



SMD BI Color LED (Visible LED) - NO: 8541401000SL10A
SPECIFICATION FOR APPROVALFOR APPROVAL

S35284 &BI-color LEDs**



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Features:

PLCC 3528 White package.

Emission color: BI-color type.

Lens appearance: Water Clear

Inter reflector

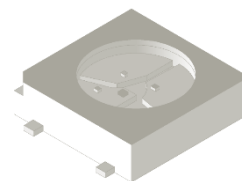
Applicable to all SMT assembly methods.

Compatible with infrared and vapor phase reflow soldering processes.

Compatible with automatic placement equipment.

Available on tape and reel (8mm Tape).

The product itself will remain within RoHS compliant



Descriptions:

The S3528 series is available in soft Red green\red yellow\red blue\blue green\blue yellow\ . Due to the package design, LED has wide viewing angle and optimized light coupling by inter reflector.

This feature makes the SMTTOP LED ideal for light pipe application. The low current requirement makes this device ideal for portable equipment or any other application where power

Applications:

Automobile: dashboard, brake lights, turn signals.

Biomedical optics, instrument and equipment testing

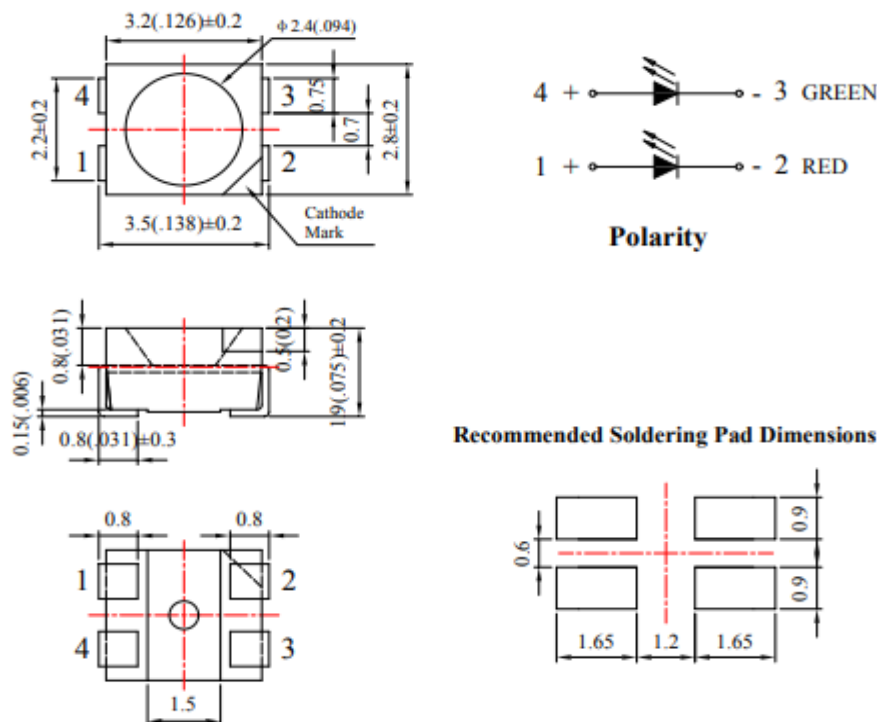
Status indicator: consumer electronics and industrial electronics.

Security, infrared monitoring, night vision

The low current requirement makes this device ideal for portable equipment or any other application where power

Package SIZE:

Picture 1



Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is ± 0.25 mm (.010") unless otherwise noted.
3. Protruded resin under flange is 1.00mm (.039") max.

Absolute Maximum Ratings

Table 1. Absolute maximum ratings for Queendom LEDs.

PARAMETER	RED \ ORANGE \ YELLOW GENERAL GREEN	GREEN AND BLUE
Parameter PD (mW)	180	200
DC Forward Current ^[1, 2]	20mA	20mA
Peak Pulsed Forward Current ^[1, 3]	100mA	100mA
LED Junction Temperature ^[1] (DC & Pulse)	115°C	115°C
Reverse Voltage (V _{reverse})	5	5
ESD Sensitivity (ANSI/ESDA/JEDEC JS-001-2012)	Class 1	
LED Storage Temperature	-40°C to 80°C	
Operating Temperature Range	Minus 40°C To plus 80°C	
Soldering Temperature	JEDEC 020c 260°C	
Allowable Reflow Cycles	3~5 Seconds	
ESD Sensitivity	2000V HBM	

Notes for Table 1:
1. Proper current derating must be observed to maintain the junction temperature below the maximum allowable junction temperature.
2. Single-color light.
3. At 0.01ms pulse on time test with a pulse period of 0.1ms.

Performance Characteristics
Product model code corresponding SKU table

RODUCT	RANK NO.	PEAK	PART NUMBER
		NM	
S3528RG4	SL10A01	Red	8541401000SL10A01
		Green	
S3528RB4	SL10A02	Red	8541401000SL10A02
		Blue	
S3528RG4	SL10A03	Red	8541401000SL10A03
		Y-G	
S3528BG4	SL10A04	Blue	8541401000SL10A04
		Green	
S3528RY4	SL10A05	Red	8541401000SL10A05
		Y	
S3528BY4	SL10A06	Blue	8541401000SL10A06
		Y	

Product Selection Guide

Table 2. Product performance of QUEENDOM at 20mA, Tj=25°C.

RODUCT	RANK NO.	PEAK	WAVELENGTH (nm)		FLUX (mcd)		VOLTAGE (V)		TYPICAL DEG	TEST
		NM	MIN	MAX	MIN	MAX	MIN	MAX	2Θ 1/2	(mA)
S3528RG4	SL10A01	Red	619	630	280	560	1.8	2.4	120	20
		Green	520	530	300	500	2.8	3.2		
S3528RB4	SL10A02	Red	619	630	280	560	1.8	2.4		
		Blue	460	470	120	500	2.8	3.2		
S3528RG4	SL10A03	Red	619	630	120	300	1.8	2.4		
		Y-G	565	575	85	180	2.8	3.2		
S3528BG4	SL10A04	Blue	460	470	120	500	2.8	3.2		
		Green	520	530	300	500	2.8	3.2		
S3528RY4	SL10A05	Red	619	630	120	300	1.8	2.4		
		Y	585	595	120	300	2.8	3.2		
S3528BY4	SL10A06	Blue	460	470	120	500	2.8	3.2		
		Y	585	595	120	300	2.8	3.2		

Notes for Table 1:
1. Queendom leds maintains a tolerance of ±1nm on dominant wavelength measurements.
2. Queendom leds maintains a tolerance of ±10% on luminous intensity measurements.

Optical Characteristics

Table 3. Optical characteristics for QUEENDOM at 20mA, Tj=25°C.

PRODUCT	COLOR	TYPICAL SPECTRAL HALF-WIDTH ^[1] (nm)	TYPICAL TEMPERATURE COEFFICIENT OF DOMINANT WAVELENGTH (nm/°C)	TYPICAL VIEWING ANGLE ^[2]	PART NUMBER
S3528**4	Red	6	0.04	120°	8541401000SL10A
	Green	5	0.04	120°	
	Yellow	6	0.04	120°	
	Blue	5	0.04	120°	

Notes for Table 2:
1. Spectral half-width is the spectral bandwidth at 50% of the peak intensity.
2. Viewing angle is the off axis angle from the LED centerline where the luminous intensity is ½ of the peak value.

Electrical and Thermal Characteristics

Table4. Electrical and thermal characteristics for QUEENDOM at 20mA, Tj=25°C.

COLOR	PART NUMBER	FORWARD VOLTAGE ^[1] (V _f)			TYPICAL TEMPERATURE COEFFICIENT OF FORWARD VOLTAGE ^[2] (mV/°C)	TYPICAL THERMAL RESISTANCE—JUNCTION TO SOLDER PAD (°C/W)
		MINIMUM	TYPICAL	MAXIMUM		
Red	S3528**4	1.80	2.10	2.40	-1.6	75
Green		2.80	3.00	3.20	-2.4	120
Blue		2.80	3.00	3.20	-2.6	85
Yellow		1.80	2.10	2.40	-1.6	75

Characteristic Curves

Characteristic Curves

Spectral Power Distribution Characteristics

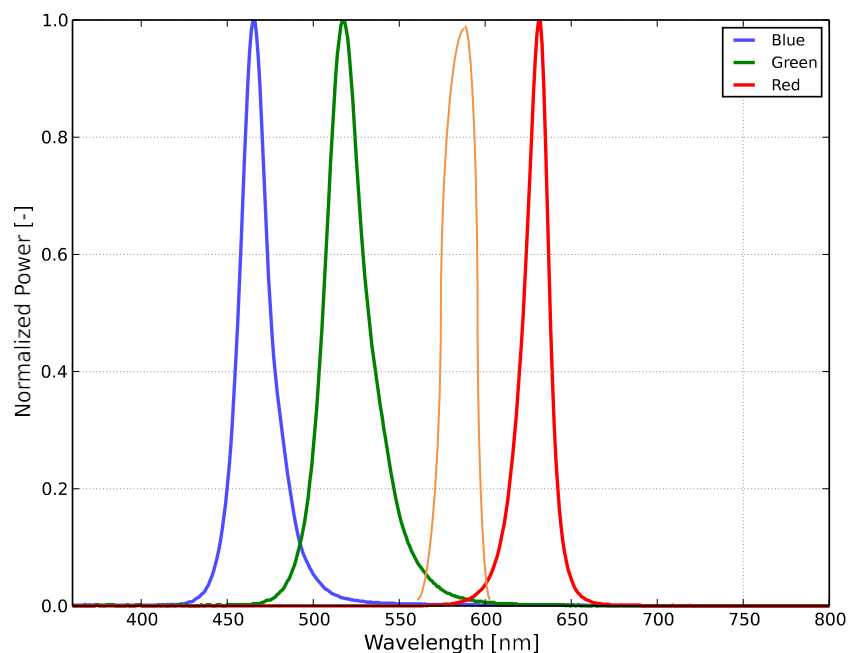


Figure 1. Typical normalized power vs. wavelength for Queendom led at 20mA, $T_j=25^{\circ}\text{C}$.

Light Output Characteristics

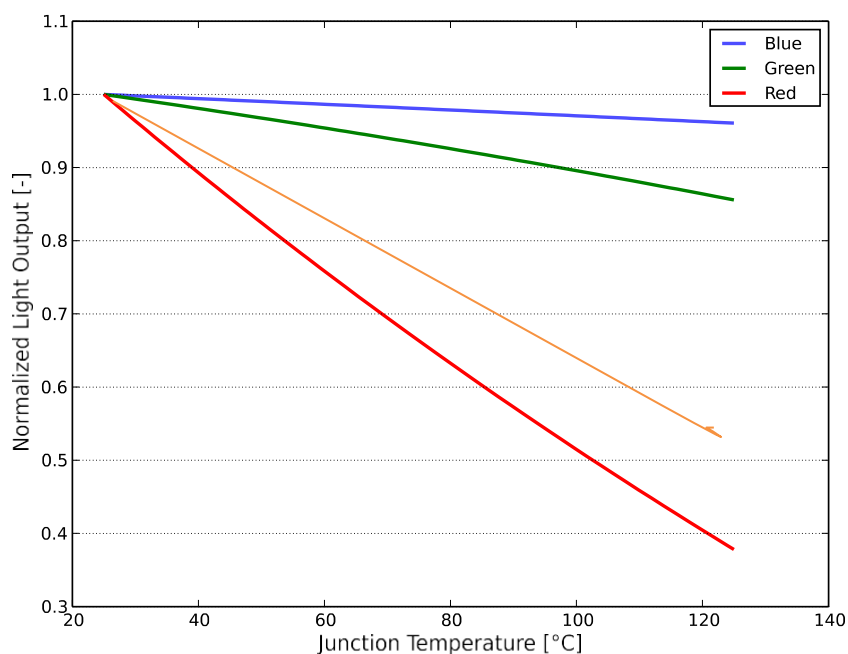
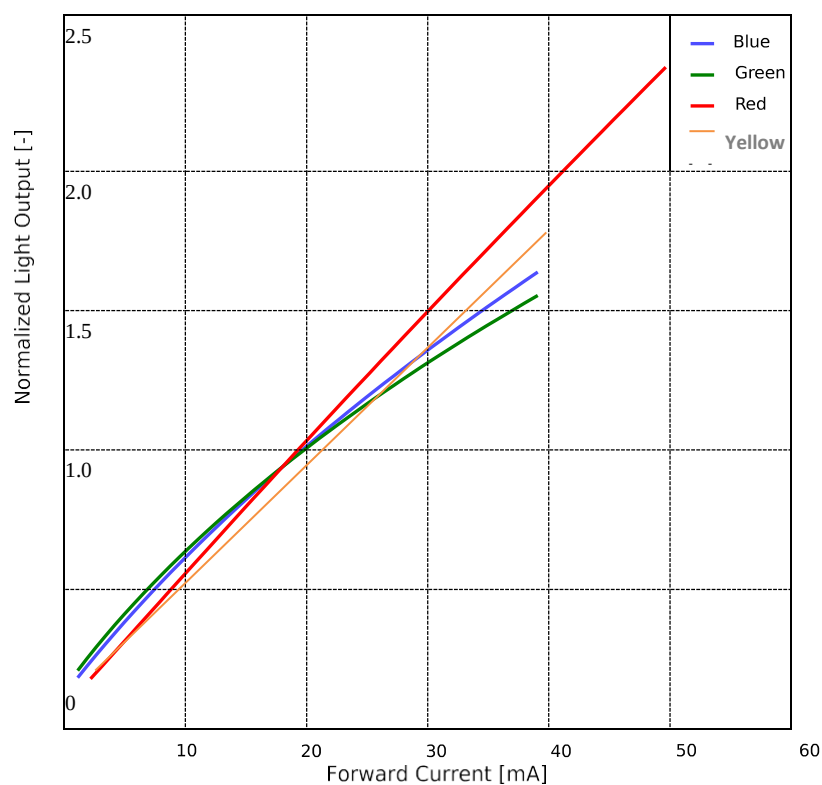


Figure 2. Typical normalized light output vs. junction temperature for Queendom LED at 20mA.

Light Output Characteristics

Figure 3. Typical normalized light output vs. forward current for Queendom LED at $T_j=25^{\circ}\text{C}$.



Forward Current Characteristics

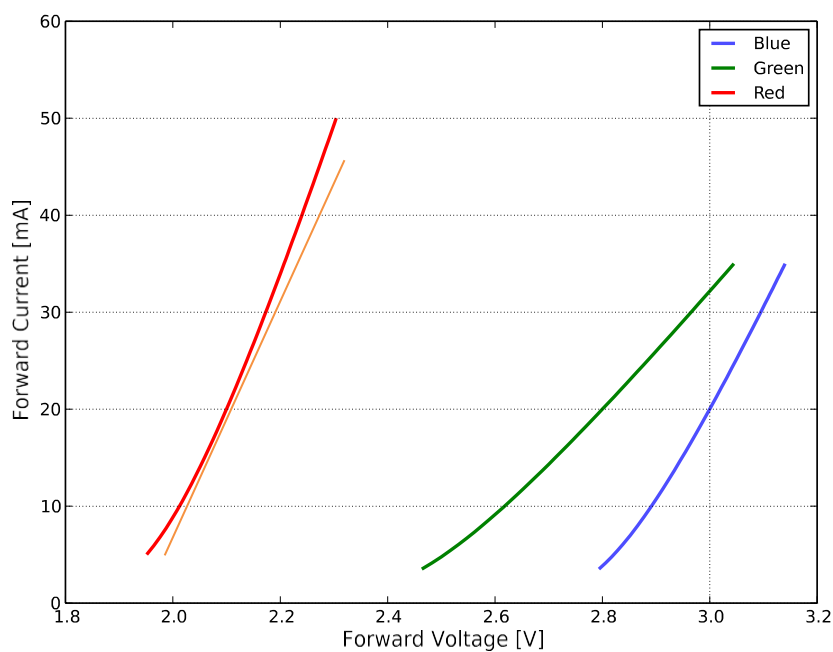


Figure 4. Typical forward current vs. forward voltage for Queendom LED at $T_j=25^{\circ}\text{C}$.

Radiation Pattern Characteristics

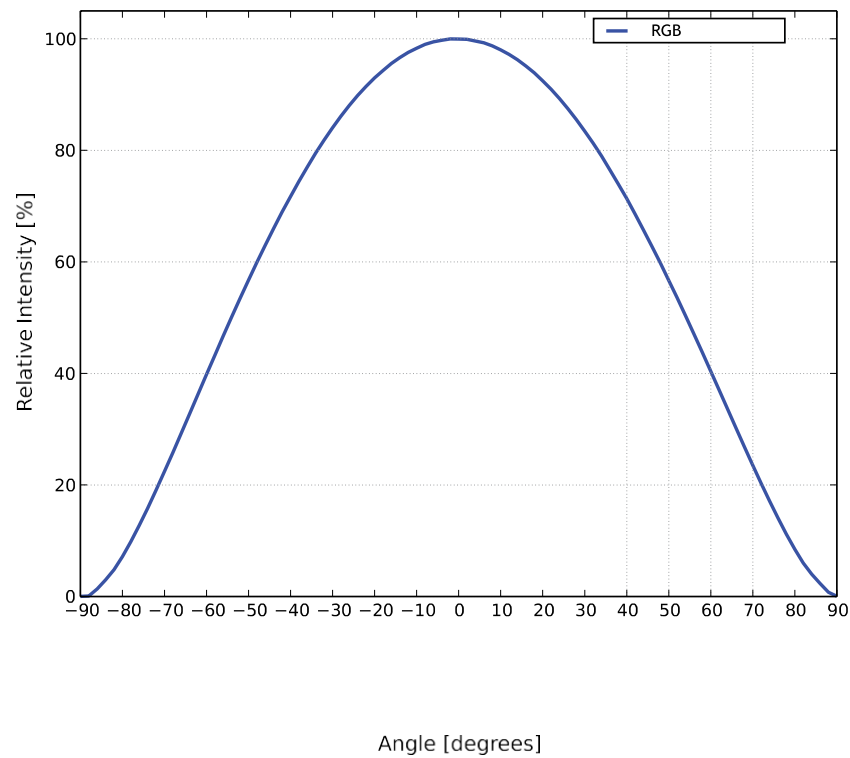


Figure 5. Typical radiation pattern for Queendom at 20mA, $T_j=25^{\circ}\text{C}$.

Product Bin and Labeling Definitions

Decoding Product Bin Labeling

In the manufacturing of semiconductor products, there are variations in performance around the average values given in the technical datasheet. For this reason, Queendom leds bins LED components for luminous flux, intensity, radiometric power, color point, peak wavelength, dominant wavelength and forward voltage.

Dominant Wavelength Bins

RANK Table 1. Dominant wavelength bins & Product performance of Queendom Commercial LEDs at specified test conditions.

PRODUCT	COLOR	BIN	DOMINANT WAVELENGTH [1] (nm)		RANK WAVELENGTH [2] (nm)	
			MINIMUM	MAXIMUM	MINIMUM	MAXIMUM
SMD LEDs	Blue	B4D	459	465	2.5	5
		B5E	465	470	2.5	5
		B6F	470	475	2.5	5
		B6G	475	478	2.5	5
	Green	G0A	500	505	2.5	5
		G0B	505	510	2.5	5
		G1A	510	515	2.5	5
		G1B	515	520	2.5	5
	Green	G2C	520	525	2.5	5
		G2D	525	530	2.5	5
		G3E	530	535	2.5	5
		G5A	550	555	2.5	5
		G5B	555	560	2.5	5
	Green	G6A	560	565	2.5	5
		G6B	565	570	2.5	5
		Y1A	570	575	2.5	5
	Yellow	Y1B	575	580	2.5	5
		Y2A	580	585	2.5	5
	Orange	A0A	600	605	2.5	5
		A0B	605	610	2.5	5
		R1A	610	615	2.5	5
		R1V	615	619	2.5	5
	Red	R2A	619	624	2.5	5
		R2B	624	627	2.5	5
		R2C	627	630	2.5	5
		R3A	630	635	2.5	5
		R3B	635	640	2.5	5
		R4A	640	645	2.5	5
		R4B	645	650	2.5	5

Notes for Table 1:
1.Queendom maintains a tolerance of ±1nm on dominant wavelength measurements

LUMINOUS FLUX BINS

Table 2.Luminous flux bin definitions for QUEENDOM Color Line at Tj=25°C.

RANK BIN	QUEENDOM FLUX [1] (mcd)		RANK FLUX [2] (mcd)		TYPICAL FLUX HALF WIDTH
	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM	[3] (mcd)
LB	15	30	5	15	15
LC	25	40	7	15	15
LD	40	60	10	20	20
LE	60	80	13	20	20
LF	90	120	20	30	30
LG	120	190	32	70	70
LH	190	300	50	110	110
LI	300	500	83	200	200
LJ	500	780	130	280	280
LK	780	1060	177	280	280
LL	1060	1560	260	500	500
LM	1560	2460	351	900	900
LN	2460	3360	480	900	900
LO	3360	5760	823	2400	2400
LP	5760	8200	1171	2440	2440
LQ	8200	11700	1671	3500	3500
LR	11700	15700	1963	4000	4000
LS	15700	19200	2400	3500	3500
LT	19200	23700	2633	4500	4500

TABLE Forward Voltage BINS

Table 3. Electrical and thermal characteristics for Queendom at specified test current, Tj=25°C

NUMBER	FORWARD VOLTAGE [1] (Vf)			RANK WAVELENGTH [2] (Vf)		TYPICAL VOLTAGE HALF WIDTH
	MINIMUM	TYPICAL	MAXIMUM	MINIMUM	MAXIMUM	[3] (Vf)
V1	1	1.2	1.4	0.1	0.2	0.2
V2	1.4	1.6	1.8	0.1	0.2	0.2
V3	1.8	2	2.2	0.1	0.2	0.2
V4	2.2	2.4	2.6	0.1	0.2	0.2
V5	2.6	2.8	3	0.1	0.2	0.2
V6	3	3.2	3.4	0.1	0.2	0.2
V7	3.4	3.6	3.8	0.1	0.2	0.2

TABLE TYPICAL POWER BINS

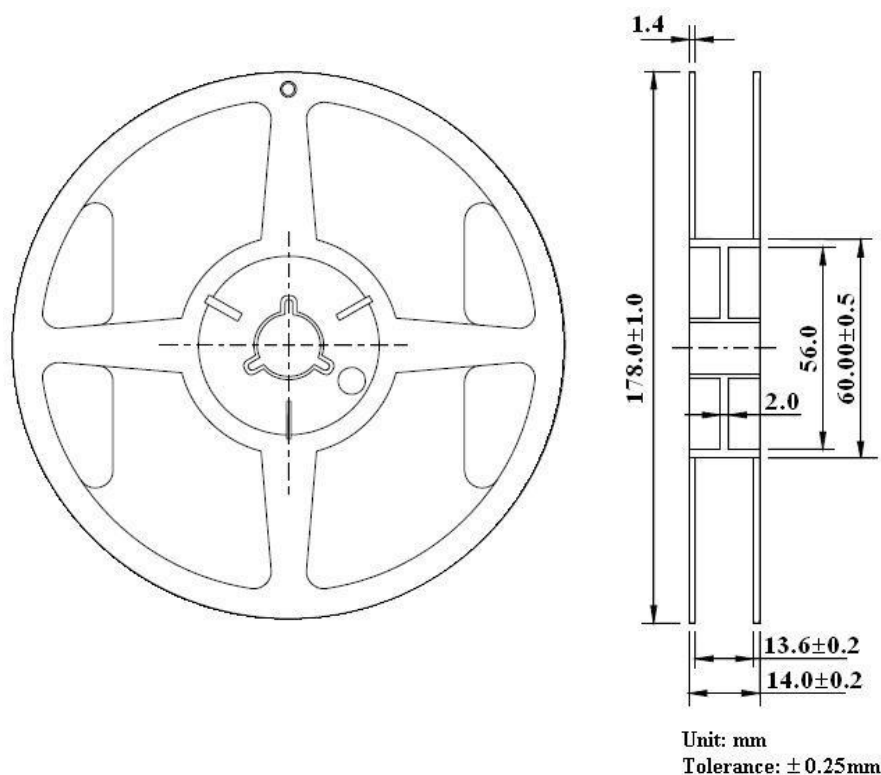
Table 4. Electrical and thermal characteristics for Queendom at specified test current, Tj=25°C

RANK NO.	TYPICAL POWER RANK (W) [1]		RANK POWER [2] (W)		TYPICAL POWER HALF WIDTH
	min	max	MINIMUM	MAXIMUM	[3] (W)
WA	0.06	0.1	0.02	0.1	0.1
WB	0.1	0.2	0.1	0.2	0.2
WC	0.2	0.5	0.2	0.5	0.5
WD	0.5	1	0.2	0.5	0.5
WE	1	3	1	3	3

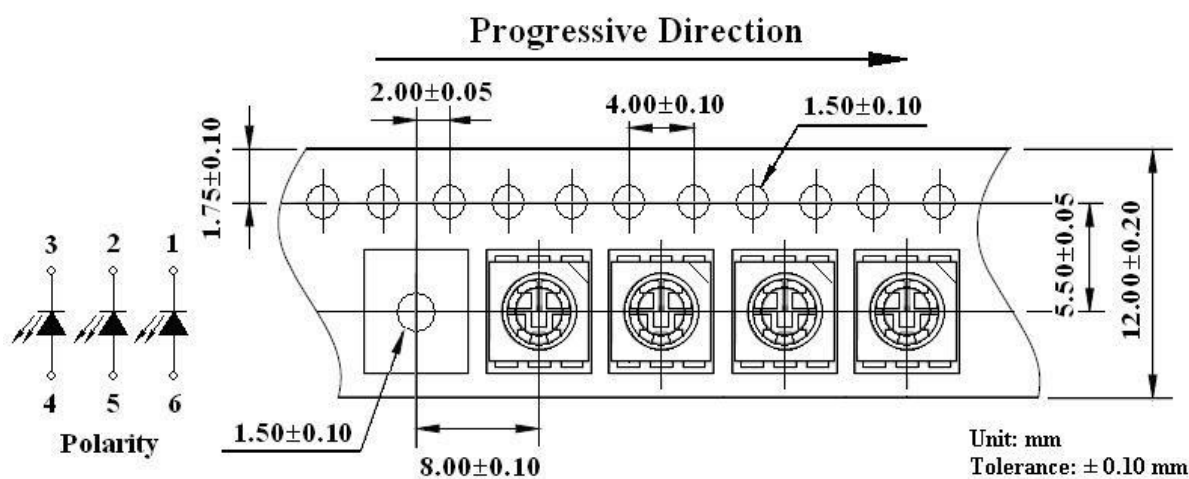
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Packaging Information

Reel Dimensions:

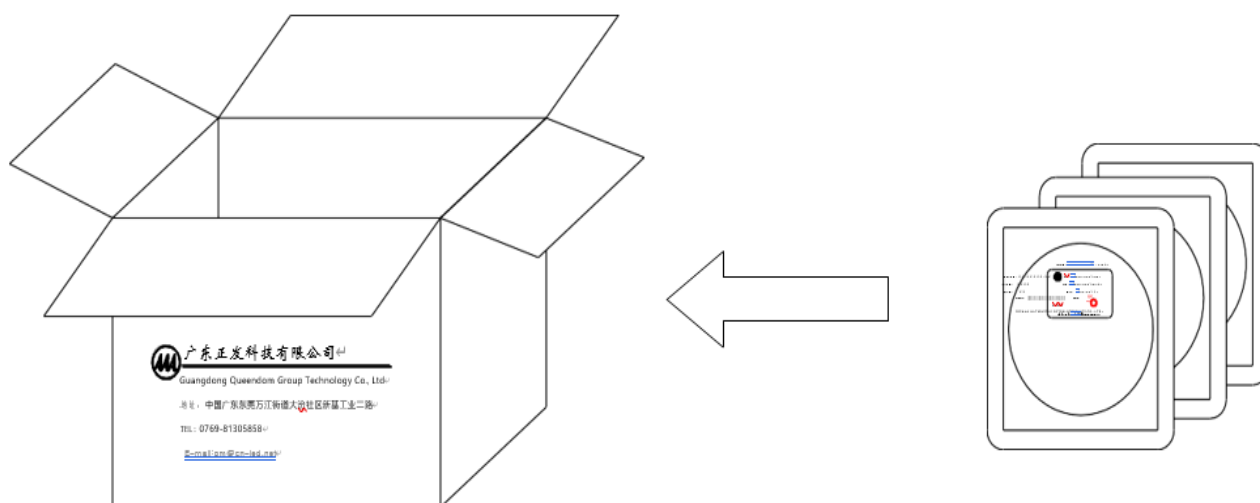


Carrier Tape Dimensions:



Loaded quantity 3000 pcs per reel.

Packaging cartons



Information

- With Stopper

CPN: P/N:XXXXXXXXXX	VF:XX-XX
	IV:XX-XX
QTY:XXX	WLD:XX-XX
	BIN:XX-XX
LOT NO:XXXXXXXXXX	DATE:XX-XX-XX

Without Stopper

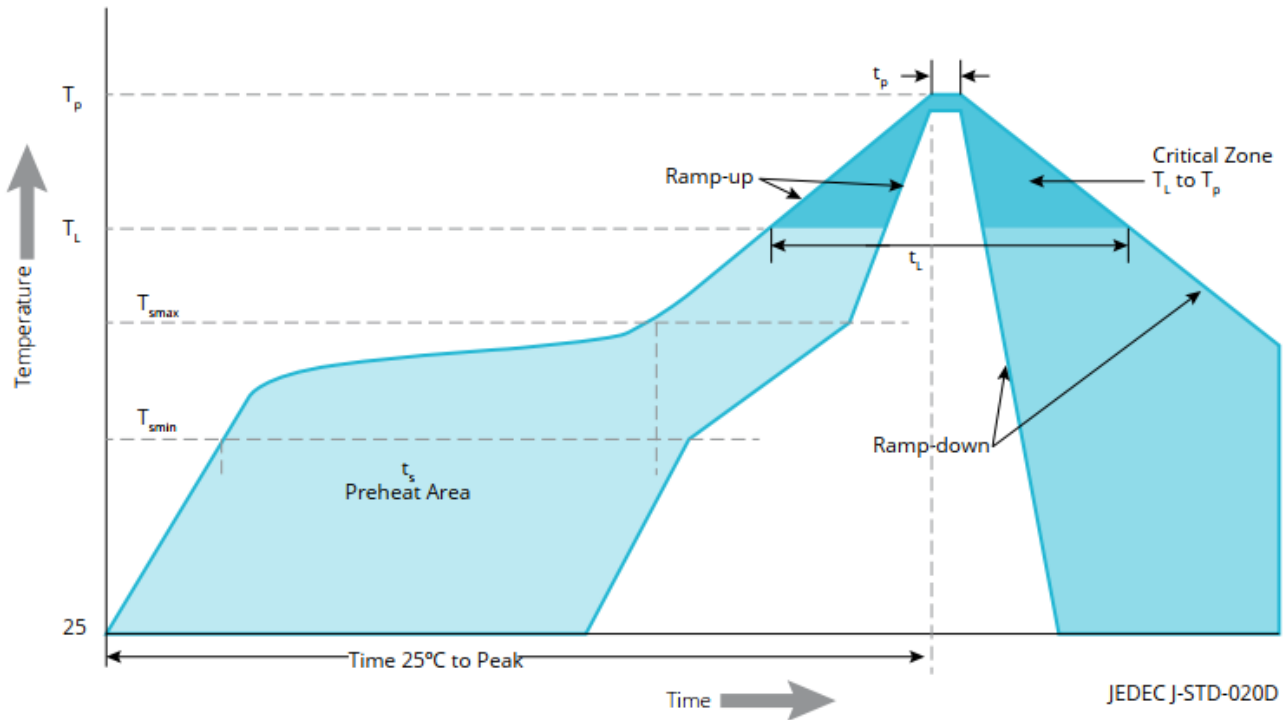
CPN:Customer's Product Number
P/N:Product Number
QTY:Packing Quantity
LOT NO:Lot Number
VF:Forward Voltage Rank
IV:Luminous Intensity Rank
WLD:Dom. Wavelength Rank
BIN:BIN Code
DATE:Date Of Dispatch

Packing Quantity

1. 3000 PCS/1 Bag,
- 2.10 Inner Cartons/1 Outside Carton

CAUTIONS

Reflow Soldering Guidelines



Visualization of the acceptable reflow temperature profile as specified

Reflow profile characteristics for Queendom smd.

PROFILE FEATURE	LEAD-FREE ASSEMBLY
Preheat Minimum Temperature (T_{smin})	150°C
Preheat Maximum Temperature (T_{smax})	200°C
Preheat Time (t_{smin} to t_{smax})	60 to 120 seconds
Ramp-Up Rate (T_L to T_p)	4°C / second maximum
Liquidous Temperature (T_L)	217°C
Time Maintained Above Temperature T_L (t_L)	60 to 150
seconds Peak / Classification Temperature (T_p)	250°C
Time Within 5°C of Actual Peak Temperature (t_p)	20 to 40 seconds
Ramp-Down Rate (T_p to T_L)	6°C / second maximum maximum
Time 25°C to Peak Temperature	8 minutes maximum

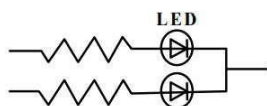
JEDEC Moisture Sensitivity

LEVEL	FLOOR LIFE		SOAK REQUIREMENTS STANDARD	
	TIME	CONDITIONS	TIME	CONDITIONS
5a	24 hours	$\leq 30^\circ\text{C} / 60\% \text{ RH}$	48 Hours +2/-0	$30^\circ\text{C} / 60\% \text{ RH}$

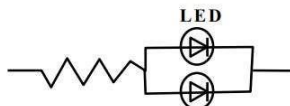
Drive Method

An LED is a current-operated device. In order to ensure intensity uniformity on multiple LEDs connected in parallel in an application, it is recommended that a current limiting resistor be incorporated in the drive circuit, in series with each LED as shown in Circuit A below.

Circuit model A



Circuit model B



Recommended circuit

The brightness of each LED might appear different due to the differences in the I-V characteristics of those LEDs.

Repairing

Repair 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.

ESD (Electrostatic Discharge)

Static Electricity or power surge will damage the LED. Suggestions to prevent ESD damage:

Use a conductive wrist band or anti- electrostatic glove when handling these LEDs.

All devices, equipment, and machinery must be properly grounded.

Work tables, storage racks, etc. should be properly grounded.

Use ion blower to neutralize the static charge which might have built up on surface of the LEDs plastic lens as a result of friction between LEDs during storage and handing.

Others

The information included in this document reflects representative usage scenarios and is intended for technical reference only.

The part number, type, and specifications mentioned in this document are subject to future change and improvement without notice. Before production usage customer should refer to the latest datasheet for the updated specifications.

When using the products referenced in this document, please make sure the product is being operated within the environmental and electrical limits specified in the datasheet. If customer usage exceeds the specified limits, Queendom will not be responsible for any subsequent issues.

The LEDs described here are intended to be used for ordinary electronic equipment (such as office equipment, communication equipment and household applications). Consult Queendom's Sales in advance for information on applications in which exceptional reliability is required, particularly when the failure or malfunction of the LEDs may directly jeopardize life or health, such as in aviation, transportation, traffic control equipment, medical and life support systems and safety devices.