



Q **QUELIGHTING**
Sustainable Lighting Solution



QLUV07DZGCD
7mW UVB LED



Product Outline:

The high-performance output 3535 LEDs, UVB LED series are designed for high current operation and high power output applications. Quelighting UV LED is ideal UV light source for water disinfection.

Features:

- UVB 290~300nm LED
- **Quartz glass lens**
- Package Dimension = 3.8mmX3.8mmX3.15mm
- View angle 60 degree
- RoHS compliant
- Custom Bin available upon special request
- Spectra output = 80% between 288-298nm

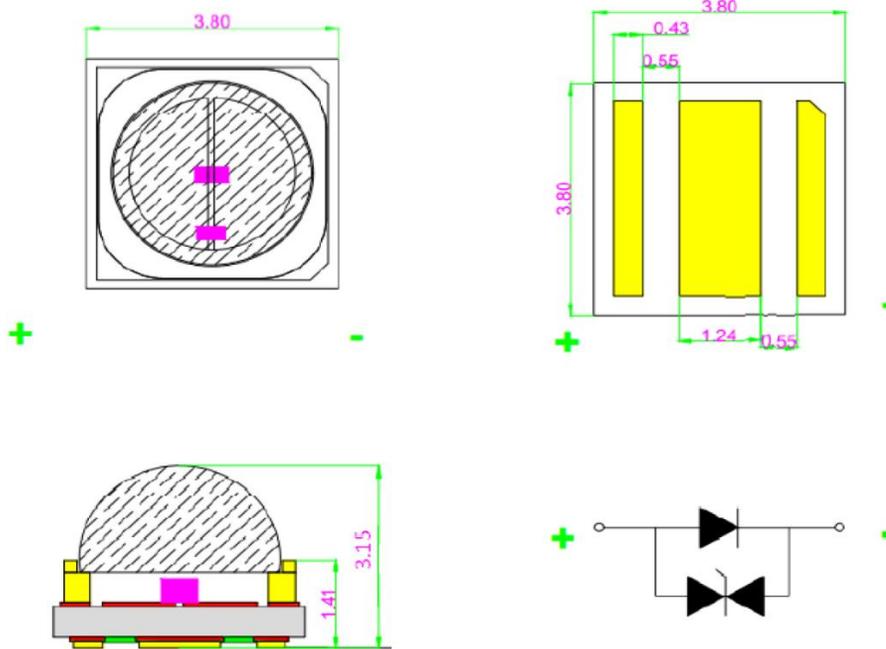
Application:

- Plant Growth
- Skin Condition Treatment
- Disinfection
- Phototherapy
- Bio-Analysis/Detection Features
- Curing

Compliance and Certification:



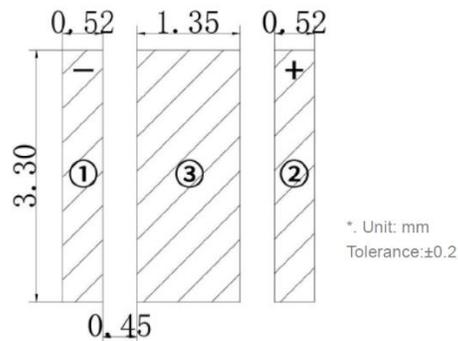
Mechanical Property:



Note:

1. All dimension in millimeters
2. tolerance is ± 0.4 mm

Recommended Solder footprint:



Note:

1. Pad ① is the positive pole, pad ② is the negative pole, and pad ③ is the heat dissipation pad.
2. All dimension in millimeters
3. The drawing without tolerances is for reference only
4. Suggest stencil $T=0.12$ mm
5. It is recommended that the metal mask be designed below 80% of the pad size.



Electrical / Optical Characteristic

(T=25 °C)

Product	View angle	I _F (mA)	V _F (V)		Wavelength (nm)	Radiant Power(mW)	
			Typ.	max		min.	typ.
QLUV07DZGCD	60	50	6	6.5	292-303	6.5	7.5

- (1) The Forward Voltage tolerance is $\pm 0.2V$
 (2) The Peak wavelength tolerance is ± 5
 (3) The Radiant power is $\pm 10\%$

Absolute Maximum Rating

(T=25 °C)

Part #	P _d (mW)	I _F (mA)	I _{FP} (mA)*	V _R (V)	T _{OP} (°C)	T _{ST} (°C)	T _J (°C)**	T _{SOL} (°C)**	R _{th(J-S)} (C/W)***
QLUV07DZGCD	1	80	100	-10	-30 – 60	-40 - 85	80	260	43

*Duty 1/10 @ 10Khz

** Junction Temperature

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

**** Thermal resistance is calculated from junction to solder



Peak Wavelength Binning

Wavelength Rank @ 50mA			
Code name	Low	High	Units
U292	292	303	nm

Forward Voltage (V_F) Bin:

VF Rank @ 50mA			
Code name	Min.	Max.	Units
3	5.0	5.5	V
4	5.5	6.0	
5	6.0	6.5	
6	6.5	7.0	

The forward voltage tolerance is $\pm 0.2V$

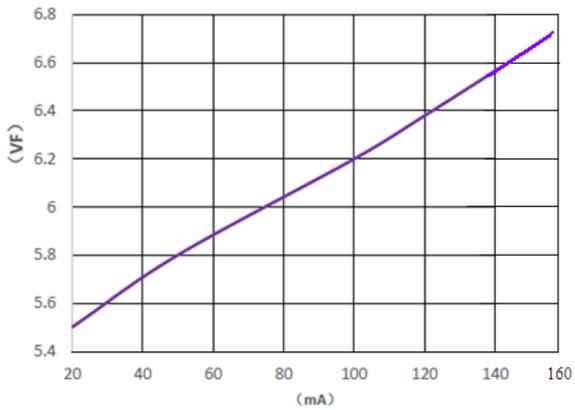
Radiant Power Binning:

Radiant Power rank (mW) @ 50mA			
Code name	Low	High	Units
P1	6.5		mW

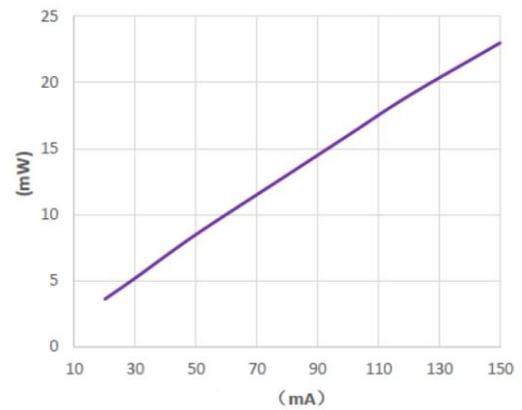
luminous flux tolerance is $\pm 7\%$



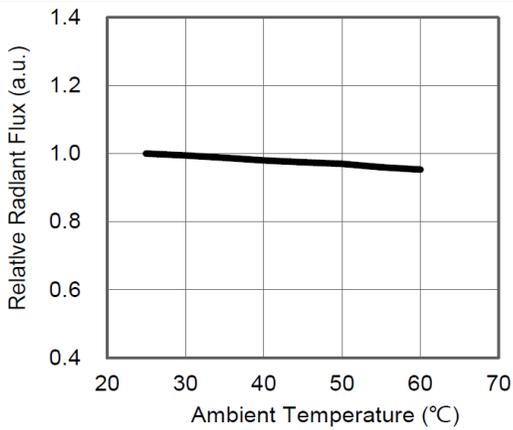
Characteristic Curves



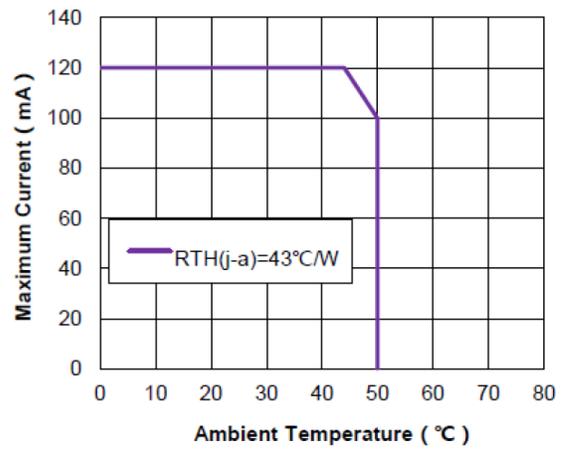
Forward Voltage vs. Forward Current



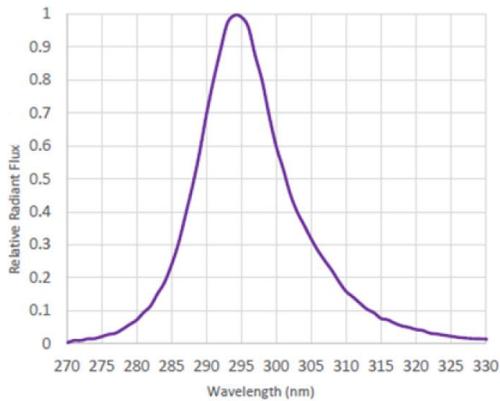
Forward current vs. Relative luminous intensity



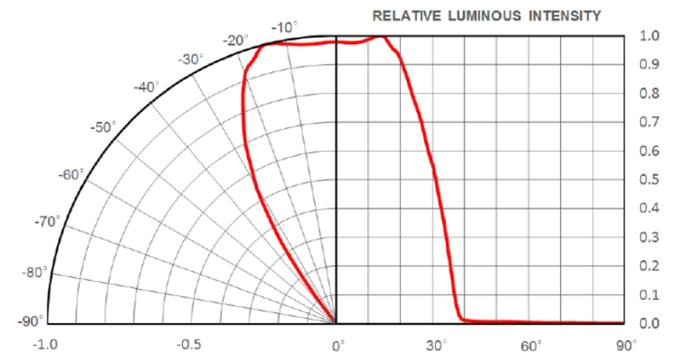
Relative Luminous Intensity vs Ambient Temperature



Solder Temperature vs. Maximum Forward Current



Spectrum Distribution



Typical Representative Spatial Radiation Pattern



■ 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/ 20minr~ 5minr~125°C/20min	100 Cycle	20 pcs

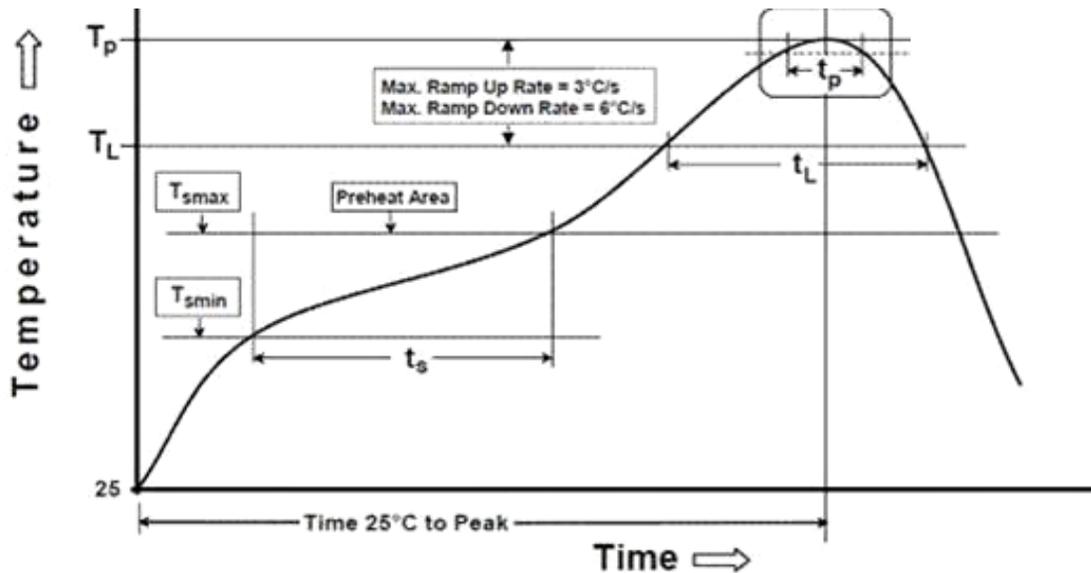
■ Judgment Criteria:

Item	Symbol	Test Condition	Judgment Criteria
Forward Voltage	Vf	50 mA	$\Delta Vf < 10\%$
Luminous Flux	Iv	50 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):



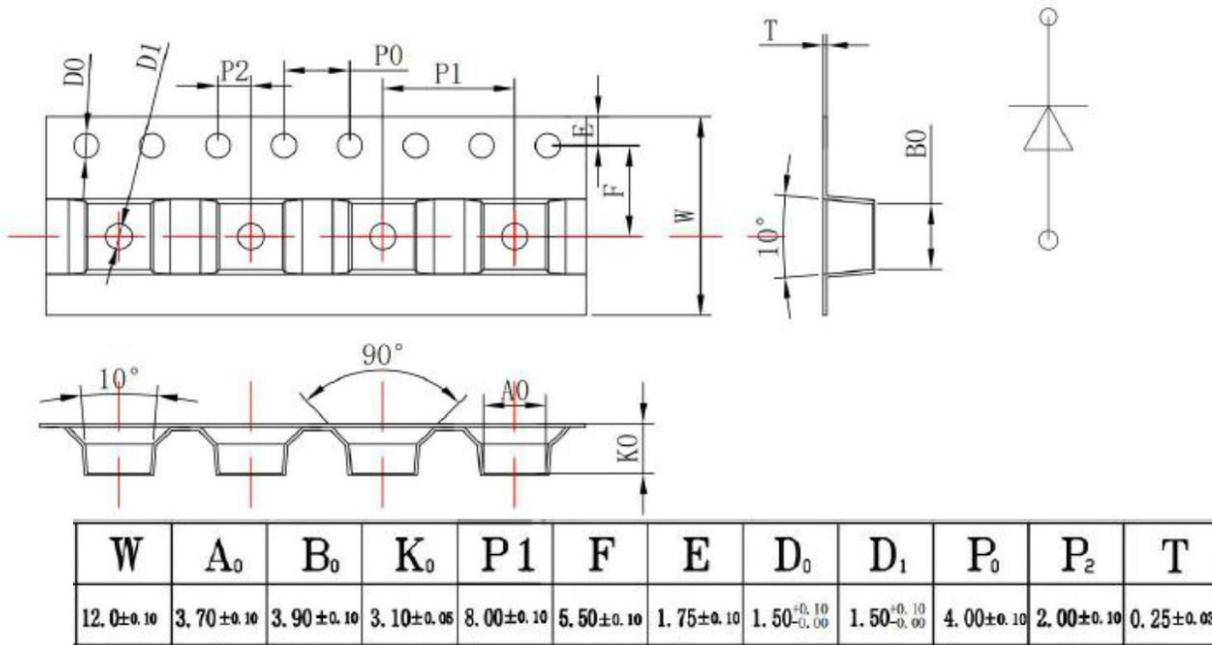
Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Temperature Min(T_{smin})	100°C	150°C
Temperature Max(T_{smax})	150°C	200°C
Time(t_a) from (T_{smin} to T_{smax})	60-120 seconds	60-120 seconds
Ramp-up rate(T_L to T_p)	3°C/second max.	3°C/second max.
Liquidous Temperature(T_L)	183°C	217°C
Time(t_L)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



Notes:

- We recommend using the M705-S101-S4 solder paste from SMIC (SenjuMetal 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
- All temperatures refer to topside of the package, measured on the package body surface.
- Repairing should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used. It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.
- Reflow soldering should not be done more than three times
- When soldering, do not put stress on the LEDs during heating.
- After soldering, do not warp the circuit board.

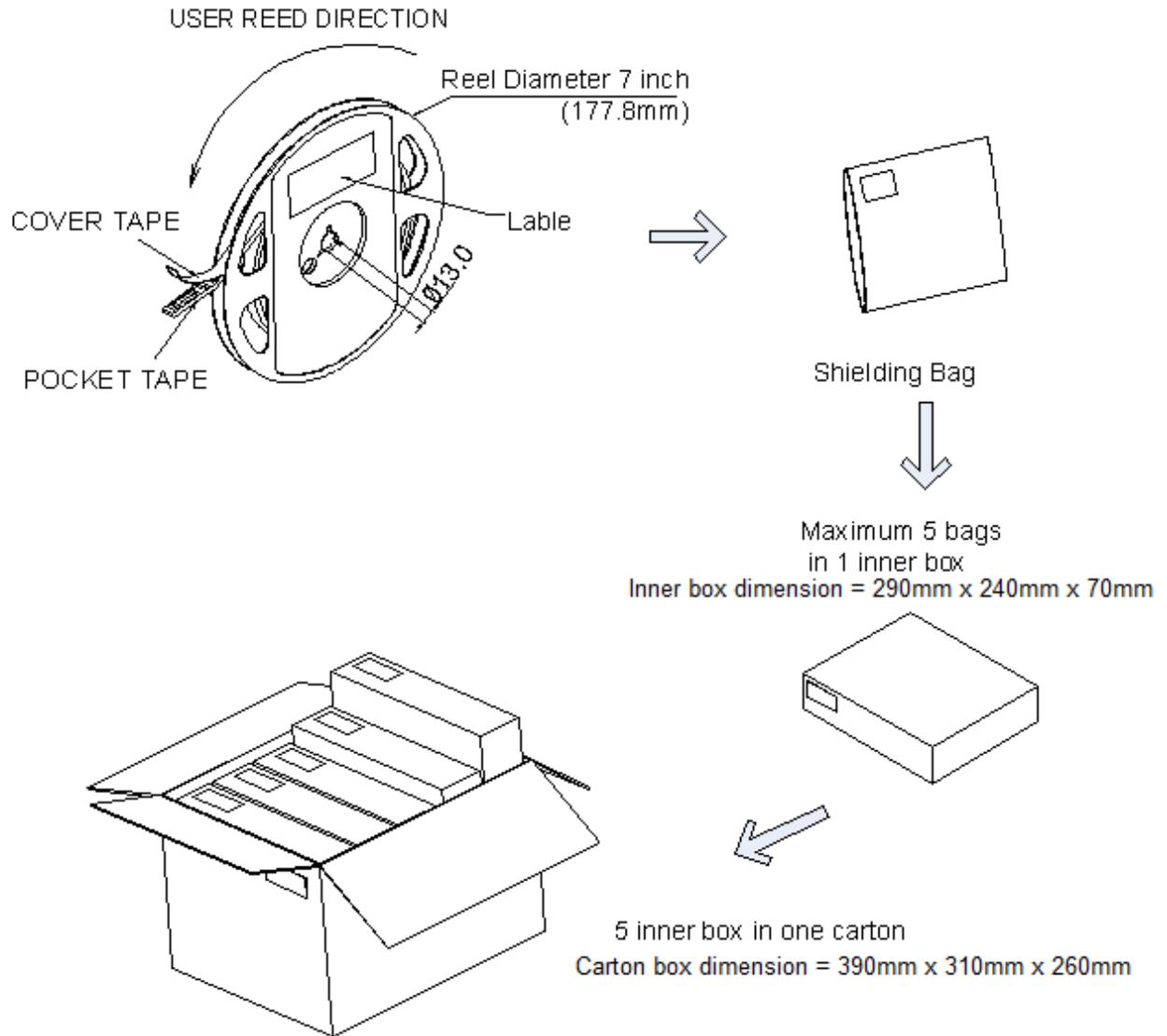
Taping & Packing:



Notes:

1. Drawing not to scale.
2. All dimensions are in millimeters.
3. Unless otherwise indicated, tolerances are ± 0.10mm.





Handling Precautions

- LEDs are ESD (electrostatic discharge) sensitive; static electricity and surge voltages seriously damage UV LEDs and can result in product failure
- Use proper ESD protection, including grounded wrist straps, ESD footwear and clothes
- Ensure that tools, jigs and machines being used are properly grounded
- LED mounting equipment should include protection against voltage surge
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- The UV LED is not protected by a lens and requires careful handling

- Do not handle the LED with bare hands as it may contaminate the LED surface and affect the optical characteristics.
- Avoid touching the LED die
- Do not use adhesives that outgas organic vapor
- Dropping the product may cause damage
- If handling the product with tweezers, use only the side of the package and be careful not to apply excessive force
- Proper thermal management is required to prevent warpage and damage to the modules and its components.
- Do not apply mechanical force or excess vibration during handling or normal operation

Storage Precautions

Please do not open the moisture proof package (with silica desiccant).more than one week. This may cause the leads of LED discoloration.

We recommend storing LEDs in a dry box once moisture proof bag is opened.

The recommended storage conditions are temperature 5 to 30°C and humidity less than 40% RH. It is also recommended to restore the LEDs into the moisture proof bag and reseal it.

Notes for handling Quartz lens LEDs

- Avoid touching the quartz lens especially by sharp tools such as Tweezers.
- Avoid leaving fingerprints on the quartz lens.
- Please store the LEDs away from dusty areas or seal the product against dust.
- Under SMT production, please avoid the mechanical pressure on the quartz lens.
- Please do not mold over the quartz lens with another resin. (epoxy, urethane, etc)

Eye Safety Guidelines During operation

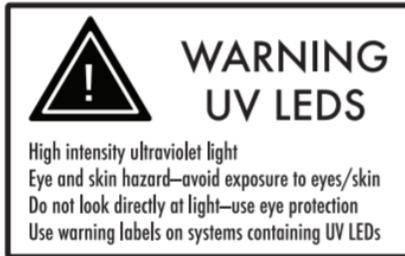
The LED emits high intensity ultraviolet (UV) light, which is harmful to skin and eyes. UV light is hazardous to skin and may cause cancer.

- 1) Avoid looking directly at the UV light: Wear protective glasses/goggle with ANSI Z87 rated.
- 2) Wear facial shield / Lab Coat with long sleeve / Gloves to cover skin may exposed to UV LEDs.



3) Attach warning labels on products/systems that is composed with UV LEDs.

Samples of Warning label:



Labeling



Ordering Information:

Part #	Multiple Quantities	Quantity per Reel
QLUV07DZGCD		600 pcs



Revision History:

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

