QueLighting

QLSP15RGB

Reverse Mount

Tri color RGB

Product Outline:

This is a reverse mountable Tri color LED with AlInGaP Red and InGaN Blue & Green color. With small footprint and compact size, this package is ideal for status indication.

Features:

- Package in 8mm tape on 7″ diameter reel
- Compatible with automatic placement equipment.
- Compliance with EU REACH
- RoHS compliant
- Compatible with infrared and vapor phase reflow solder process.
- Custom Bin available upon special request
- View angel >120°
- Color: AlInGaP Red / InGaN Blue & Green

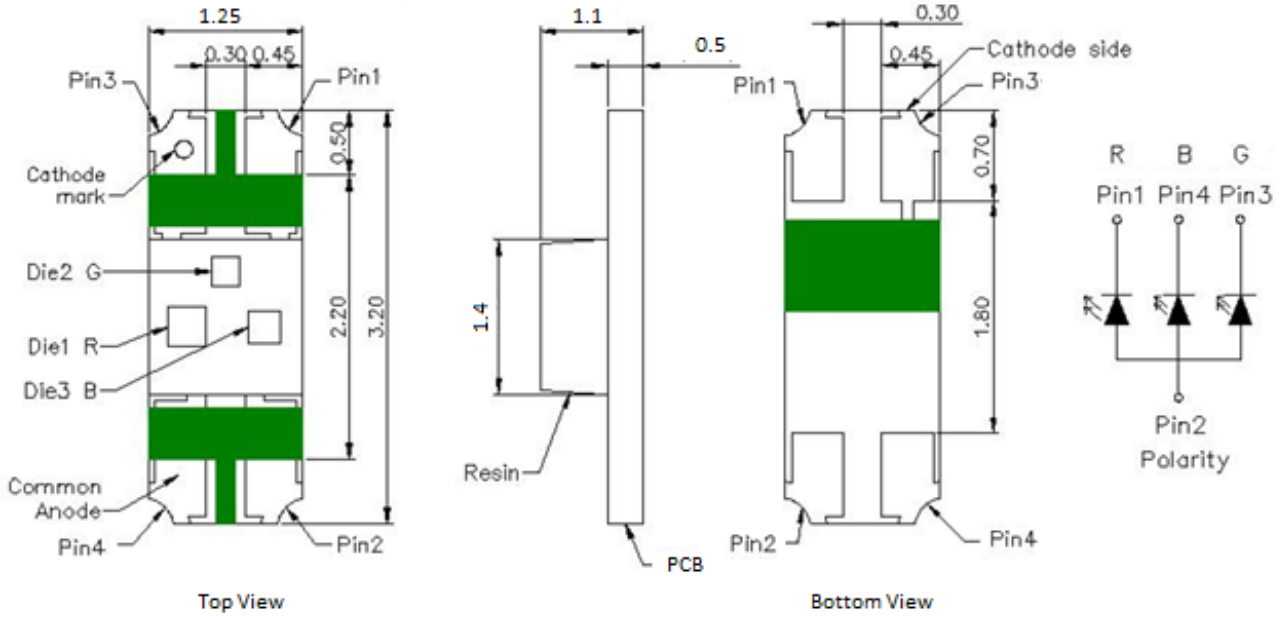
Application:

- Backlighting in dashboard and switch.
- Telecommunication: indicator and backlighting in telephone and fax.
- Flat backlight for LCD switch and symbol.
- General use.

Compliance and Certification:

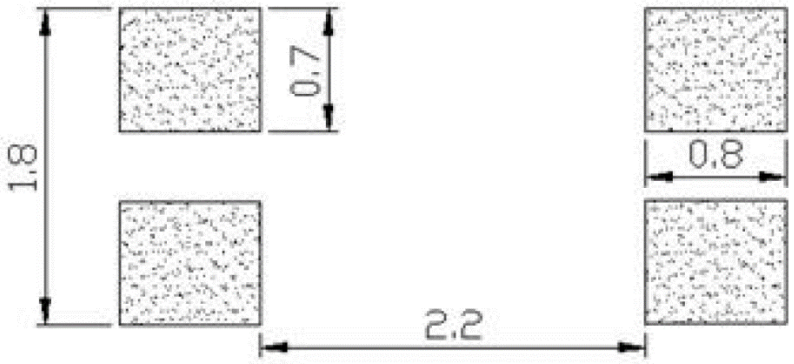
Mechanical Property:

(Dimension)



* All dimensions are in millimeters,
* Tolerances are ± 0.10mm.

Recommended Solder footprint:



Recommended hole size for reverse mount ~ 2.2mm diameter

* All dimensions are in millimeters.
* Reflow soldering must not be performed more than twice.

Characteristics

■ Absolute Maximum Ratings (Ta=25℃)

Color	P_D (mW)	I_F (mA)	I_{FP}* (mA)	T_{OP} (℃)	T_{ST} (℃)	V_R (V)
R (Red)	50	20	100	-40 ~ 85	-40 ~ 85	5
B (Blue)	65	20	60	-40 ~ 85	-40 ~ 85	5
G (Green)	80	20	80	-40 ~ 85	-40 ~ 85	5

***I_{FP}: is pulse @ 1/10 duty cycle and 0.1ms**

■ Electrical / Optical Characteristic (Ta=25 oC)

(AlInGaP RED)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Intensity	Iv		180		mcd	I_F=20mA
Peak Wavelength	λp		632		nm	
Dominant Wavelength	λd		624		nm	
Forward Voltage	Vf	1.9		2.4	V	
View Angle	θ		120		deg	

(InGaN Green)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Intensity	Iv		600		mcd	I_F=20mA
Peak Wavelength	λp		523		nm	
Dominant Wavelength	λd		525		nm	
Forward Voltage	Vf			3.4	V	
View Angle	θ		120		deg	

(InGaN Blue)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Intensity	Iv		130		mcd	I_F=20mA
Peak Wavelength	λp		470		nm	
Dominant Wavelength	λd		472		nm	
Forward Voltage	Vf			3.4	V	
View Angle	θ		120		deg	

(1) Tolerance of Dominant Wavelength ±1nm
(2) Tolerance of measurement: VF=+/- 0.1V
(3) Tolerance of Luminous Intensity: ±11%

Binning

Brightness: (R&G&B)

	Low (mcd)	High (mcd)
Full	**100**	**600**
1	**100**	**200**
2	**200**	**300**
3	**300**	**400**
4	**400**	**600**
5	**550**	**750**

Vf: (R)

	Low (V)	High (V)
A1	**1.9**	**2.2**
B1	**2.1**	**2.4**

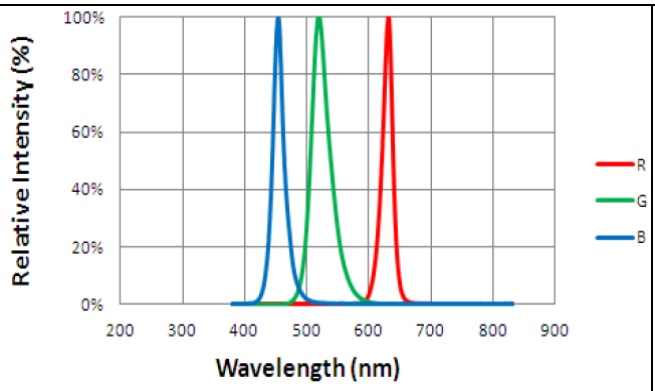
Vf: (B&G)

	Low (V)	High (V)
X	**2.8**	**3.2**
Y	**3.0**	**3.4**

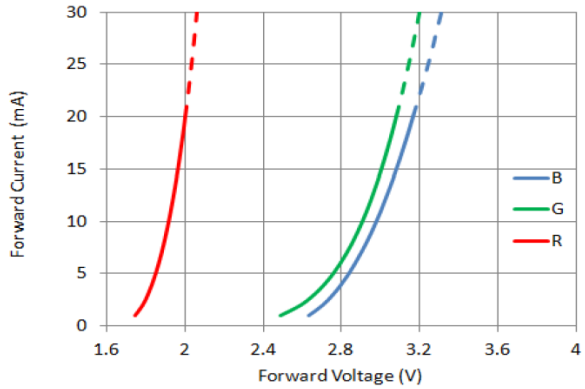
Color: (R&G&B)

	Low (nm)	High (nm)
Full (Blue) = FB	**465**	**475**
Full (Red) = FR	**615**	**625**
Full (Green) = FG	**518**	**524**

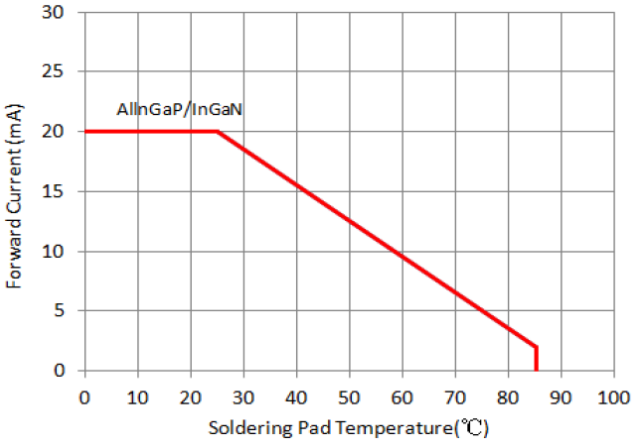
Characteristic Curves



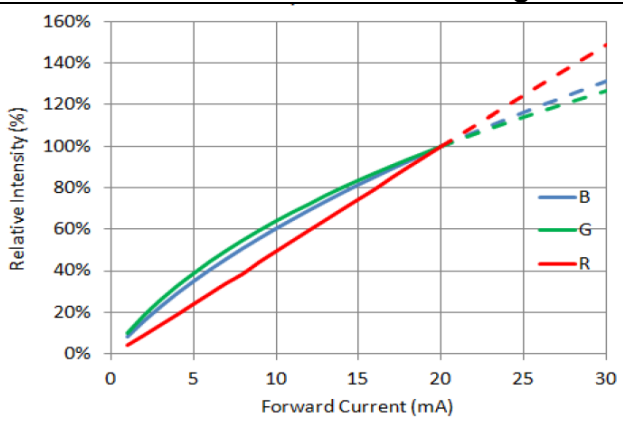
Relative Intensity vs Wavelength



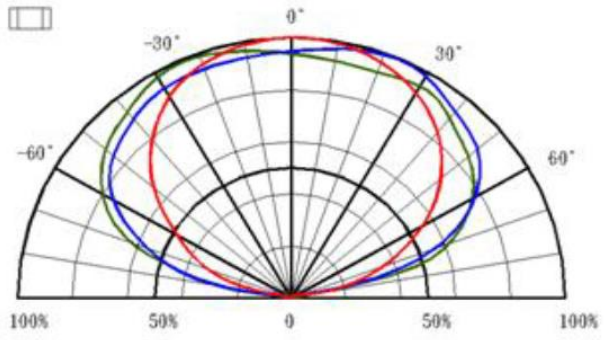
Forward current vs Forward Voltage



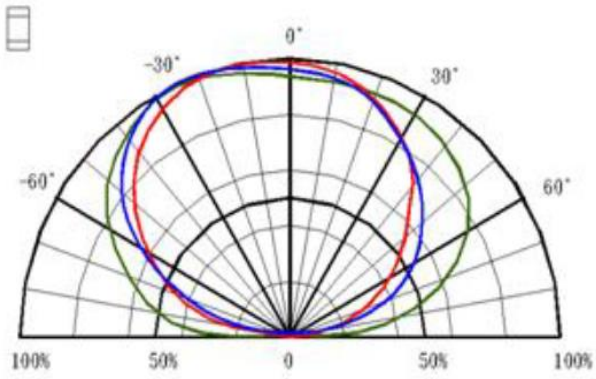
Forward Current vs Soldering Pad Temp



Relative Intensity vs Forward Current



X radiation pattern



Y Radiation pattern

■ Reliability test:

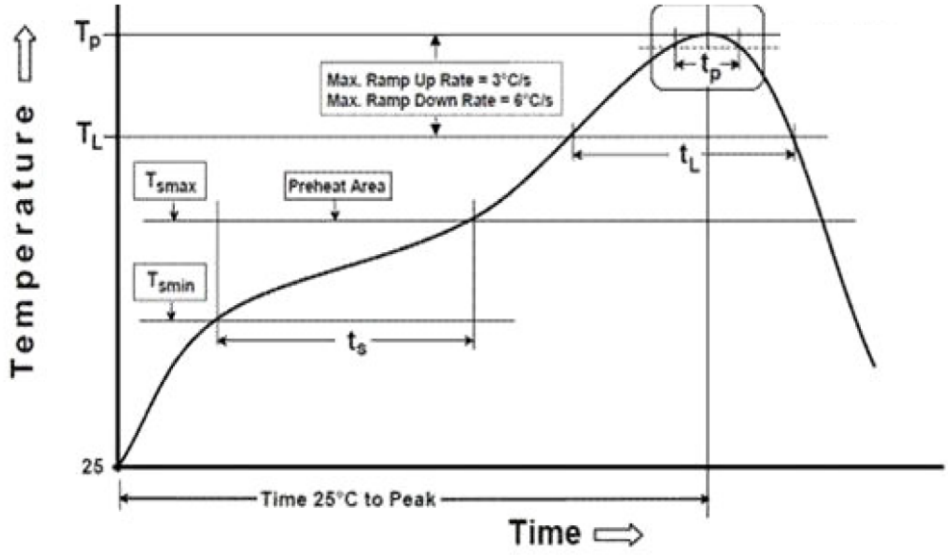
No	Item	Condition	Time/Cycle	Sample size
1	Steady State Operating Life of Room Temperature	25℃ Operating	1000 Hrs	20 pcs
2	Steady State Operating Life of Low Temperature -40℃	-40℃ Operating	1000 Hrs	20 pcs
3	Steady State Operating Life of Low Temperature 60℃	60℃ Operating	1000 Hrs	20 pcs
4	Steady State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

■ Judgment Criteria:

Item	Symbol	Test Condition	Judgment Criteria
Forward Voltage	Vf	R：IF=20 mA	△Vf< 10%
Luminous Flux	Iv		△Iv< 30%

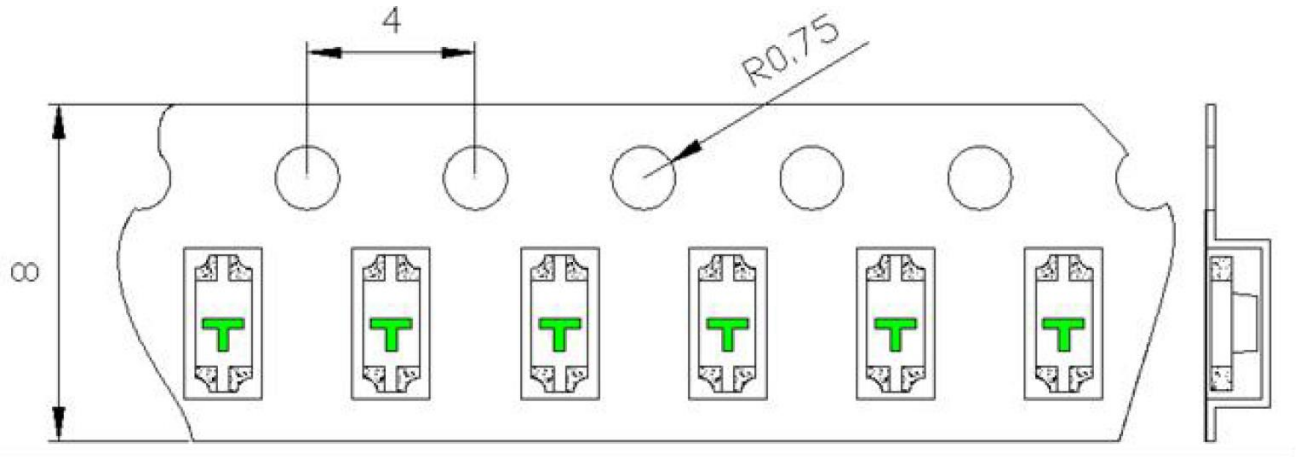
Solder Profile:

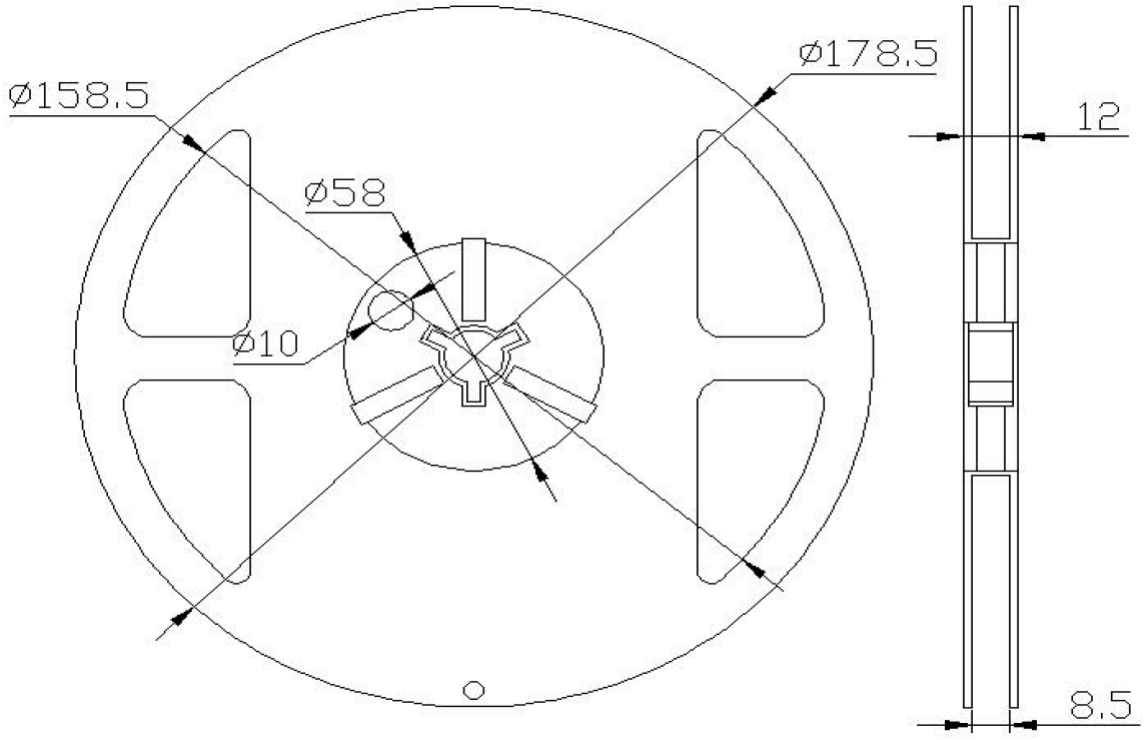
-The recommended reflow soldering profile is as follows (temperatures indicated are as measured on the surface of the LED resin):



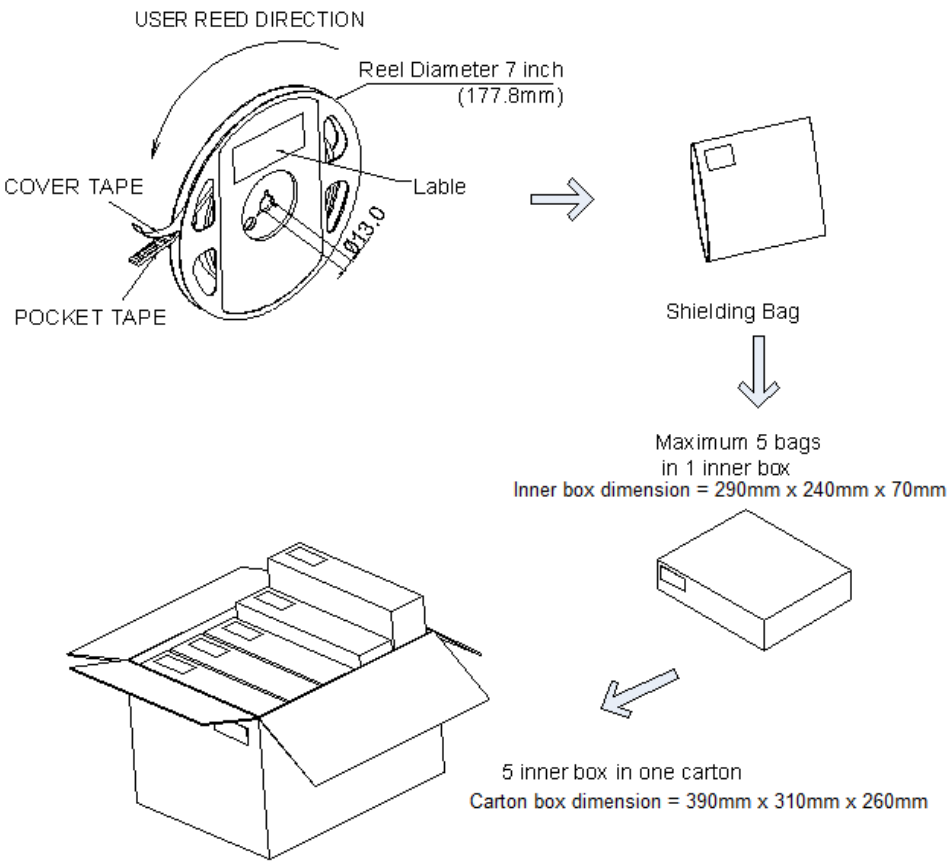
Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Temperature Min(T_{smin})	100℃	150℃
Temperature Max(T_{smax})	150℃	200℃
Time(t_a) from (T_{smin} to T_{smax})	60-120 seconds	60-120 seconds
Ramp-up rate(T_L to T_P)	3℃/second max.	3℃/second max.
Liquidous Temperature(T_L)	183℃	217℃
Time(t_L) maintained above T_L	60-150 seconds	60-150 seconds
Peak package body temperature(T_P)	235℃	260℃
Time within 5℃ of Actual Peak temperature (t_p)	20seconds*	30 seconds*
Ramp-down rate(T_P to T_L)	6℃/second max.	6℃/second max.
Time 25℃ 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.		

Taping & Packing:

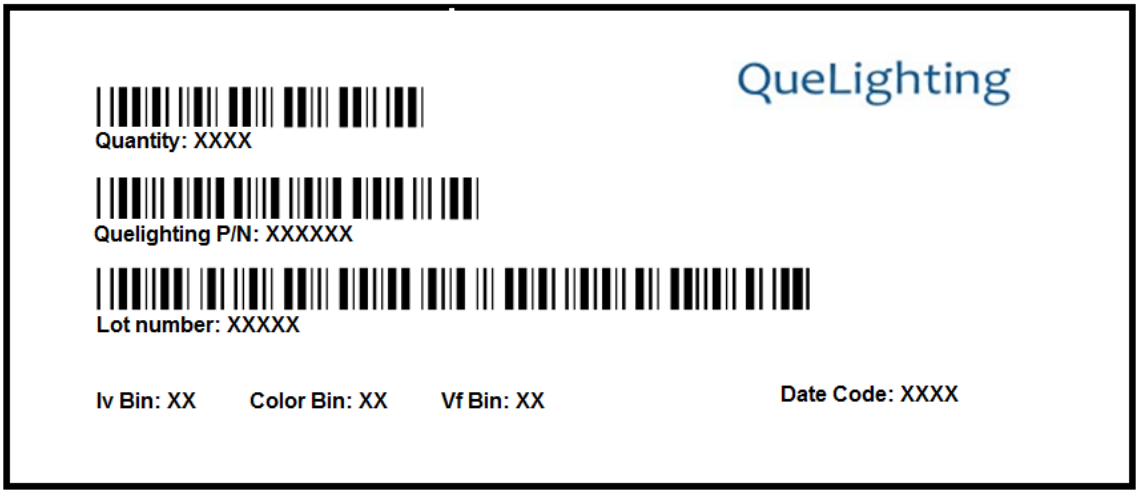




Unit : mm



Labeling



Ordering Information:

Part #	Multiple Quantities	Quantity per Reel
QLSP15RGB		3000 pcs

Revision History:

Revision Date:	Changes:	Version #:
2-5-2021	Initial release	1.0
11-20-2022	Added recommended reverse mount hole dimension	1.1