



# SMD LED CHIPS

**QUEENDOM GROUP**

SMD 3216 WHITE LEDS

# PRECISION SMD CHIP LEDs

## OVERVIEW

Surface-mount (SMD) 1206/3216 package LEDs  
 Emitting colors: White, Warm White, Yellow;  
 Lens appearance: Water Clear / Diffused (optional);  
 Compatible with reflow soldering process (JEDEC standard);  
 Tape and reel packaging (standard), bulk packaging (optional);  
 High luminous intensity matched for uniform light output;  
 Long lifespan (50,000+ hours), solid-state reliability;  
 Low power consumption (0.06W typical);  
 Integrated circuit compatible (low forward voltage);  
 European compliance (CE certified);  
 RoHS compliant (lead-free, halogen-free).



## FEATURES:

These SMD 1206 (3216 metric) LEDs are miniature surface-mount light sources designed for space-constrained electronic applications requiring compact, efficient illumination.

They feature a 3.2 mm × 1.6 mm footprint (standard 0805 size) with a low-profile design (1.1mm height), enabling seamless integration into dense PCB layouts.

By utilizing advanced chip-on-board (COB) technology, they deliver consistent color rendering (CRI > 80) and stable performance across a wide temperature range (-40°C to +85°C).

Ideal for automated assembly lines, they support high-speed pick-and-place machinery and comply with IPC/JEDEC J-STD-020 reflow profiles.

## APPLICATIONS:

Consumer Electronics: Smartphones, tablets, smartwatches, wireless earbuds (status indicators, backlighting);

Home Appliances: Smart speakers, coffee makers, air purifiers (operation status lights);

Industrial Equipment: Control panels, sensors, IoT devices (signal indication);

Automotive: Interior lighting, dashboard indicators (low-power, vibration-resistant);

Medical Devices: Portable monitors, diagnostic tools (reliable, low-heat emission);

Communication Devices: Routers, modems, network switches (data transmission status lights).

## ABSOLUTE MAXIMUM RATINGS

Table 1. Absolute maximum ratings for LEDs.

| PARAMETER                                            | WHITE                   |
|------------------------------------------------------|-------------------------|
| Parameter PD (mW)                                    | 60                      |
| DC Forward Current <sup>[1, 2]</sup>                 | 20 mA                   |
| Peak Pulsed Forward Current <sup>[1, 3]</sup>        | 95 mA                   |
| LED Junction Temperature <sup>[1]</sup> (DC & Pulse) | 115°C                   |
| Reverse Voltage (V <sub>reverse</sub> )              | 5                       |
| ESD Sensitivity (ANSI/ESDA/JEDEC JS-001-2012)        | Class 1                 |
| LED Storage Temperature                              | -40°C to 85°C           |
| Operating Temperature Range                          | Minus 40°C To plus 85°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. All-color light.
4. At 0.01ms pulse on time test with a pulse period of 0.1ms

## Product Selection Guide

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

| Model        | Rank Code | Color Type | Part Number      |
|--------------|-----------|------------|------------------|
| Device Model | Rank      | CCT/K      | P/N              |
| S3216YW2WA   | SL0714    | 2200K      | 8541401000SL0714 |
| S3216WW2WA   | SL0715    | 2700K      | 8541401000SL0715 |
| S3216WV2WA   | SL0716    | 3000K      | 8541401000SL0716 |
| S3216WU2WA   | SL0717    | 3500K      | 8541401000SL0717 |
| S3216WT2WA   | SL0718    | 4000K      | 8541401000SL0718 |
| S3216WR2WA   | SL0719    | 5000K      | 8541401000SL0719 |
| S3216WQ2WA   | SL0720    | 5700K      | 8541401000SL0720 |
| S3216WP2WA   | SL0721    | 6500K      | 8541401000SL0721 |
| S3216WD2WA   | SL0722    | 7600K      | 8541401000SL0722 |
| S3216WD2WA   | SL0723    | 10500K     | 8541401000SL0723 |

## Product Electrical Index & TYPICALWAVELENGTH

IF =20 mA; TJ = 25 °C

Table 3 Product performance of Queendom LEDs at 20mA, Tj=25°C

| Model        | Rank Code | Color Type | CRI  | Luminous Flux (mcd) |     | Forward Voltage VF (V) |     |
|--------------|-----------|------------|------|---------------------|-----|------------------------|-----|
| Device Model | Rank      | CCT/K      | (Ra) | MIN                 | MAX | MIN                    | MAX |
| S3216YW2WA   | SL0714    | 2200K      | 80   | 300                 | 780 | 2.7                    | 3.2 |
| S3216WW2WA   | SL0715    | 2700K      | 80   | 300                 | 780 | 2.7                    | 3.2 |
| S3216WV2WA   | SL0716    | 3000K      | 80   | 300                 | 780 | 2.7                    | 3.2 |
| S3216WU2WA   | SL0717    | 3500K      | 80   | 300                 | 780 | 2.7                    | 3.2 |
| S3216WT2WA   | SL0718    | 4000K      | 80   | 300                 | 780 | 2.7                    | 3.2 |
| S3216WR2WA   | SL0719    | 5000K      | 80   | 300                 | 780 | 2.7                    | 3.2 |
| S3216WQ2WA   | SL0720    | 5700K      | 80   | 300                 | 780 | 2.7                    | 3.2 |
| S3216WP2WA   | SL0721    | 6500K      | 80   | 300                 | 780 | 2.7                    | 3.2 |
| S3216WD2WA   | SL0722    | 7600K      | 80   | 300                 | 780 | 2.7                    | 3.2 |
| S3216WD2WA   | SL0723    | 10500K     | 80   | 300                 | 780 | 2.7                    | 3.2 |

Notes for Table 2:

1. Main wavelength measurement maintains an error of  $\pm 1\text{nm}$ .
2. Luminous flux measurement maintains an error of  $\pm 7.5\%$ .

## Optical Characteristics

Table 4 Optical characteristics for QUEENDOM SMD CHIP at 20mA, Tj=25°C.

| PRODUCT   | COLOR  | TYPICAL SPECTRAL HALF-WIDTH [1] (K) | TYPICAL TEMPERATURE COEFFICIENT OF DOMINANT WAVELENGTH (CCT /°C) | TYPICAL VIEWING ANGLE [2] |
|-----------|--------|-------------------------------------|------------------------------------------------------------------|---------------------------|
| S3216*2WA | 2200K  | 45                                  | -2.0 ~ -2.5                                                      | 120°                      |
|           | 2700K  | 50                                  | -1.8 ~ -2.3                                                      | 120°                      |
|           | 3000K  | 100                                 | -1.5 ~ -2.0                                                      | 120°                      |
|           | 3500K  | 100                                 | -1.5 ~ -2.0                                                      | 120°                      |
|           | 4000K  | 120                                 | -1.2 ~ -1.8                                                      | 120°                      |
|           | 5000K  | 120                                 | -1.0 ~ -1.5                                                      | 120°                      |
|           | 5700K  | 150                                 | -1.0 ~ -1.5                                                      | 120°                      |
|           | 6500K  | 249                                 | -0.6 ~ -1.0                                                      | 120°                      |
|           | 7600K  | 300                                 | -0.5 ~ -0.8                                                      | 120°                      |
|           | 10500K | 500                                 | -0.4 ~ -0.7                                                      | 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  $\frac{1}{2}$  of the peak value.

## OPTICAL CHARACTERISTICS

Table 5. Optical characteristics for Queendom LEDs at 20mA, Tj=25°C

| Device Model | PEAK COLOR | TYPICAL SPECTRAL HALF-<br>WIDTH [1] (nm) | TYPICAL TEMPERATURE COEFFICIENT<br>OF DOMINANT WAVELENGTH (K/°C) | PART NUMBER         |
|--------------|------------|------------------------------------------|------------------------------------------------------------------|---------------------|
| S3216*2WA    | WHITE      | 5                                        | +0.12 ~ +0.25                                                    | 8541401000SL0714-23 |

Notes for Table 3:

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

Table 6 . Electrical and thermal characteristics for Queendom LEDs at 20mA, Tj=25°C

| Device Model | PEAK COLOR | FORWARD VOLTAGE [1] (Vf ) |         |         | TYPICAL TEMPERATURE COEFFICIENT OF<br>FORWARD VOLTAGE [2] (mV/°C) | TYPICAL THERMAL RESISTANCE—<br>JUNCTION TO SOLDER PAD (°C/W) |
|--------------|------------|---------------------------|---------|---------|-------------------------------------------------------------------|--------------------------------------------------------------|
|              |            | MINIMUM                   | TYPICAL | MAXIMUM |                                                                   |                                                              |
| S3216*2WA    | WHITE      | 2.8                       | 3.2     | 3.4     | -1.5 ~ -2.0                                                       | 12 ~ 18                                                      |

Notes for Table 4:

1. Maintains a tolerance of ±0.1V on forward voltage measurements.
2. Measured between 25°C and 85°C.

## CHARACTERISTIC CURVES

### SPECTRAL POWER DISTRIBUTION CHARACTERISTIC

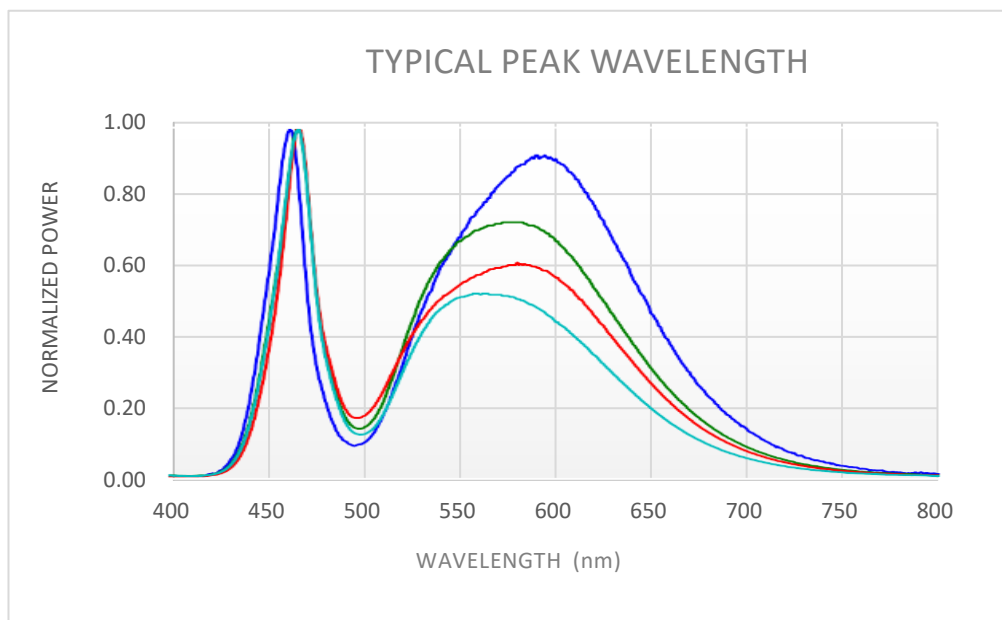


Figure 1. Typical normalized light output vs. junction temperature for at specified test current.  $T_j=25^{\circ}\text{C}$

## LIGHT OUTPUT CHARACTERISTICS

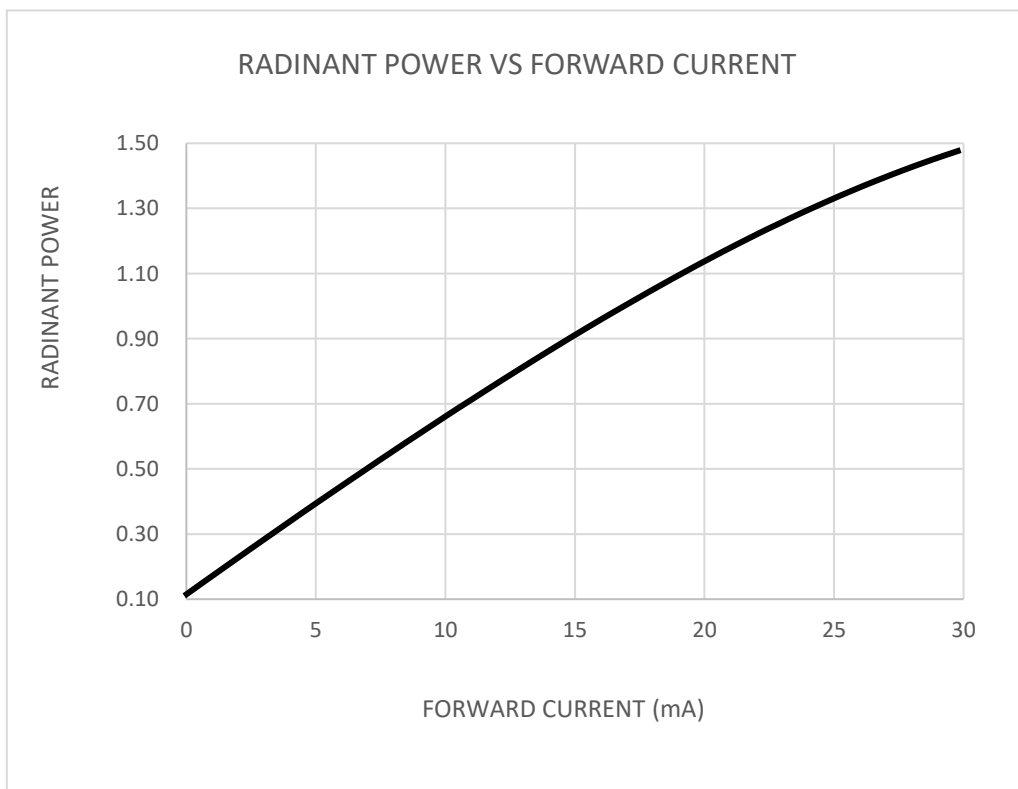


Figure 2 Typical normalized radiant power vs. junction temperature for at  $T_j=25^{\circ}\text{C}$ .

## LIGHT OUTPUT CHARACTERISTICS

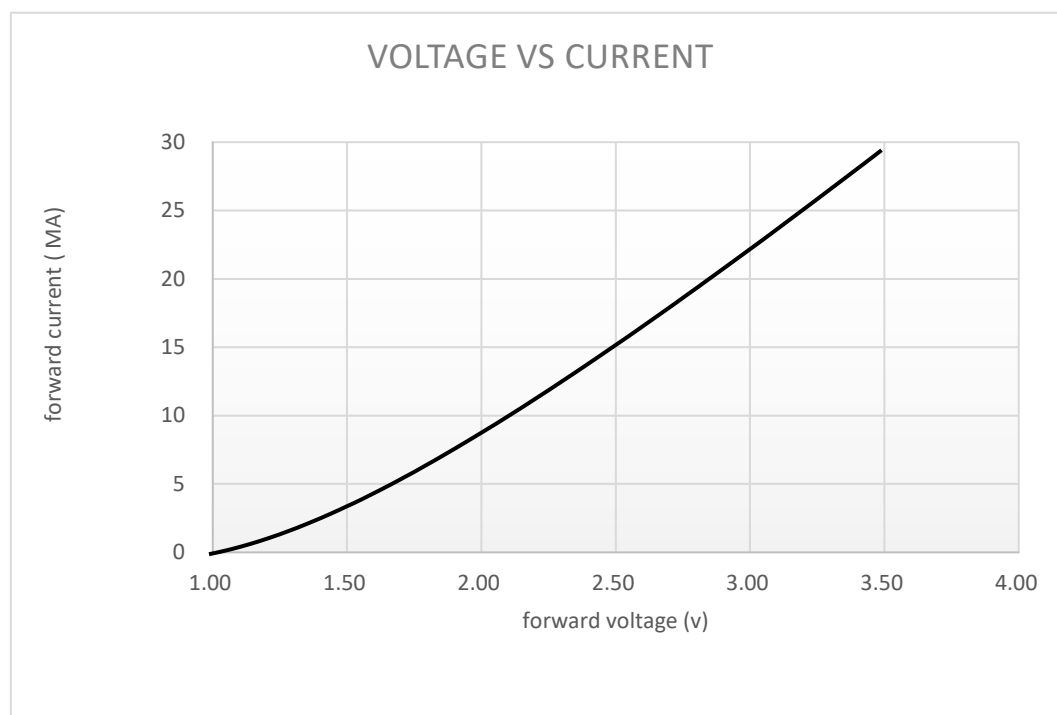


Figure 3. Typical forward current vs. forward voltage for at  $T_j=25^{\circ}\text{C}$ .

## RADIATION PATTERN CHARACTERISTICS

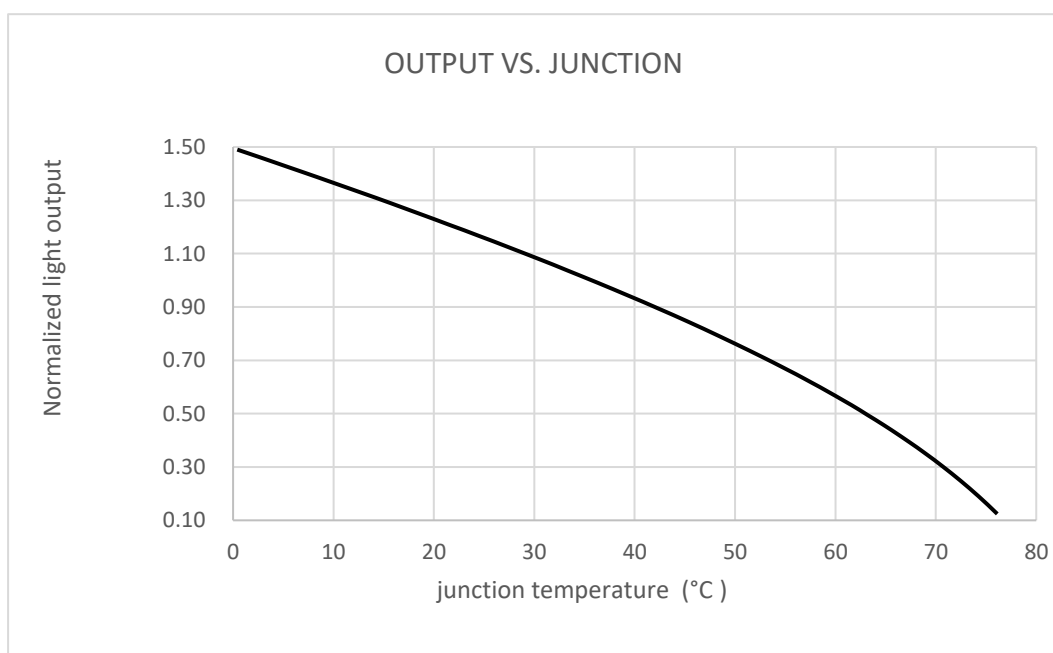
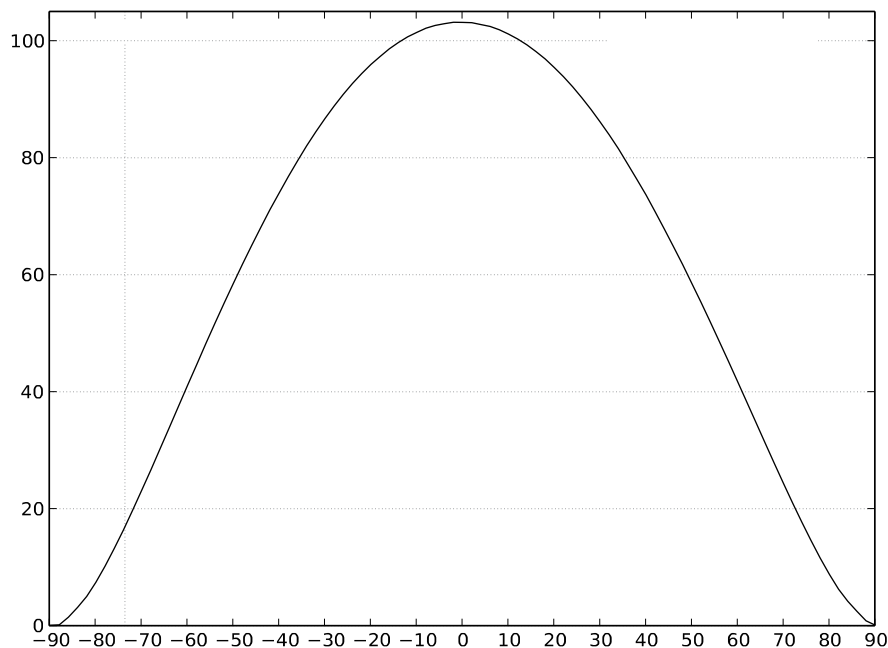


Figure 4. Typical normalized light output vs. junction temperature for at test current.

## TYPICAL RADIATION PATTERN



Notes for Figure :

1. Typical viewing angle is 30°.
2. The viewing angle is defined as the off axis angle from the centerline where luminous intensity (Iv) is 1/2 of the peak value.

## TYPICAL RADIATION PATTERN

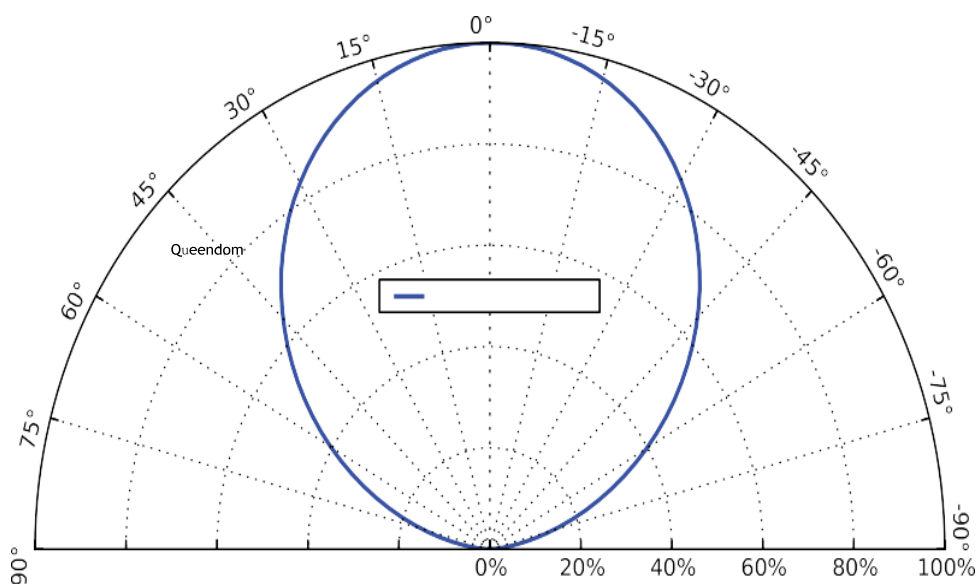
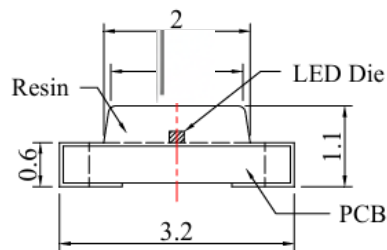
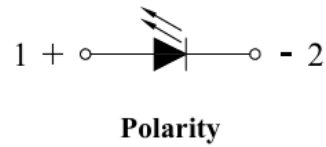
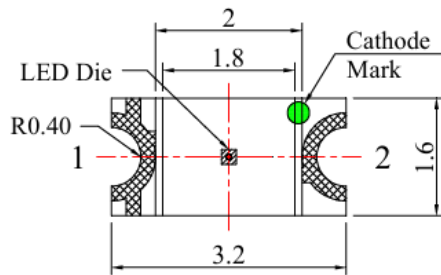
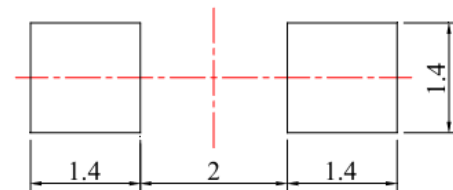
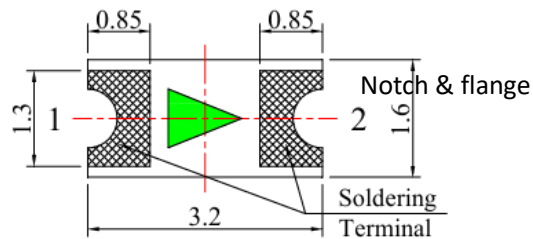


Figure 5. TYPICAL POLAR RADIATION PATTERN AT 20MA, TSP=25°C

## DIMENSIONAL DRAWING:



## Recommended Soldering Pad Dimensions



### Notes:

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

## Chromaticity Region & Coordinates

Figure 1a. Typical normalized power vs. wavelength for QUEENDOM LEDs, Tj=25 °C.

| Region          | CIE x  | CIE y  | Region | CIE x  | CIE y  |
|-----------------|--------|--------|--------|--------|--------|
| Y rank (2200 K) |        |        |        |        |        |
| Y1              | 0.4854 | 0.4022 | Y9     | 0.4974 | 0.421  |
|                 | 0.4914 | 0.4116 |        | 0.5033 | 0.4304 |
|                 | 0.4964 | 0.4116 |        | 0.5087 | 0.4304 |
|                 | 0.4903 | 0.4022 |        | 0.5025 | 0.421  |
| Y2              | 0.4903 | 0.4022 | YA     | 0.5025 | 0.421  |
|                 | 0.4964 | 0.4116 |        | 0.5087 | 0.4304 |
|                 | 0.5014 | 0.4116 |        | 0.514  | 0.4303 |
|                 | 0.4952 | 0.4023 |        | 0.5077 | 0.421  |
| Y3              | 0.4952 | 0.4023 | YB     | 0.5077 | 0.421  |
|                 | 0.5014 | 0.4116 |        | 0.514  | 0.4303 |
|                 | 0.5065 | 0.4116 |        | 0.5194 | 0.4303 |
|                 | 0.5    | 0.4023 |        | 0.5129 | 0.421  |
| Y4              | 0.5    | 0.4023 | YC     | 0.5129 | 0.421  |
|                 | 0.5065 | 0.4116 |        | 0.5194 | 0.4303 |
|                 | 0.5115 | 0.4116 |        | 0.5247 | 0.4303 |
|                 | 0.5049 | 0.4023 |        | 0.5181 | 0.421  |
| Y5              | 0.4914 | 0.4116 | YD     | 0.5033 | 0.4304 |
|                 | 0.4974 | 0.421  |        | 0.5093 | 0.4398 |
|                 | 0.5025 | 0.421  |        | 0.5148 | 0.4398 |
|                 | 0.4964 | 0.4116 |        | 0.5087 | 0.4304 |
| Y6              | 0.4964 | 0.4116 | YE     | 0.5087 | 0.4304 |
|                 | 0.5025 | 0.421  |        | 0.5148 | 0.4398 |
|                 | 0.5077 | 0.421  |        | 0.5203 | 0.4397 |
|                 | 0.5014 | 0.4116 |        | 0.514  | 0.4303 |
| Y7              | 0.5014 | 0.4116 | YF     | 0.514  | 0.4303 |
|                 | 0.5077 | 0.421  |        | 0.5203 | 0.4397 |
|                 | 0.5129 | 0.421  |        | 0.5258 | 0.4397 |
|                 | 0.5065 | 0.4116 |        | 0.5194 | 0.4303 |
| Y8              | 0.5065 | 0.4116 | YG     | 0.5194 | 0.4303 |
|                 | 0.5129 | 0.421  |        | 0.5258 | 0.4397 |
|                 | 0.5181 | 0.421  |        | 0.5313 | 0.4396 |
|                 | 0.5115 | 0.4116 |        | 0.5247 | 0.4303 |

| Region          | CIE x  | CIE y  | Region | CIE x  | CIE y  |
|-----------------|--------|--------|--------|--------|--------|
| W rank (2700 K) |        |        |        |        |        |
| W1              | 0.4417 | 0.394  | W9     | 0.4515 | 0.4128 |
|                 | 0.4472 | 0.3953 |        | 0.4573 | 0.4141 |
|                 | 0.4522 | 0.4047 |        | 0.4623 | 0.4235 |
|                 | 0.4466 | 0.4034 |        | 0.4563 | 0.4222 |
| W2              | 0.4472 | 0.3953 | WA     | 0.4573 | 0.4141 |
|                 | 0.4527 | 0.3966 |        | 0.4631 | 0.4153 |
|                 | 0.4579 | 0.4059 |        | 0.4683 | 0.4247 |
|                 | 0.4522 | 0.4047 |        | 0.4623 | 0.4235 |
| W3              | 0.4527 | 0.3966 | WB     | 0.4631 | 0.4153 |
|                 | 0.4582 | 0.3978 |        | 0.4689 | 0.4166 |
|                 | 0.4635 | 0.4072 |        | 0.4742 | 0.426  |
|                 | 0.4579 | 0.4059 |        | 0.4683 | 0.4247 |
| W4              | 0.4582 | 0.3978 | WC     | 0.4689 | 0.4166 |
|                 | 0.4637 | 0.3991 |        | 0.4747 | 0.4179 |
|                 | 0.4692 | 0.4085 |        | 0.4802 | 0.4272 |
|                 | 0.4635 | 0.4072 |        | 0.4742 | 0.426  |
| W5              | 0.4466 | 0.4034 | WD     | 0.4563 | 0.4222 |
|                 | 0.4522 | 0.4047 |        | 0.4623 | 0.4235 |
|                 | 0.4573 | 0.4141 |        | 0.4673 | 0.4329 |
|                 | 0.4515 | 0.4128 |        | 0.4612 | 0.4316 |
| W6              | 0.4522 | 0.4047 | WE     | 0.4623 | 0.4235 |
|                 | 0.4579 | 0.4059 |        | 0.4683 | 0.4247 |
|                 | 0.4631 | 0.4153 |        | 0.4735 | 0.4341 |
|                 | 0.4573 | 0.4141 |        | 0.4673 | 0.4329 |
| W7              | 0.4579 | 0.4059 | WF     | 0.4683 | 0.4247 |
|                 | 0.4635 | 0.4072 |        | 0.4742 | 0.426  |
|                 | 0.4689 | 0.4166 |        | 0.4796 | 0.4354 |
|                 | 0.4631 | 0.4153 |        | 0.4735 | 0.4341 |
| W8              | 0.4635 | 0.4072 | WG     | 0.4742 | 0.426  |
|                 | 0.4692 | 0.4085 |        | 0.4802 | 0.4272 |
|                 | 0.4747 | 0.4179 |        | 0.4857 | 0.4366 |
|                 | 0.4689 | 0.4166 |        | 0.4796 | 0.4354 |



Figure 1b. Typical normalized power vs. wavelength for QUEENDOM LEDs, Tj=25 °C.

| Region          | CIE x  | CIE y  | Region | CIE x  | CIE y  |
|-----------------|--------|--------|--------|--------|--------|
| U rank (3500 K) |        |        |        |        |        |
| U1              | 0.3889 | 0.369  | U9     | 0.3941 | 0.3848 |
|                 | 0.3915 | 0.3768 |        | 0.3968 | 0.393  |
|                 | 0.3981 | 0.38   |        | 0.404  | 0.3966 |
|                 | 0.3953 | 0.372  |        | 0.401  | 0.3882 |
| U2              | 0.3953 | 0.372  | UA     | 0.401  | 0.3882 |
|                 | 0.3981 | 0.38   |        | 0.404  | 0.3966 |
|                 | 0.4048 | 0.3832 |        | 0.4113 | 0.4001 |
|                 | 0.4017 | 0.3751 |        | 0.408  | 0.3916 |
| U3              | 0.4017 | 0.3751 | UB     | 0.408  | 0.3916 |
|                 | 0.4048 | 0.3832 |        | 0.4113 | 0.4001 |
|                 | 0.4116 | 0.3865 |        | 0.4186 | 0.4037 |
|                 | 0.4082 | 0.3782 |        | 0.415  | 0.395  |
| U4              | 0.4082 | 0.3782 | UC     | 0.415  | 0.395  |
|                 | 0.4116 | 0.3865 |        | 0.4186 | 0.4037 |
|                 | 0.4183 | 0.3898 |        | 0.4259 | 0.4073 |
|                 | 0.4147 | 0.3814 |        | 0.4221 | 0.3984 |
| U5              | 0.3915 | 0.3768 | UD     | 0.3968 | 0.393  |
|                 | 0.3941 | 0.3848 |        | 0.3996 | 0.4015 |
|                 | 0.401  | 0.3882 |        | 0.4071 | 0.4052 |
|                 | 0.3981 | 0.38   |        | 0.404  | 0.3966 |
| U6              | 0.3981 | 0.38   | UE     | 0.404  | 0.3966 |
|                 | 0.401  | 0.3882 |        | 0.4071 | 0.4052 |
|                 | 0.408  | 0.3916 |        | 0.4146 | 0.4089 |
|                 | 0.4048 | 0.3832 |        | 0.4113 | 0.4001 |
| U7              | 0.4048 | 0.3832 | UF     | 0.4113 | 0.4001 |
|                 | 0.408  | 0.3916 |        | 0.4146 | 0.4089 |
|                 | 0.415  | 0.395  |        | 0.4222 | 0.4127 |
|                 | 0.4116 | 0.3865 |        | 0.4186 | 0.4037 |
| U8              | 0.4116 | 0.3865 | UG     | 0.4186 | 0.4037 |
|                 | 0.415  | 0.395  |        | 0.4222 | 0.4127 |
|                 | 0.4221 | 0.3984 |        | 0.4299 | 0.4165 |
|                 | 0.4183 | 0.3898 |        | 0.4259 | 0.4073 |

| Region          | CIE x  | CIE y  | Region | CIE x  | CIE y  |
|-----------------|--------|--------|--------|--------|--------|
| T rank (4000 K) |        |        |        |        |        |
| T1              | 0.367  | 0.3578 | T9     | 0.3702 | 0.3722 |
|                 | 0.3726 | 0.3612 |        | 0.3763 | 0.376  |
|                 | 0.3744 | 0.3685 |        | 0.3782 | 0.3837 |
|                 | 0.3686 | 0.3649 |        | 0.3719 | 0.3797 |
| T2              | 0.3726 | 0.3612 | TA     | 0.3763 | 0.376  |
|                 | 0.3783 | 0.3646 |        | 0.3825 | 0.3798 |
|                 | 0.3804 | 0.3721 |        | 0.3847 | 0.3877 |
|                 | 0.3744 | 0.3685 |        | 0.3782 | 0.3837 |
| T3              | 0.3783 | 0.3646 | TB     | 0.3825 | 0.3798 |
|                 | 0.384  | 0.3681 |        | 0.3887 | 0.3836 |
|                 | 0.3863 | 0.3758 |        | 0.3912 | 0.3917 |
|                 | 0.3804 | 0.3721 |        | 0.3847 | 0.3877 |
| T4              | 0.384  | 0.3681 | TC     | 0.3887 | 0.3837 |
|                 | 0.3898 | 0.3716 |        | 0.395  | 0.3875 |
|                 | 0.3924 | 0.3794 |        | 0.3978 | 0.3958 |
|                 | 0.3863 | 0.3758 |        | 0.3912 | 0.3917 |
| T5              | 0.3686 | 0.3649 | TD     | 0.3719 | 0.3797 |
|                 | 0.3744 | 0.3685 |        | 0.3782 | 0.3837 |
|                 | 0.3763 | 0.376  |        | 0.3802 | 0.3916 |
|                 | 0.3702 | 0.3722 |        | 0.3736 | 0.3874 |
| T6              | 0.3744 | 0.3685 | TE     | 0.3782 | 0.3837 |
|                 | 0.3804 | 0.3721 |        | 0.3847 | 0.3877 |
|                 | 0.3825 | 0.3798 |        | 0.3869 | 0.3958 |
|                 | 0.3763 | 0.376  |        | 0.3802 | 0.3916 |
| T7              | 0.3804 | 0.3721 | TF     | 0.3847 | 0.3877 |
|                 | 0.3863 | 0.3758 |        | 0.3912 | 0.3917 |
|                 | 0.3887 | 0.3836 |        | 0.3937 | 0.4001 |
|                 | 0.3825 | 0.3798 |        | 0.3869 | 0.3958 |
| T8              | 0.3863 | 0.3758 | TG     | 0.3912 | 0.3917 |
|                 | 0.3924 | 0.3794 |        | 0.3978 | 0.3958 |
|                 | 0.395  | 0.3875 |        | 0.4006 | 0.4044 |
|                 | 0.3887 | 0.3836 |        | 0.3937 | 0.4001 |



Figure 1c. Typical normalized power vs. wavelength for QUEENDOM LEDs, Tj=25 °C.

| Region          | CIE x  | CIE y  | Region | CIE x  | CIE y  |
|-----------------|--------|--------|--------|--------|--------|
| R rank (5000 K) |        |        |        |        |        |
| R1              | 0.3366 | 0.3369 | R9     | 0.3374 | 0.3554 |
|                 | 0.3369 | 0.3431 |        | 0.3371 | 0.3493 |
|                 | 0.3407 | 0.346  |        | 0.3411 | 0.3522 |
|                 | 0.3403 | 0.3398 |        | 0.3415 | 0.3587 |
| R2              | 0.3403 | 0.3398 | RA     | 0.3415 | 0.3587 |
|                 | 0.3407 | 0.346  |        | 0.3411 | 0.3522 |
|                 | 0.3446 | 0.3491 |        | 0.3451 | 0.3554 |
|                 | 0.344  | 0.3427 |        | 0.3457 | 0.3621 |
| R3              | 0.3446 | 0.3491 | RB     | 0.3451 | 0.3554 |
|                 | 0.344  | 0.3427 |        | 0.3457 | 0.3621 |
|                 | 0.3477 | 0.3458 |        | 0.35   | 0.3655 |
|                 | 0.3485 | 0.3522 |        | 0.3492 | 0.3587 |
| R4              | 0.3485 | 0.3522 | RC     | 0.3492 | 0.3587 |
|                 | 0.3477 | 0.3458 |        | 0.35   | 0.3655 |
|                 | 0.3514 | 0.3487 |        | 0.3542 | 0.369  |
|                 | 0.3524 | 0.3554 |        | 0.3533 | 0.362  |
| R5              | 0.3371 | 0.3493 | RD     | 0.3376 | 0.3616 |
|                 | 0.3369 | 0.3431 |        | 0.3374 | 0.3554 |
|                 | 0.3407 | 0.346  |        | 0.3415 | 0.3587 |
|                 | 0.3411 | 0.3522 |        | 0.342  | 0.3652 |
| R6              | 0.3407 | 0.346  | RE     | 0.3415 | 0.3587 |
|                 | 0.3411 | 0.3522 |        | 0.342  | 0.3652 |
|                 | 0.3451 | 0.3554 |        | 0.3463 | 0.3687 |
|                 | 0.3446 | 0.3491 |        | 0.3457 | 0.3621 |
| R7              | 0.3446 | 0.3491 | RF     | 0.3457 | 0.3621 |
|                 | 0.3451 | 0.3554 |        | 0.3463 | 0.3687 |
|                 | 0.3492 | 0.3587 |        | 0.3507 | 0.3724 |
|                 | 0.3485 | 0.3522 |        | 0.35   | 0.3655 |
| R8              | 0.3485 | 0.3522 | RG     | 0.35   | 0.3655 |
|                 | 0.3492 | 0.3587 |        | 0.3507 | 0.3724 |
|                 | 0.3533 | 0.362  |        | 0.3551 | 0.376  |
|                 | 0.3524 | 0.3554 |        | 0.3542 | 0.369  |

| Region          | CIE x  | CIE y  | Region | CIE x  | CIE y  |
|-----------------|--------|--------|--------|--------|--------|
| Q rank (5700 K) |        |        |        |        |        |
| Q1              | 0.3218 | 0.3298 | Q9     | 0.3211 | 0.3407 |
|                 | 0.3222 | 0.3243 |        | 0.3215 | 0.3353 |
|                 | 0.3258 | 0.3275 |        | 0.3254 | 0.3388 |
|                 | 0.3256 | 0.3331 |        | 0.3252 | 0.3444 |
| Q2              | 0.3256 | 0.3331 | QA     | 0.3252 | 0.3444 |
|                 | 0.3258 | 0.3275 |        | 0.3254 | 0.3388 |
|                 | 0.3294 | 0.3306 |        | 0.3293 | 0.3423 |
|                 | 0.3294 | 0.3364 |        | 0.3293 | 0.3481 |
| Q3              | 0.3294 | 0.3364 | QB     | 0.3293 | 0.3481 |
|                 | 0.3294 | 0.3306 |        | 0.3293 | 0.3423 |
|                 | 0.333  | 0.3338 |        | 0.3332 | 0.3458 |
|                 | 0.3331 | 0.3398 |        | 0.3333 | 0.3518 |
| Q4              | 0.3331 | 0.3398 | QC     | 0.3333 | 0.3518 |
|                 | 0.333  | 0.3338 |        | 0.3332 | 0.3458 |
|                 | 0.3366 | 0.3369 |        | 0.3371 | 0.3493 |
|                 | 0.3369 | 0.3431 |        | 0.3374 | 0.3554 |
| Q1              | 0.3215 | 0.3353 | QD     | 0.3207 | 0.3462 |
|                 | 0.3218 | 0.3298 |        | 0.3211 | 0.3407 |
|                 | 0.3256 | 0.3331 |        | 0.3252 | 0.3444 |
|                 | 0.3254 | 0.3388 |        | 0.325  | 0.3501 |
| Q2              | 0.3254 | 0.3388 | QE     | 0.325  | 0.3501 |
|                 | 0.3256 | 0.3331 |        | 0.3252 | 0.3444 |
|                 | 0.3294 | 0.3364 |        | 0.3293 | 0.3481 |
|                 | 0.3293 | 0.3423 |        | 0.3292 | 0.3539 |
| Q3              | 0.3293 | 0.3423 | QF     | 0.3292 | 0.3539 |
|                 | 0.3294 | 0.3364 |        | 0.3293 | 0.3481 |
|                 | 0.3331 | 0.3398 |        | 0.3333 | 0.3518 |
|                 | 0.3332 | 0.3458 |        | 0.3334 | 0.3578 |
| Q4              | 0.3332 | 0.3458 | QG     | 0.3334 | 0.3578 |
|                 | 0.3331 | 0.3398 |        | 0.3333 | 0.3518 |
|                 | 0.3369 | 0.3431 |        | 0.3374 | 0.3554 |
|                 | 0.3371 | 0.3493 |        | 0.3376 | 0.3616 |

Figure 1d. Typical normalized power vs. wavelength for QUEENDOM LEDs, Tj=25 °C.

| Region          | CIE x  | CIE y  | Region | CIE x  | CIE y  |
|-----------------|--------|--------|--------|--------|--------|
| P rank (6500 K) |        |        |        |        |        |
| P1              | 0.3068 | 0.3113 | P9     | 0.3048 | 0.3207 |
|                 | 0.3106 | 0.315  |        | 0.3089 | 0.3249 |
|                 | 0.3098 | 0.3199 |        | 0.308  | 0.3298 |
|                 | 0.3058 | 0.316  |        | 0.3038 | 0.3256 |
| P2              | 0.3106 | 0.315  | PA     | 0.3089 | 0.3249 |
|                 | 0.3144 | 0.3186 |        | 0.313  | 0.329  |
|                 | 0.3137 | 0.3238 |        | 0.3123 | 0.3341 |
|                 | 0.3098 | 0.3199 |        | 0.308  | 0.3298 |
| P3              | 0.3144 | 0.3186 | PB     | 0.313  | 0.329  |
|                 | 0.3183 | 0.3224 |        | 0.3172 | 0.3332 |
|                 | 0.3177 | 0.3278 |        | 0.3166 | 0.3384 |
|                 | 0.3137 | 0.3238 |        | 0.3123 | 0.3341 |
| P4              | 0.3183 | 0.3224 | PC     | 0.3172 | 0.3332 |
|                 | 0.3221 | 0.3261 |        | 0.3214 | 0.3373 |
|                 | 0.3218 | 0.3317 |        | 0.321  | 0.3427 |
|                 | 0.3177 | 0.3278 |        | 0.3166 | 0.3384 |
| P5              | 0.3058 | 0.316  | PD     | 0.3038 | 0.3256 |
|                 | 0.3098 | 0.3199 |        | 0.308  | 0.3298 |
|                 | 0.3089 | 0.3249 |        | 0.3072 | 0.3348 |
|                 | 0.3048 | 0.3207 |        | 0.3028 | 0.3304 |
| P6              | 0.3098 | 0.3199 | PE     | 0.308  | 0.3298 |
|                 | 0.3137 | 0.3238 |        | 0.3123 | 0.3341 |
|                 | 0.313  | 0.329  |        | 0.3115 | 0.3391 |
|                 | 0.3089 | 0.3249 |        | 0.3072 | 0.3348 |
| P7              | 0.3137 | 0.3238 | PF     | 0.3123 | 0.3341 |
|                 | 0.3177 | 0.3278 |        | 0.3166 | 0.3384 |
|                 | 0.3172 | 0.3332 |        | 0.316  | 0.3436 |
|                 | 0.313  | 0.329  |        | 0.3115 | 0.3391 |
| P8              | 0.3177 | 0.3278 | PG     | 0.3166 | 0.3384 |
|                 | 0.3218 | 0.3317 |        | 0.321  | 0.3427 |
|                 | 0.3214 | 0.3373 |        | 0.3206 | 0.3481 |
|                 | 0.3172 | 0.3332 |        | 0.316  | 0.3436 |



## Dominant Wavelength Bins

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

|        | Region | CIE x  | CIE y  | Major-axis | Minor-axis | Rotation |
|--------|--------|--------|--------|------------|------------|----------|
| 3 step | 2700   | 0.4578 | 0.4101 | 0.0081     | 0.0042     | 53.7     |
|        | 3000   | 0.4338 | 0.403  | 0.0083     | 0.0041     | 53.22    |
|        | 3500   | 0.4073 | 0.3917 | 0.0093     | 0.0041     | 54       |
|        | 4000   | 0.3818 | 0.3797 | 0.0094     | 0.004      | 53.72    |
|        | 5000   | 0.3447 | 0.3553 | 0.0082     | 0.0035     | 59.62    |
|        | 5700   | 0.3287 | 0.3417 | 0.0075     | 0.0032     | 59.1     |
|        | 6500   | 0.3123 | 0.3282 | 0.0067     | 0.0029     | 58.57    |
| 5 step | 2700   | 0.4578 | 0.4101 | 0.0135     | 0.007      | 53.7     |
|        | 3000   | 0.4338 | 0.403  | 0.0138     | 0.0068     | 53.22    |
|        | 3500   | 0.4073 | 0.3917 | 0.0155     | 0.0068     | 54       |
|        | 4000   | 0.3818 | 0.3797 | 0.0157     | 0.0067     | 53.72    |
|        | 5000   | 0.3447 | 0.3553 | 0.0137     | 0.0058     | 59.62    |
|        | 5700   | 0.3287 | 0.3417 | 0.0125     | 0.0053     | 59.1     |
|        | 6500   | 0.3123 | 0.3282 | 0.0112     | 0.0048     | 58.57    |

Notes:

1. The tolerance of luminous intensity (Iv )is  $\pm 15\%$  .
2. The tolerance of dominant wavelength is  $\pm 1\text{nm}$ .
3. This specification is preliminary.
- 4.This specification is a standard specification of our factory, can make in accordance with customer's special requirement.

## LUMINOUS FLUX BINS

Table 1. .Luminous flux bin definitions for QUEENDOM Color Line at Tj=25°C.

| BIN | QUEENDOM FLUX [1] (mcd) |         |
|-----|-------------------------|---------|
|     | MINIMUM                 | MAXIMUM |
| LF  | 90                      | 120     |
| LG  | 120                     | 190     |
| LH  | 190                     | 300     |
| LI  | 300                     | 500     |
| LJ  | 500                     | 780     |
| LK  | 780                     | 1060    |
| LL  | 1060                    | 1560    |

## TABLE Forward Voltage BINS

Table 2. Electrical and thermal characteristics for Queendom at specified test current, Tj=25°C

| NUMBER | FORWARD VOLTAGE [1] (Vf) |         |         |
|--------|--------------------------|---------|---------|
|        | MINIMUM                  | TYPICAL | MAXIMUM |
| V3     | 1.8                      | 2       | 2.2     |
| V4     | 2.2                      | 2.4     | 2.6     |
| V5     | 2.6                      | 2.8     | 3       |
| V6     | 3                        | 3.2     | 3.4     |
| V3     | 1.8                      | 2       | 2.2     |
| V4     | 2.2                      | 2.4     | 2.6     |
| V5     | 2.6                      | 2.8     | 3       |
| V6     | 3                        | 3.2     | 3.4     |

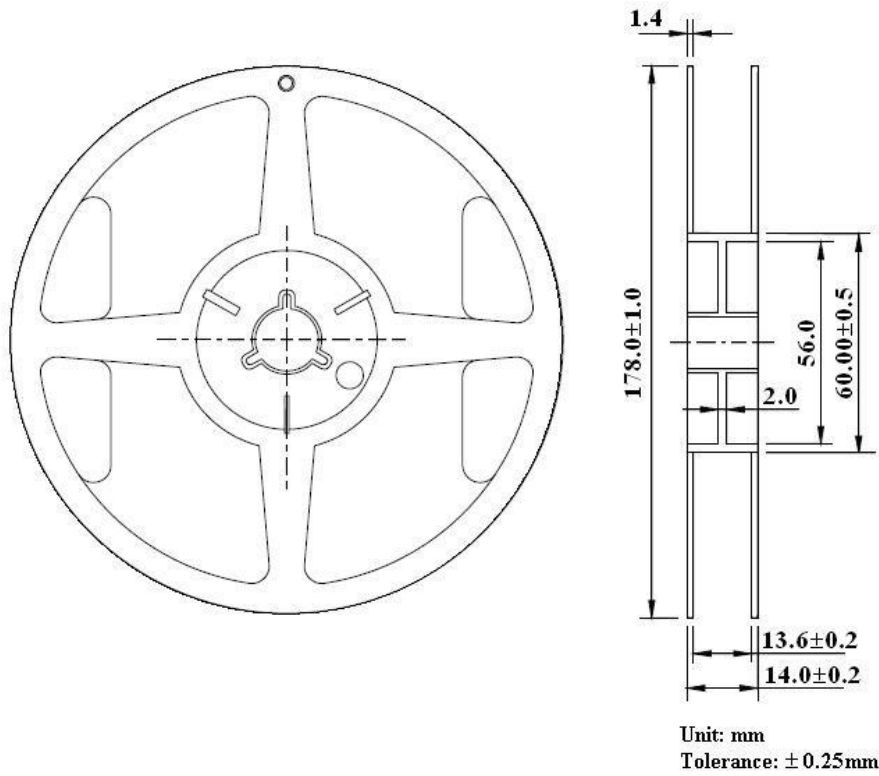
## TABLE TYPICAL POWER BINS

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

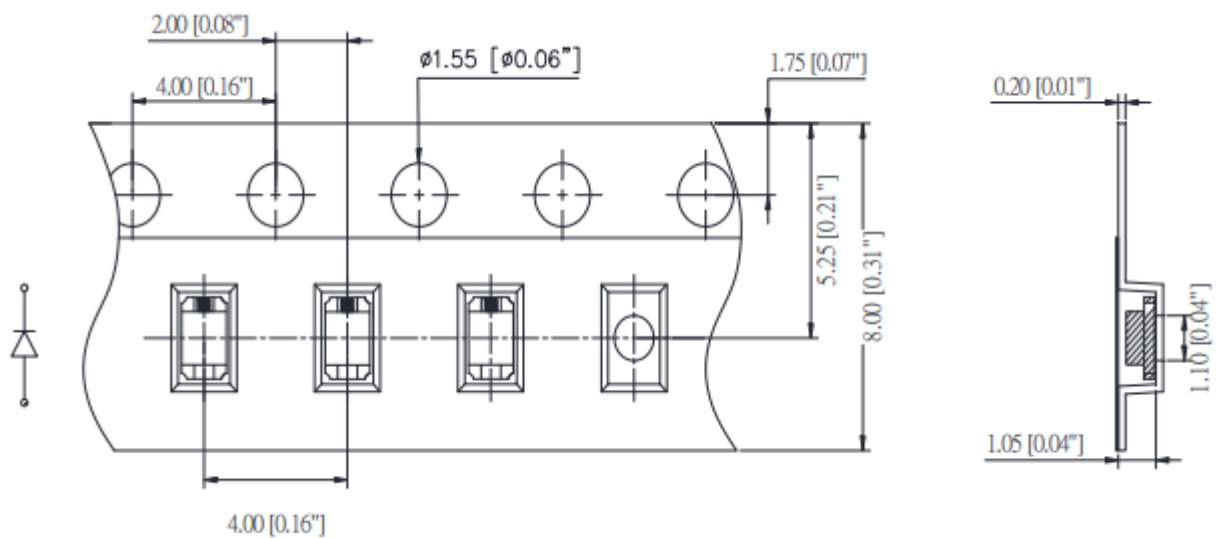
| RANK NO. | TYPICAL POWER RANK (W) [1] |     | RANK POWER [2] (W) |         | TYPICAL POWER HALF WIDTH |
|----------|----------------------------|-----|--------------------|---------|--------------------------|
|          | min                        | max | MINIMUM            | MAXIMUM | [3] (W)                  |
| 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                        |

## Packaging Information

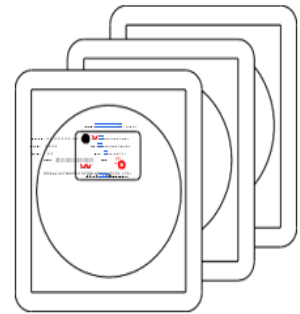
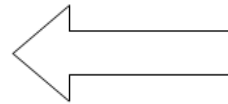
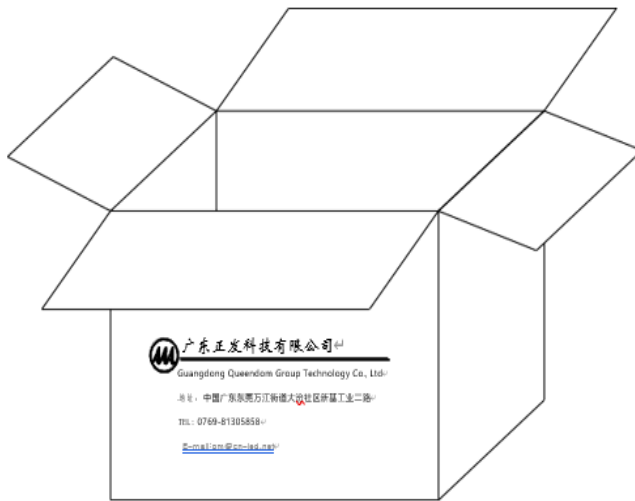
## Reel Dimensions:



## Carrier Tape Dimensions:



## Packaging cartons



## Information

### - With Stopper

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

### Without Stopper

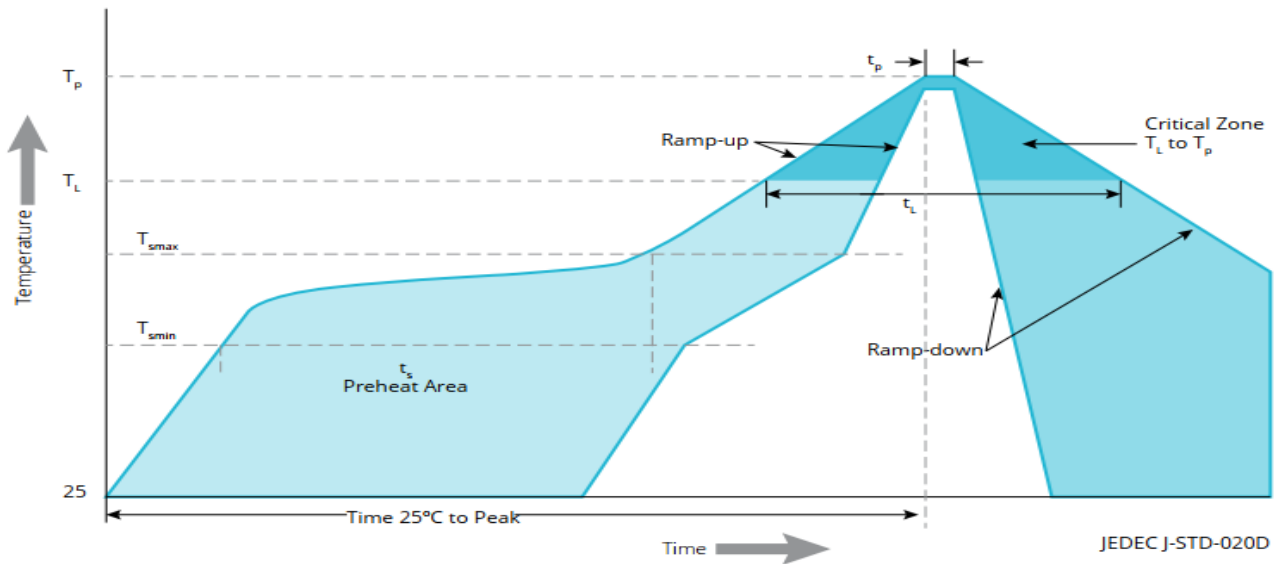
CPN:Customer's Product Number  
 P/N:Product Number  
 QTY:Packing Quantity  
 LOT NO:Lot Number  
 VF:Forward Voltage Rank  
 IV:Luminous Intensity Rank  
 WLD:Dom. Wavelength Rank  
 BIN:BIN Code  
 DATE: Date Of Dispatch

### Packing Quantity

1. 4000PCS/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   |
|---------------------------------------------------|----------------------|
| Reheat 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 $T_p$ )                   | 3°C / second maximum |
| Liquidus Temperature ( $T_L$ )                    | 217°C                |
| Time Maintained Above Temperature $T_L$ ( $t_L$ ) | 60 to 150 seconds    |
| Peak / Classification Temperature ( $T_p$ )       | 260°C                |
| Time Within 5°C of Actual Temperature ( $t_p$ )   | 20 to 40 seconds     |
| Ramp-Down Rate ( $T_p$ to $T_L$ )                 | 6°C / second maximum |
| Time 25°C to P                                    | 8 minutes maximum    |

### JEDEC Moisture Sensitivity

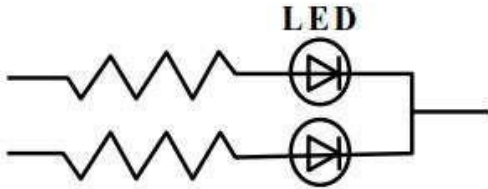
Moisture sensitivity levels for LEDs Line

| leVel | Floor lIfe |                                           | soaK requirements standard |               |
|-------|------------|-------------------------------------------|----------------------------|---------------|
|       | tIme       | conditions                                | tIme                       | conditions    |
| 1     | Unlimited  | $\leq 30^\circ\text{C} / 85\% \text{ RH}$ | 168 Hours +5 / -0          | 85°C / 85% RH |

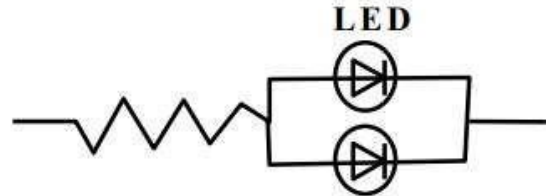
## Drive Method

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.