

**QLSP08RGB\_B**  
(5050 Black-Face 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:

- Tri-Color LED, Red/Green/Blue LED
- With Black-face Lead frame
- High brightness output @ 20mA,
- Package Dimension = 5.4mmX5.0mmX1.45mm
- RoHS compliant
- Reflow solderable- JEDEC J-STD-020
- Custom Bin available upon special request
- View angel >120°
- Resin color by diffused white

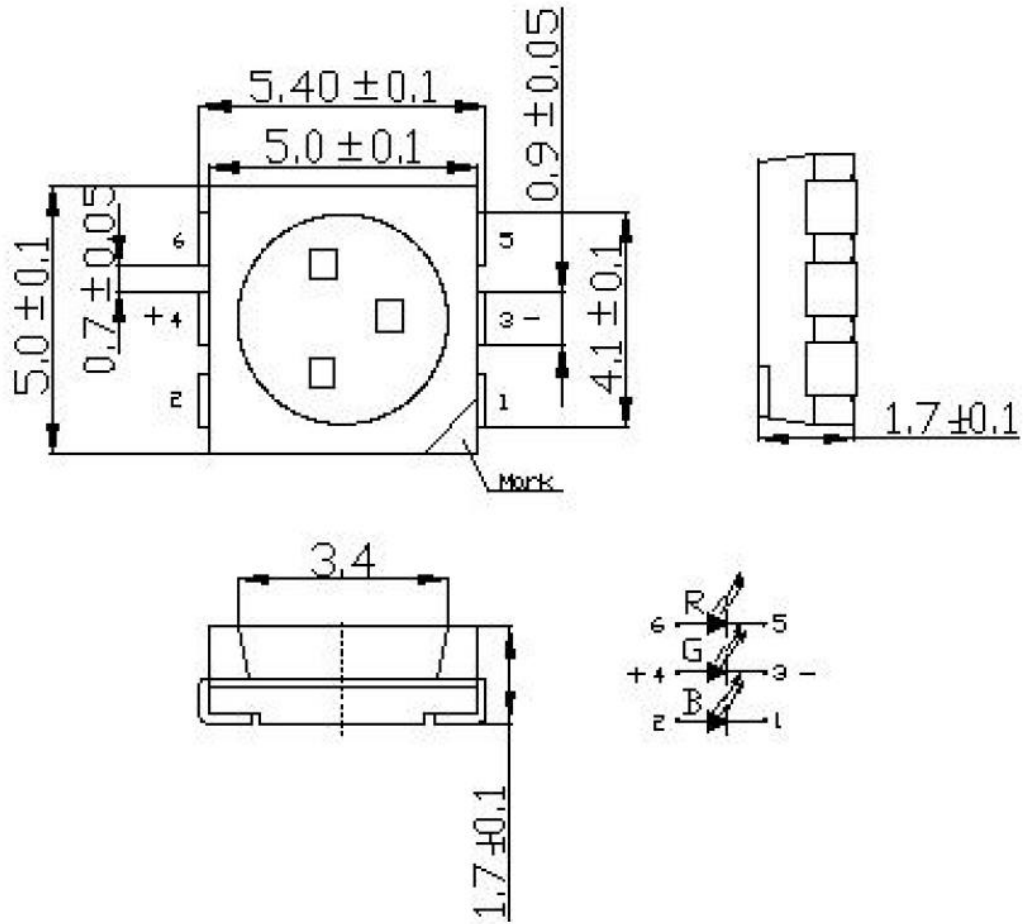
## Application:

- Stage lighting,
- Architecture Lighting
- Garden Lighting
- Indoor directional lighting
- Entertainment lighting.

## Compliance and Certification:



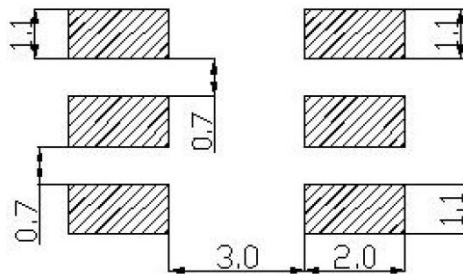
**Mechanical Property:**  
(Dimension)



\* All dimensions are in millimeters,  
\* Tolerances are  $\pm 0.10$ 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	I <sub>f</sub>	20	mA
Leakage Current (5V)	I <sub>r</sub>	10	μA
Total Power Dissipation	P <sub>d</sub>	180	mW
Pulse Forward Current	I <sub>fp</sub>	30	mA
LED Junction Temperature	T <sub>J</sub>	120	°C
Storage Temperature	T <sub>stg</sub>	-40 ~ 100	°C
Operation Temperature	T <sub>opr</sub>	-40 ~ 85	°C
Soldering Temperature	T <sub>sol</sub>	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 - Red	Vf	20mA	2.0		2.4	V
Forward Voltage – Green	Vf		3.0		3.4	V
Forward Voltage - Blue	Vf		3.0		3.4	V
View Angle	$\theta$			125		deg

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

## ■ Specification

Product	Color	Condition	Vf(V) Typ.	Dominant Wavelength (nm)	Luminous Intensity (mcd)	
					Min.	Typ.
QLSP08RGB_B	Red	20mA	2.2	620~630	600	700
	Green		3.2	515~530	1400	1500
	Blue		3.2	460~470	400	500

\*Tolerance = +/- 10%



## ■ Groups

### Dominant Wavelength

Wd (nm) @20mA			
Color	Code name	Min.	Max.
Red	A8	620	625
	A9	625	630
Green	DM	515	520
	DN	520	525
	DP	525	530
Blue	DC	460	465
	DD	465	470

Measurement tolerance is +/- 1nm

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

VF Rank@20mA			
Color	Code name	Low	High
Red	R4	2.0	2.4
Green/Blue	24	3.0	3.4

The forward voltage tolerance is  $\pm 0.1V$

### Luminous Intensity Bin:

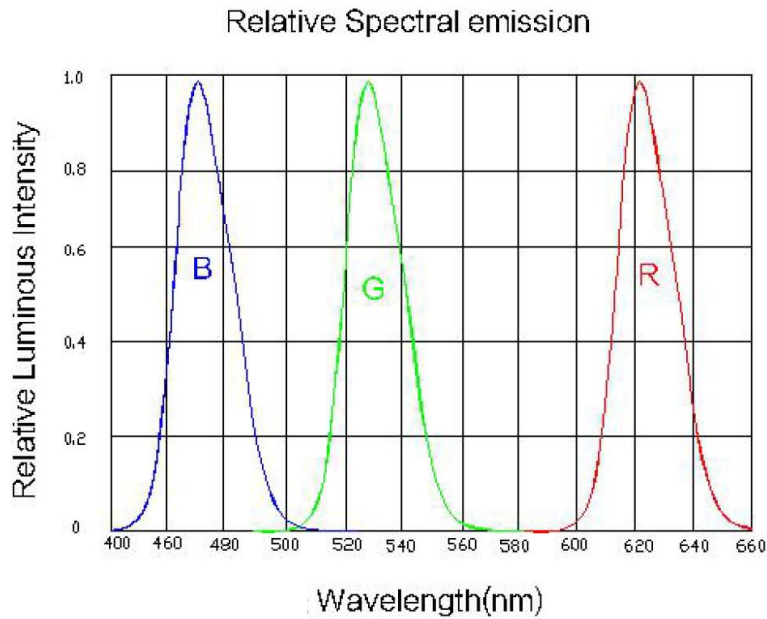
Rank (mcd)@20mA			
Color	Code name	Low	High
Red	P31	600	800
Green	N102	1400	1600
Blue	N32	400	600

luminous flux tolerance is  $\pm 7\%$

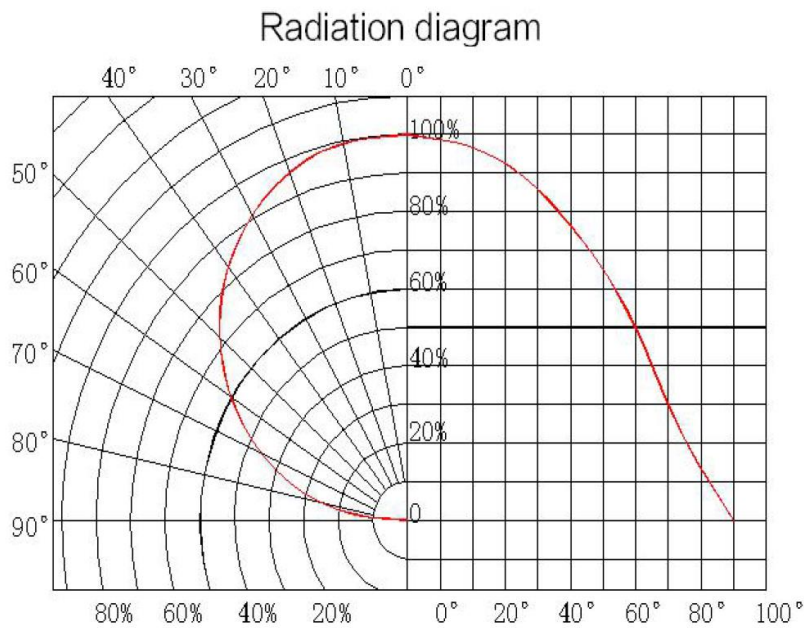


# Characteristic Curves

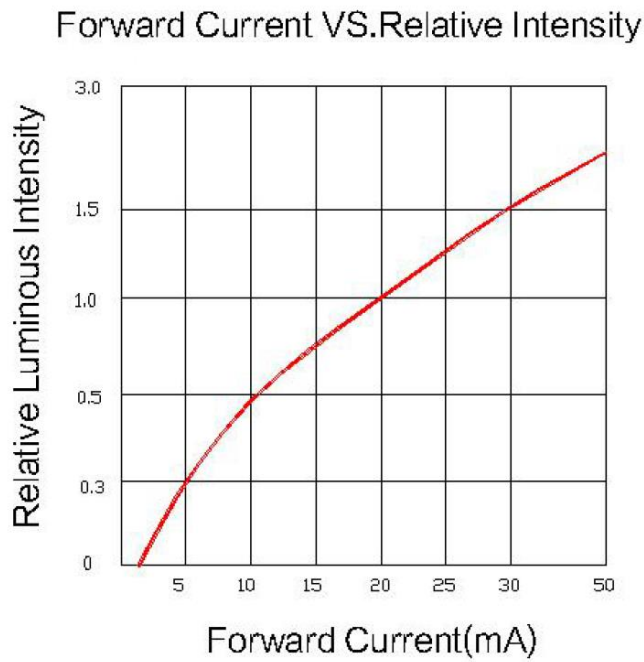
## (1) Color Spectrum



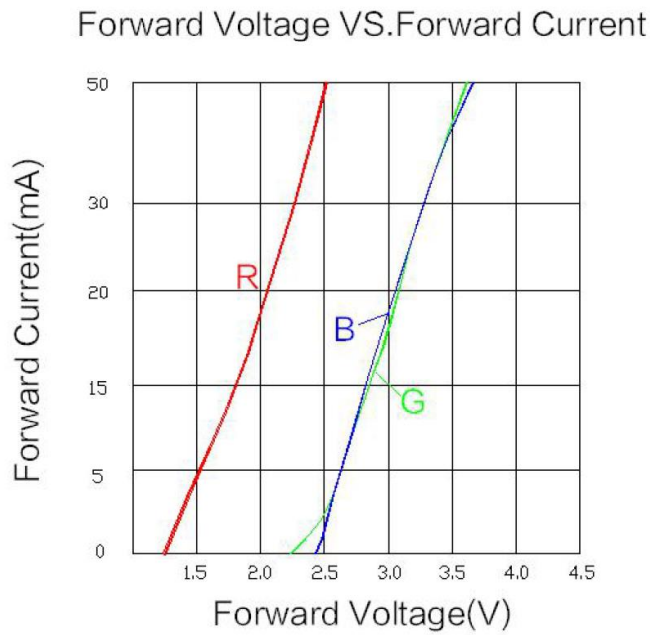
## (2). Typical Representative Spatial Radiation Pattern



### (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 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

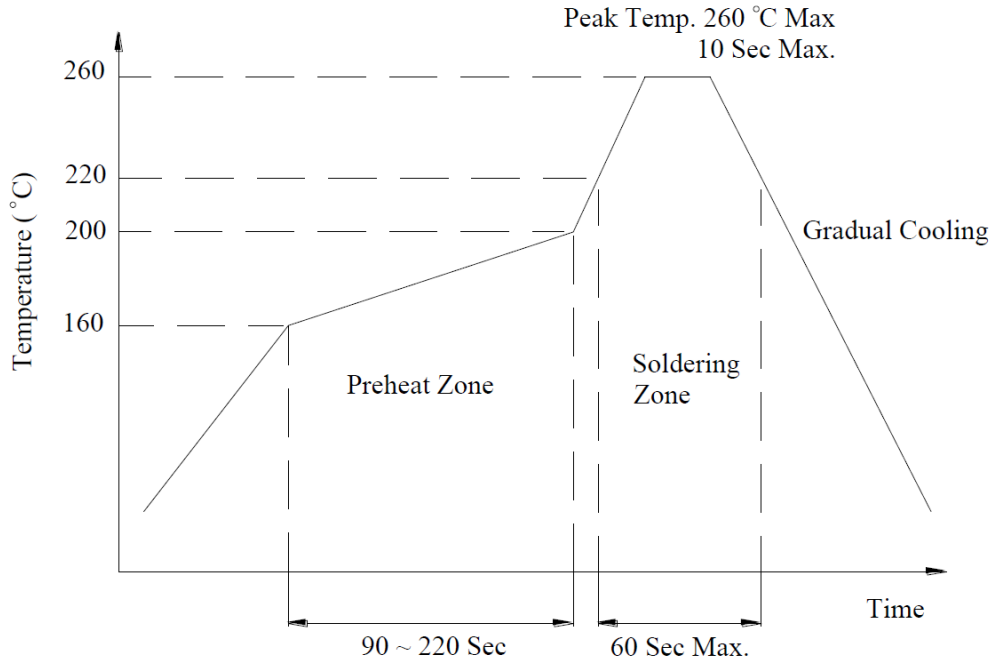
## ■ Judgment Criteria:

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



### Solder Profile:

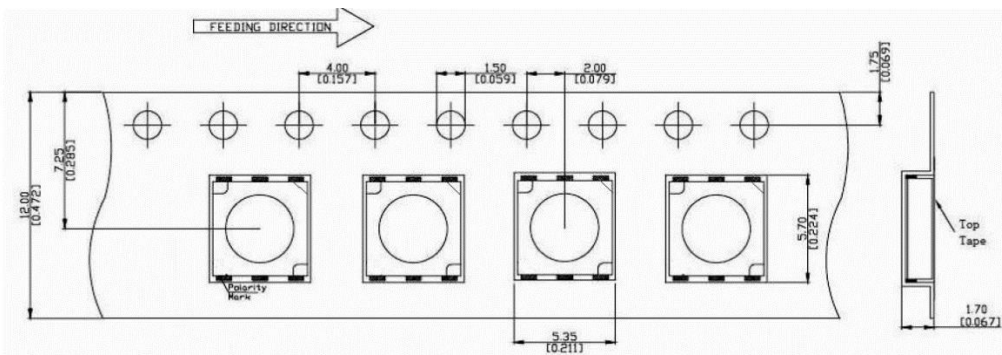
-The recommended reflow soldering profile is as follows (temperatures indicated are as measured on the surface of the LED resin):



### Note:

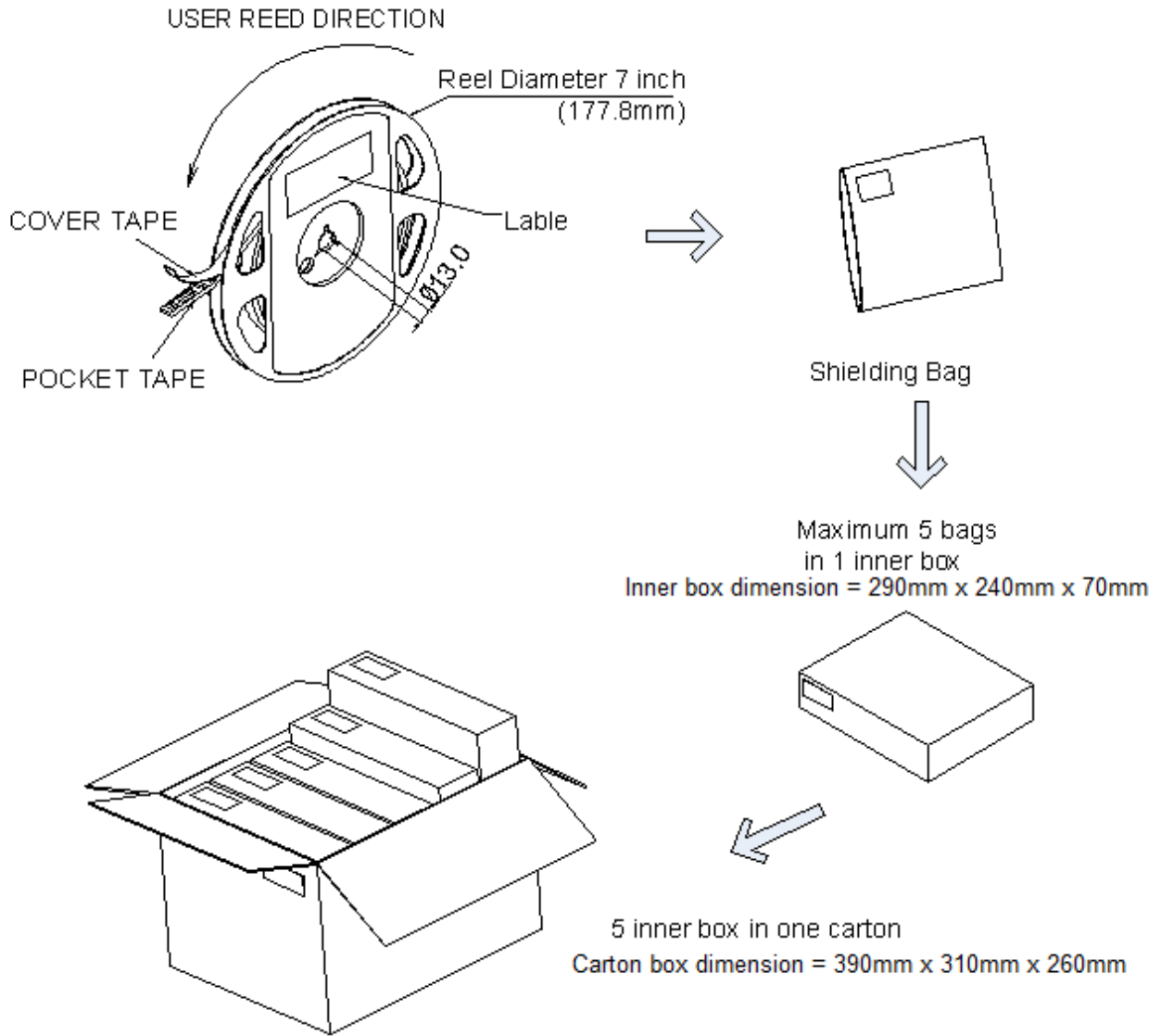
1. The recommended reflow temperature is 230°C(±5°C). The maximum soldering temperature should be limited to 240°C.
2. Do not stress the silicone resin while it is exposed to high temperature.
3. The number of reflow process should not exceed 3 times.

### Taping & Packing:

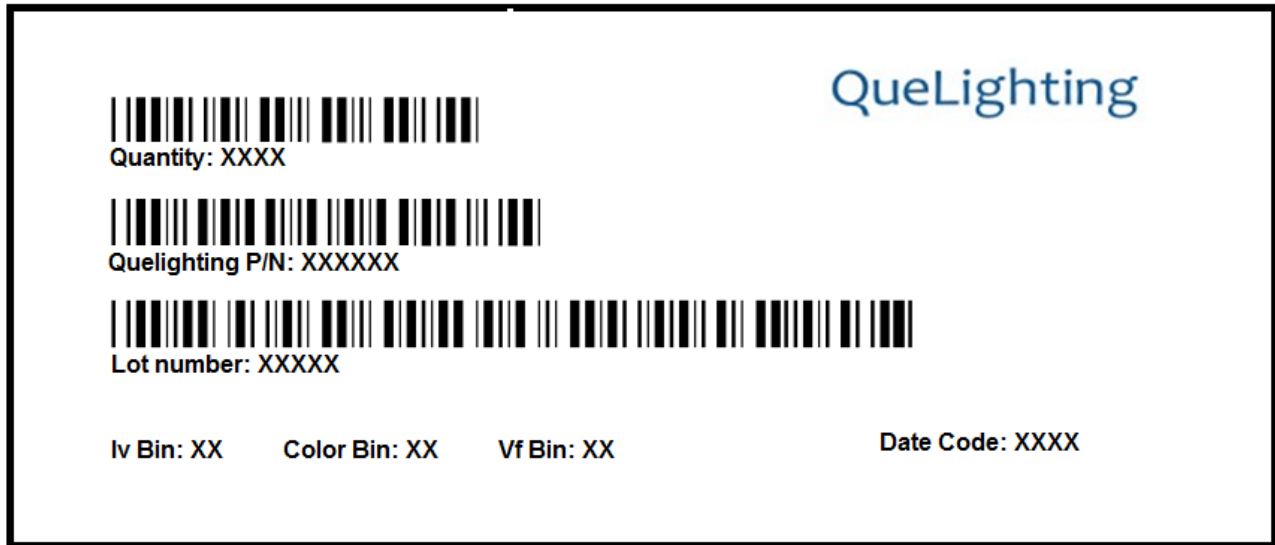


Unit : mm





## Labeling



## Ordering Information:

Part #	Multiple Quantities	Quantity per Reel
QLSP08RGB_B		1000 pcs



**Revision History:**

<b>Revision Date:</b>	<b>Changes:</b>	<b>Version #:</b>
09-23-2019	Initial release	1.0
12-21-2019	Revised the solder pin to swap led color places	1.1
09-17-2023	Revised the quantity per reel to 1K	1.2

