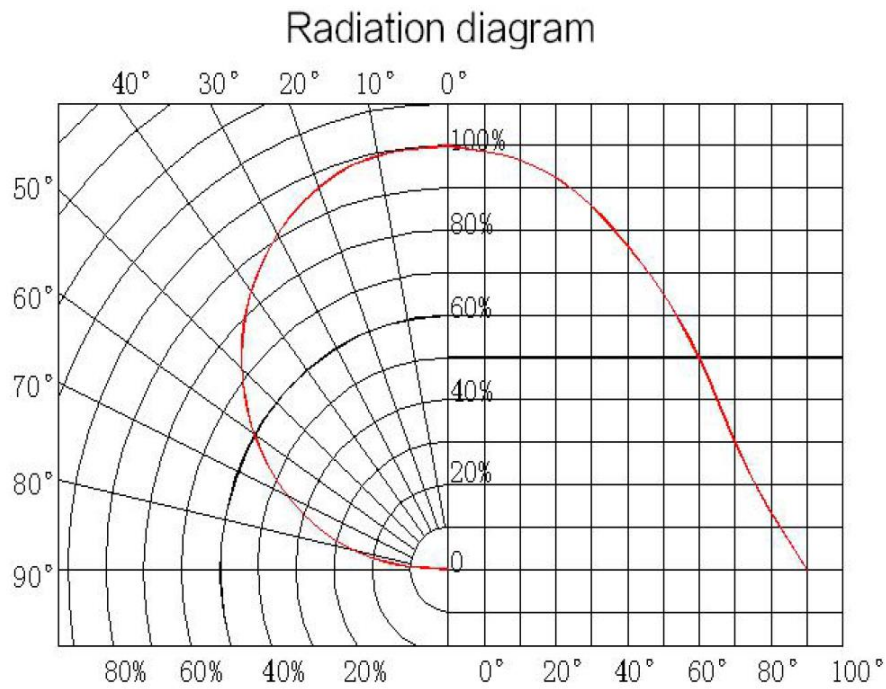
#### (1) Color Spectrum



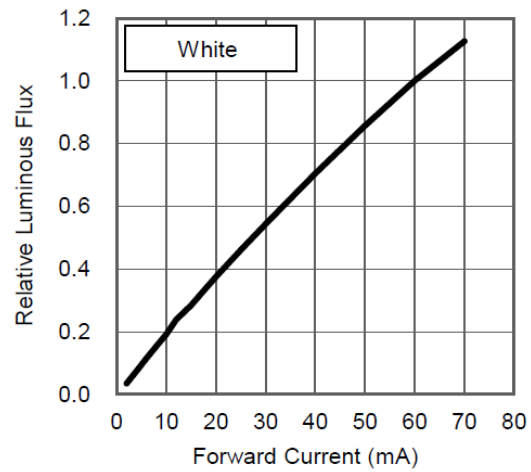
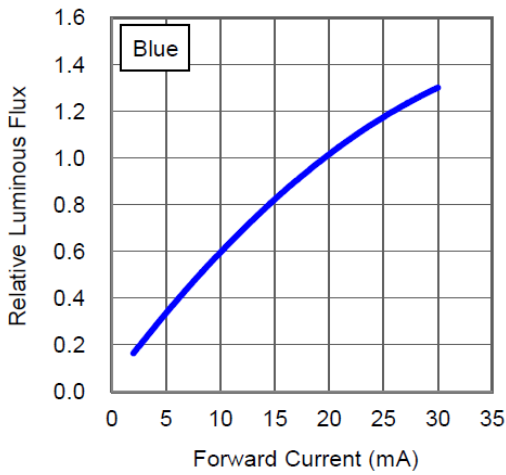
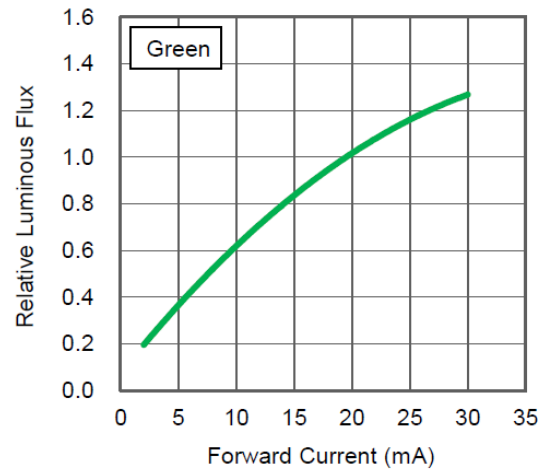
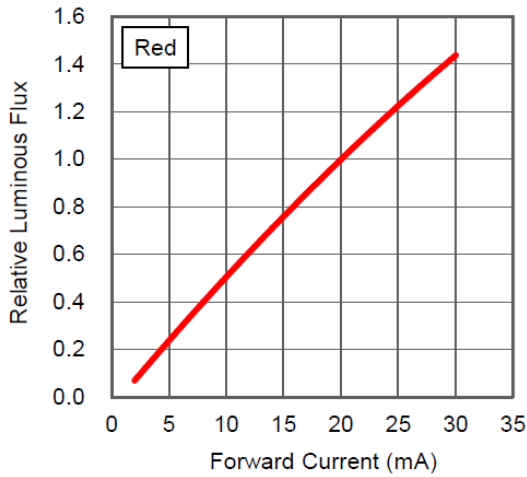




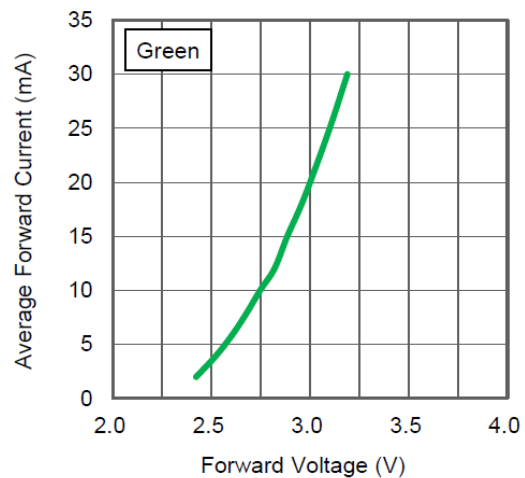
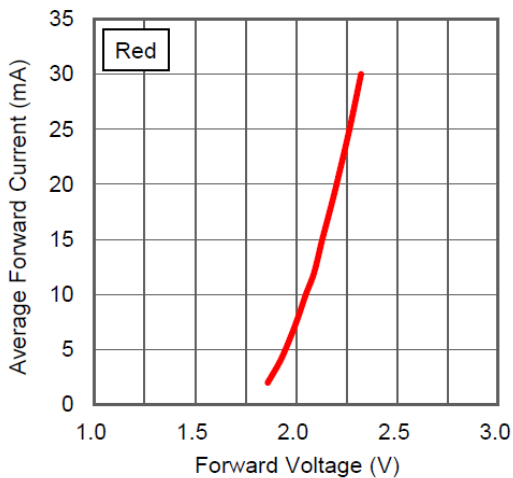
**(2). Typical Representative Spatial Radiation Pattern**

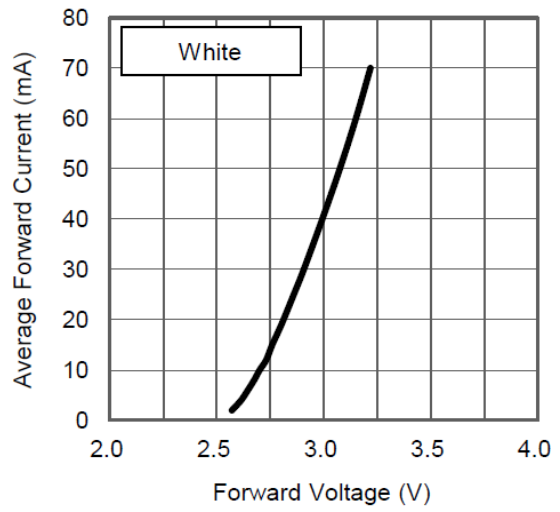
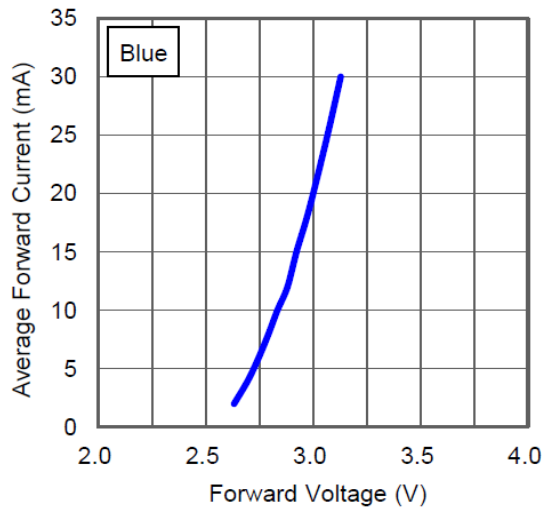


### (3). Forward Current vs Relative Luminous Flux

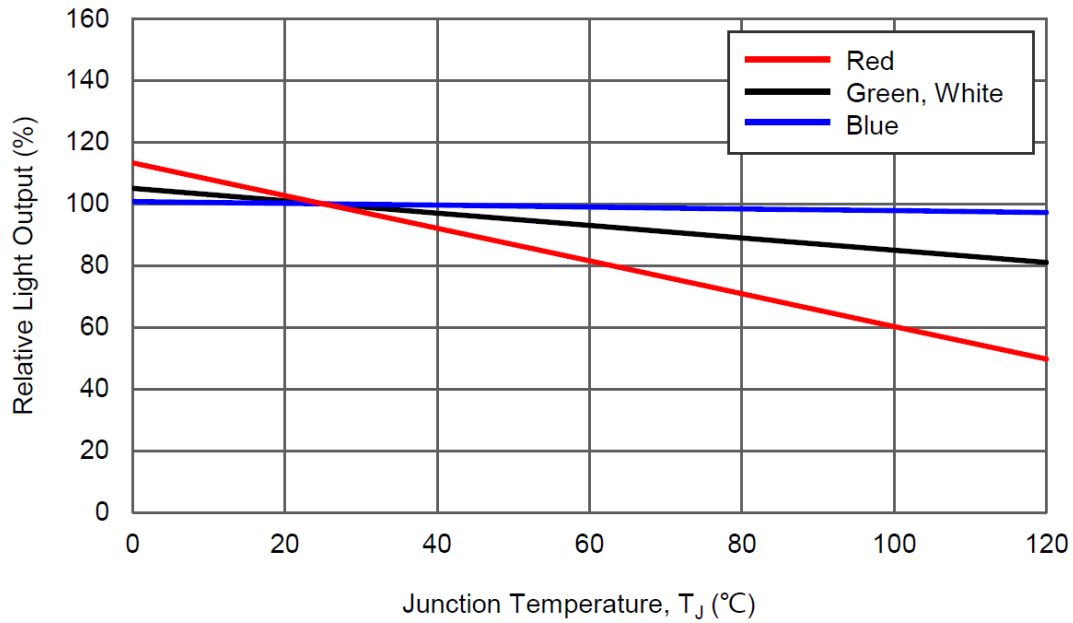


### (4). Forward Current vs Forward Voltage





**(5). Relative Light Output vs. Junction Temperature**



## ■ 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 Tslid 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

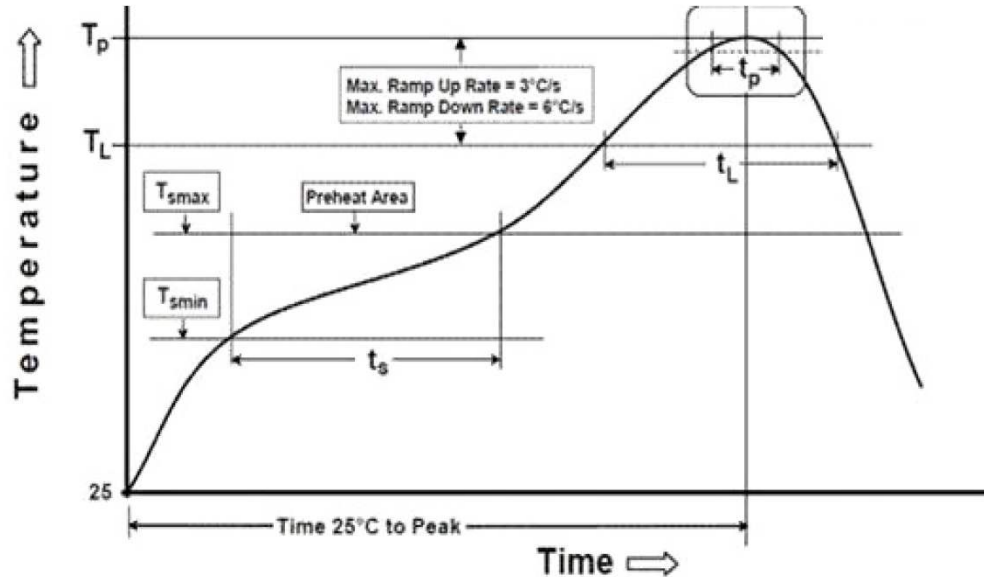
## ■ Judgment Criteria:

Item	Symbol	Test Condition	Judgment Criteria
Forward Voltage	Vf	20 mA	$\Delta Vf < 10\%$
Luminous Flux	Iv	20 mA	$\Delta Iv < 30\%$



## Solder Profile:

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



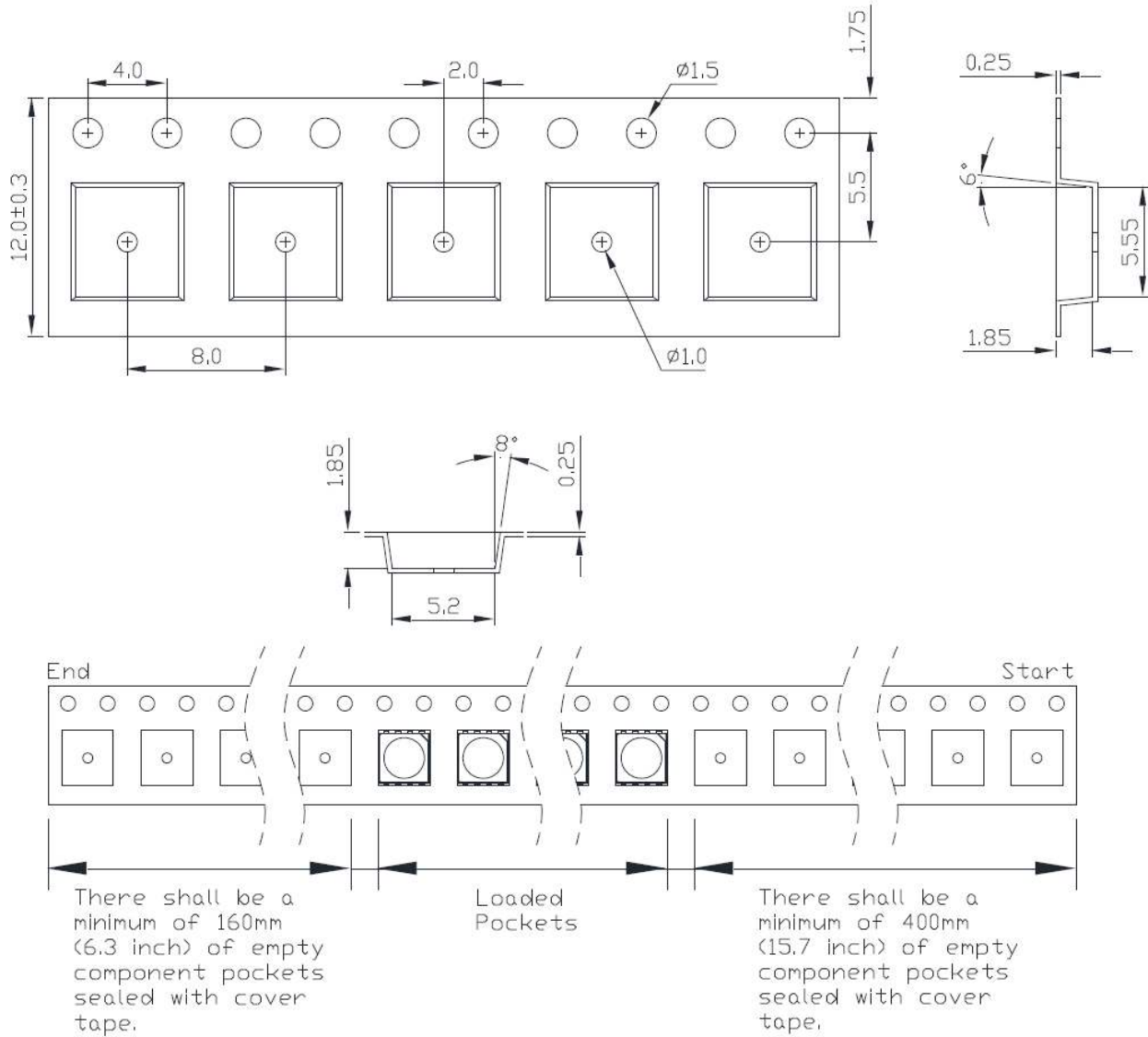
Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Temperature Min( $T_{smin}$ )	100°C	150°C
Temperature Max( $T_{smax}$ )	150°C	200°C
Time( $t_a$ ) from ( $T_{smin}$ to $T_{smax}$ )	60-120 seconds	60-120 seconds
Ramp-up rate( $T_L$ to $T_p$ )	3°C/second max.	3°C/second max.
Liquidous Temperature( $T_L$ )	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.		

### Note:

1. The recommended reflow temperature is 230°C(±5°C). The maximum soldering temperature should be limited to 240°C.
2. Do not stress the silicone resin while it is exposed to high temperature.
3. The number of reflow process should not exceed 3 times.

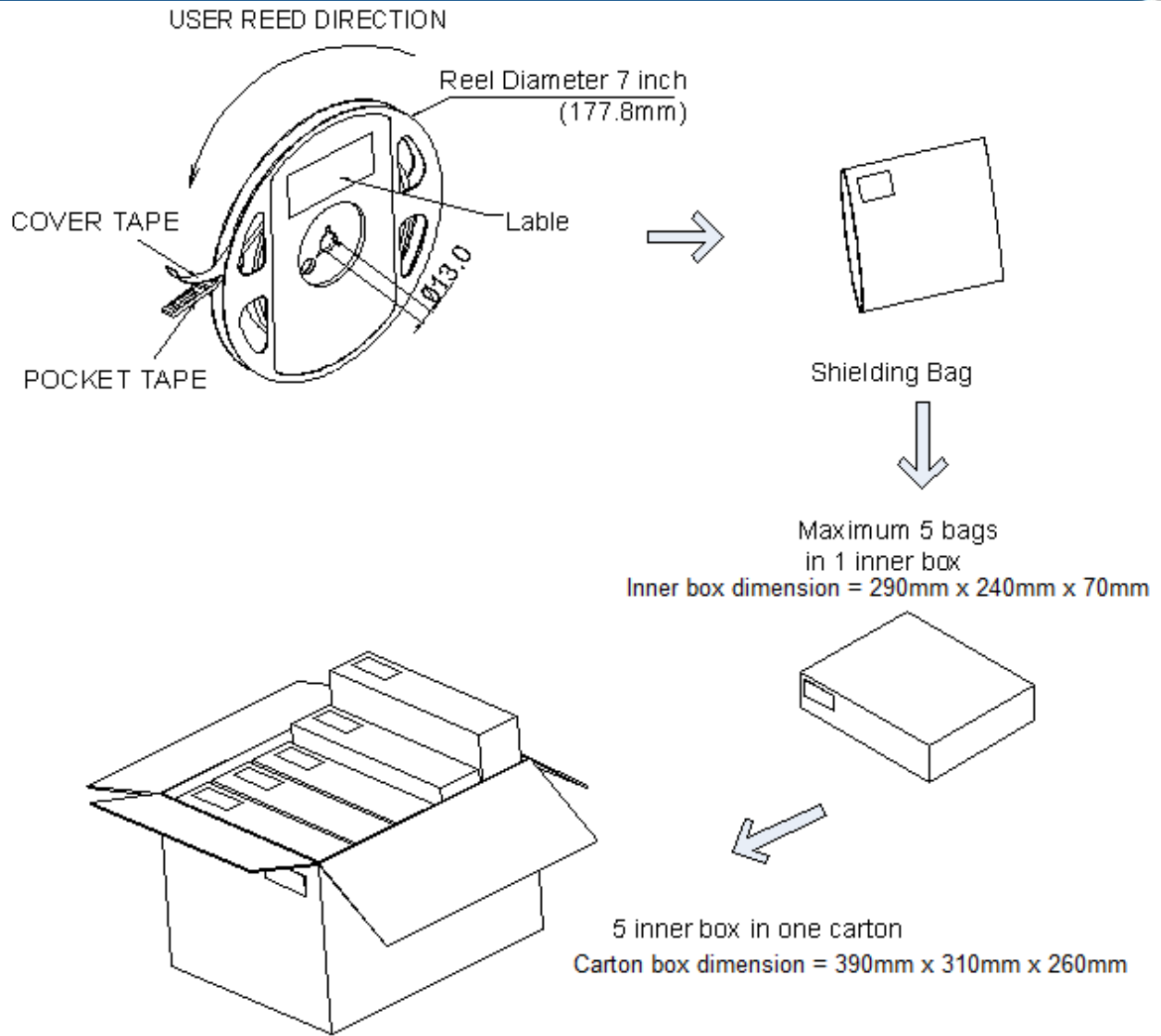


## Taping & Packing:





Unit : mm







## Labeling

  
**Quantity: XXXX**





**Quelighting P/N: XXXXXX**



**Lot number: XXXXX**

Iv Bin: XX

Color Bin: XX

Vf Bin: XX

Date Code: XXXX

## Ordering Information:

Part #	Multiple Quantities	Quantity per Reel
QLSP08RGBXW		1000 pcs





## Revision History:

Revision Date:	Changes:	Version #:
11-23-2020	Initial release	1.0

