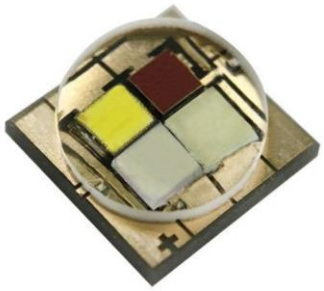
QUELIGHTING

Sustainable Lighting Solution



QLSP08RGBXWHU

(5050 15W Multi-Color LED)

Product Outline:

This is the high power multi-color LED that can provides high lumen output in small package. Creating a small optical light source efficient color mixing. The product used high performance and high quality gold plated ceramic substrate that have good thermal dissipation and low thermal resistance.

Features:

- Four-Color LED, Red/Green/Blue/White
- High brightness output @ 700mA,
- High driving current to 1000mA.
- Package Dimension = 5.2mmX5.2mmX2.4mm
- RoHS compliant
- Reflow solderable- JEDEC J-STD-020
- Custom Bin available upon special request
- View angel >150°

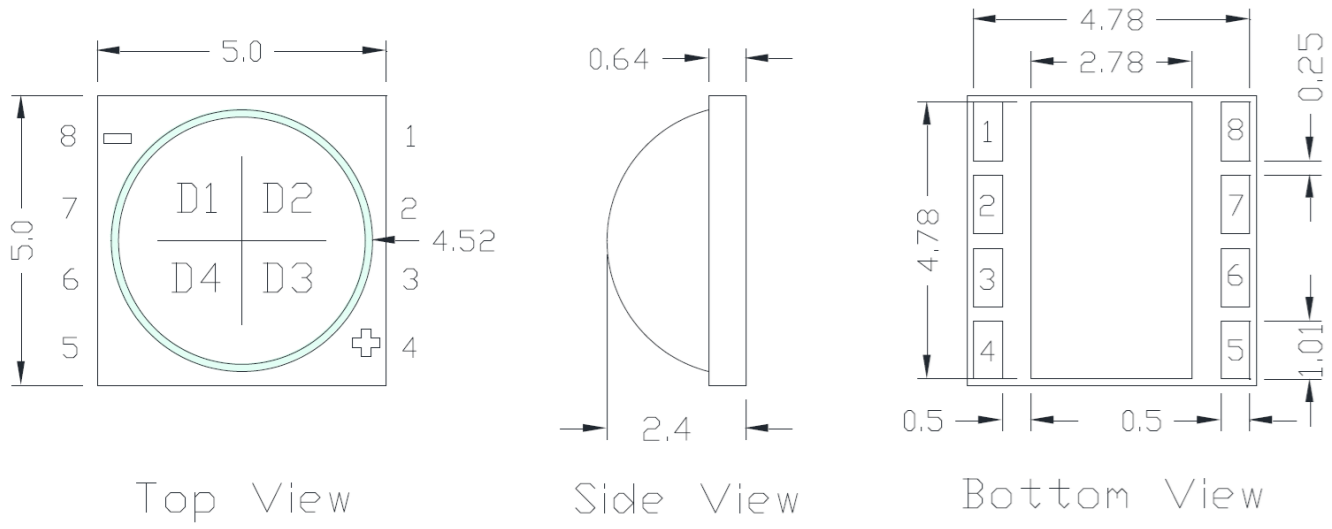
Application:

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

Compliance and Certification:

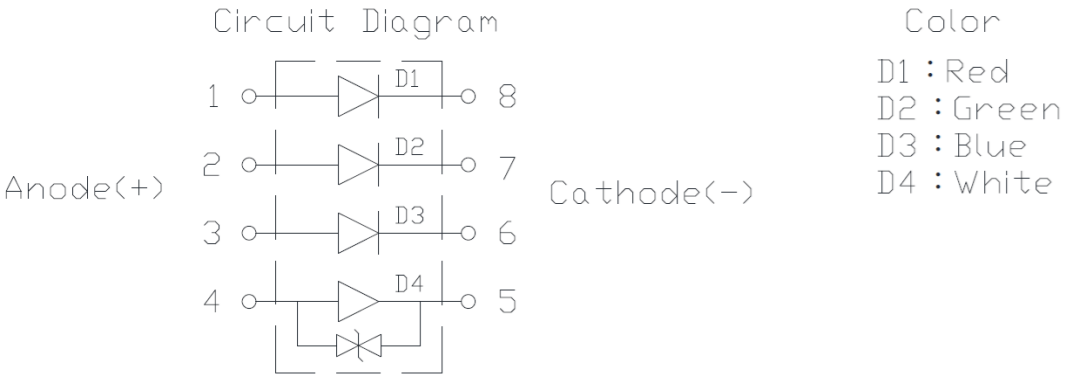
Mechanical Property:

(Dimension)

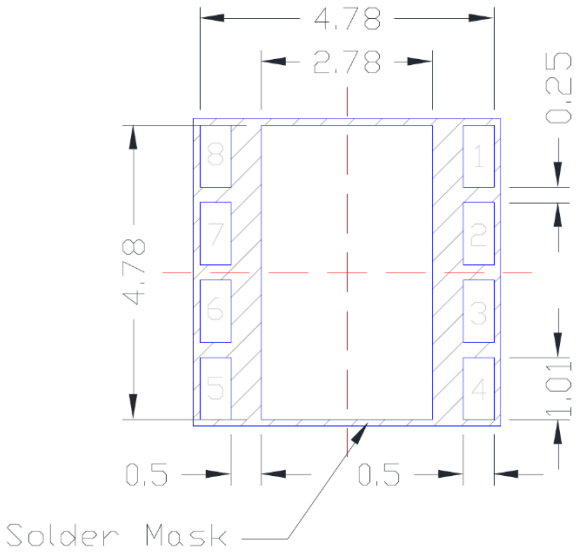


* All dimensions are in millimeters,
* Tolerances are ± 0.10mm.

Circuit Drawing:



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℃)

Parameter	Symbol	Rating	Unit
DC Forward Current	If	1000	mA
Leakage Current (5V)	Ir	10	μA
Total Power Dissipation	Pd	15	W
Pulse Forward Current	Ifp	1200	mA
LED Junction Temperature	TJ	120	℃
Storage Temperature	Tstg	-40 ~ 100	℃
Operation Temperature	Topr	-40 ~ 85	℃
Soldering Temperature	Tsol	260 < 10 sec	℃

(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	700mA		2.2	2.6	V
Forward Voltage – Green	Vf			3.2	3.8	V
Forward Voltage - Blue	Vf			3.2	3.6	V
Forward Voltage - White	Vf			3.2	3.6	V
View Angle	θ			150		deg
Thermal Resistance	R_{th}			3.5		℃/W

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

■ Specification

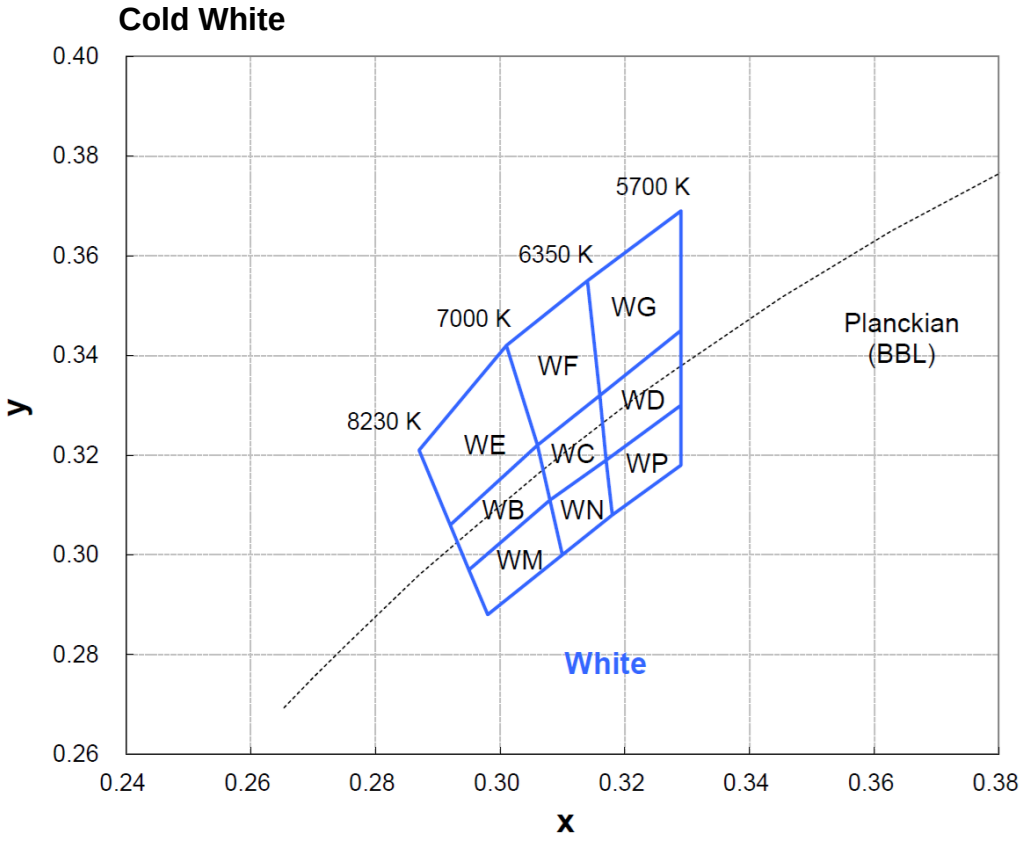
Product	Color	Vf(V) Typ. IF=700mA	Dominant Wavelength(nm)/ CCT	Luminous Flux IF=700mA	
				Min.	Max.
QLSP08RGB**CW**HU	Red	2.4	620~630	110	165
	Green	3.3	520~530	165	240
	Blue	3.3	455~465	35	55
	Cold white	3.3	5700~8230K	210	296

Product	Color	Vf(V) Typ. IF=700mA	Dominant Wavelength(nm)/ CCT	Luminous Flux IF=700mA	
				Min.	Max.
QLSP08RGB**NW**HU	Red	2.4	620~630	110	165
	Green	3.3	520~530	165	240
	Blue	3.3	455~465	35	55
	Neutral white	3.3	3810~4120K	176	248

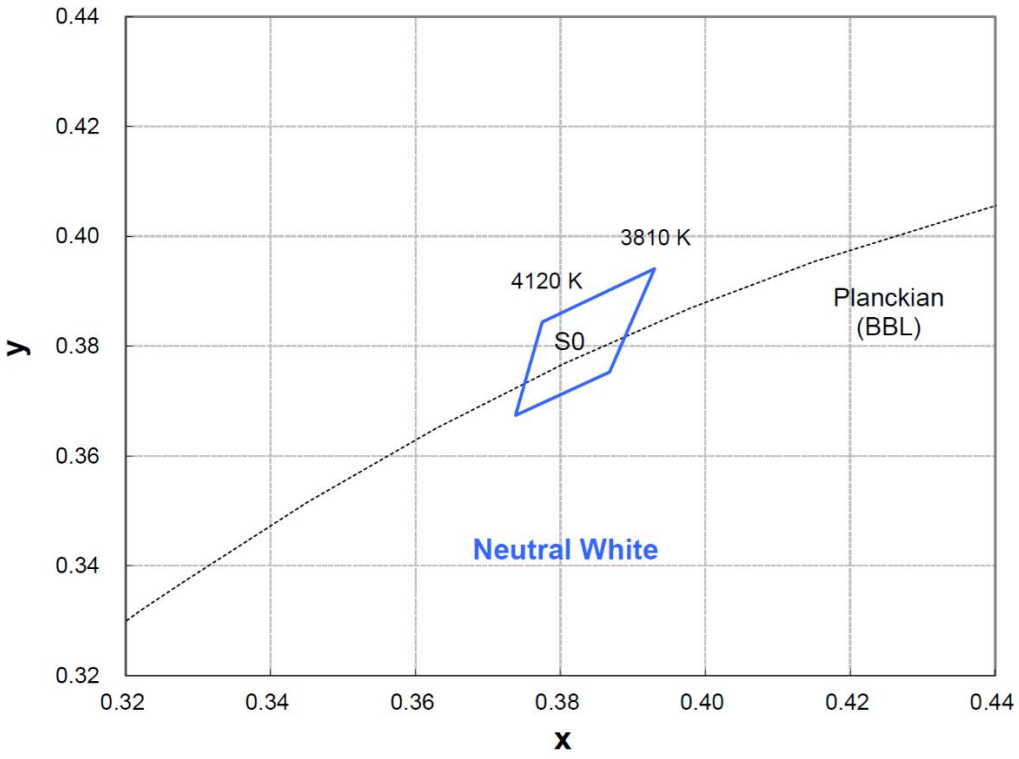
Product	Color	Vf(V) Typ. IF=700mA	Dominant Wavelength(nm)/ CCT	Luminous Flux IF=700mA	
				Min.	Max.
QLSP08RGB**WW**HU	Red	2.4	620~630	110	165
	Green	3.3	520~530	165	240
	Blue	3.3	455~465	35	55
	Warm white	3.3	2930~3140K	165	233

■ Groups

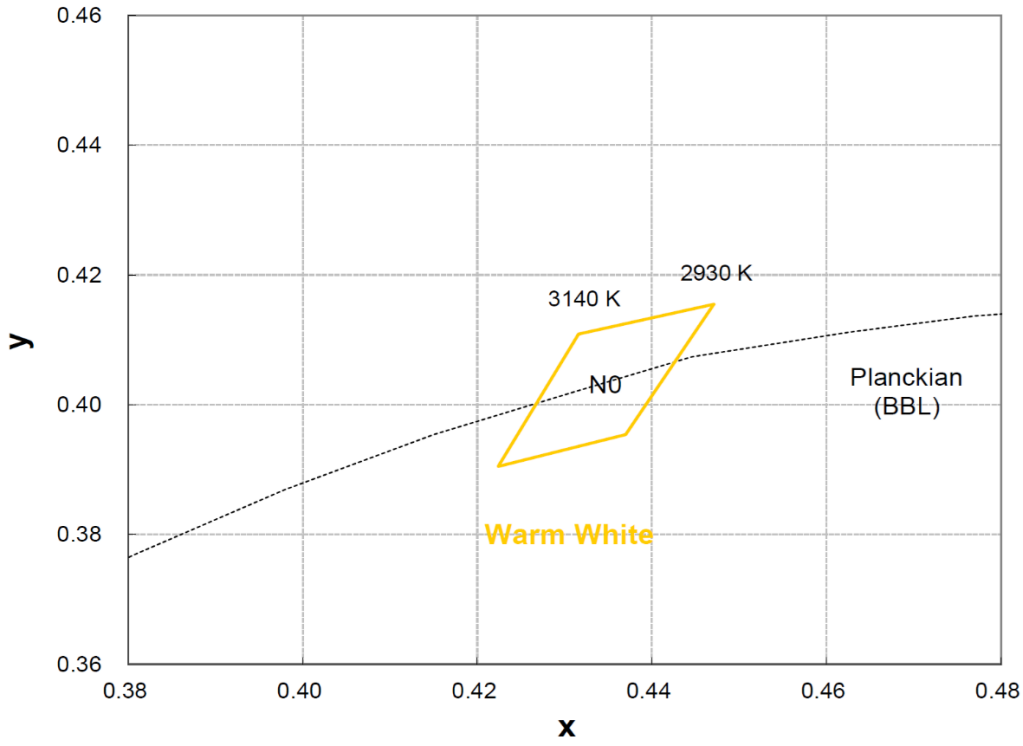
CIE Binning



Neutral white



Warm white



Dominant Wavelength

Wd (nm) @ 700mA			
Color	**Code name**	**Min.**	**Max.**
Red	A85	620	630
Green	DNP	520	530
Blue	DB	455	460
	DC	460	465

Measurement tolerance is +/- 1nm

Forward Voltage (V_F) Bin:

VF Rank @ 700mA			
Color	**Code name**	**Low**	**High**
Red	P44	1.8	2.6
Green/Blue/White	25	3.0	3.5

The forward voltage tolerance is ± 0.1V

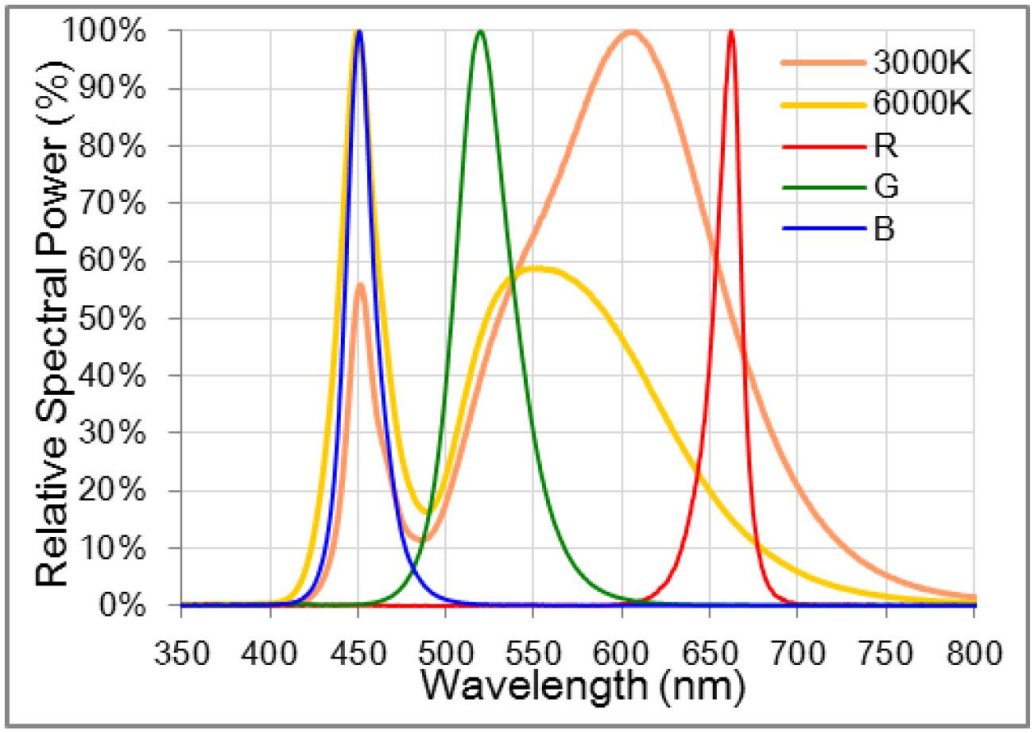
Luminous Flux Bin:

lm Rank (lm) @ 700mA				
Color		**Code name**	**Low**	**High**
Red		R1	110	165
Green		G1	165	440
Blue		B1	35	55
White	Cold	W3	210	296
	Neutral	W2	176	248
	Warm	W1	165	233

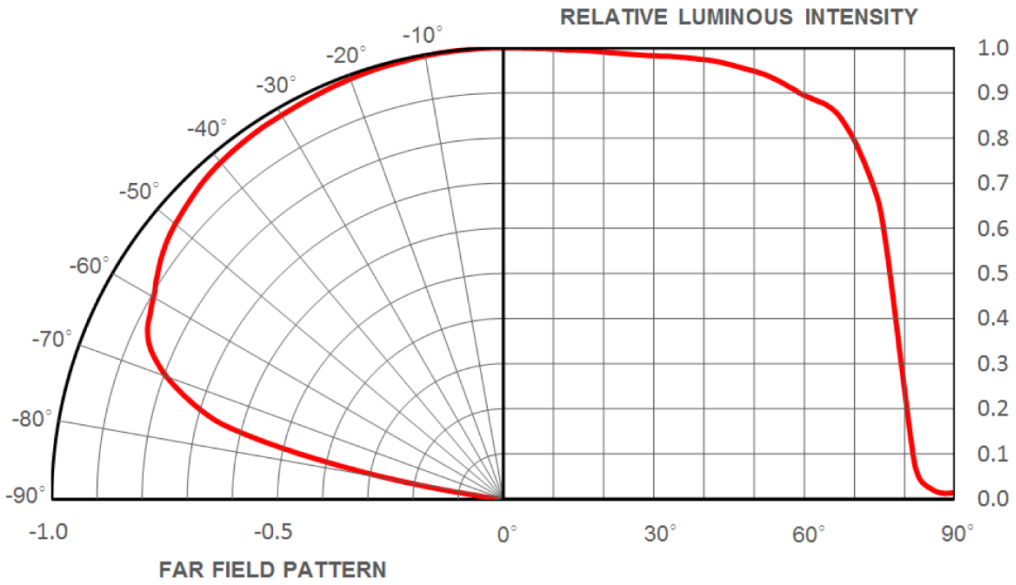
luminous flux tolerance is ± 7%

Characteristic Curves

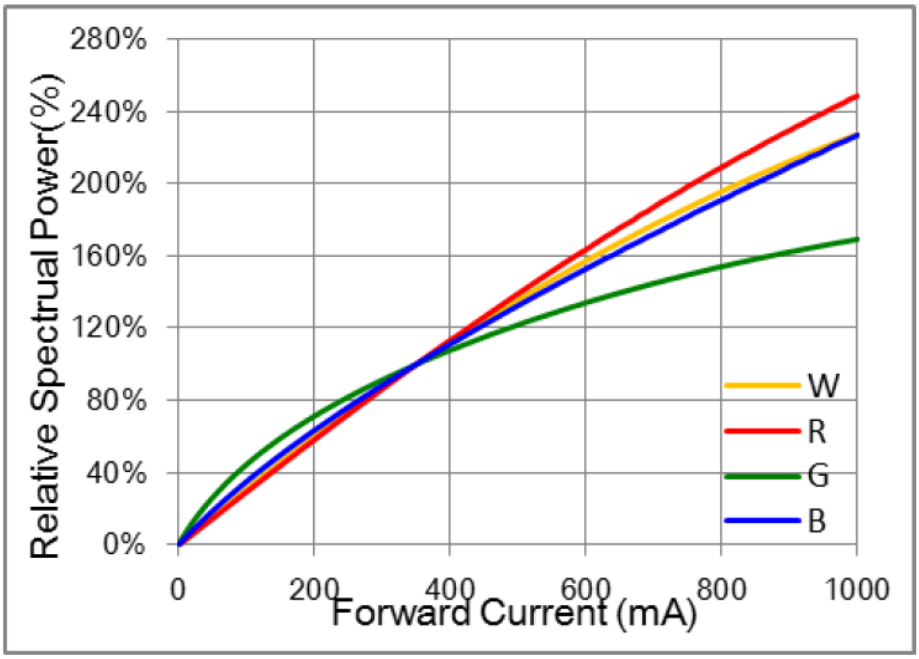
(1) Color Spectrum



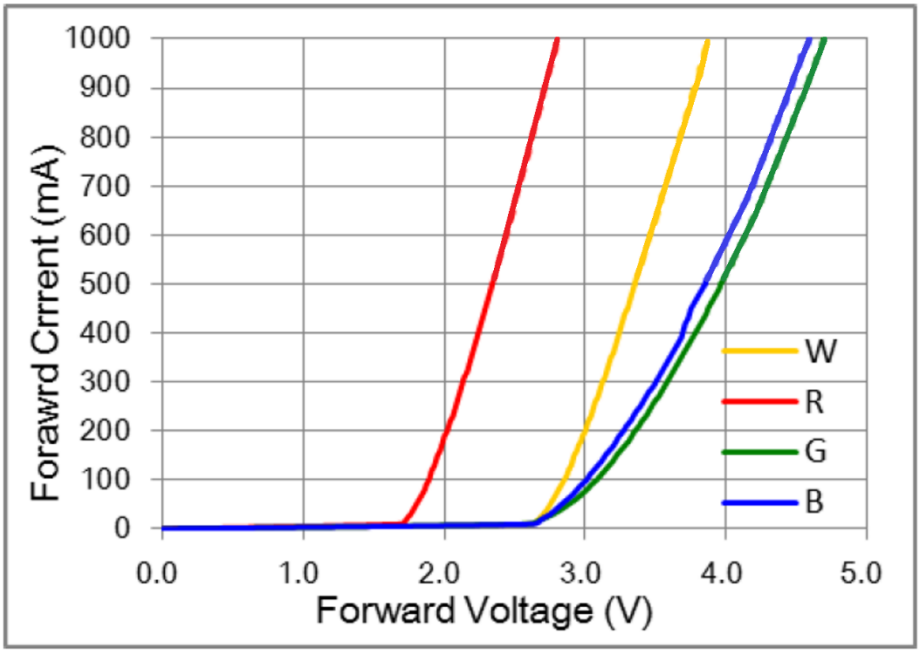
(2). Typical Representative Spatial Radiation Pattern



(3). Forward Current Characteristics



(4). Forward Current vs Forward Voltage



■ Reliability test:

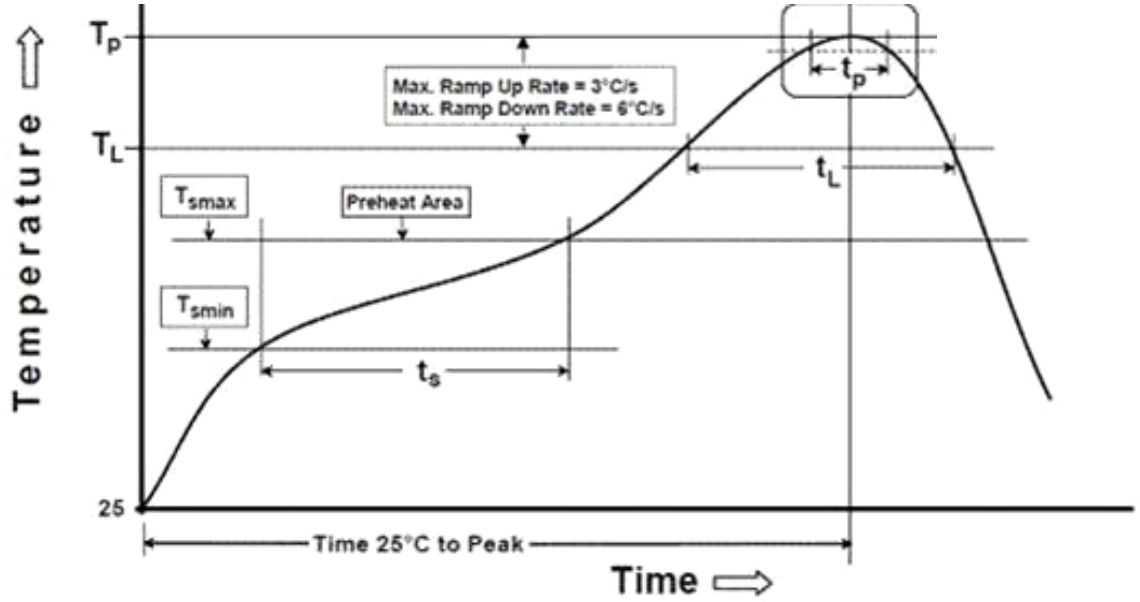
No	Item	Condition	Time/Cycle	Sample size
1	Steady State Operating Life of Room Temperature	25℃ Operating	1000 Hrs	20 pcs
2	Steady State Operating Life of Low Temperature -40℃	-40℃ Operating	1000 Hrs	20 pcs
3	Steady State Operating Life of Low Temperature 60℃	60℃ Operating	1000 Hrs	20 pcs
4	Steady State 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	700 mA	△Vf< 10%
Luminous Flux	Iv	700 mA	△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.		

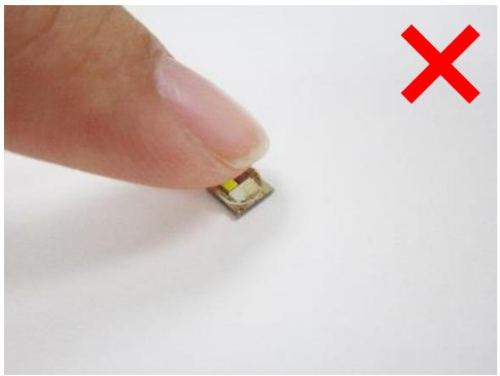
Note: Number of reflow process shall be less than 2 times

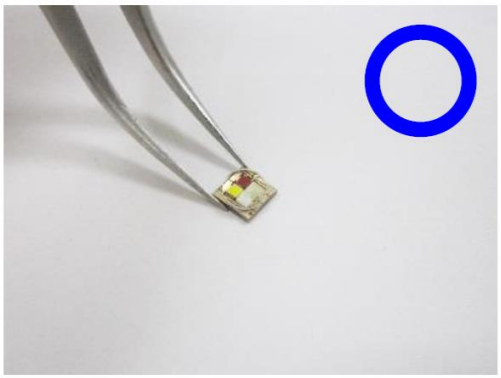
Precaution for Use

●We recommend using the M705-S101-S4 solder paste from SMIC (Senju Metal Industry Co., Ltd.) for lead-free soldering.
●Do not use solder pastes with post reflow flux residue>47%. (58Bi-42Sn eutectic alloy, etc) This kind of solder pastes may cause a reliability problem to LED.
●Electric Static Discharge (ESD) Protection
The LEDs are STATIC SENSITIVE device. ESD protection or surge voltages shall be considered and taken care in the initial design stage, and whole production process.
The following protection is recommended:
(1) A wrist band or an anti-electrostatic glove shall be used when handling the LEDs.
(2) All devices, equipment and machinery must be properly grounded.
●Any mechanical force or any excess vibration shall not be accepted to apply during cooling process to normal temperature after soldering.
●Please avoid rapid cooling after soldering.
●Components should not be mounted on warped direction of PCB.
●Repairing should not be done after the LEDs have been soldered. When repairing is unavoidable.a heat plate should be used. It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.
●This device should not be used in any type of fluid such as water, oil, organic solvent and etc. When cleaning is required, isopropyl alcohol should be used.
●When the LEDs are illuminating, operating current should be decide after considering the package maximum temperature.

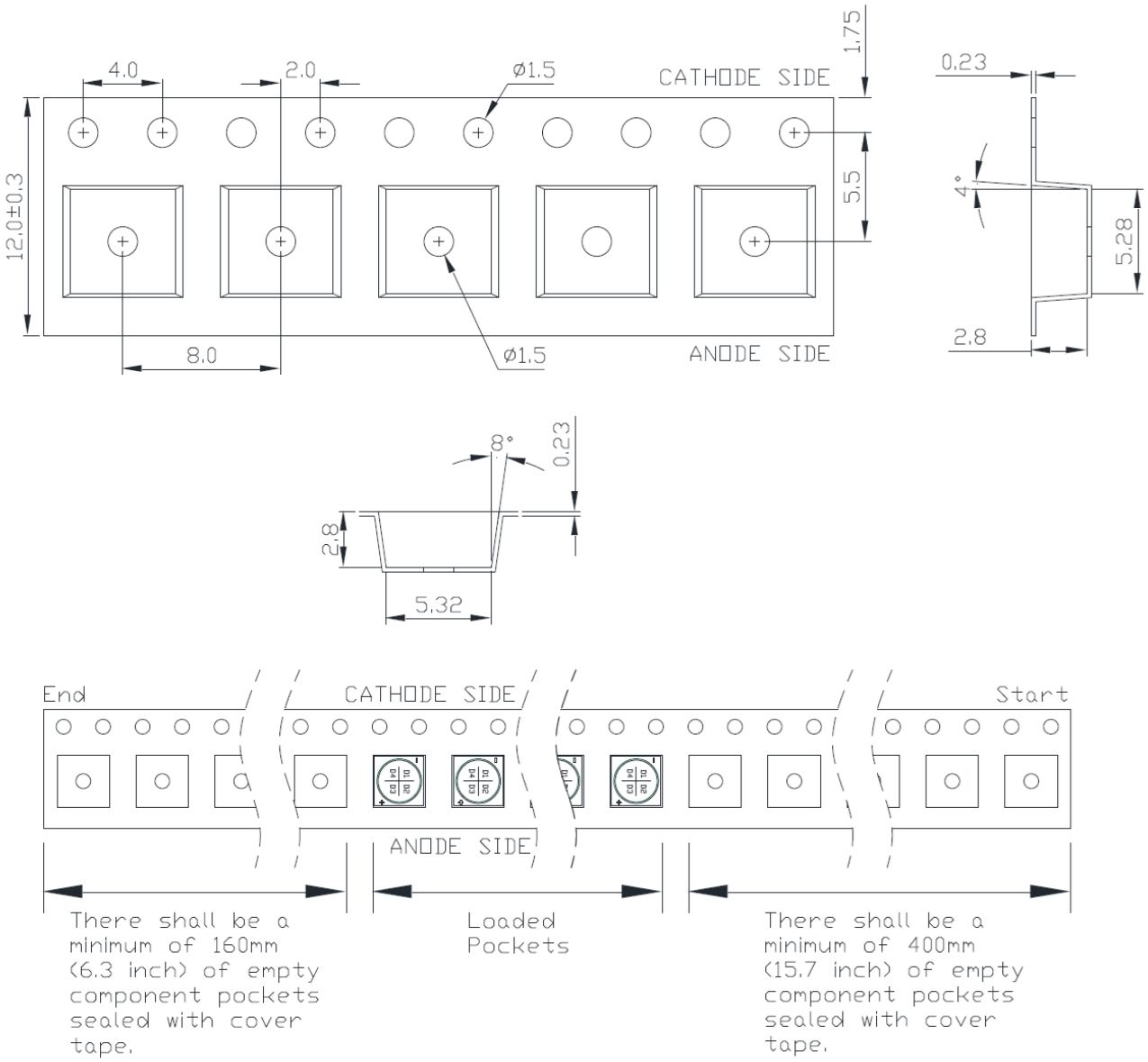
Handling of Lens LEDs

Notes for handling of lens LEDs
●Please do not use a force of over 1kgf impact or pressure on the lens, otherwise it will cause a catastrophic failure.
●The LEDs should only be picked up by making contact with the sides of the LED body.
●Avoid touching the lens especially by sharp tools such as Tweezers.
●Avoid leaving fingerprints on the lens.
●Please store the LEDs away from dusty areas or seal the product against dust.
●Please do not mold over the lens with another resin. (epoxy, urethane, etc)

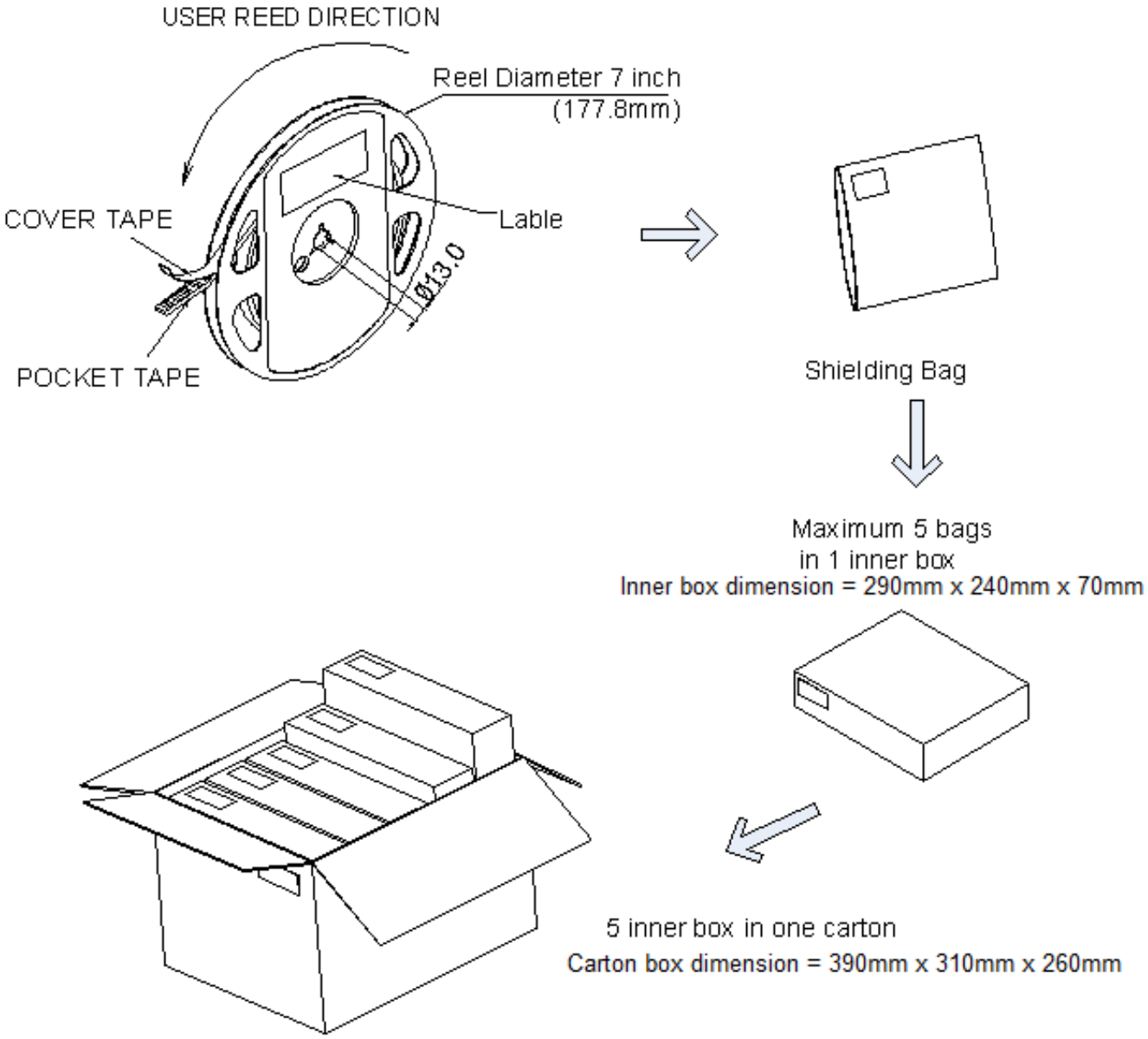




Taping & Packing:



Notes:
1. Drawing not to scale.
2. All dimensions are in millimeters.
3. Unless otherwise indicated, tolerances are ±0.1mm.


USER REED DIRECTION
Reel Diameter 7 inch
(177.8mm)
COVER TAPE
Lable
ø13.0
POCKET TAPE
Shielding Bag
Maximum 5 bags
in 1 inner box
Inner box dimension = 290mm x 240mm x 70mm
5 inner box in one carton
Carton box dimension = 390mm x 310mm x 260mm

Labeling

Ordering Information:

Part #	Multiple Quantities	Quantity per Reel
QLSP08RGBXWHU		250/500 pcs

Revision History:

Revision Date:	Changes:	Version #:
05-01-2024	Initial release	1.0