



QLSP04DRH
(Color 3030 LEDs)



Product Outline:

This is the high efficiency 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:

- Deep Red 660nm
- High brightness output @ 150mA,
- High driving current to 200mA.
- Package Dimension = 3.2mmX3.0mmX0.6mm
- RoHS compliant
- Custom Bin available upon special request

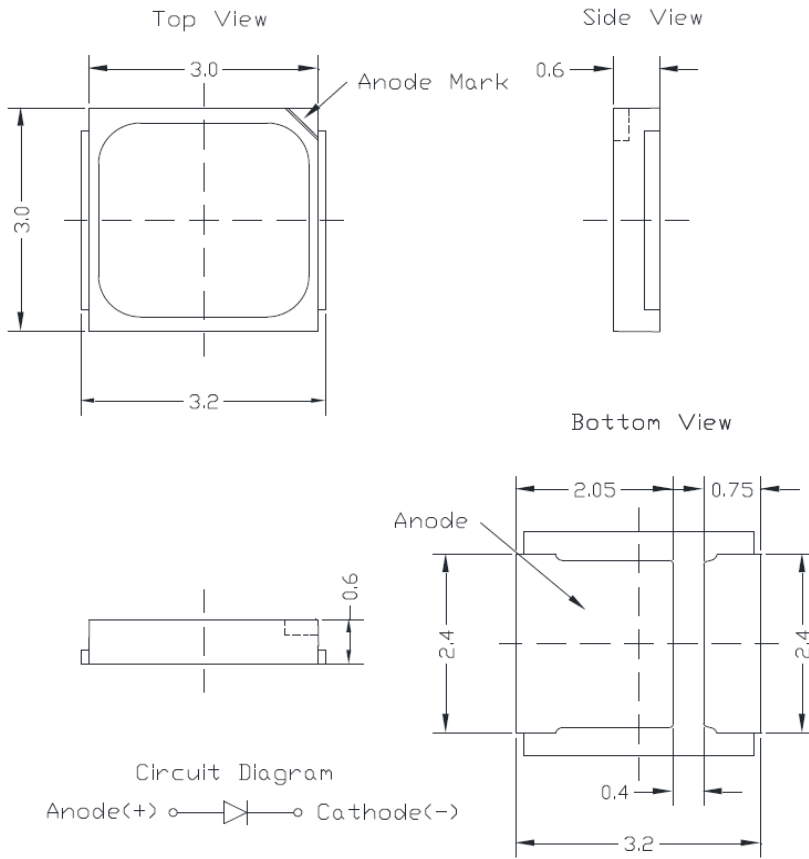
Application:

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

Compliance and Certification:

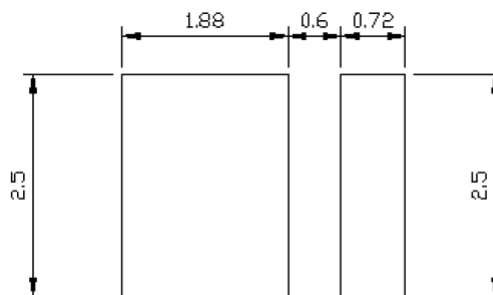


Mechanical Property: (Dimension)



- * All dimensions are in millimeters,
- * Tolerances are $\pm 0.10\text{mm}$.

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°C)

Parameter	Symbol	Rating	Unit
DC Forward Current	I _f	200	mA
Leakage Current	I _r	1.0	μA
Power Dissipation	P _d	0.6	W
Pulse Forward Current	I _{fp}	240	mA
LED Junction Temperature	T _J	125	°C
Storage Temperature	T _{stg}	-40 ~ 100	°C
Operation Temperature	T _{opr}	-40 ~ 85	°C
Soldering Temperature	T _{sol}	260 < 10 sec	°C
ESD Sensitivity(HBM)		8	KV
Thermal Resistance	R _{th}	10	°CW

(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 nm	Brightness (lm/mW)	
			Typ.	max		min	typ.
QLSP04DRH	Deep Red	150	2.0	2.6	650~670		135 mW



Radiometric Power Bin Structure at 150mA

Product	Color	Radiometric Power (mW)		PPF (μmol/s)		PPF/W (μmol/J) Typ.
		min.	max.	min.	max.	
QLSP04DRH	Deep Red	120	140	0.64	0.75	2.4

■ Groups

Dominant Wavelength

Wd (nm) @ 150mA			
Color	Code name	Min.	Max.
Deep Red	A145	650	660
	A165	660	670

Measurement tolerance is +/- 1nm

Forward Voltage (V_F) Bin:

VF Rank @ 150mA (Vf)			
Color	Code name	Low	High
Deep Red	PQ	1.8	2.0
	RS	2.0	2.2
	TU	2.2	2.4

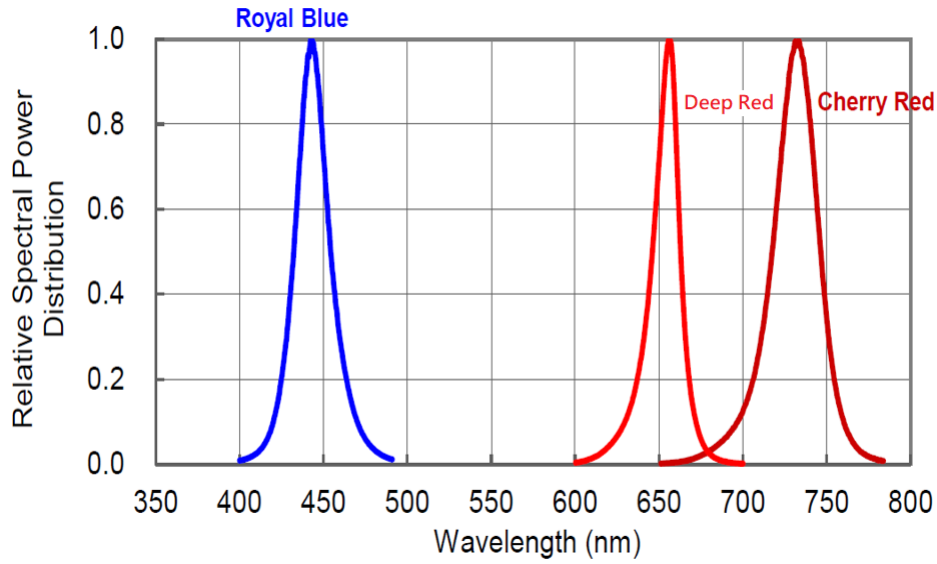
The forward voltage tolerance is ± 0.1V

Rank @ 150mA (mW)			
Color	Code name	Low	High
Deep Red	H2	120	130
	J1	130	140

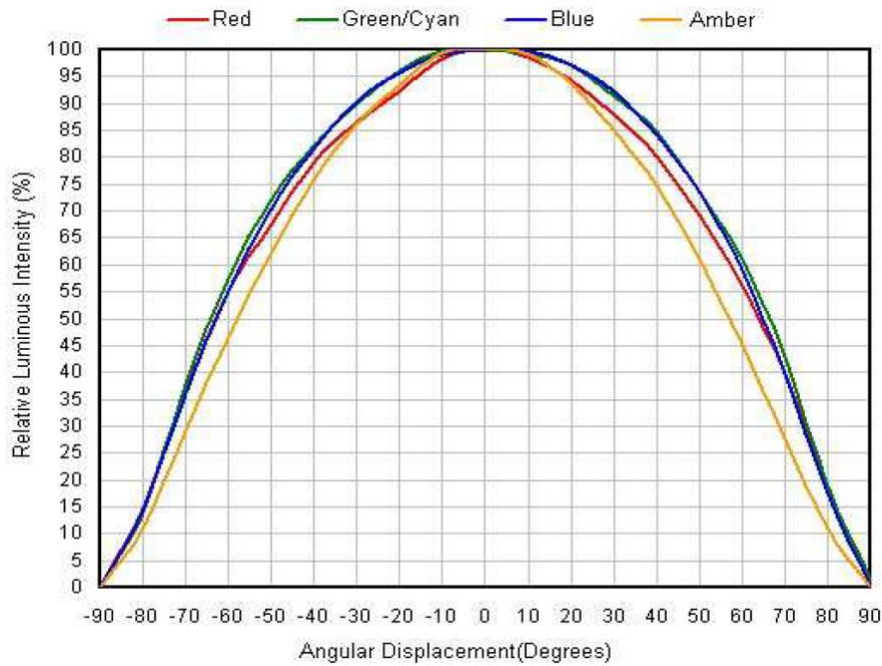


Characteristic Curves

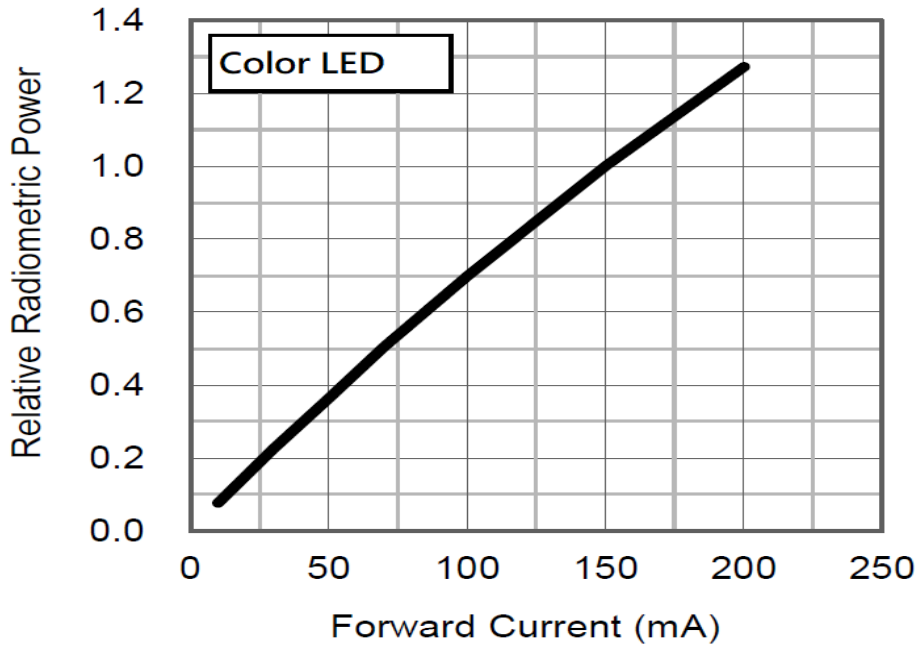
(1) Color Spectrum



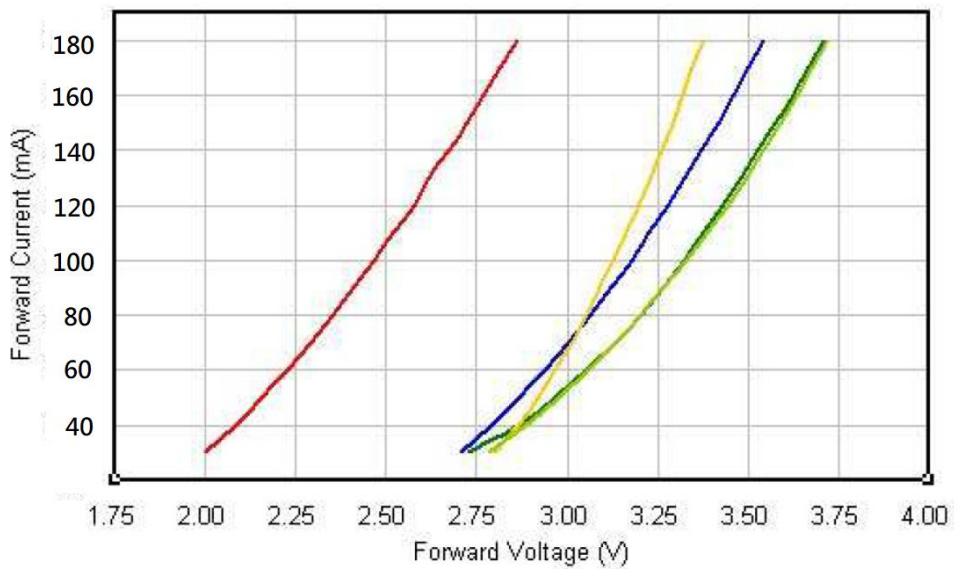
(2). Typical Representative Spatial Radiation Pattern



(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°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 T _{sld} 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/ 20minr~ 5minr~100°C /20min	300 Cycle	20 pcs

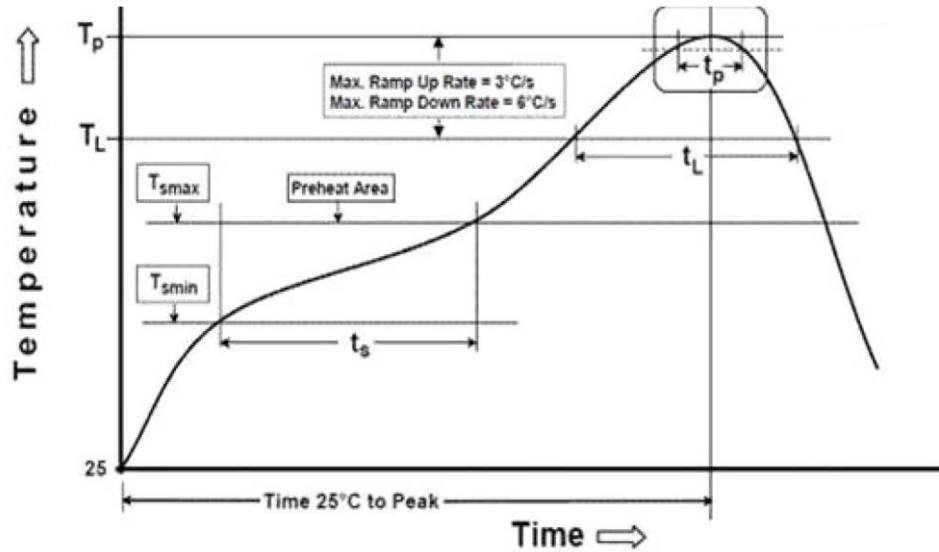
■ Judgment Criteria:

Item	Symbol	Test Condition	Judgment Criteria
Forward Voltage	V _f	150 mA	ΔV _f < 10%
Luminous Flux	I _v	150 mA	ΔI _v < 30%



Solder Profile:

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

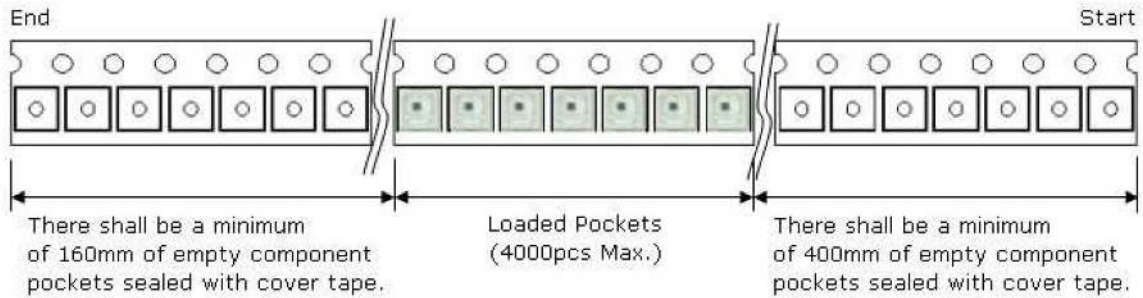
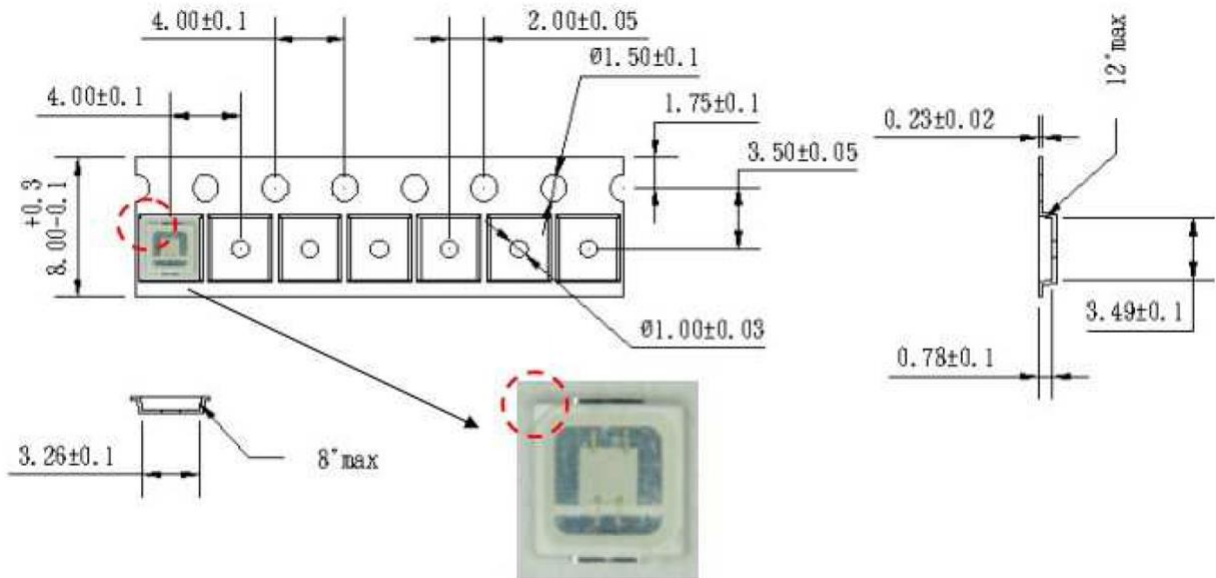


Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Temperature Min(T_{smin})	100°C	150°C
Temperature Max(T_{smax})	150°C	200°C
Time(t_a) from (T_{smin} to T_{smax})	60-120 seconds	60-120 seconds
Ramp-up rate(T_L to T_p)	3°C/second max.	3°C/second max.
Liquidous Temperature(T_L)	183°C	217°C
Time(t_L)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

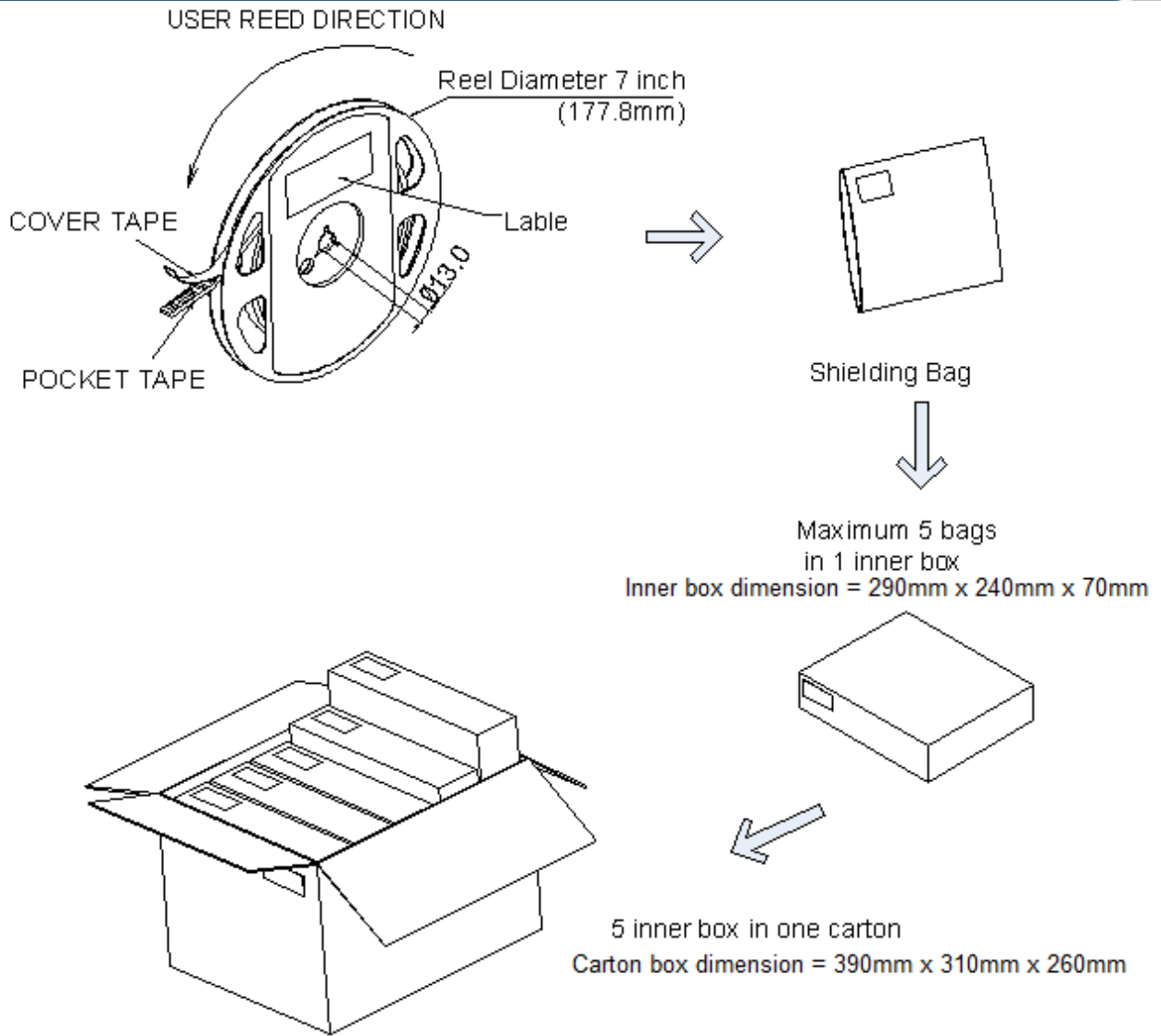


Taping & Packing:





Unit : mm






Labeling






Quantity: XXXX



Quelighting P/N: XXXXXX



Lot number: XXXXX

Iv Bin: XX

Color Bin: XX

Vf Bin: XX

Date Code: XXXX

Ordering Information:

Part #	Multiple Quantities	Quantity per Reel
QLSP04DRH		1000,2000 pcs

Revision History:

Revision Date:	Changes:	Version #:
09-21-2020	Initial release	1.0

