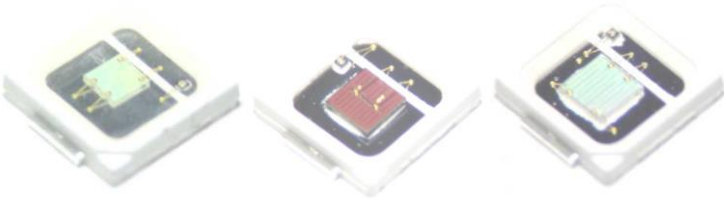
QueLighting



QLSP04XXU-XXX

(High Power color 3030 LEDs)

Product Outline:

This is the high power LED with reflector type. EMC 3030 Single color is a surface-mount LED which with heat sink to enhance operating performance. With special binning technology, these LEDs are ideal for architecture lighting and special lighting needs.

Features:

- High brightness output @ 350mA,
- High driving current to 700mA.
- Package Dimension = 3.2mmX3.0mmX0.6mm
- ESD protection up to 8KV
- RoHS compliant
- Custom Bin available upon special request

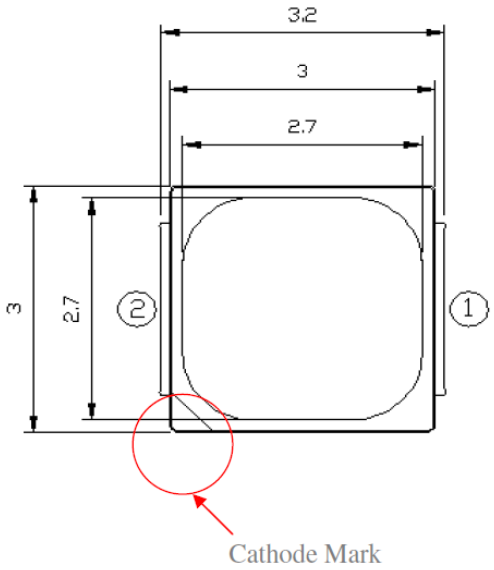
Application:

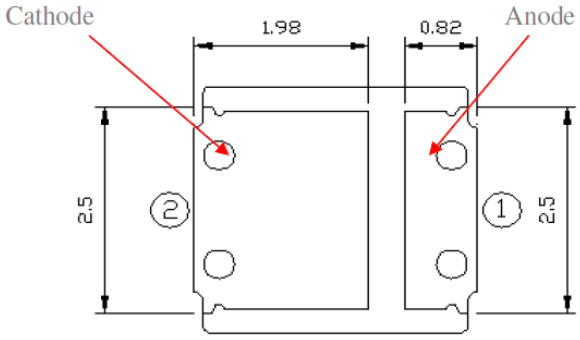
- Warning lamp
- Decoration lamp
- Architecture Lighting
- Garden Lighting

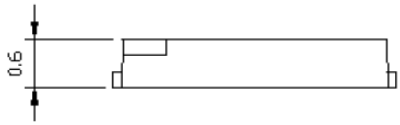
Compliance and Certification:

Mechanical Property:

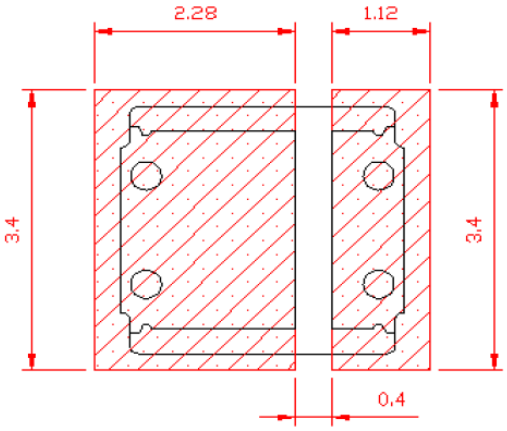
(Dimension)





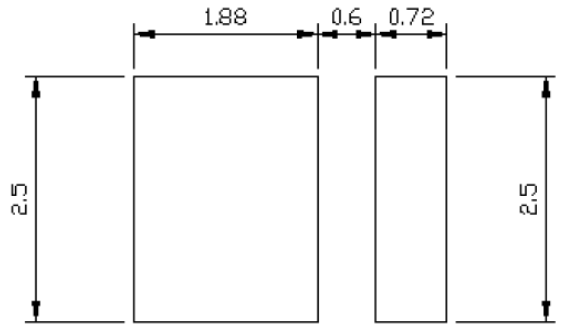


Recommended Solder Pad Design



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

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	700	mA
Leakage Current	Ir	1.0	μA
Power Dissipation	Pd	2.3	W
Pulse Forward Current	Ifp	1000	mA
LED Junction Temperature	TJ	125	℃
Storage Temperature	Tstg	-40 ~ 100	℃
Operation Temperature	Topr	-40 ~ 85	℃
Soldering Temperature	Tsol	260 < 10 sec	℃
ESD Sensitivity(HBM)		8	KV
Thermal Resistance	Rth	10	℃W

(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)

Product	Color	I_F(mA)	V_F(V)		Wavelength	Luminous Flux(lm)/mW		Refer @ 700mA Typ.(lm)/mW
			Typ.	max	nm	min	typ.	
QLSP04RBU	Royal Blue	350	3.2	3.5	450~460	18	20	33
QLSP04BU	Blue	350	3.2	3.5	460~475	26	33.6	56
QLSP04CGU	Cyan Green	350	3.2	3.5	495~515	60	70	120
QLSP04GU	Green	350	3.2	3.5	515~535	90	100	150
QLSP04RU	Red	350	2.4	2.6	615~630	40	44	76
QLSP04DRU	Deep Red	350	2.2	2.4	650~670	-	240mW	400mW
QLSP04CRU	Cherry Red	350	2	2.4	720~740	-	200mW	320mW

■ Groups

Dominant Wavelength

Wd (nm)			
Color	Code name	Min.	Max.
Royal Blue	DA	450	455
	DB	455	460
Blue	DC	460	465
	DD	465	470
	DE	470	475
Cyan Green	DI	495	500
	DJ	500	505
	DK	505	510
	DL	510	515

Green	DM	515	520
	DN	520	525
	DP	525	530
Red	A7	615	620
	A8	620	625
	A9	625	630
Deep Red	A145	650	660
	A165	660	670
Cherry Red	R720	720	730
	R730	730	740

Measurement tolerance is +/- 1nm

Forward Voltage (V_F) Bin:

VF Rank			
Color	**Code name**	**Low**	**High**
Royal Blue/ Blue/ Cyan Green/ Green	01	2.8	3.0
	23	3.0	3.2
	45	3.2	3.4
	67	3.4	3.6
Red/ Deep Red/ Cherry Red	PQ	1.8	2.0
	RS	2.0	2.2
	TU	2.2	2.4
	VW	2.4	2.6

The forward voltage tolerance is ± 0.1V

Luminous Flux Bin:

Rank @350mA (lm)			
Color	**Code name**	**Low**	**High**
Royal Blue /Blue	QJ9	20	30
	QN9	30	40
Cyan Green	QT9	60	70
	QU9	70	80
Green	QV9	80	90
	QW9	90	100
	QX9	100	110
Red	QP9	40	50
	QR9	50	60

luminous flux tolerance is ± 7%

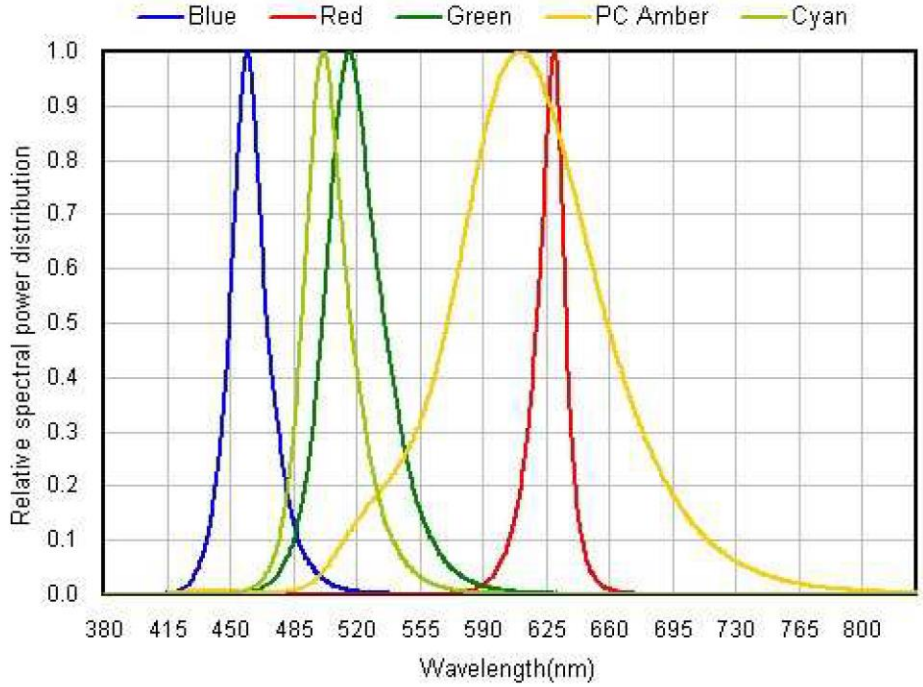
Radiometric power Bin:

Rank @ 350mA (mW)			
Color	**Code name**	**Low**	**High**
Deep Red/ Cherry Red	N015	150	200
	N020	200	250
	N025	250	300

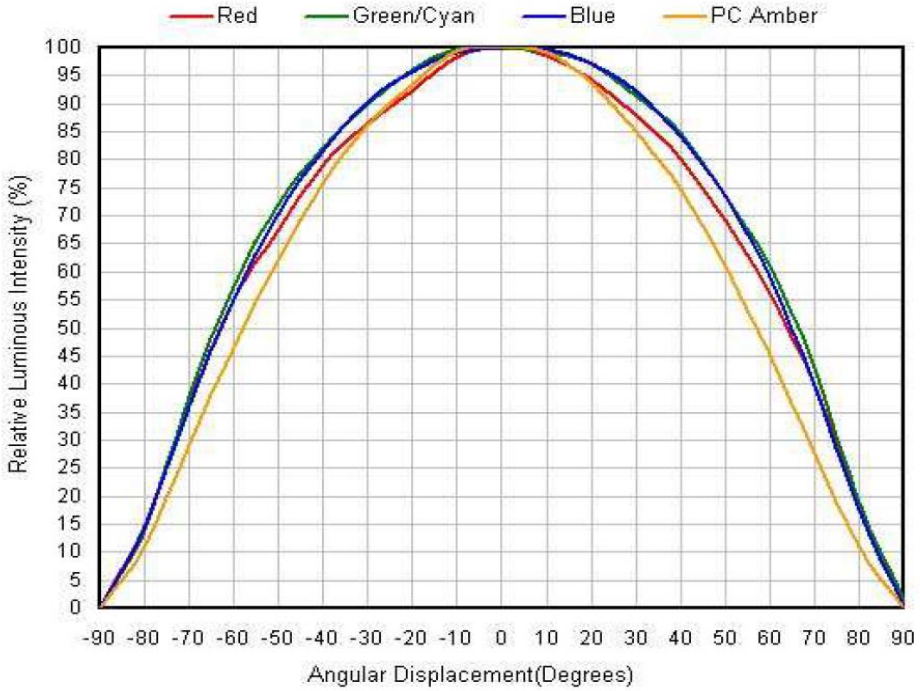
luminous flux tolerance is ± 10%

Characteristic Curves

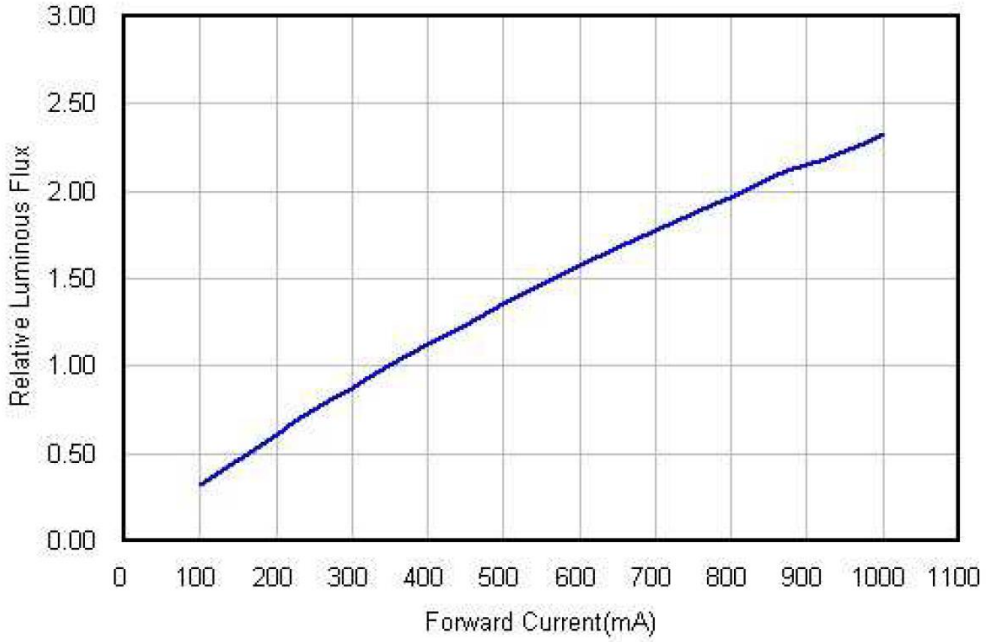
(1) Color Spectrum



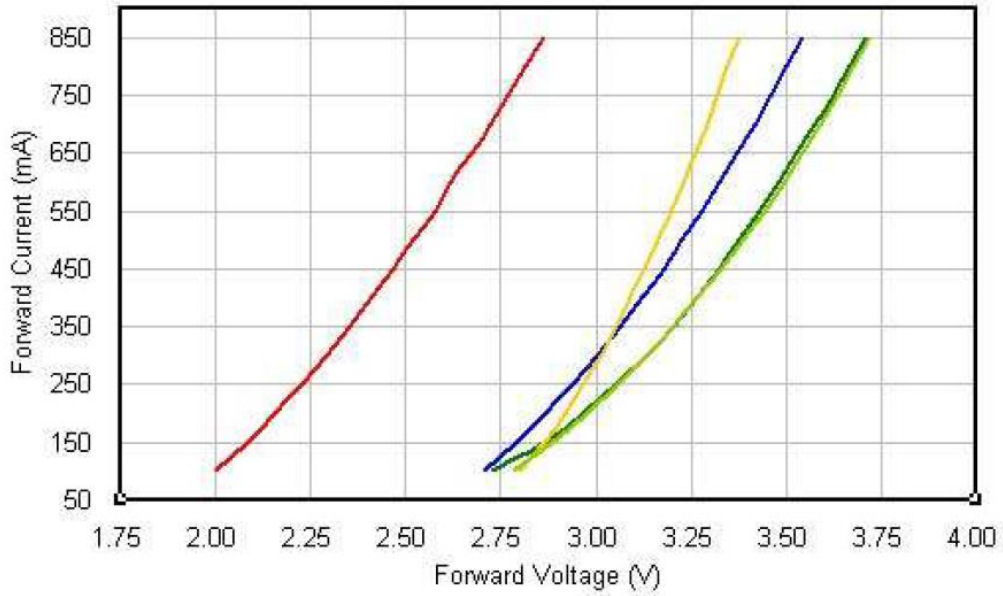
(2). Typical Representative Spatial Radiation Pattern



(3). Forward Current Characteristics



(4). Forward Current vs Forward Voltage



■ Reliability test:

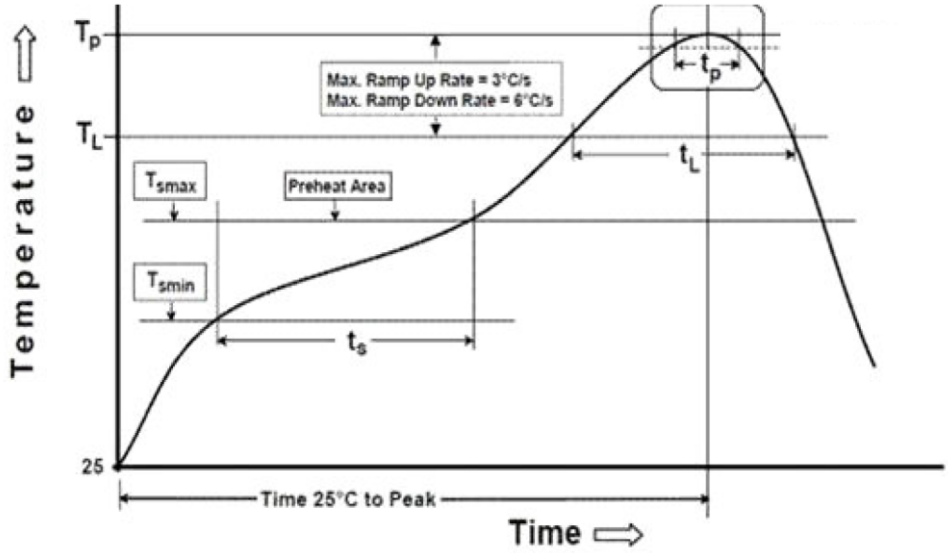
No	Item	Condition	Time/Cycle	Sample size
1	Steady State Operating Life of Room Temperature	25℃ Operating	1000 Hrs	20 pcs
2	Steady State Operating Life of Low Temperature -40℃	-40℃ Operating	1000 Hrs	20 pcs
3	Steady State Operating Life of Low Temperature 60℃	60℃ Operating	1000 Hrs	20 pcs
4	Steady State 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	350 mA	△Vf< 10%
Luminous Flux	Iv	350 mA	△Iv< 30%

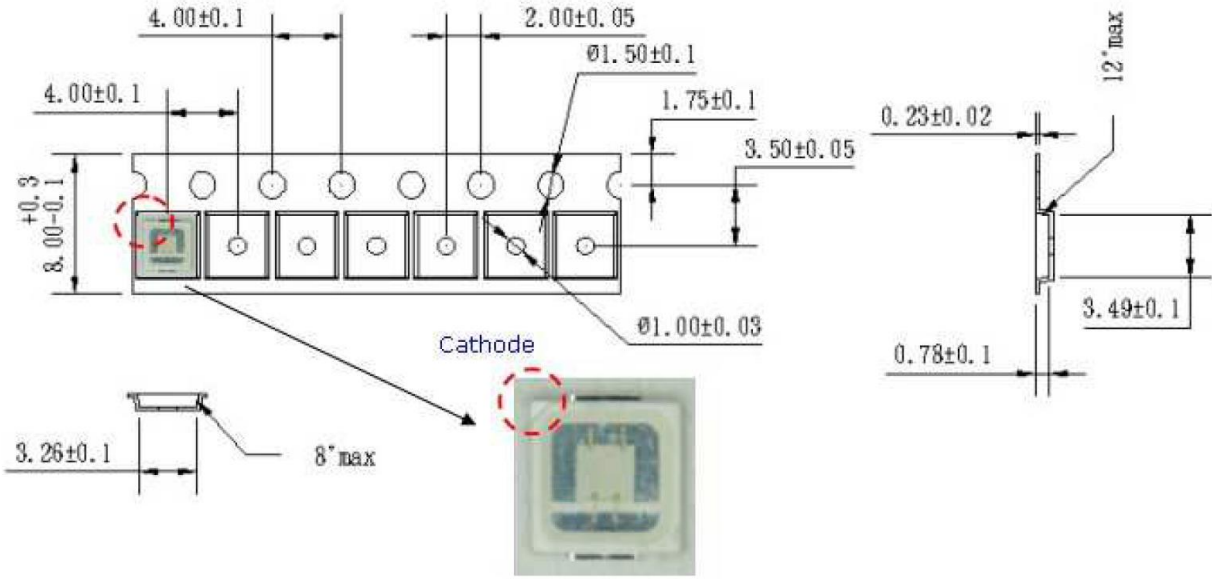
Solder Profile:

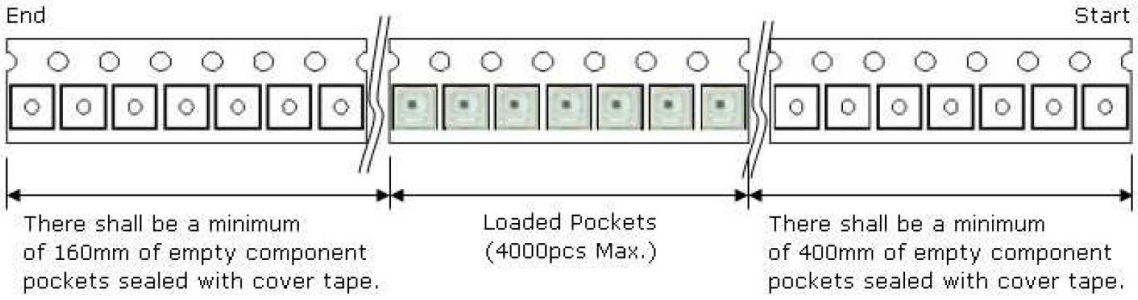
-The recommended reflow soldering profile is as follows (temperatures indicated are as measured on the surface of the LED resin):



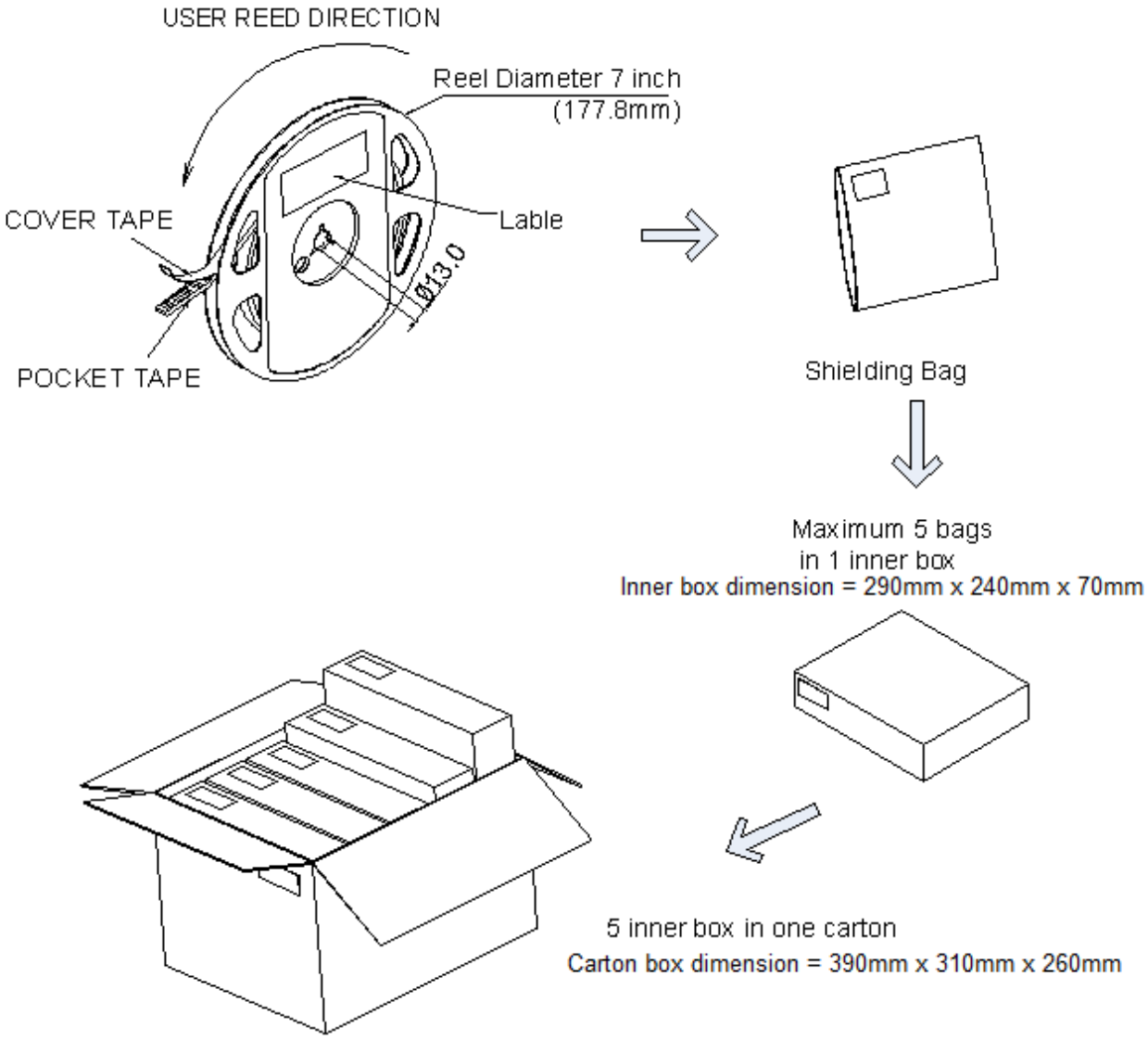
Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Temperature Min(T_{smin})	100℃	150℃
Temperature Max(T_{smax})	150℃	200℃
Time(t_a) from (T_{smin} to T_{smax})	60-120 seconds	60-120 seconds
Ramp-up rate(T_L to T_P)	3℃/second max.	3℃/second max.
Liquidous Temperature(T_L)	183℃	217℃
Time(t_L) maintained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

Taping & Packing:

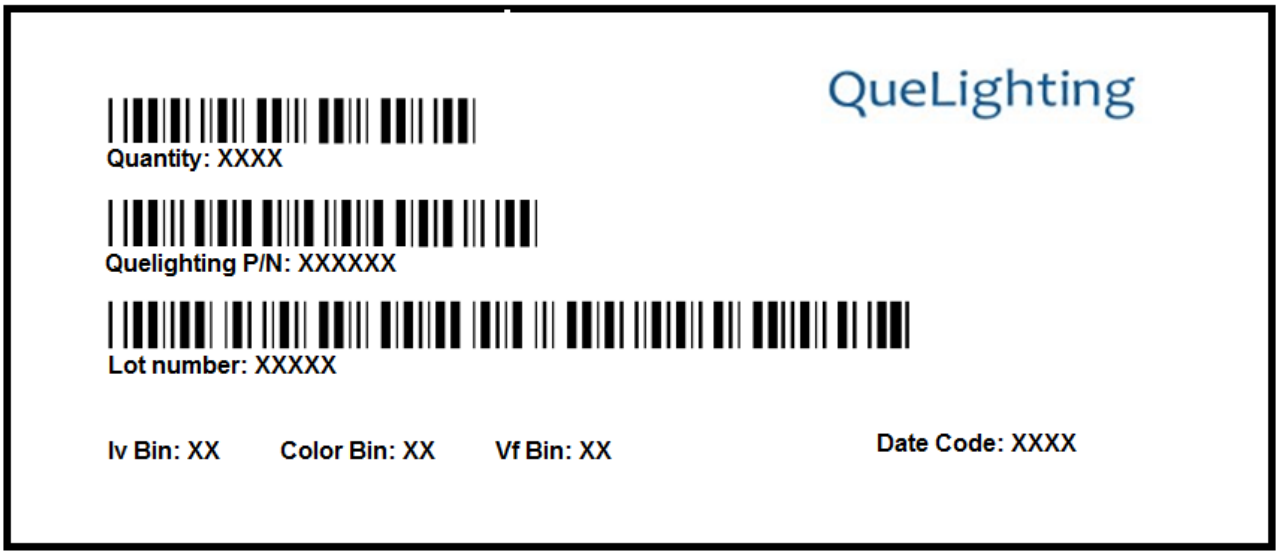




Unit : mm


USER REED DIRECTION
Reel Diameter 7 inch
(177.8mm)
COVER TAPE
Lable
ϕ13.0
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
QLSP04XXU-XXX		2000 pcs

Revision History:

Revision Date:	Changes:	Version #:
03-30-2017	Initial release	1.0
08-01-2018	Add color on Royal Blue, Cyan Green, Deep Red, Cherry Red	1.1