



Q QUELIGHTING
Sustainable Lighting Solution



QLSP20XXAU
(High Power 2020 LED)



Product Outline:

QLSP20XXAU series are color LEDs bring high performance and quality of light to wide range of lighting application. The lighting application such as cation light, decoration light, signal, specific industrial and commercial lighting.

Features:

- High brightness output @ 350mA,
- High driving current to 1000mA
- Package Dimension = 2.0mmX2.0mmX1.65mm
- Low thermal resistance : <math><6^{\circ}\text{C/W}</math>
- ESD protection up to 2KV
- RoHS compliant
- Custom Bin available upon special request

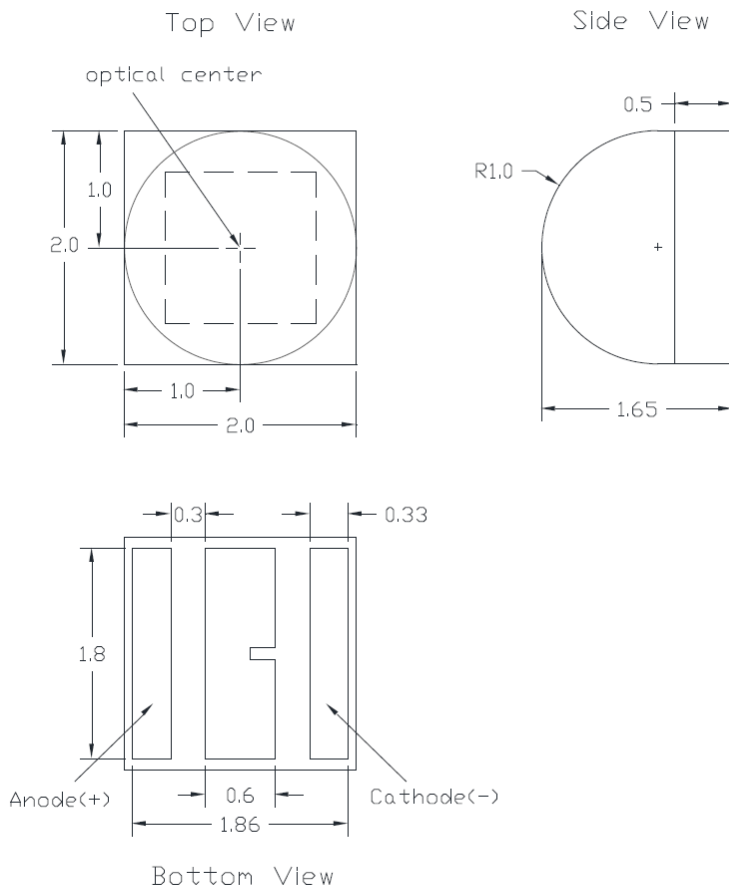
Application:

- Architecture Lighting
- Garden Lighting
- Exterior Automotive Lighting
- Warming lamp
- Indoor Lighting
- Outdoor Lighting

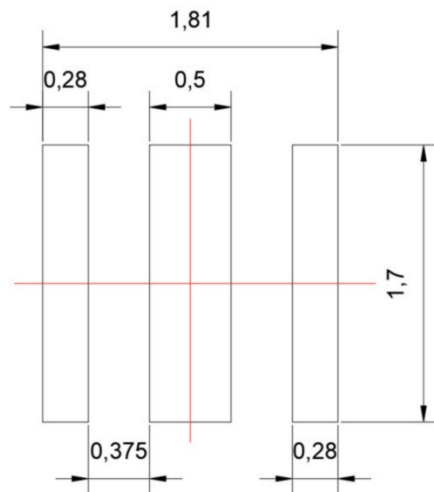
Compliance and Certification:



Mechanical Property: (Dimension)



Recommended Solder footprint:



Electrical / Optical Characteristic

(T=25 °C)

Product	Color	I _F (mA)	V _F (V)		Wavelength nm (CCT)	Luminous Flux(lm)		Refer @ 700mA Typ.(lm)
			Typ.	max		min	typ.	
QLSP20BAU	Blue	350	3.0	3.4	465~485	31	40	71
QLSP20GAU	Green	350	3.0	3.4	515~535	100	120	210
QLSP20PCAAU	PC Amber	350	3.0	3.4	NA	100	105	190
QLSP20RAU	Red	350	2.2	2.6	615~630	60	70	125
QLSP20WCAU	Cold White	350	3.0	3.4	5000K~6000K	130	150	268

*Tolerance = +/- 7%

Absolute Maximum Rating

(T=25 °C)

Part #	P _d (mW)	I _F (mA)	I _{FP} (mA)*	V _R (V)	T _j (°C)	TOP (°C)	T _{ST} (°C)	T _{SOL} (°C)**	R _{th(J-S)} (C/W)***
QLSP20BAU	4000	1000	1300	5	125	-40~90	-40~100	260	6
QLSP20GAU	4000	1000	1300	5	125	-40~90	-40~100	260	6
QLSP20PCAAU	4000	1000	1300	5	150	-40~90	-40~100	260	6
QLSP20RAU	4000	1000	1300	5	125	-40~90	-40~100	260	6
QLSP20WCAU	4000	1000	1300	5	150	-40~90	-40~100	260	6

*Duty 1/10 @ 10Khz

** IR Reflow for no more than 10 sec @ 260 °C

*** Junction to substrate

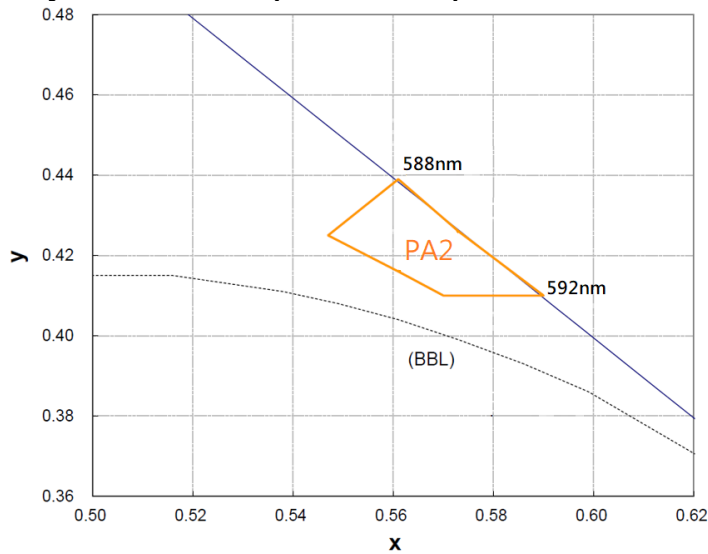


Dominate Wavelength (nm) Bin:

Wd (nm)			
Color	Code name	Min.	Max.
Blue	DD	465	470
	DE	470	475
	DF	475	480
	DG	480	485
Green	DM	515	520
	DN	520	525
	DP	525	530
Red	A7	615	620
	A8	620	625
	A9	625	630

Measurement tolerance is +/- 1nm

Chromaticity Coordinates (PC Amber)

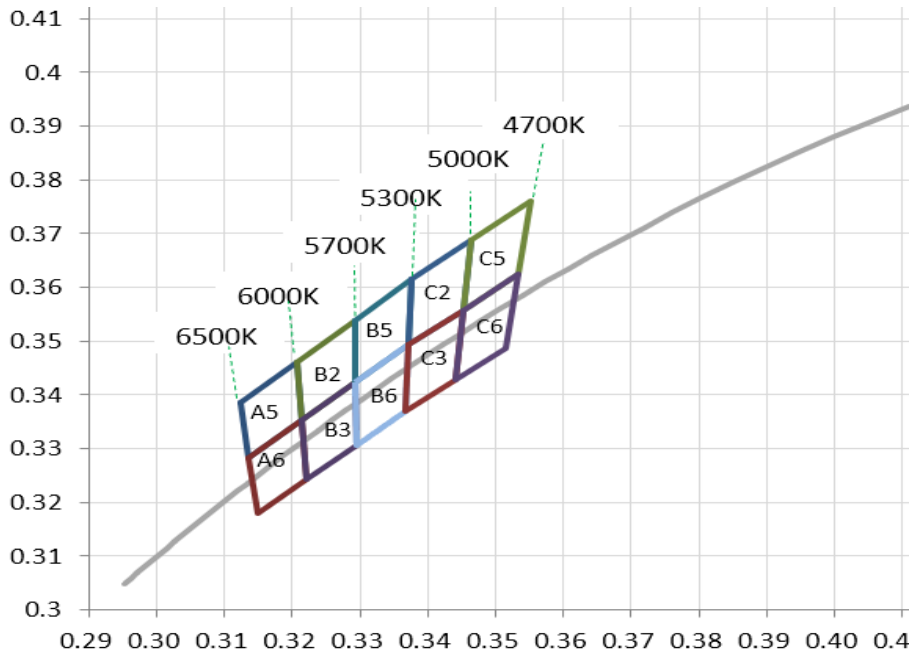


Bin code	CIE-X	CIE-Y
PA2	0.547	0.425
	0.57	0.41
	0.59	0.41
	0.561	0.439

Note : 1. Correlated color temperature is derived from the CIE 1931 chromaticity diagram
2. CIE measurement tolerance is ± 0.007



Chromaticity Coordinates (Cold White)



6000~6500K				5700~6000K				5300~5700K			
A5		A6		B2		B3		B5		B6	
CIE X	CIE Y	CIE X	CIE Y	CIE X	CIE Y	CIE X	CIE Y	CIE X	CIE Y	CIE X	CIE Y
0.3123	0.3385	0.3136	0.3283	0.3207	0.3462	0.3215	0.3353	0.3292	0.3539	0.3293	0.3423
0.3207	0.3462	0.3215	0.3353	0.3292	0.3539	0.3293	0.3423	0.3376	0.3616	0.3371	0.3493
0.3215	0.3353	0.3222	0.3243	0.3293	0.3423	0.3294	0.3306	0.3371	0.3493	0.3366	0.3369
0.3136	0.3283	0.315	0.318	0.3215	0.3353	0.3222	0.3243	0.3293	0.3423	0.3294	0.3306
0.3123	0.3385	0.3136	0.3283	0.3207	0.3462	0.3215	0.3353	0.3292	0.3539	0.3293	0.3423

5000~5300K				4700~5000K			
C2		C3		C5		C6	
CIE X	CIE Y	CIE X	CIE Y	CIE X	CIE Y	CIE X	CIE Y
0.3376	0.3616	0.3371	0.3493	0.3464	0.3688	0.3452	0.3558
0.3464	0.3688	0.3452	0.3558	0.3551	0.376	0.3533	0.3624
0.3452	0.3558	0.3441	0.3428	0.3533	0.3624	0.3515	0.3487
0.3371	0.3493	0.3366	0.3369	0.3452	0.3558	0.3441	0.3428
0.3376	0.3616	0.3371	0.3493	0.3464	0.3688	0.3452	0.3558

Note : 1. Correlated color temperature is derived from the CIE 1931 chromaticity diagram
2. CIE measurement tolerance is ± 0.007



Forward Voltage (VF) Bin:

VF Rank (V)			
Color	Code name	Low	High
Blue/ Green/ PC Amber/ Cold White	01	2.8	3.0
	23	3.0	3.2
	45	3.2	3.4
	67	3.4	3.6
Red	NO	1.6	1.8
	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 $\pm 0.1V$

Luminous Flux Bin:

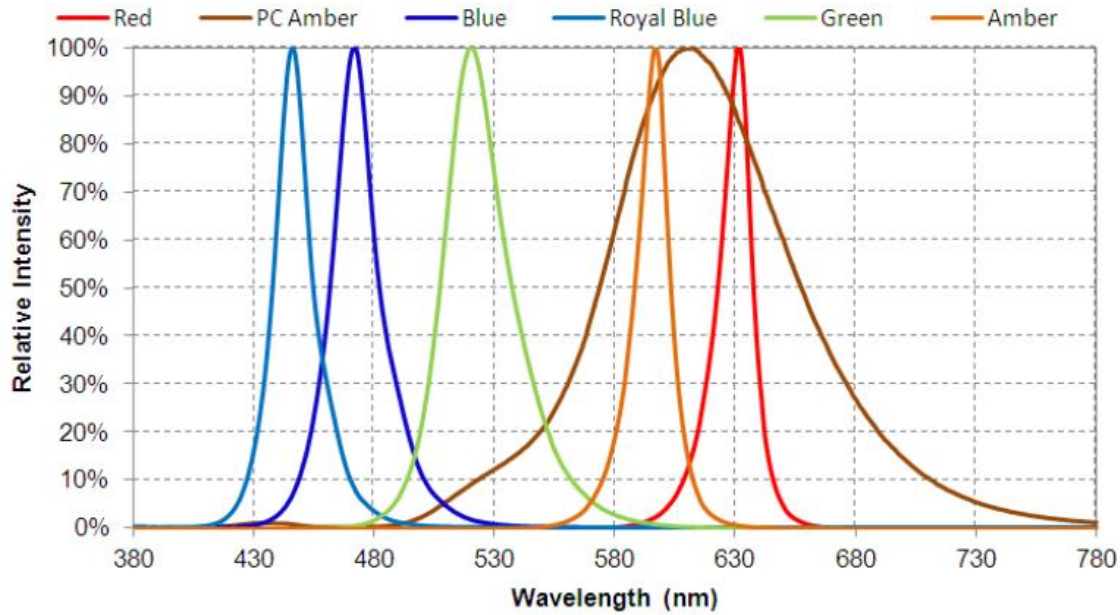
Rank @350mA (lm)			
Color	Code name	Low	High
Blue	QN9	30	40
	QP9	40	50
Green	QX9	100	110
	QY9	110	120
	QZ9	120	130
PC Amber	QX9	100	110
	QY9	110	120
Red	QT9	60	70
	QU9	70	80
Cold White	Q19	140	150
	Q29	150	160
	Q39	160	170

luminous flux tolerance is $\pm 7\%$

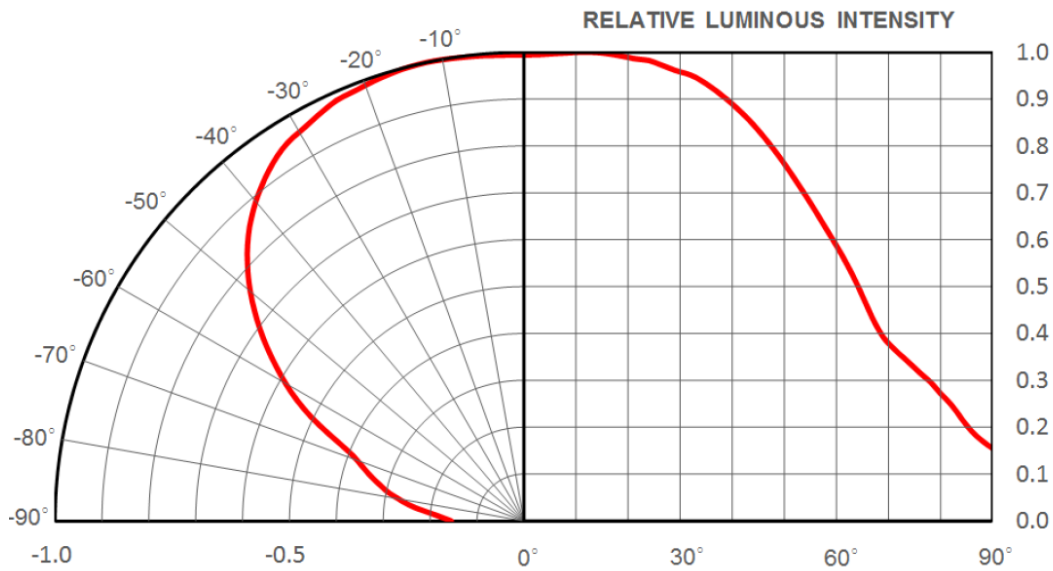


Characteristic Curves

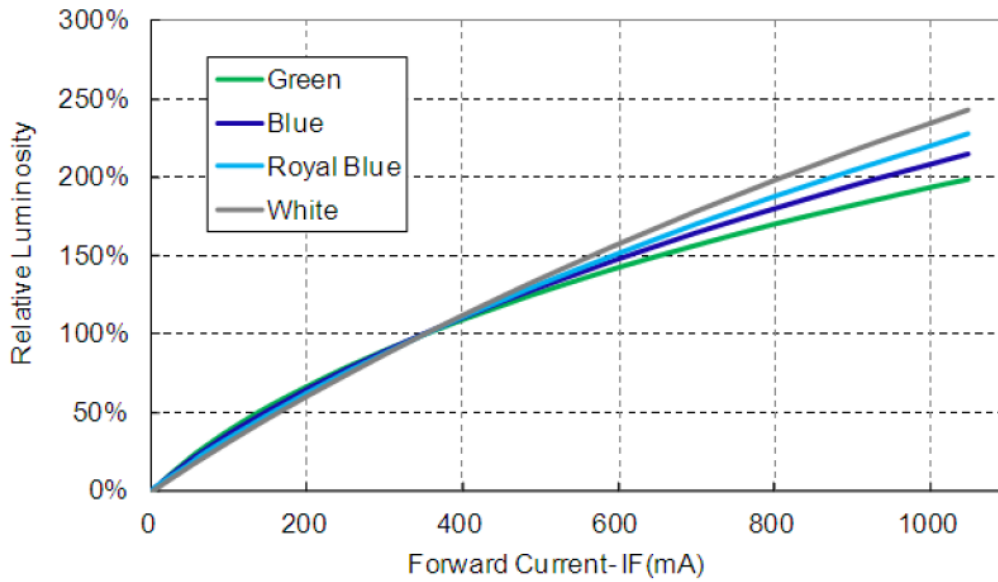
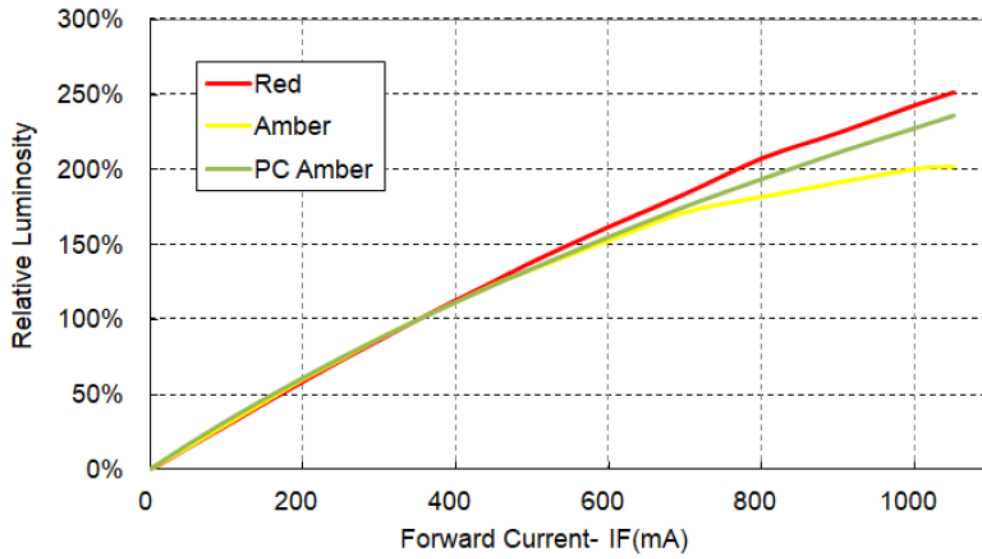
(1) Color Spectrum



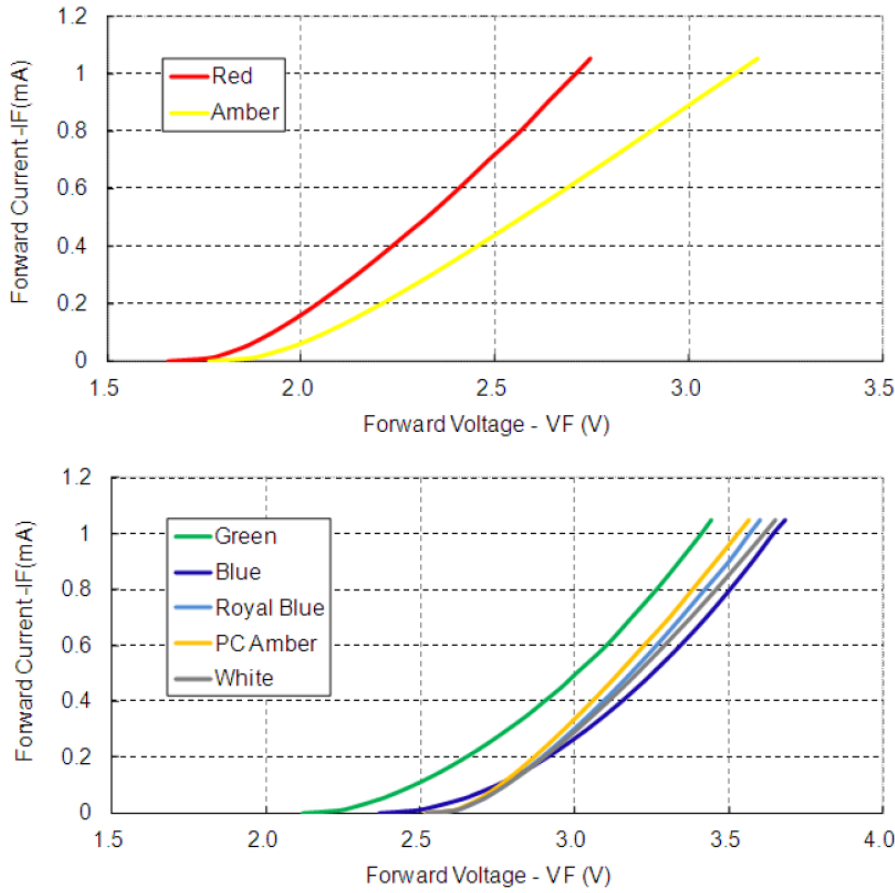
(2). Typical Representative Spatial Radiation Pattern



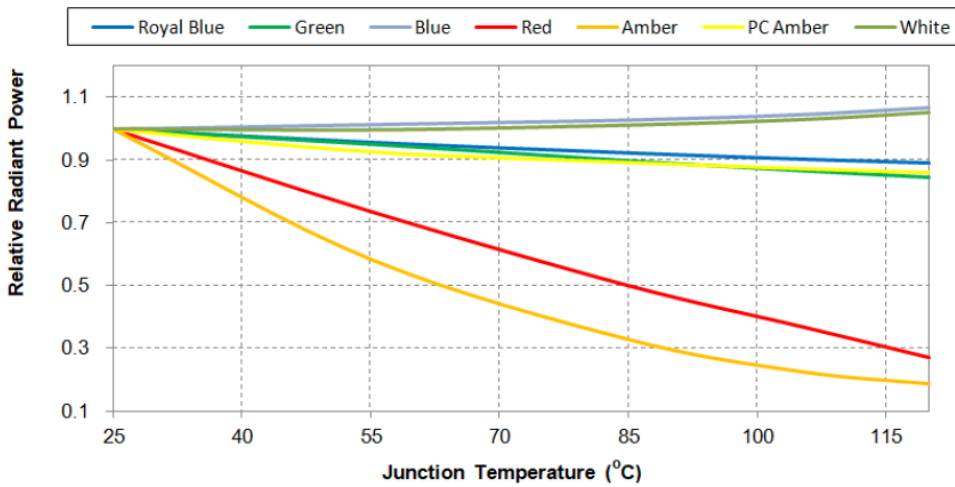
(3). Forward Current Characteristics



(4). Forward Current vs Forward Voltage



(5). Relative light output VS. T_j ($I_F = 350\text{mA}$)



■ **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~ 5minr~100°C /20min	300 Cycle	20 pcs

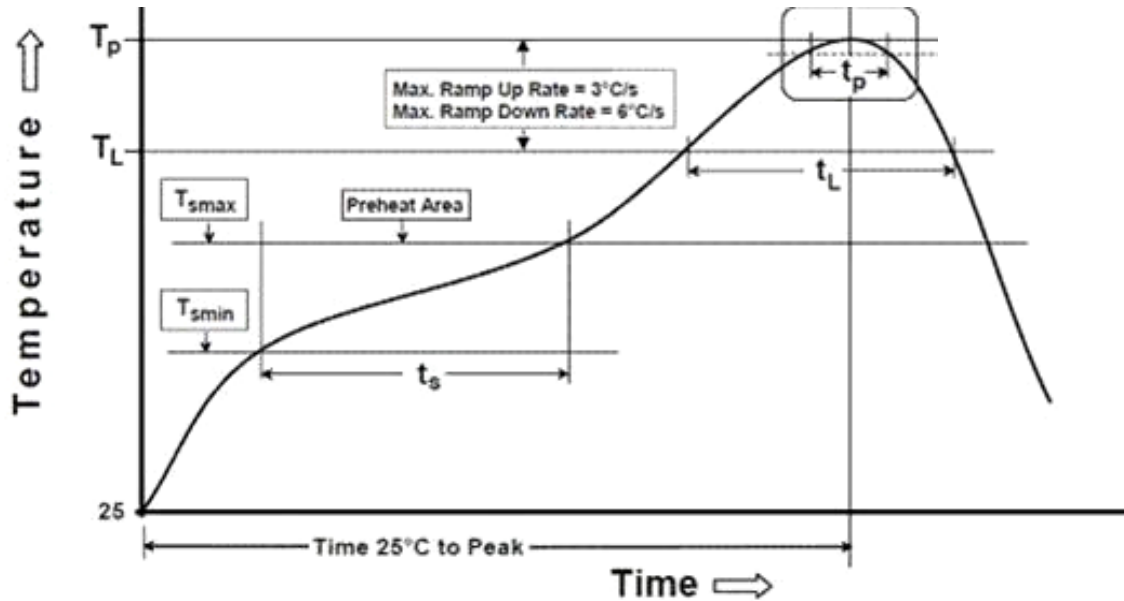
■ **Judgment Criteria:**

Item	Symbol	Test Condition	Judgment Criteria
Forward Voltage	Vf	350 mA	$\Delta Vf < 10\%$
Luminous Flux	Iv	350 mA	$\Delta Iv < 30\%$



Solder Profile:

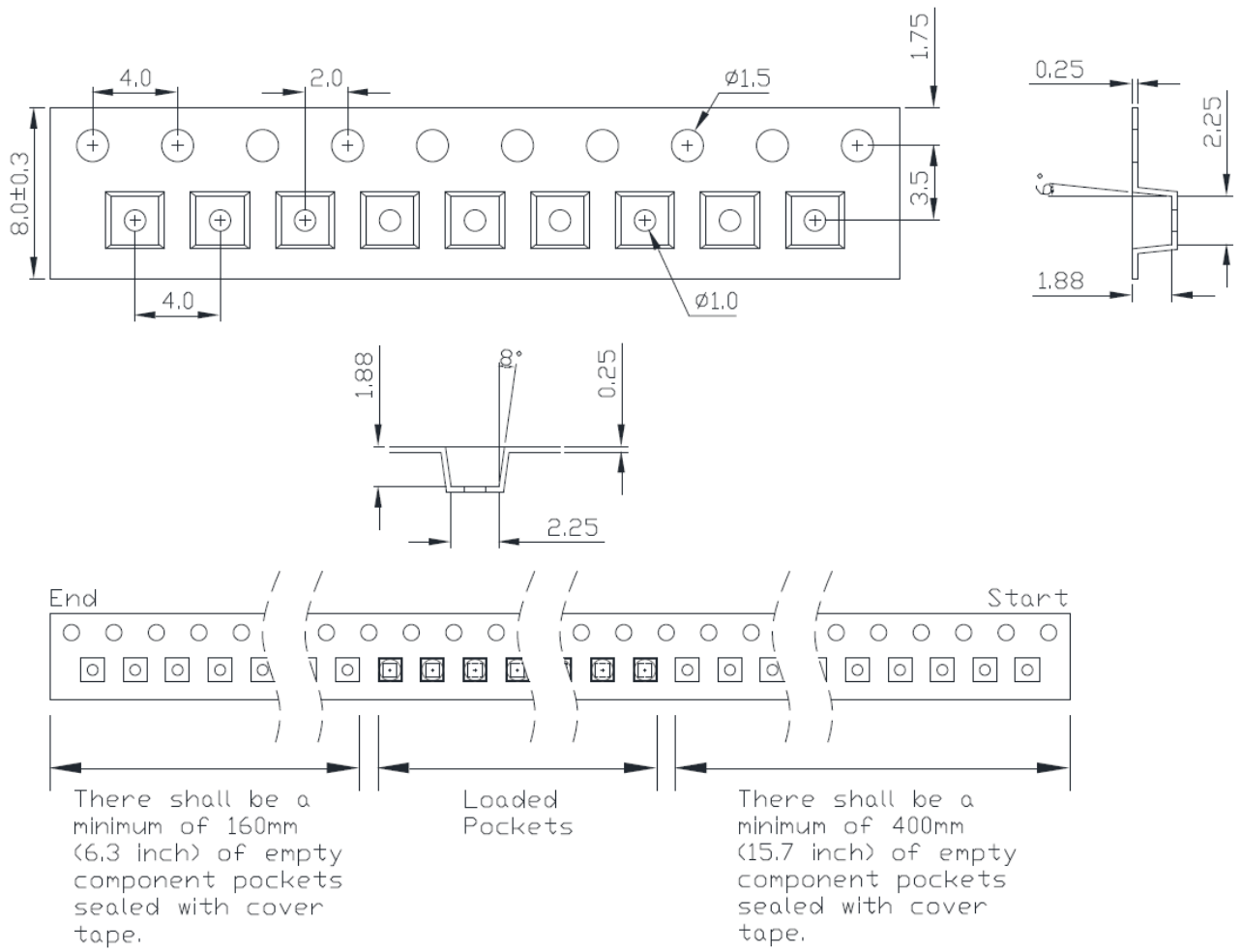
-The recommended reflow soldering profile is as follows (temperatures indicated are as measured on the surface of the LED resin):

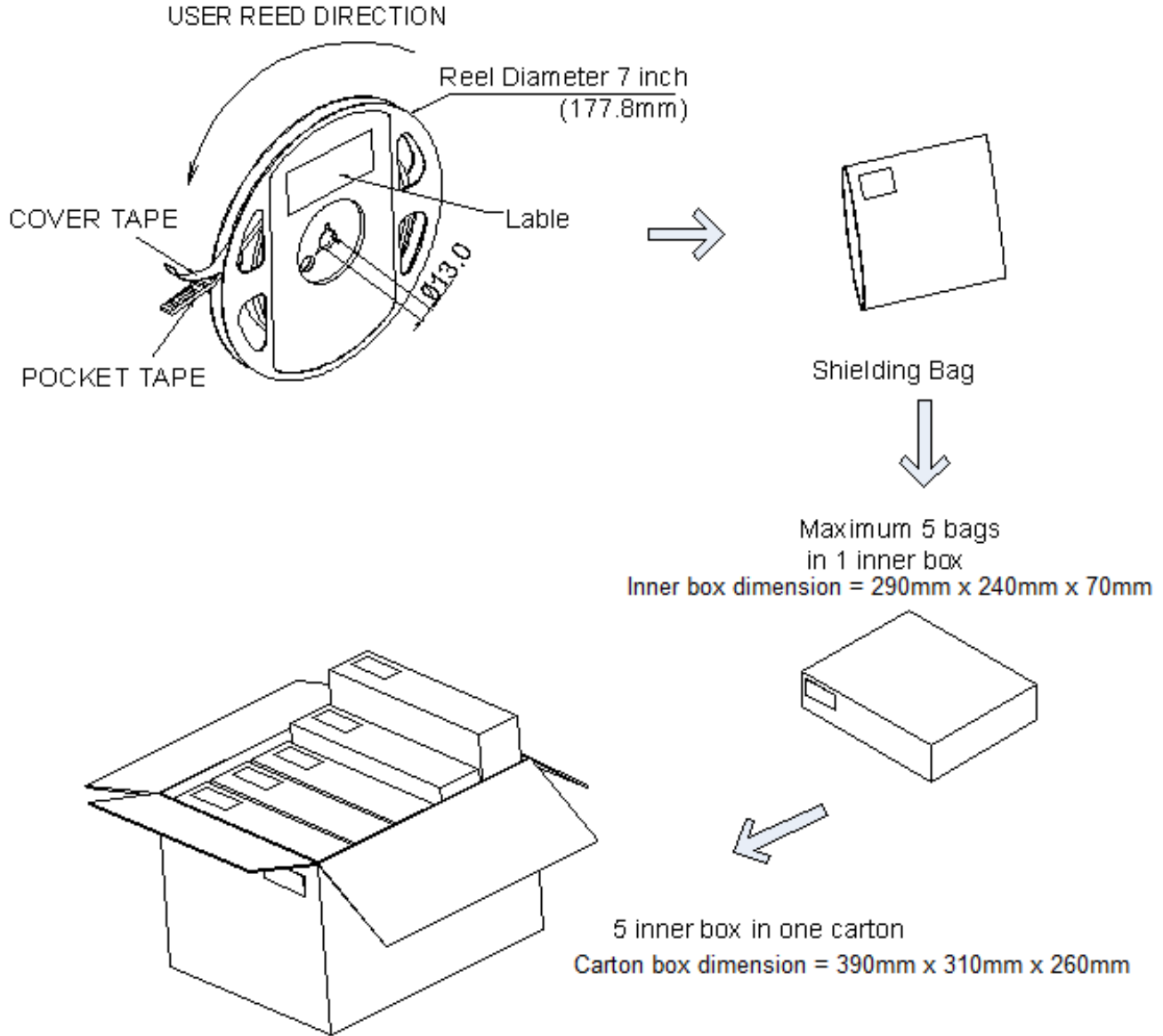


Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Temperature Min(T_{smin})	100°C	150°C
Temperature Max(T_{smax})	150°C	200°C
Time(t_a) from (T_{smin} to T_{smax})	60-120 seconds	60-120 seconds
Ramp-up rate(T_L to T_p)	3°C/second max.	3°C/second max.
Liquidous Temperature(T_L)	183°C	217°C
Time(t_L)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

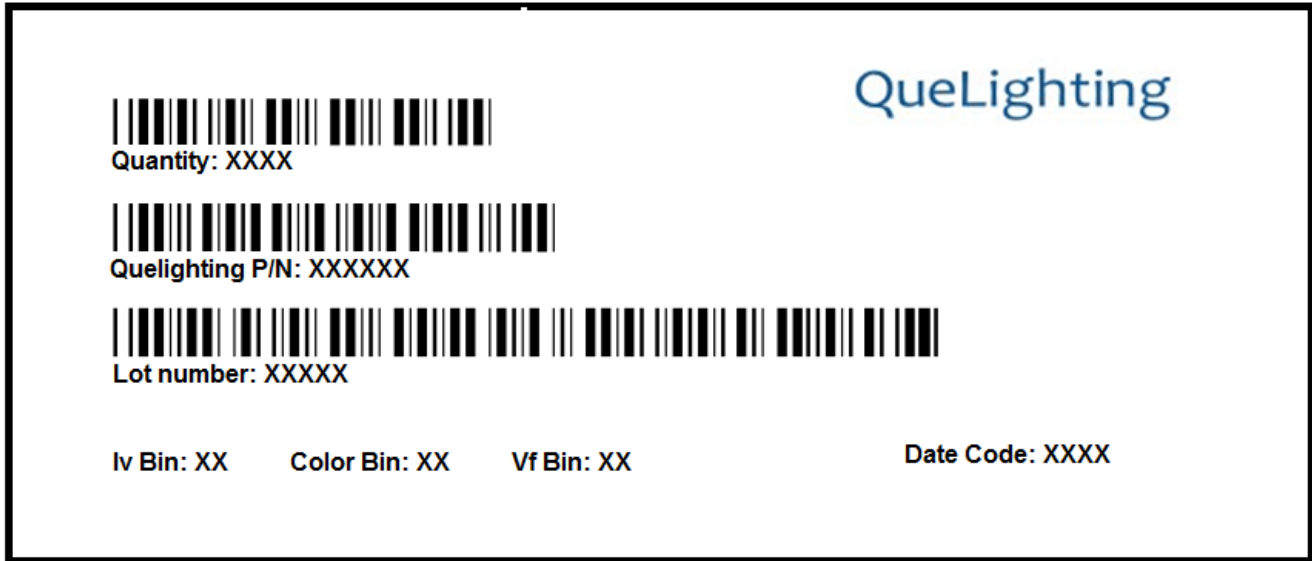


Taping & Packing:





Labeling



Ordering Information:

Part #	Multiple Quantities	Quantity per Reel
QLSP20XXAU		500/1000/2000 pcs



Revision History:

Revision Date:	Changes:	Version #:
06-16-2021	Initial release	1.0
11-02-2023	Update the performance	1.1

