QUELIGHTING

Sustainable Lighting Solution

QLSP12ZXV-302

(2121 5W CSP White LED)

Product Outline:

QLSP12ZXV-302 series is a High Power White LED with very low thermal resistance. It's can provide high performance and light quality. it also provide high flux density of lighting source for 2nd lens design. The lighting application such as cation light, Fog light, working light, Head lamp, specific industrial and commercial lighting.

Features:

- High brightness output @ 700mA,
- Ceramic substrate
- Plating material is gold for good sulfur resistance.
- Ra 70
- Package Dimension = 2.1mm x 2.1mm x 0.27mm
- Low thermal resistance : 0.3°C/W
- RoHS compliant
- Custom Bin available upon special request

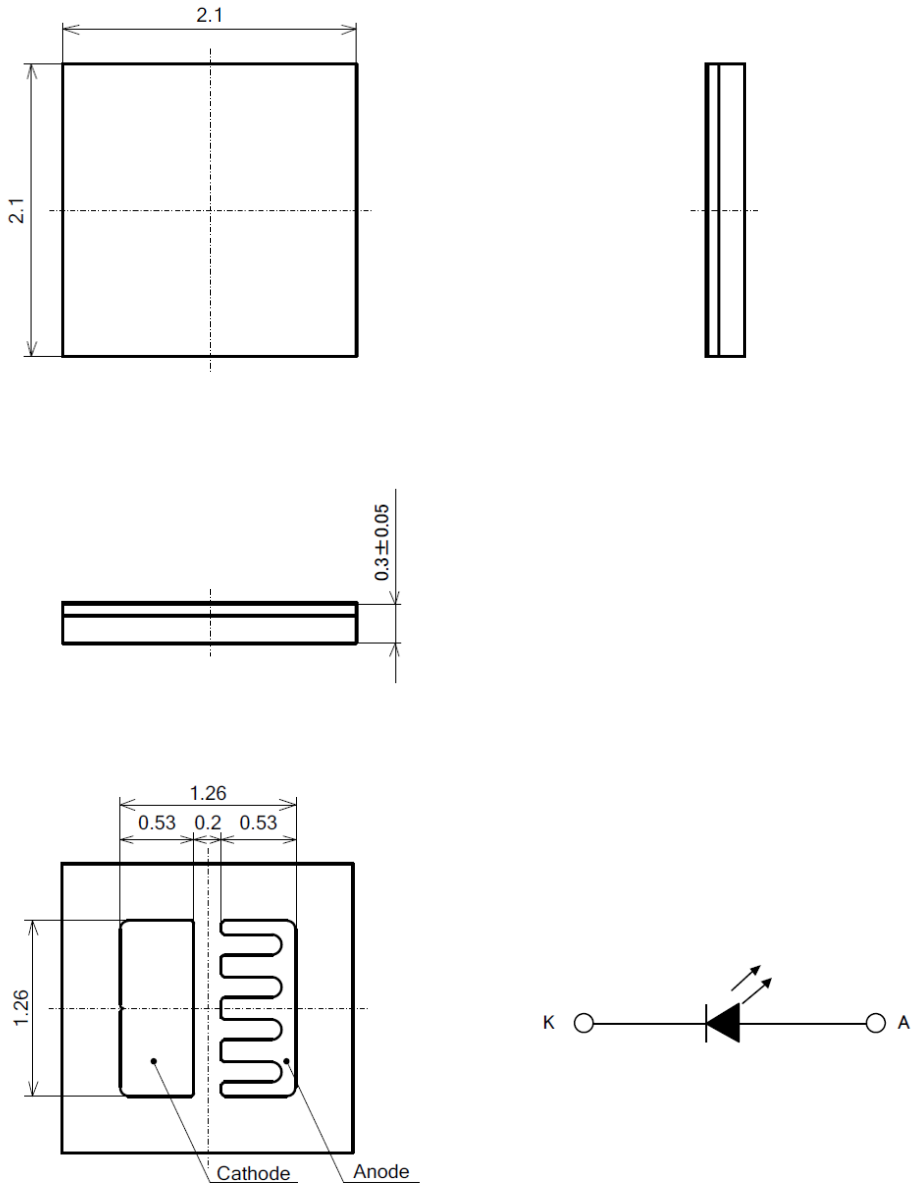
Application:

- Outdoor Lighting
- Working Light
- Fog light
- Head lamp
- Spot Light

Compliance and Certification:

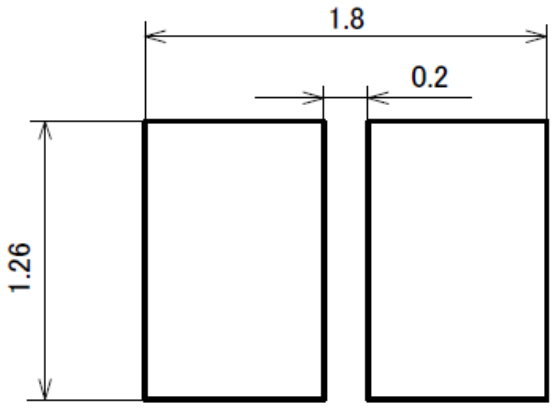
Mechanical Property:

(Dimension)



Notes:
1. Drawing not to scale.
2. All dimensions are in millimeters.
3. Unless otherwise indicated, tolerances are ± 0.10mm.
4. Please do not solder the emitter by manual hand soldering, otherwise it will damage the emitter.
5. 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:



Electrical / Optical Characteristic

(T=25 °C)

Product	Color	I_F(mA)	V_F(V)		CCT	Luminous Flux(lm)	
			Typ.	max	Typ	min	typ.
QLSP12ZPV-302	Pure White	700	3.0	3.4	5000K	300	330
QLSP12ZC1V-302	Cold White	700	3.0	3.4	5700K	300	330
QLSP12ZC2V-302	Cold White	700	3.0	3.4	6500K	300	330

(1) The Forward Voltage tolerance is ±0.1V
(2) The luminous flux tolerance is ±10%
(3) Thermal resistance is calculated from junction to solder
(4) Electric and optical data is tested at 50 ms pulse condition
(5) The color coordinates measurement tolerance is ±0.005

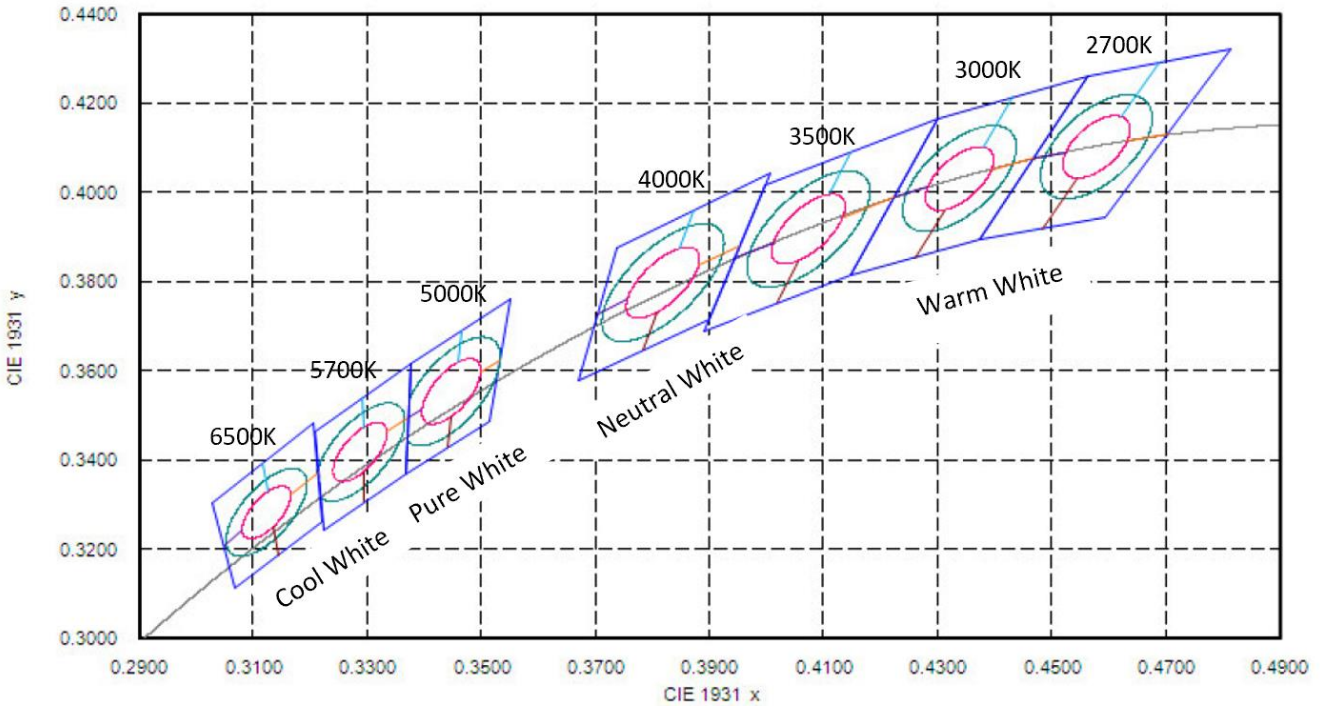
Absolute Maximum Rating

(T=25 °C)

Part #	P_d (mW)	I_F (mA)	I_{FP} (mA)*	V_R (V)	Tj(°C)	TOP (oC)	T_{ST} (°C)	T_{SOL} (°C)**	$R_{th(J-S)}$ (C/W)***
QLSP12ZXV-302	5000	1400	2000	5	130	-40 – 100	-40 - 100	260	0.3

*Duty 1/10 @ 10Khz
** IR Reflow for no more than 10 sec @ 260 °C
*** Junction to substrate

White Binning



ANSI CCT	Color Space	Target Center point (cx,cy)	Major Axis,a	Minor Axis,b	Ellipse Rotation Angle
5000K	3-step MacAdam ellipse	(0.3447,0.3553)	0.00822	0.00354	59.62°
5000K	5-step MacAdam ellipse	(0.3447,0.3553)	0.0137	0.0059	59.62°
5700K	3-step MacAdam ellipse	(0.3287,0.3417)	0.00746	0.0032	59.09°
5700K	5-step MacAdam ellipse	(0.3287,0.3417)	0.01243	0.00533	59.09°
6500K	3-step MacAdam ellipse	(0.3123,0.3282)	0.00669	0.00285	58.57°
6500K	5-step MacAdam ellipse	(0.3123,0.3282)	0.01115	0.00475	58.57°

Forward Voltage (V_F) Bin:

VF Rank @ 700mA (V)		
Code name	**Low**	**High**
01	2.8	3.0
23	3.0	3.2
45	3.2	3.4

The forward voltage tolerance is ± 0.1V

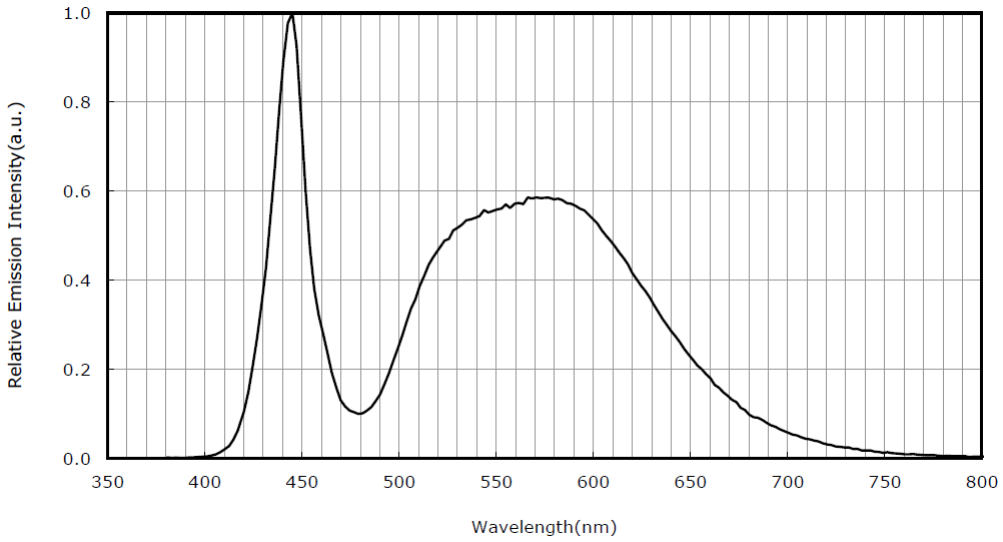
Luminous Flux Bin:

Rank @ 700mA (lm)		
Code name	**Low**	**High**
Q179A	300	320
Q199A	320	340
Q219A	340	360

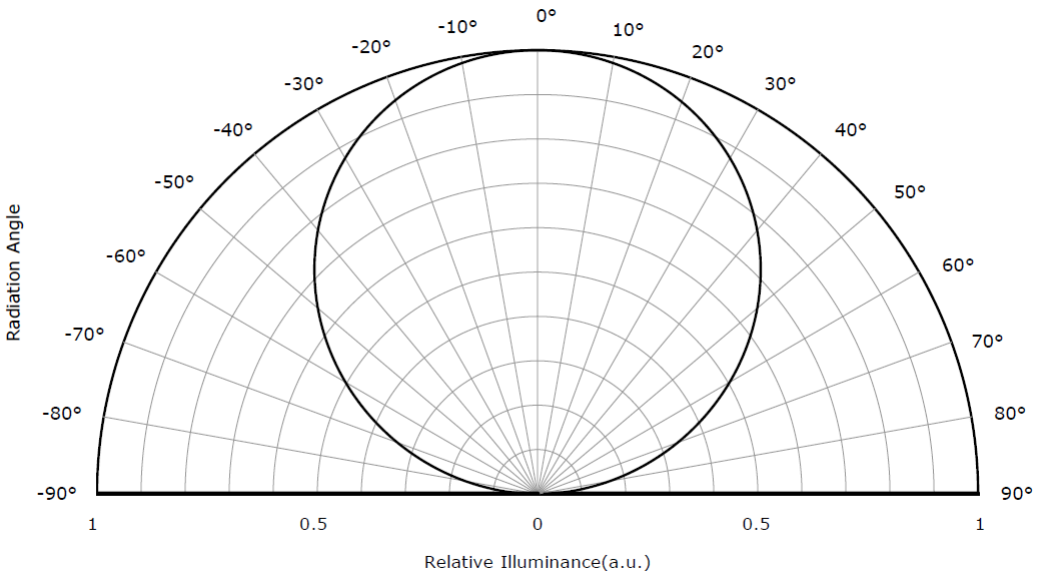
luminous flux tolerance is ± 10%

Characteristic Curves

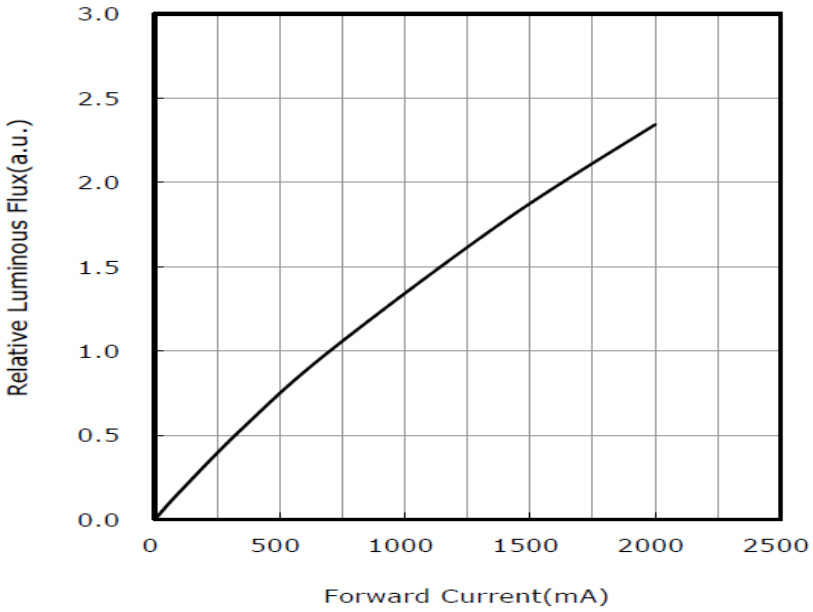
(1) Color Spectrum



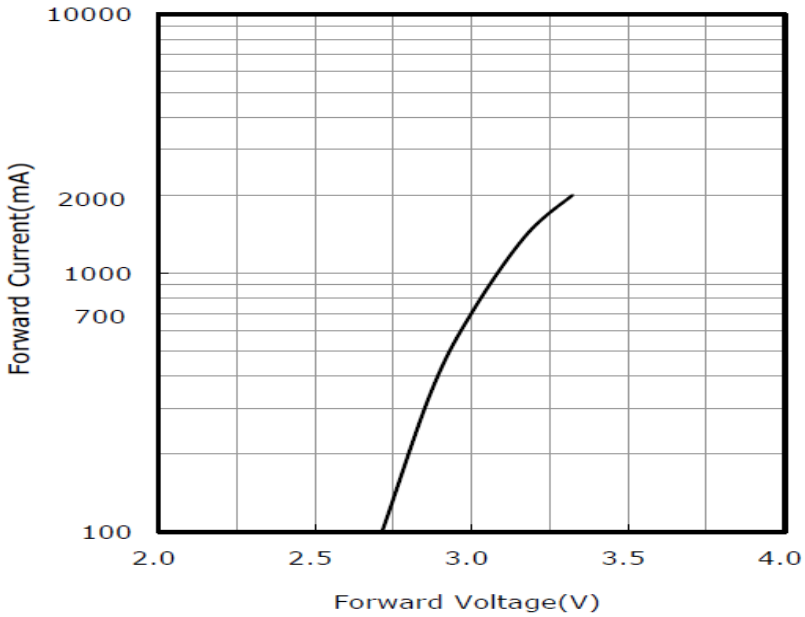
(2). Typical Representative Spatial Radiation Pattern



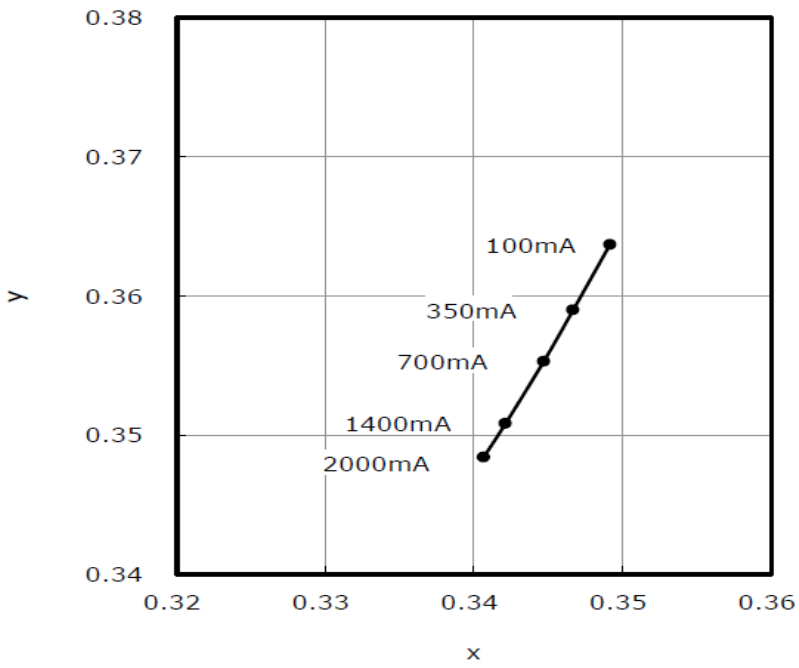
(3). Forward Current Characteristics



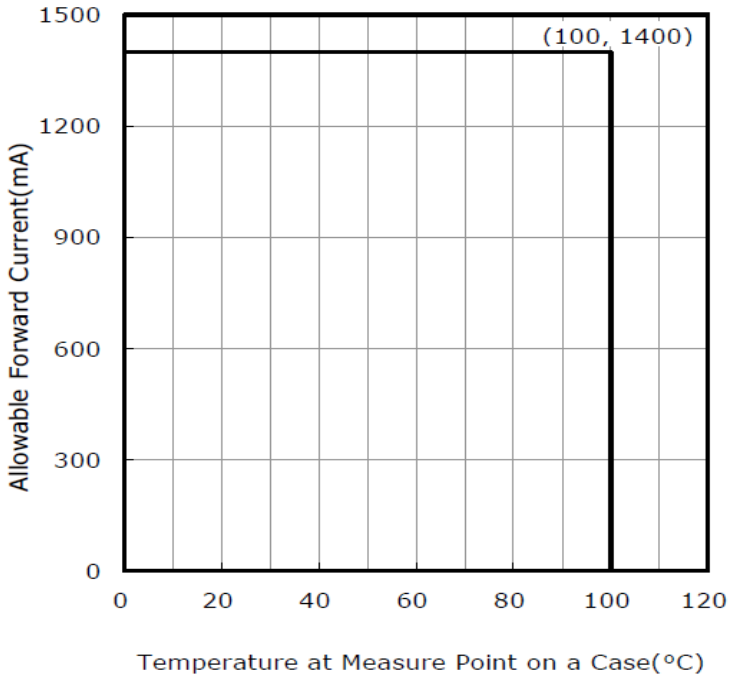
(4). Forward Current vs Forward Voltage



(5). Forward Current vs. Chromaticity Coordinate



(6). Forward Current Derating Curve



■ Reliability test:

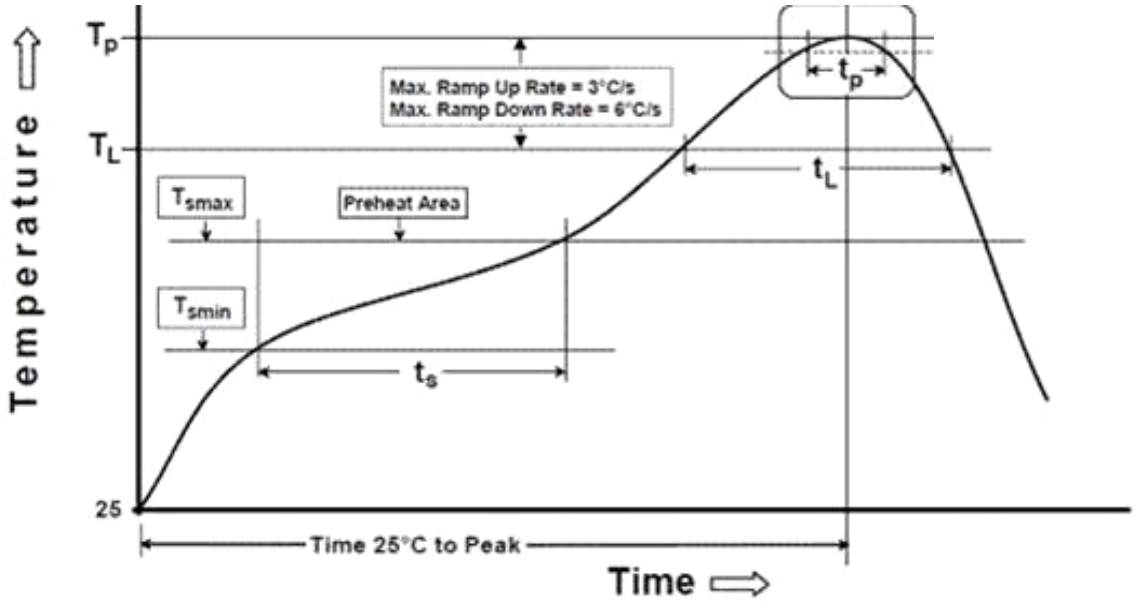
No	Item	Condition	Time/Cycle	Sample size
1	Steady State Operating Life of Room Temperature	25℃ Operating	1000 Hrs	20 pcs
2	Steady State Operating Life of Low Temperature -40℃	-40℃ Operating	1000 Hrs	20 pcs
3	Steady State Operating Life of Low Temperature 60℃	60℃ Operating	1000 Hrs	20 pcs
4	Steady State 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< 20%

Solder Profile:

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

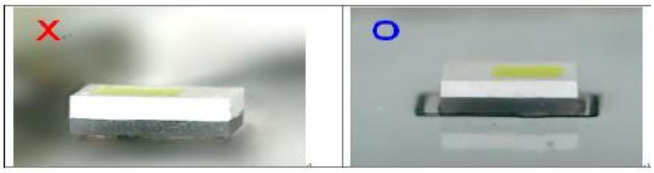


Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Temperature Min(T_{smin})	100℃	150℃
Temperature Max(T_{smax})	150℃	200℃
Time(t_a) from (T_{smin} to T_{smax})	60-120 seconds	60-120 seconds
Ramp-up rate(T_L to T_P)	3℃/second max.	3℃/second max.
Liquidous Temperature(T_L)	183℃	217℃
Time(t_L) maintained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

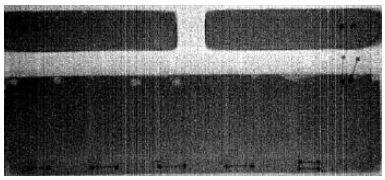
The selection of nozzle for SMT:
If the nozzle is not suitable for the sample, it drops easily, when it is picked up.
Recommended nozzle size is as the following list.

Precautions for SMT:
Undergoing the SMT, beware of the way of picking and pressing the sample, the appearance of sample is easily broken by the stress or the shear.

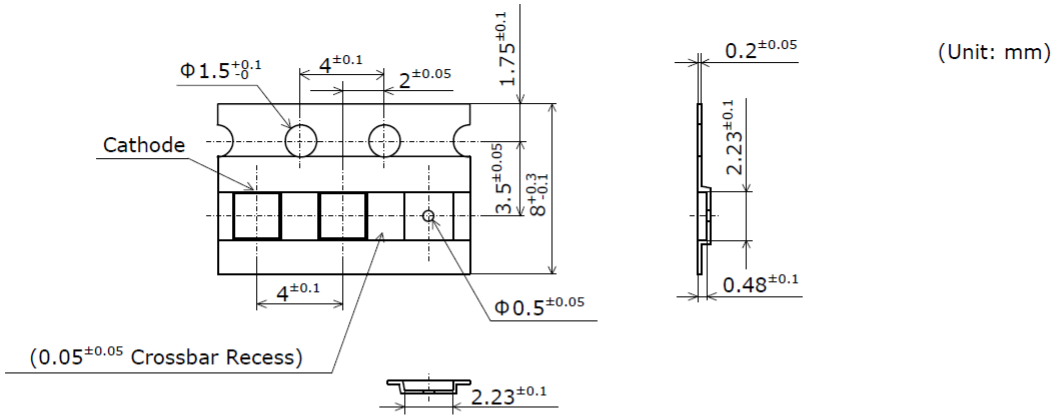
- After LEDs have been soldered, strongly recommend not to repair to keep the LEDs performance.
- Thicker solder will induce higher heat resistance. Thickness of solder is recommended to be thinner than 75um, at least 100um.

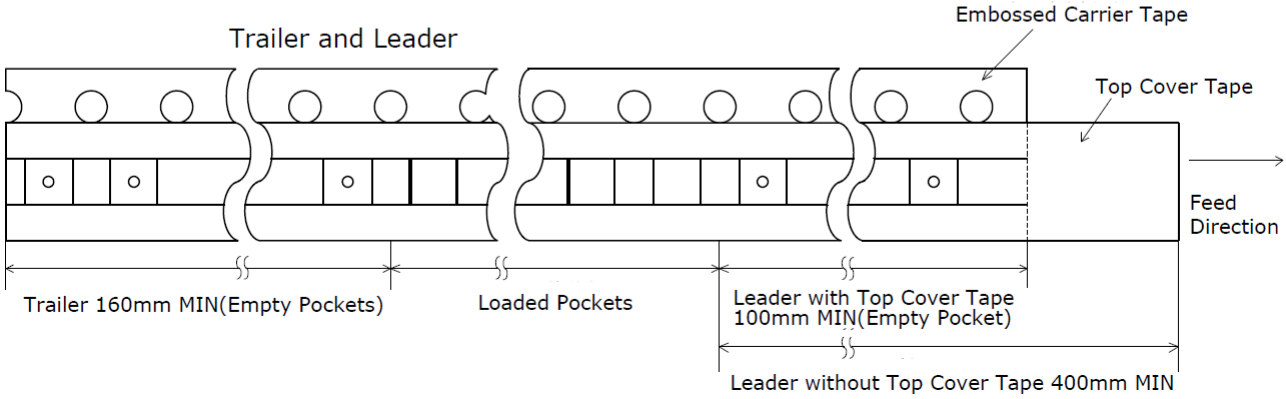


The void rate of the solder on heat transparent lower than 10% is recommended.

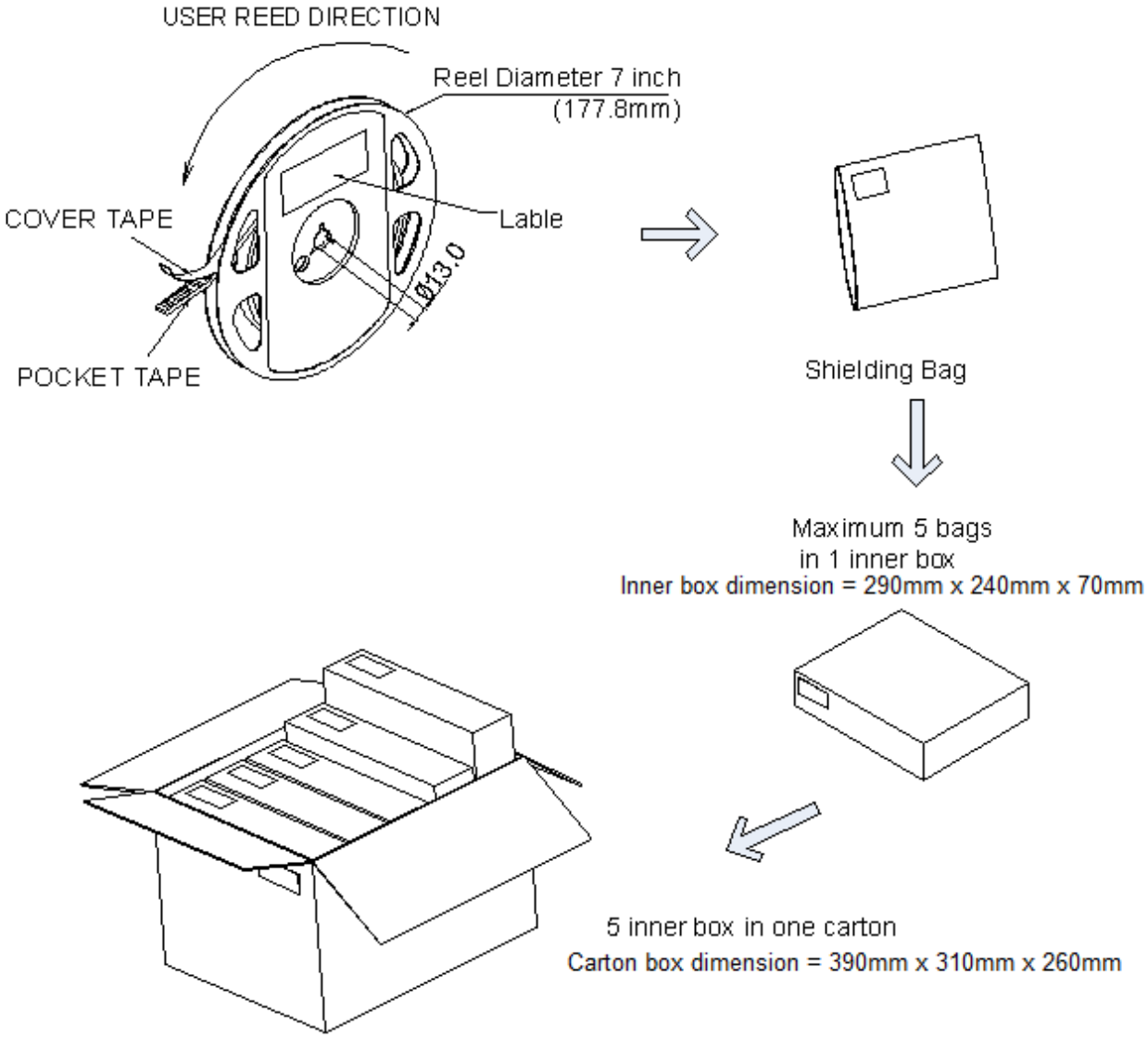


Taping & Packing:



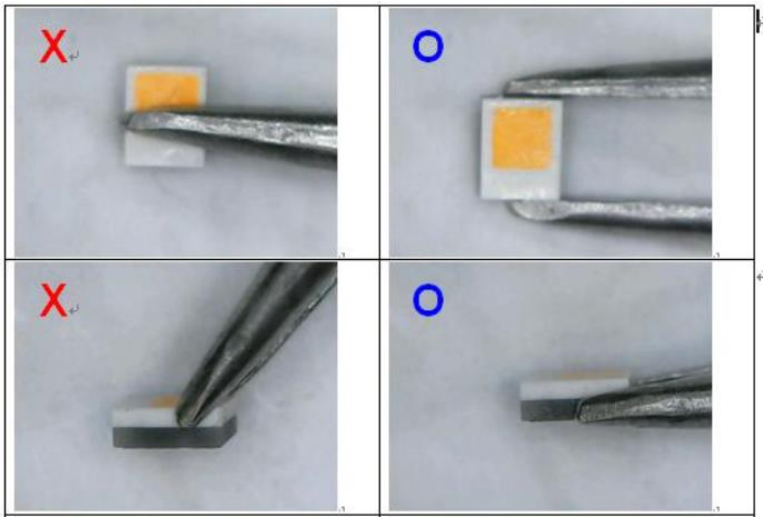


Unit : mm


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

Handling of LEDs

1. Under SMT process, mechanical stress on the LED surface should be avoided.
2. In general, LEDs should be handled from the side of the substrate, since the surface will be scratched or the white reflector will be peeled off.

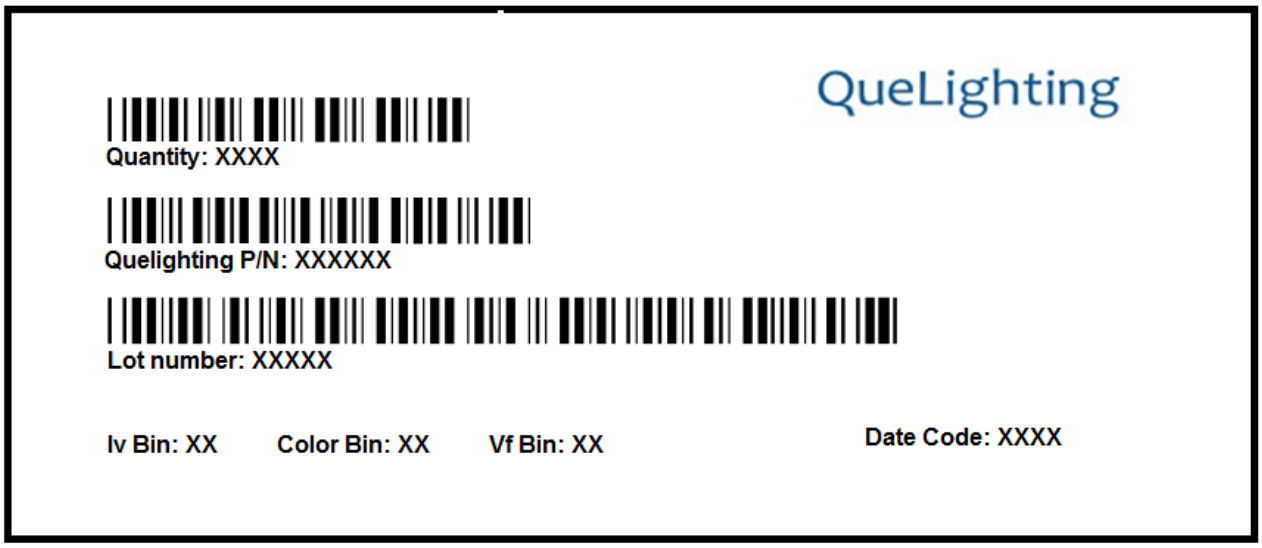


3. There are no restrictions on the form of the pick and place nozzle, except that mechanical stress on the surface of LED must be prevented. Lextar recommend that the material of nozzle is the rubber or the silicone, which the property is soft to prevent break the LED.

Soldering Notice and Conditions

Handling indications:
The sample cannot be picked up by touching the white PKG body. The sample must be picked up by gripping the side of the PKG substrate.

Labeling



Ordering Information:

Part #	Multiple Quantities	Quantity per Reel
QLSP12ZXV-302		6000pcs

Revision History:

Revision Date:	Changes:	Version #:
04-29-2021	Initial release	1.0