



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°

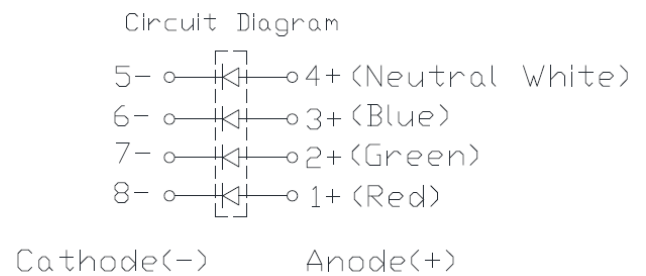
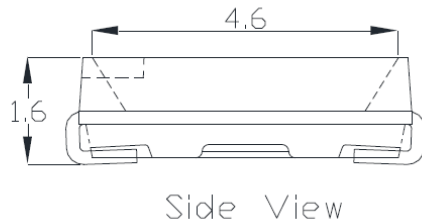
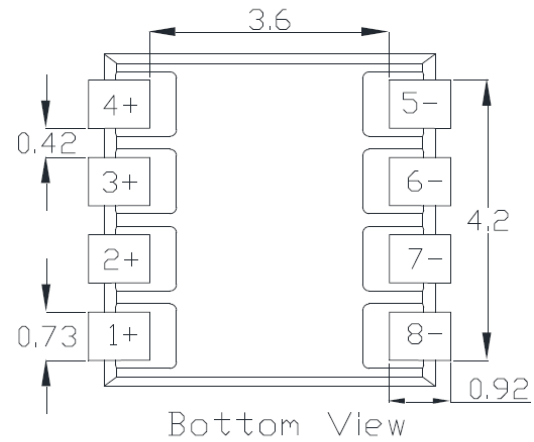
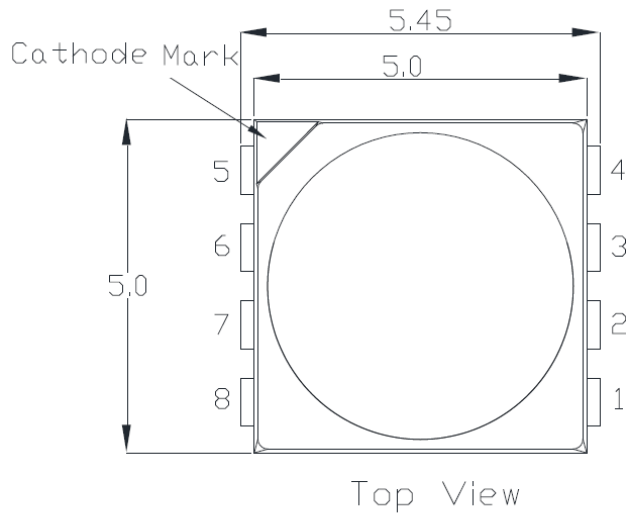
Application:

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

Compliance and Certification:



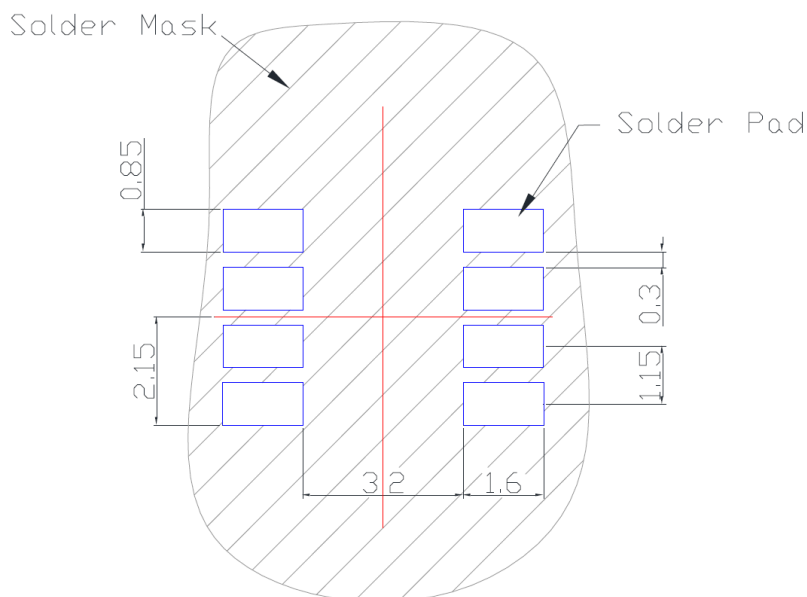
Mechanical Property: (Dimension)



- * 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	μA
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	θ			120		deg

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

■ Specification

Product	Color	Current	Vf(V) Typ.	Wd / CCT (nm)	Intensity(mcd) or Flux Φ_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_F) 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:

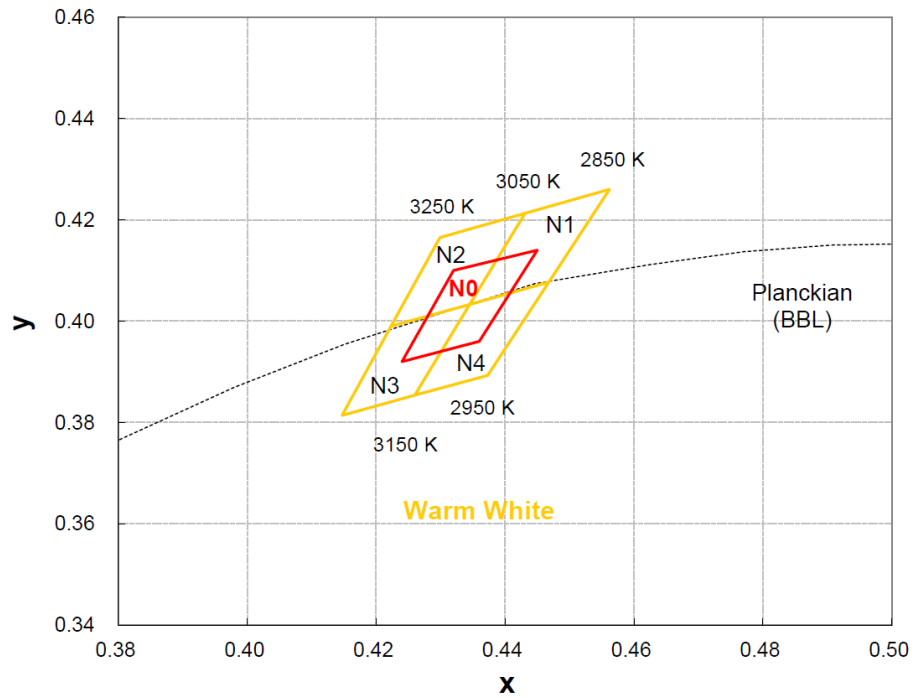
Rank (mcd) or Flux Φ_V (lm)				
Color	Code name	Low	High	Condition
Red	A	770	1000	20mA
	B	1000	1300	
Green	A	1550	2000	
	B	2000	2600	
Blue	A	330	430	
	B	430	560	
White	A	19	24	60mA
	B	24	30	

luminous flux tolerance is $\pm 7\%$

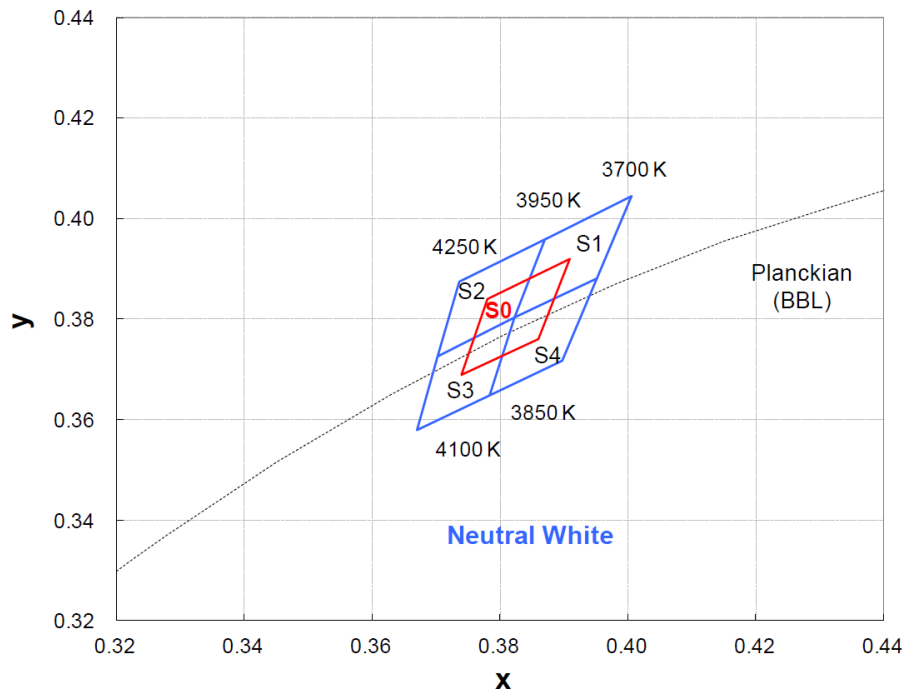


White Binning

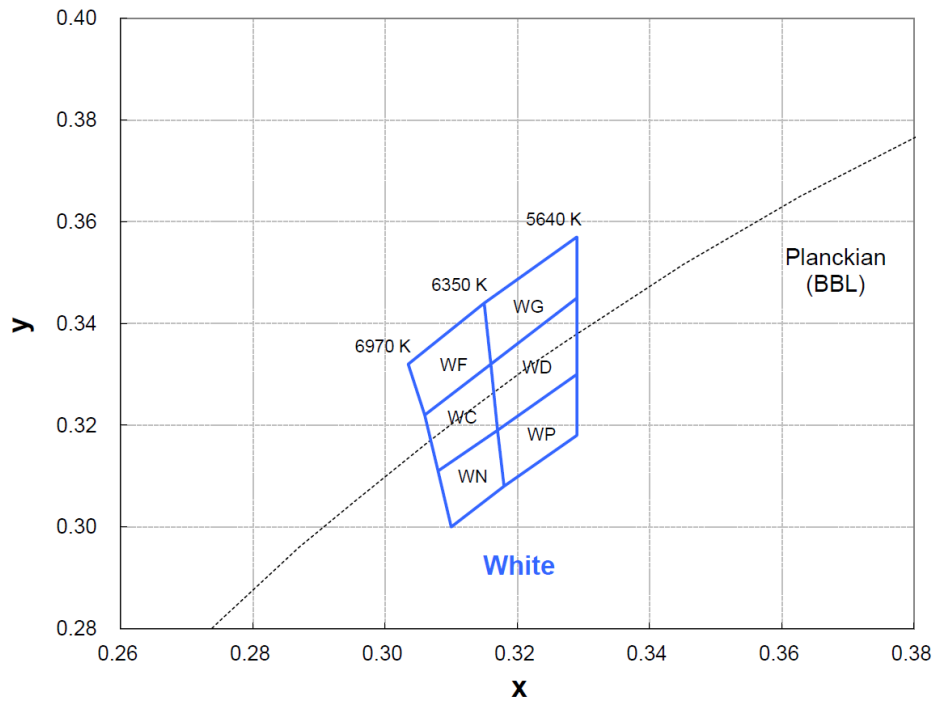
Warm White Binning:



Neutral White Binning:

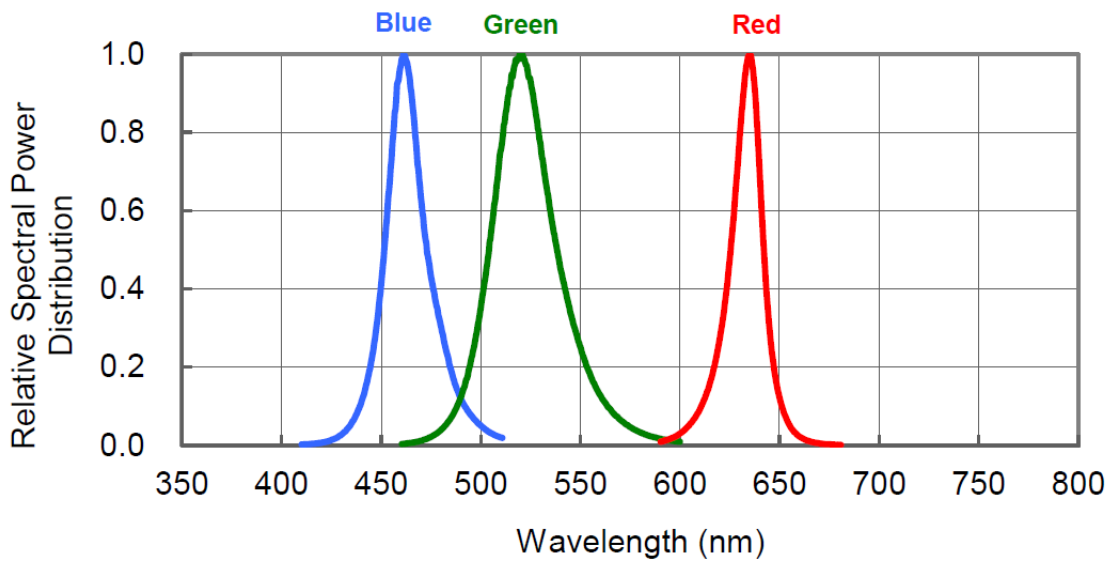


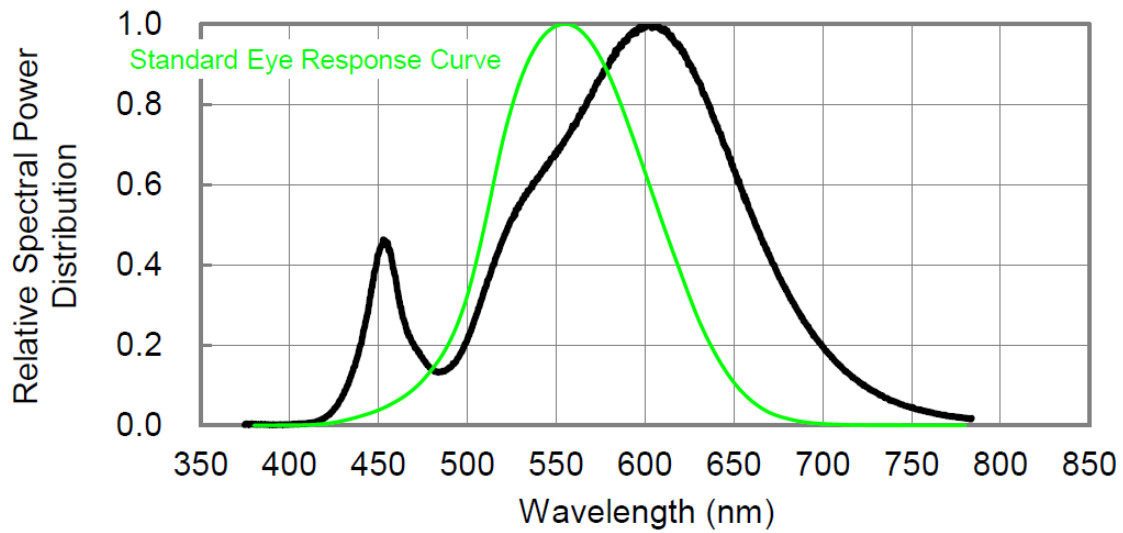
Cold White Binning:



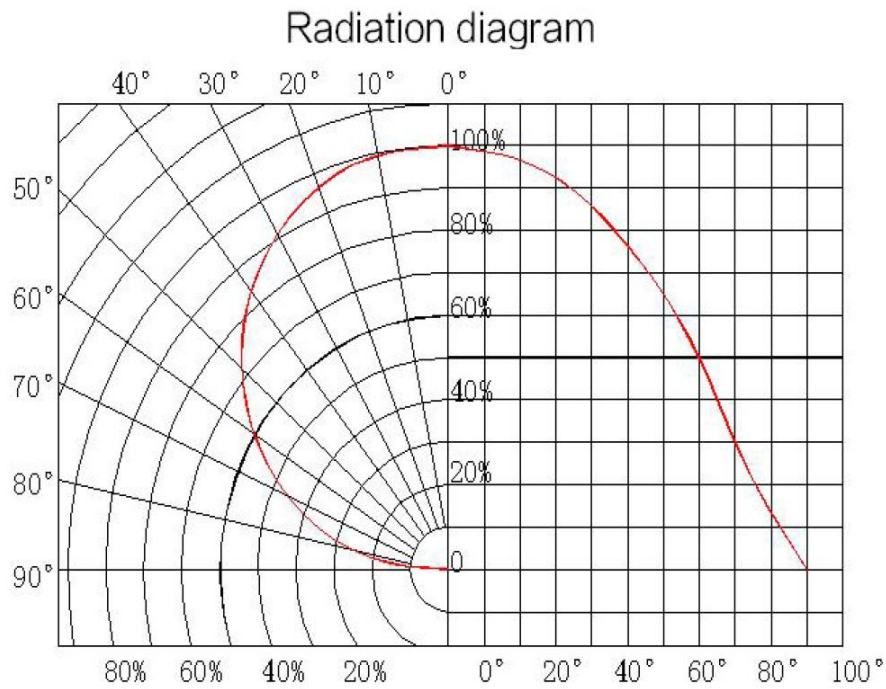
Characteristic Curves

(1) Color Spectrum

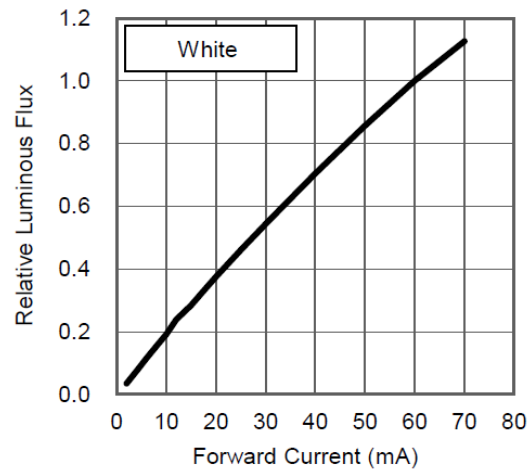
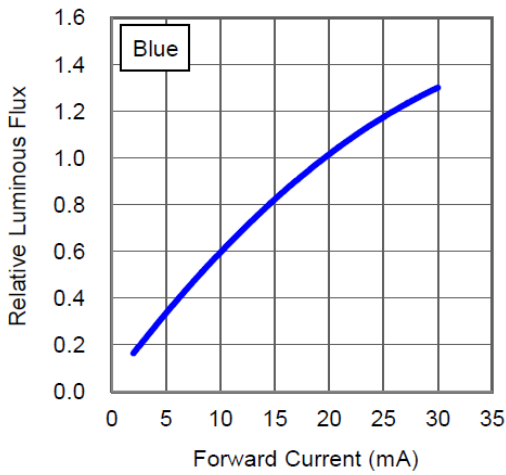
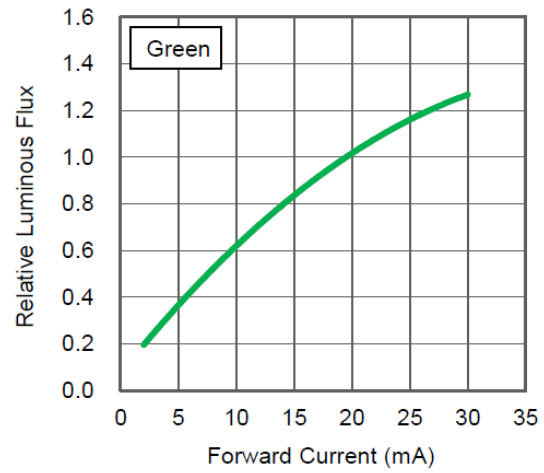
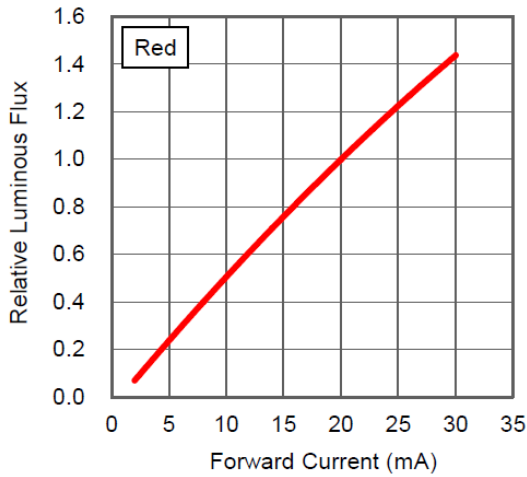




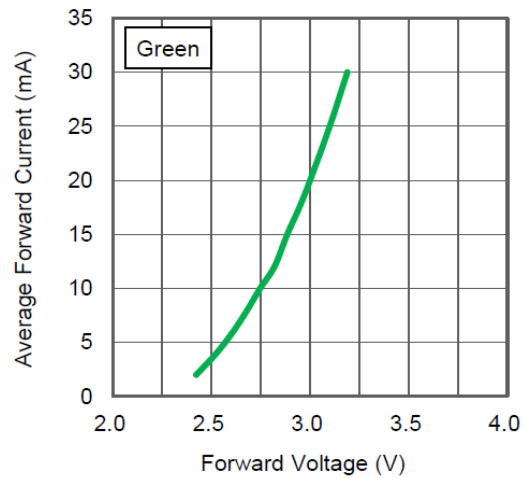
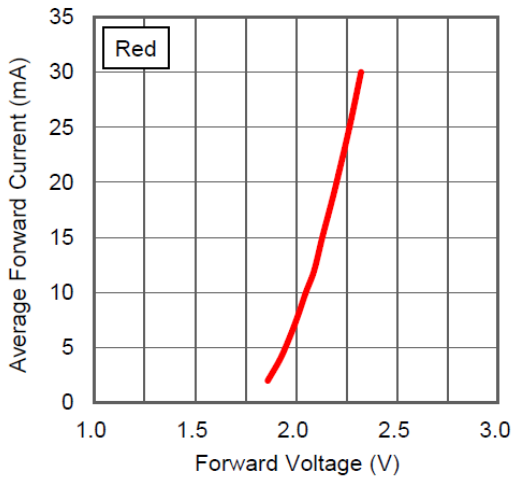
(2). Typical Representative Spatial Radiation Pattern

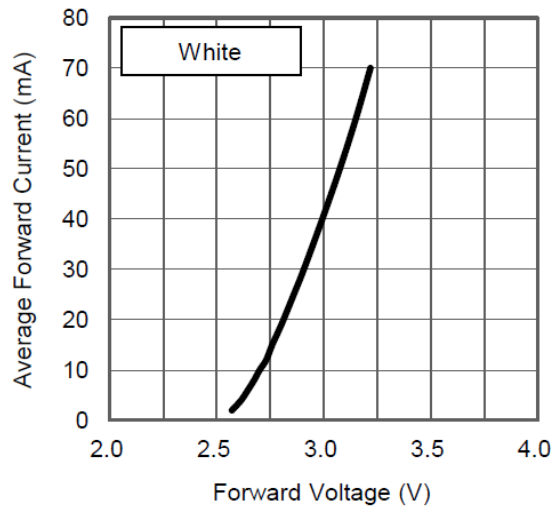
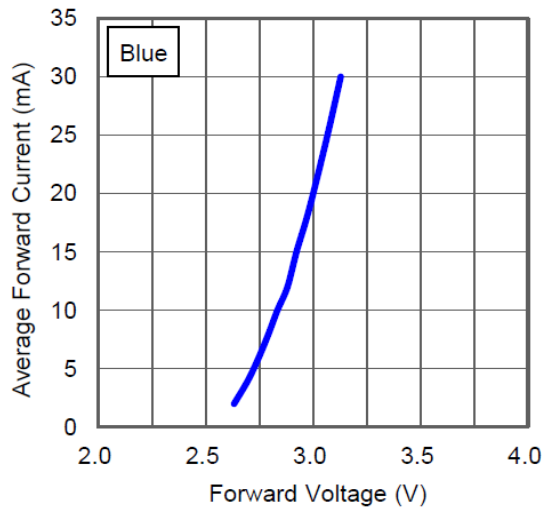


(3). Forward Current vs Relative Luminous Flux

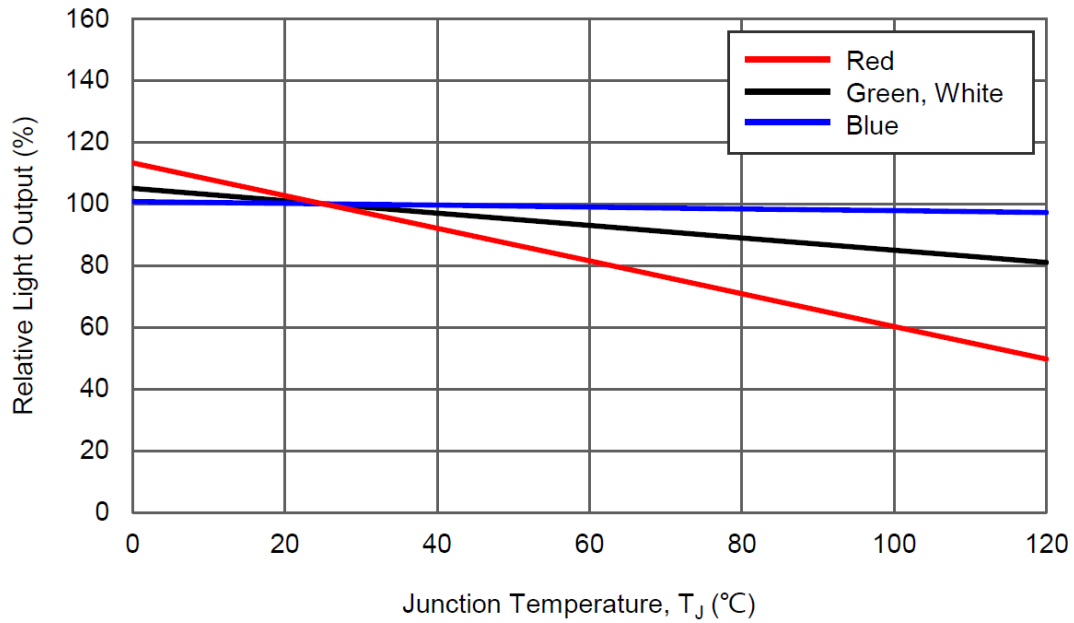


(4). Forward Current vs Forward Voltage





(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/ 20min~ 5min~100°C /20min	300 Cycle	20 pcs

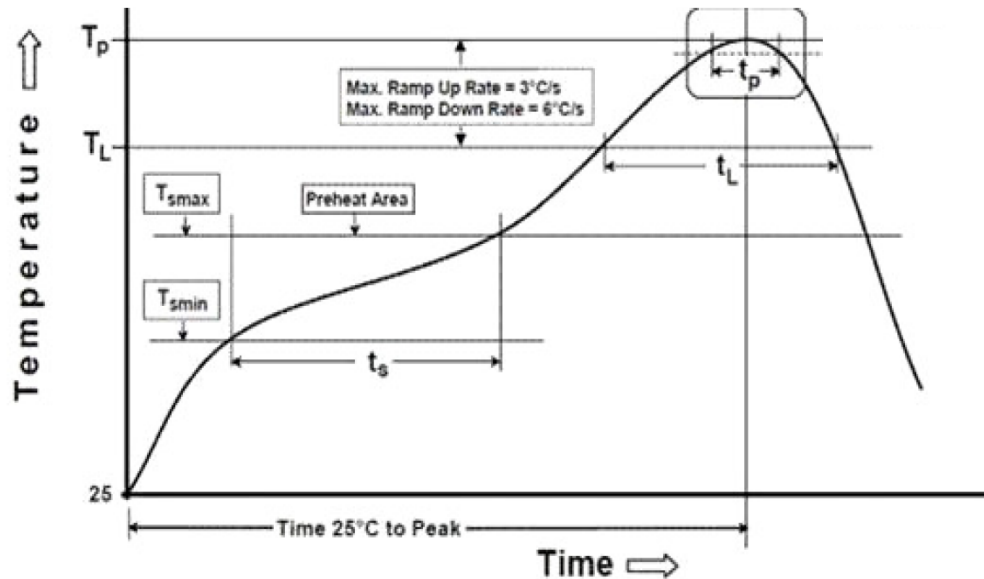
■ Judgment Criteria:

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):



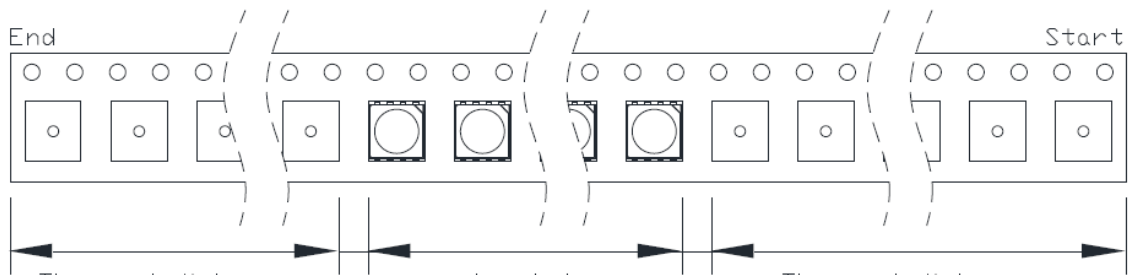
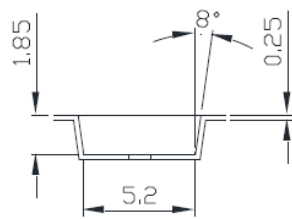
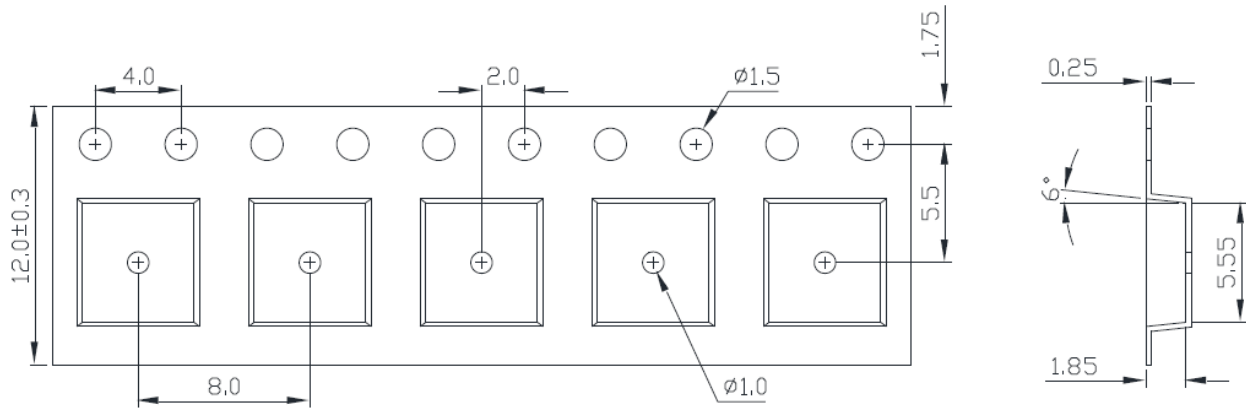
Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Temperature Min(T_{smin})	100°C	150°C
Temperature Max(T_{smax})	150°C	200°C
Time(t_a) from (T_{smin} to T_{smax})	60-120 seconds	60-120 seconds
Ramp-up rate(T_L to T_p)	3°C/second max.	3°C/second max.
Liquidous Temperature(T_L)	183°C	217°C
Time(t_L) 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:



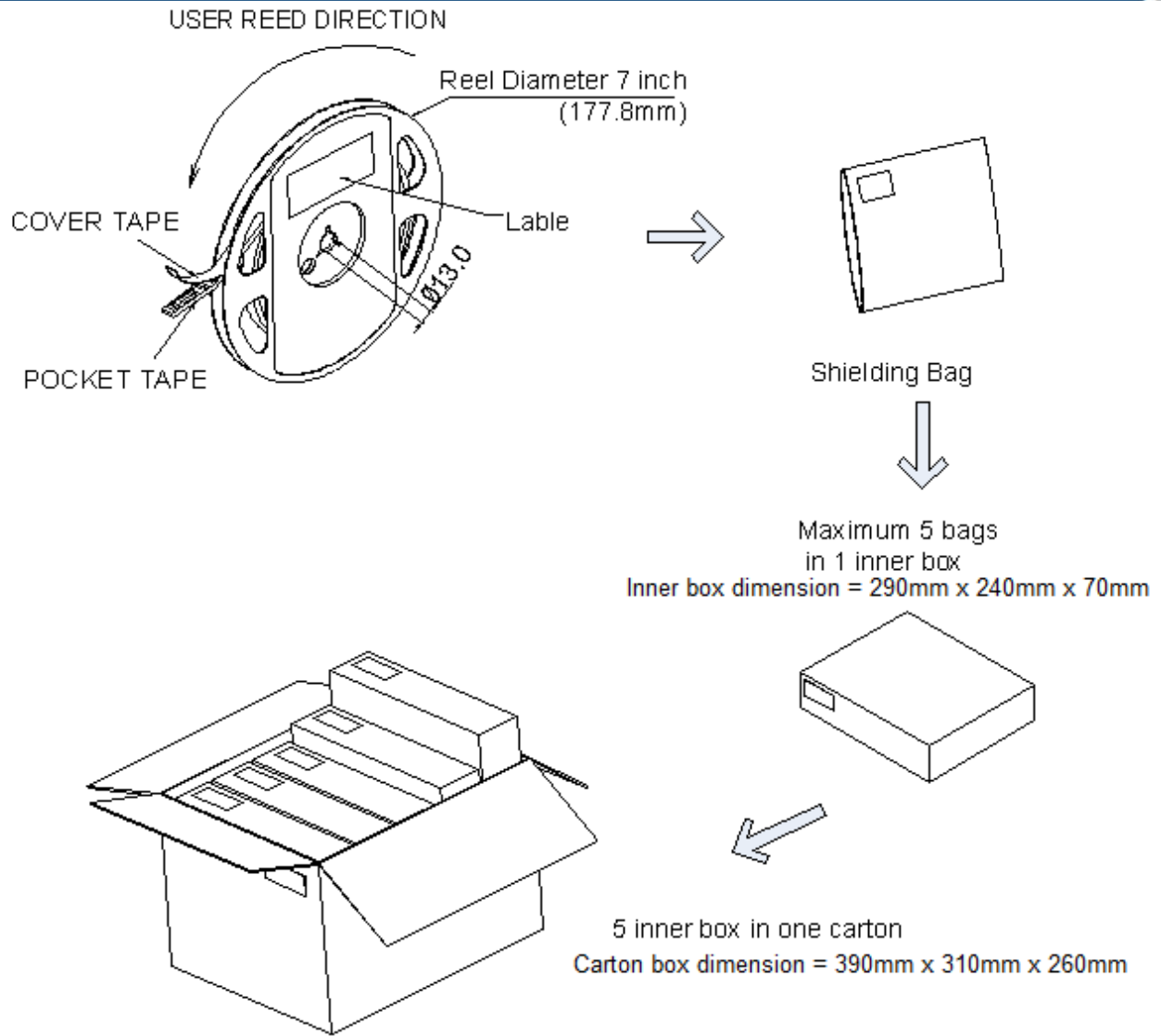
There shall be a minimum of 160mm (6.3 inch) of empty component pockets sealed with cover tape.

Loaded Pockets

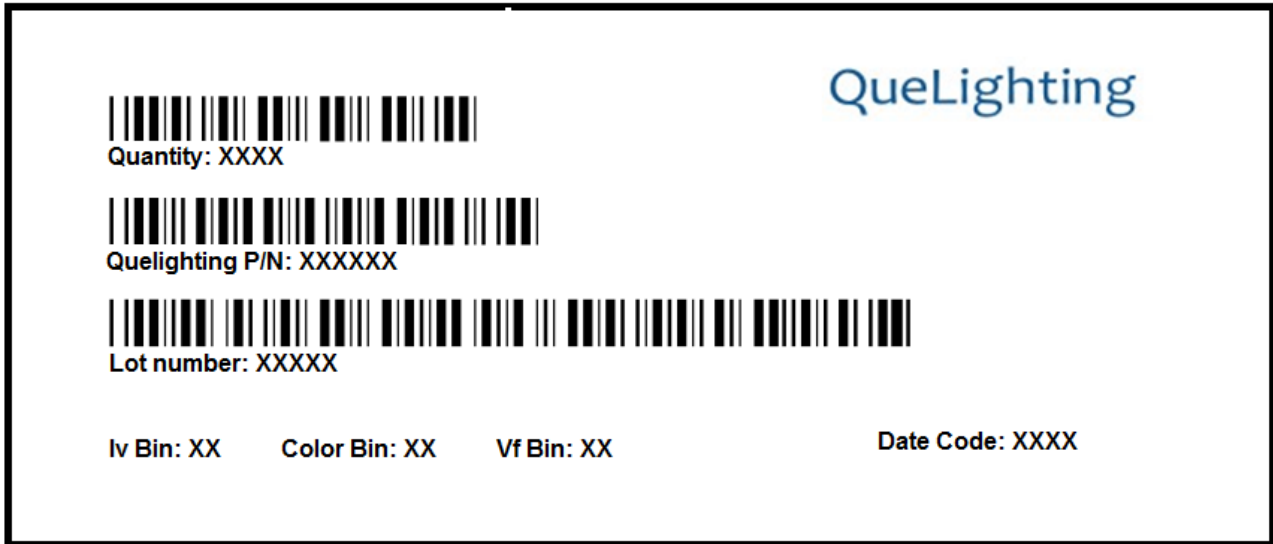
There shall be a minimum of 400mm (15.7 inch) of empty component pockets sealed with cover tape.

Unit : mm





Labeling



Ordering Information:

Part #	Multiple Quantities	Quantity per Reel
QLSP08RGBXW		1000 pcs



Revision History:

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

