



ABSOLUTE MAXIMUM RATINGS

Table 1. Absolute maximum ratings for LEDs.

| PARAMETER                                     | WHITE                   |
|-----------------------------------------------|-------------------------|
| Parameter PD (W)                              | 15-45W                  |
| DC Forward Current [1, 2]                     | 300 mA -1500 mA         |
| Peak Pulsed Forward Current [1, 3]            | --                      |
| LED Junction Temperature [1] (DC & Pulse)     | 115°C                   |
| Reverse Voltage (Vreverse)                    | 5                       |
| ESD Sensitivity (ANSI/ESDA/JEDEC JS-001-2012) | Class 3                 |
| 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: Proper current derating must be observed to maintain the junction temperature below the maximum allowable junction temperature. Single-color light. At 0.01ms pulse on time test with a pulse period of 0.1ms.



## Performance Characteristics

### Product Selection Guide

Table 2. Product performance of QUEENDOM CoB Core Range at specified test current, Tj=85°C

| Model        | Rank Code | Color Type | POWER | Test Current | Part Number       |
|--------------|-----------|------------|-------|--------------|-------------------|
| Device Model | Rank      | CCT/K      | W     | (mA)         | P/N               |
| C1919WWWJ    | HP05500   | 2700K      | 15    | 300          | 8541401000HP05500 |
| C1919WVWJ    | HP05501   | 3000K      | 15    | 300          | 8541401000HP05501 |
| C1919WUWJ    | HP05502   | 3500K      | 15    | 300          | 8541401000HP05502 |
| C1919WRWJ    | HP05503   | 5000K      | 15    | 300          | 8541401000HP05503 |
| C1919WPWJ    | HP05504   | 6500K      | 15    | 300          | 8541401000HP05504 |
| C1919WWWK    | HP05505   | 2700K      | 18    | 600          | 8541401000HP05505 |
| C1919WVWKK   | HP05506   | 3000K      | 18    | 600          | 8541401000HP05506 |
| C1919WUWK    | HP05507   | 3500K      | 18    | 600          | 8541401000HP05507 |
| C1919WRWK    | HP05508   | 5000K      | 18    | 600          | 8541401000HP05508 |
| C1919WPWK    | HP05509   | 6500K      | 18    | 600          | 8541401000HP05509 |
| C1919WWWL    | HP05510   | 2700K      | 24    | 800          | 8541401000HP05510 |
| C1919WVWL    | HP05511   | 3000K      | 24    | 800          | 8541401000HP05511 |
| C1919WUWL    | HP05512   | 3500K      | 24    | 800          | 8541401000HP05512 |
| C1919WRWL    | HP05513   | 5000K      | 24    | 800          | 8541401000HP05513 |
| C1919WPWL    | HP05514   | 6500K      | 24    | 800          | 8541401000HP05514 |
| C1919WWWO    | HP05515   | 2700K      | 30    | 1000         | 8541401000HP05515 |
| C1919WVWO    | HP05516   | 3000K      | 30    | 1000         | 8541401000HP05516 |
| C1919WUWO    | HP05517   | 3500K      | 30    | 1000         | 8541401000HP05517 |
| C1919WRWO    | HP05518   | 5000K      | 30    | 1000         | 8541401000HP05518 |
| C1919WPWO    | HP05519   | 6500K      | 30    | 1000         | 8541401000HP05519 |
| C1919WWWP    | HP05520   | 2700K      | 36    | 1200         | 8541401000HP05520 |
| C1919WVWP    | HP05521   | 3000K      | 36    | 1200         | 8541401000HP05521 |
| C1919WUWP    | HP05522   | 3500K      | 36    | 1200         | 8541401000HP05522 |
| C1919WRWP    | HP05523   | 5000K      | 36    | 1200         | 8541401000HP05523 |
| C1919WPWP    | HP05524   | 6500K      | 36    | 1200         | 8541401000HP05524 |
| C1919WWWQ    | HP05525   | 2700K      | 45    | 1500         | 8541401000HP05525 |
| C1919WVWQ    | HP05526   | 3000K      | 45    | 1500         | 8541401000HP05526 |
| C1919WUWQ    | HP05527   | 3500K      | 45    | 1500         | 8541401000HP05527 |
| C1919WRWQ    | HP05528   | 5000K      | 45    | 1500         | 8541401000HP05528 |
| C1919WQWQ    | HP05529   | 6500K      | 45    | 1500         | 8541401000HP05529 |

#### Notes:

The dominant wavelength ( $\lambda_d$ ) is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.

maintains a  $\pm 7.5\%$  tolerance on luminous flux measurements,  $\pm 0.15V$  tolerance on forward voltage measurements, and  $\pm 2$  tolerance on CRI measurements

Products tested under pulsed condition (10ms pulse width) at nominal drive current.

Typical pulsed test performance values are provided as reference only and are not a guarantee of performance.



## Product Electrical Index

Table 3. Product performance of QUEENDOM CoB Core Range at specified test current, Tj=85°C

| Model        | Rank Code | Color Type | POWER | Luminous Flux (lm) |        | Forward Voltage VF (V) |     | Efficacy | Viewing Angle | Test Current |
|--------------|-----------|------------|-------|--------------------|--------|------------------------|-----|----------|---------------|--------------|
| Device Model | Rank      | CCT/K      | W     | MIN                | MAX    | MIN                    | MAX | (lm/W)   | (2θ½, °)      | (mA)         |
| C1919WWWJ    | HP05500   | 2700K      | 15    | 2025               | 1539   | 30                     | 38  | 135      | 120           | 300          |
| C1919WVWJ    | HP05501   | 3000K      | 15    | 2025               | 1539   | 30                     | 38  | 135      | 120           | 300          |
| C1919WUWJ    | HP05502   | 3500K      | 15    | 2025               | 1539   | 30                     | 38  | 135      | 120           | 300          |
| C1919WRWJ    | HP05503   | 5000K      | 15    | 2025               | 1539   | 30                     | 38  | 135      | 120           | 300          |
| C1919WPWJ    | HP05504   | 6500K      | 15    | 2025               | 1539   | 30                     | 38  | 135      | 120           | 300          |
| C1919WWWK    | HP05505   | 2700K      | 18    | 2376               | 3009.6 | 30                     | 38  | 132      | 120           | 600          |
| C1919WVWK    | HP05506   | 3000K      | 18    | 2376               | 3009.6 | 30                     | 38  | 132      | 120           | 600          |
| C1919WUWK    | HP05507   | 3500K      | 18    | 2376               | 3009.6 | 30                     | 38  | 132      | 120           | 600          |
| C1919WRWK    | HP05508   | 5000K      | 18    | 2376               | 3009.6 | 30                     | 38  | 132      | 120           | 600          |
| C1919WPWK    | HP05509   | 6500K      | 18    | 2376               | 3009.6 | 30                     | 38  | 132      | 120           | 600          |
| C1919WWWL    | HP05510   | 2700K      | 24    | 3120               | 3952   | 30                     | 38  | 130      | 120           | 800          |
| C1919WVWL    | HP05511   | 3000K      | 24    | 3120               | 3952   | 30                     | 38  | 130      | 120           | 800          |
| C1919WUWL    | HP05512   | 3500K      | 24    | 3120               | 3952   | 30                     | 38  | 130      | 120           | 800          |
| C1919WRWL    | HP05513   | 5000K      | 24    | 3120               | 3952   | 30                     | 38  | 130      | 120           | 800          |
| C1919WPWL    | HP05514   | 6500K      | 24    | 3120               | 3952   | 30                     | 38  | 130      | 120           | 800          |
| C1919WWWO    | HP05515   | 2700K      | 30    | 3570               | 4522   | 30                     | 38  | 119      | 120           | 1000         |
| C1919WVWO    | HP05516   | 3000K      | 30    | 3570               | 4522   | 30                     | 38  | 119      | 120           | 1000         |
| C1919WUWO    | HP05517   | 3500K      | 30    | 3570               | 4522   | 30                     | 38  | 119      | 120           | 1000         |
| C1919WRWO    | HP05518   | 5000K      | 30    | 3570               | 4522   | 30                     | 38  | 119      | 120           | 1000         |
| C1919WPWO    | HP05519   | 6500K      | 30    | 3570               | 4522   | 30                     | 38  | 119      | 120           | 1000         |
| C1919WWWP    | HP05520   | 2700K      | 36    | 3960               | 5016   | 30                     | 38  | 110      | 120           | 1200         |
| C1919WVWP    | HP05521   | 3000K      | 36    | 3960               | 5016   | 30                     | 38  | 110      | 120           | 1200         |
| C1919WUWP    | HP05522   | 3500K      | 36    | 3960               | 5016   | 30                     | 38  | 110      | 120           | 1200         |
| C1919WRWP    | HP05523   | 5000K      | 36    | 3960               | 5016   | 30                     | 38  | 110      | 120           | 1200         |
| C1919WPWP    | HP05524   | 6500K      | 36    | 3960               | 5016   | 30                     | 38  | 110      | 120           | 1200         |
| C1919WWWQ    | HP05525   | 2700K      | 45    | 4950               | 6270   | 30                     | 38  | 110      | 120           | 1500         |
| C1919WVWQ    | HP05526   | 3000K      | 45    | 4950               | 6270   | 30                     | 38  | 110      | 120           | 1500         |
| C1919WUWQ    | HP05527   | 3500K      | 45    | 4950               | 6270   | 30                     | 38  | 110      | 120           | 1500         |
| C1919WRWQ    | HP05528   | 5000K      | 45    | 4950               | 6270   | 30                     | 38  | 110      | 120           | 1500         |
| C1919WQWQ    | HP05529   | 6500K      | 45    | 4950               | 6270   | 30                     | 38  | 110      | 120           | 1500         |

Table 3 continued on next page. Notes:

- Queendom LEDs maintains a tolerance of  $\pm 2$  on CRI and  $\pm 6.5\%$  on luminous flux measurements.
- Typical CRI is approximately 2 points higher than the minimum CRI specified, but this is not guaranteed.
- R9 value of 90CRI products is  $>50$ .
- Light Emitting Surface (LES) is the inner diameter (phosphor area) inside the dam.
- Energy efficiency class as specified in Commission Delegated Regulation (EU) 2019/2015. The available range of energy efficiency classes is A-G.
- Exception: Not available in EU or UK

## Electrical and Thermal Characteristics

Table 4 . Product performance of Queendom high power white at rated current,  $T_j=85^{\circ}\text{C}$  .

| PRODUCT      | COLOR  | TYPICAL SPECTRAL HALF-WIDTH<br>[1] (K) | TYPICAL TEMPERATURE<br>COEFFICIENT OF DOMINANT CCT<br>(K/ $^{\circ}\text{C}$ ) | TYPICAL VIEWING<br>ANGLE [2] | PART NUMBER |
|--------------|--------|----------------------------------------|--------------------------------------------------------------------------------|------------------------------|-------------|
| C1919***LEDs | 2700K  | 50                                     | -2.0 ~ -2.5                                                                    | 120 $^{\circ}$               | HP05500-29  |
|              | 3000K  | 100                                    | -1.8 ~ -2.3                                                                    | 120 $^{\circ}$               |             |
|              | 3500K  | 100                                    | -1.5 ~ -2.0                                                                    | 120 $^{\circ}$               |             |
|              | 4000K  | 120                                    | -1.2 ~ -1.8                                                                    | 120 $^{\circ}$               |             |
|              | 5000K  | 120                                    | -1.0 ~ -1.5                                                                    | 120 $^{\circ}$               |             |
|              | 5700K  | 150                                    | -0.8 ~ -1.2                                                                    | 120 $^{\circ}$               |             |
|              | 6500K  | 249                                    | -0.6 ~ -1.0                                                                    | 120 $^{\circ}$               |             |
|              | 7600K  | 300                                    | -0.3 ~ -0.6                                                                    | 120 $^{\circ}$               |             |
|              | 10500K | 350                                    | -0.3 ~ -0.6                                                                    | 120 $^{\circ}$               |             |

Notes for Table 2:

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

## Electrical and Thermal Characteristics

Table 5. Product performance of Queendom white at rated current,  $T_j=85^{\circ}\text{C}$

| Product      | COLOR | FORWARD VOLTAGE [1] (Vf) |         |         | TYPICAL TEMPERATURE<br>COEFFICIENT OF FORWARD<br>VOLTAGE [2] (mV/ $^{\circ}\text{C}$ ) | TYPICAL THERMAL RESISTANCE—JUNCTION TO<br>SOLDER PAD ( $^{\circ}\text{C}/\text{W}$ ) |
|--------------|-------|--------------------------|---------|---------|----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|              |       | MINIMUM                  | TYPICAL | MAXIMUM |                                                                                        |                                                                                      |
| C1919***LEDs | white | 30.00                    | 34.00   | 38.00   | -2.0 ~ -3.5                                                                            | 3-8                                                                                  |

Notes for Table 5: continued on next page

Queendom leds maintains a tolerance of  $\pm 1\text{nm}$  on dominant wavelength measurements.

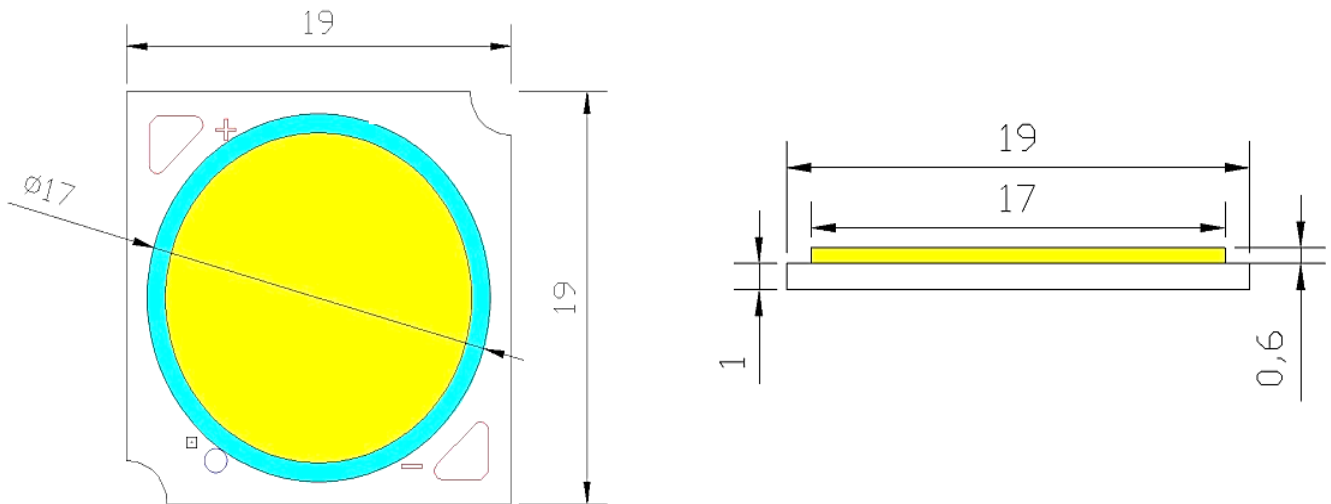
Queendom leds maintains a tolerance of  $\pm 10\%$  on luminous intensity measurements.

Correlated color temperature is hot targeted at  $T_j=85^{\circ}\text{C}$ .

Queendom flux and CRI are based upon mounted package on highly reflective surface at  $T_j=25^{\circ}\text{C}$ . Typical CRI is approximately 2 points higher than the minimum CRI specified, but this is not guaranteed.

Queendom maintains a tolerance of  $\pm 2$  on CRI and  $\pm 7\%$  on luminous flux measurements.

## DIMENSIONAL DRAWING:



Notes for Figure :

1. Drawings are not to scale.
2. Drawing dimensions are in millimeters.
3. Unless otherwise specified, tolerances are  $\pm 0.10$ mm.

## CHARACTERISTIC CURVES

### SPECTRAL POWER DISTRIBUTION CHARACTERISTIC

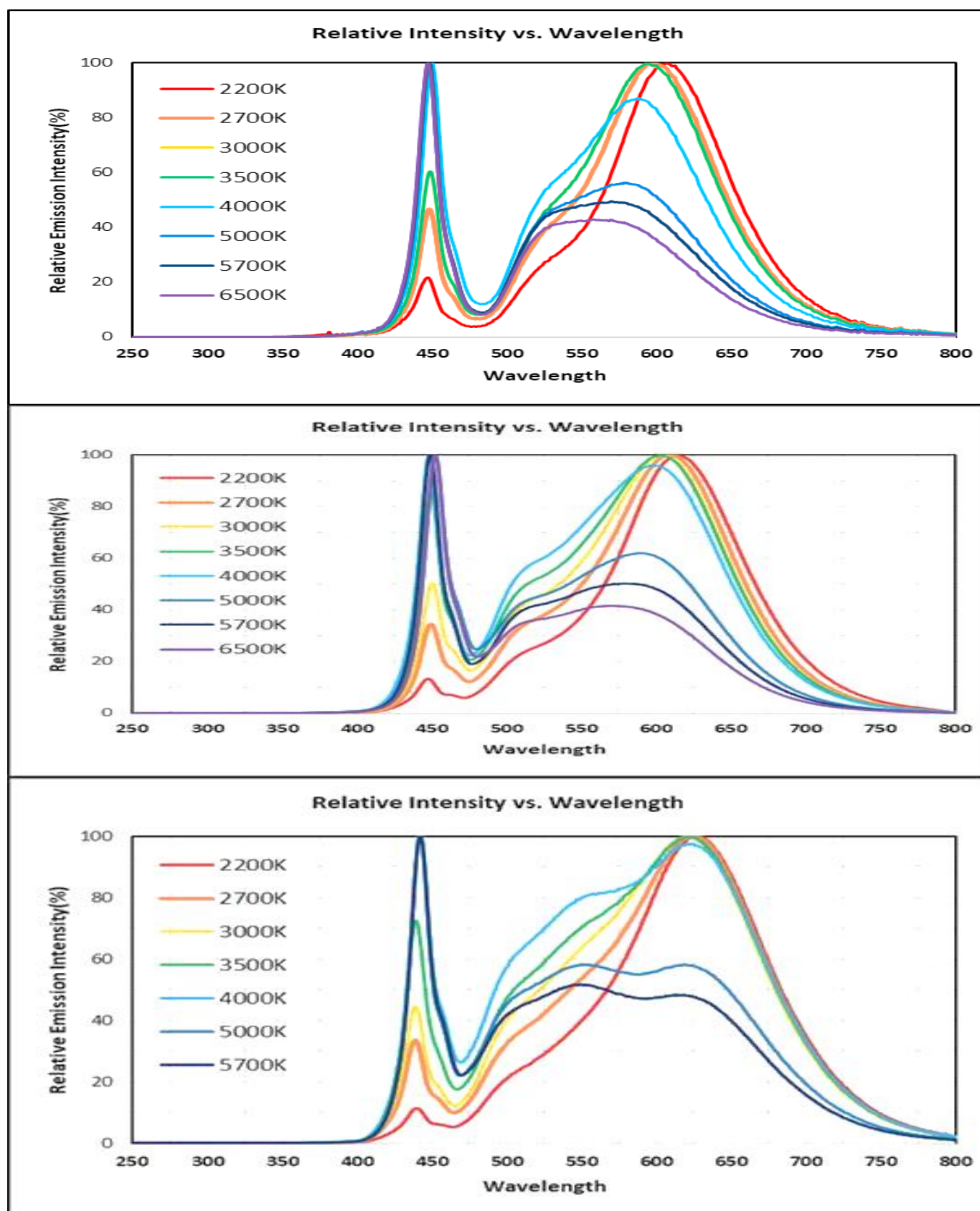


Figure 1. Typical normalized light output vs. junction temperature for at specified test current.  $T_j = 25^\circ\text{C}$

## LIGHT OUTPUT CHARACTERISTICS

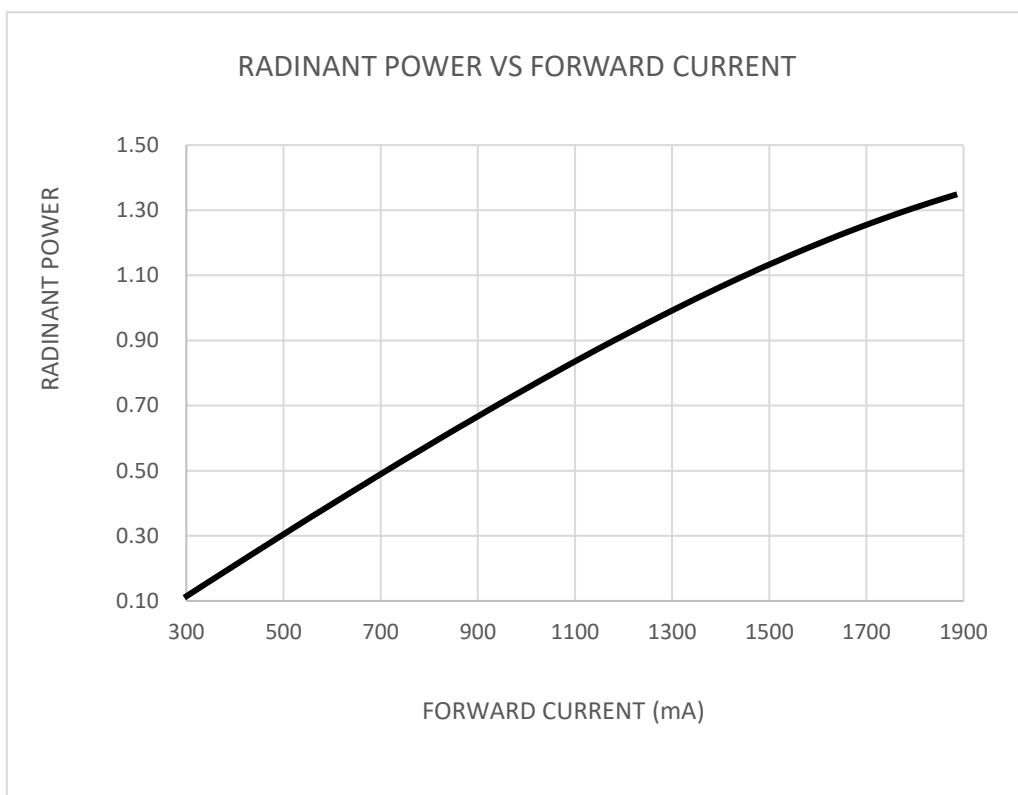


Figure 2 Typical normalized radiant power vs. junction temperature for at  $T_j=25^{\circ}\text{C}$ .

## LIGHT OUTPUT CHARACTERISTICS

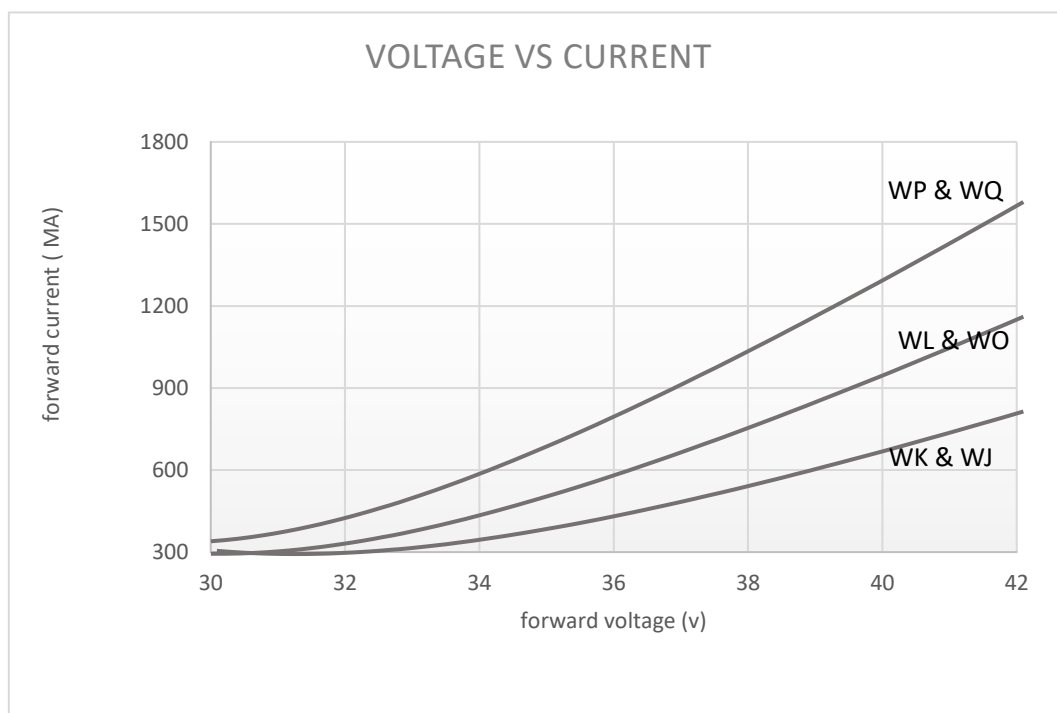


Figure 3. Typical forward current vs. forward voltage for at  $T_j=25^{\circ}\text{C}$ .

## RADIATION PATTERN CHARACTERISTICS

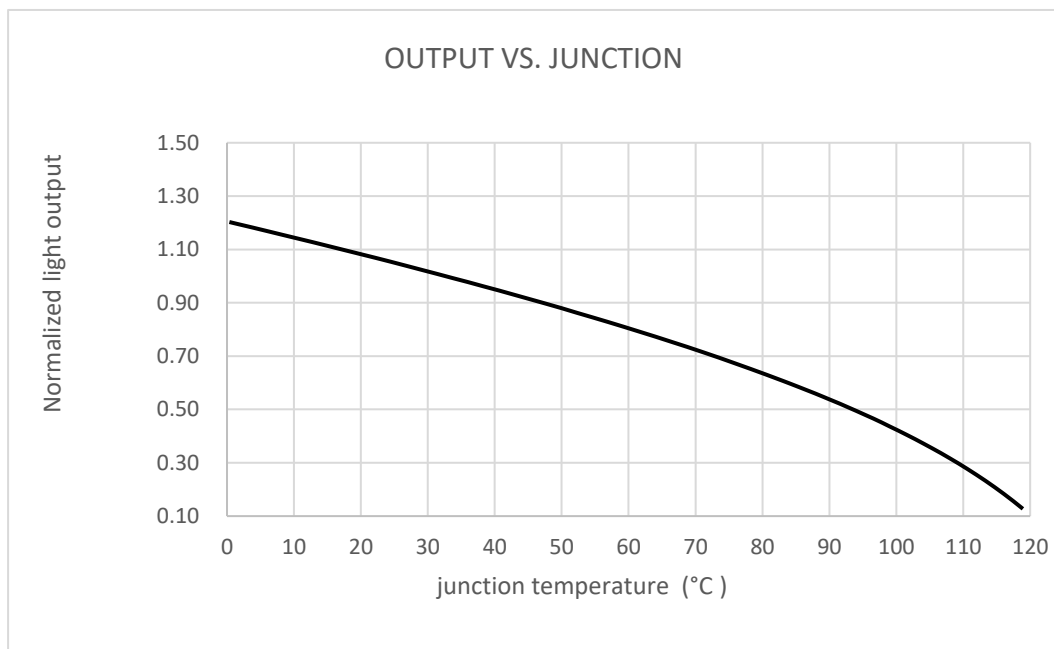


Figure 4. Typical normalized light output vs. junction temperature for at test current.

## TYPICAL RADIATION PATTERN

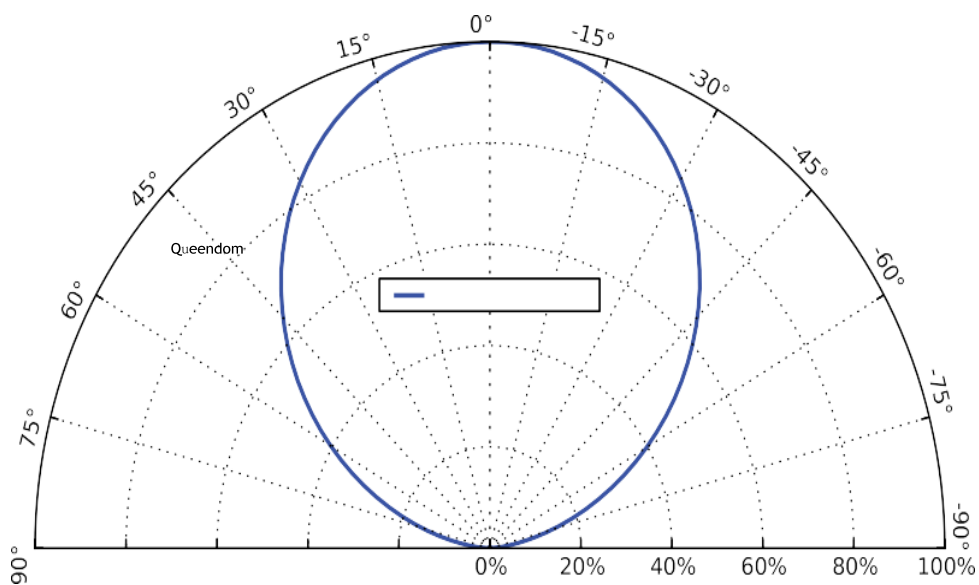


Figure 5. TYPICAL POLAR RADIATION PATTERN AT 20 OR 60MA, TSP=25°C



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.



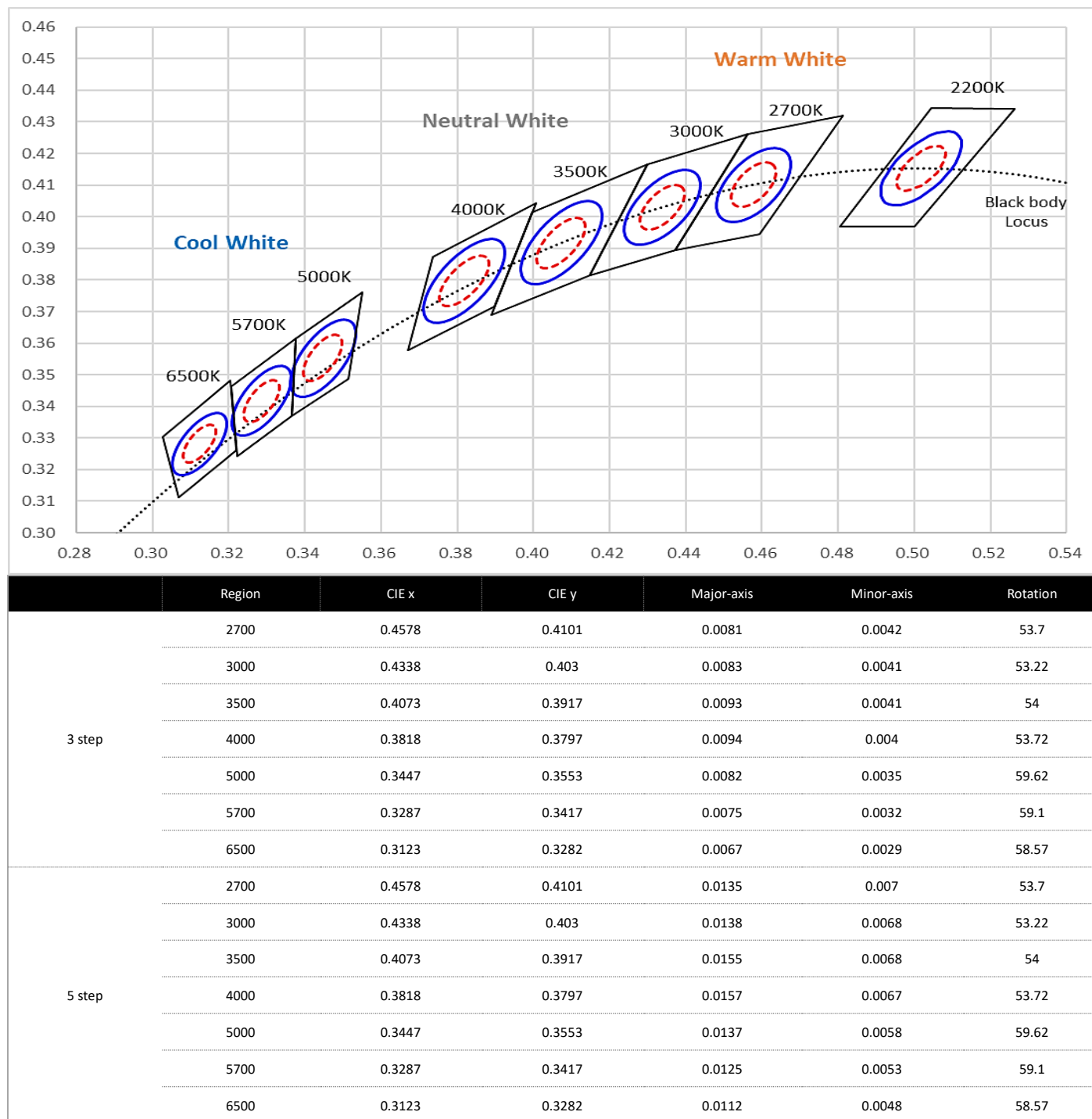
| Region          | CIE x  | CIE y  | Region | CIE x  | CIE y  |
|-----------------|--------|--------|--------|--------|--------|
| P rank (6500 K) |        |        |        |        |        |
| P1              | 0.3068 | 0.3113 | P9     | 0.3048 | 0.3207 |
|                 | 0.3106 | 0.315  |        | 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.

RANK NOMINAL CCT & COLOR COORDINATES

Chromaticity Region & Coordinates



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

| BIN | QUEENDOM FLUX [1] (lm) |         | RANK FLUX [2] (lm) |         | TYPICAL FLUX HALF WIDTH |
|-----|------------------------|---------|--------------------|---------|-------------------------|
|     | MINIMUM                | MAXIMUM | MINIMUM            | MAXIMUM | [3] (lm)                |
| LI  | 22                     | 24      | 2                  | 4       | 4                       |
| LJ  | 24                     | 26      | 2                  | 4       | 4                       |
| LK  | 26                     | 28      | 2                  | 4       | 4                       |
| LL  | 28                     | 30      | 2                  | 4       | 4                       |
| LM  | 30                     | 32      | 2                  | 4       | 4                       |
| LN  | 32                     | 34      | 2                  | 4       | 4                       |
| LO  | 34                     | 36      | 2                  | 4       | 4                       |
| LP  | 36                     | 38      | 2                  | 4       | 4                       |
| LQ  | 38                     | 40      | 2                  | 4       | 4                       |
| LR  | 45                     | 50      | 3                  | 5       | 5                       |
| LS  | 55                     | 60      | 3                  | 5       | 5                       |
| LT  | 65                     | 70      | 3                  | 5       | 5                       |
| LU  | 75                     | 80      | 3                  | 5       | 5                       |
| LV  | 85                     | 90      | 3                  | 5       | 5                       |
| LW  | 95                     | 100     | 3                  | 5       | 5                       |
| LX  | 110                    | 120     | 5                  | 10      | 10                      |
| LY  | 130                    | 140     | 5                  | 10      | 10                      |
| LZ  | 150                    | 160     | 5                  | 10      | 10                      |
| H1  | 170                    | 180     | 5                  | 10      | 10                      |
| H2  | 190                    | 200     | 5                  | 10      | 10                      |

## TABLE Forward Voltage BINS

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

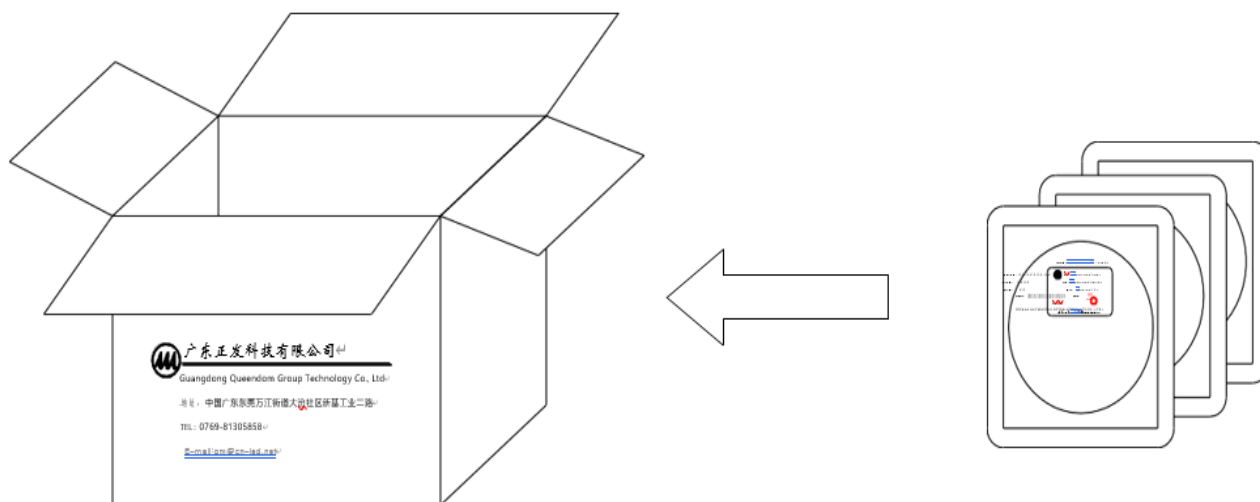
| NUMBER | FORWARD VOLTAGE [1] (Vf) |         |         | RANK WAVELENGTH [2] |         | TYPICAL VOLTAGE |
|--------|--------------------------|---------|---------|---------------------|---------|-----------------|
|        | MINIMUM                  | TYPICAL | MAXIMUM | MINIMUM             | MAXIMUM | [3]             |
| 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             |
| V8     | 3.8                      | 4       | 4.2     | 0.1                 | 0.2     | 0.2             |
| V9     | 4.2                      | 4.4     | 4.6     | 0.1                 | 0.2     | 0.2             |
| VA     | 4.6                      | 4.8     | 5       | 0.1                 | 0.2     | 0.2             |
| VB     | 5                        | 5.2     | 5.4     | 0.1                 | 0.2     | 0.2             |
| VC     | 5.4                      | 5.6     | 5.8     | 0.1                 | 0.2     | 0.2             |
| VD     | 5.8                      | 6       |         |                     |         |                 |
| VE     | 6                        | 7       | 8       | 1                   | 2       | 2               |
| VF     | 8                        | 9       | 10      | 1                   | 2       | 2               |
| VG     | 10                       | 11      | 12      | 1                   | 2       | 2               |
| VH     | 12                       | 13      | 14      | 1                   | 2       | 2               |
| VI     | 14                       | 15      | 16      | 1                   | 2       | 2               |
| VJ     | 16                       | 17      | 18      | 1                   | 2       | 2               |
| VK     | 18                       | 19      | 20      | 1                   | 2       | 2               |
| VL     | 20                       | 21      | 22      | 1                   | 2       | 2               |
| VM     | 22                       | 23      | 24      | 1                   | 2       | 2               |
| VN     | 24                       | 25      | 26      | 1                   | 2       | 2               |
| VO     | 26                       | 27      | 28      | 1                   | 2       | 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)                  |
| WE       | 1                          | 3   | 1                  | 3       | 3                        |
| WF       | 3                          | 6   | 1                  | 3       | 3                        |
| WG       | 6                          | 9   | 1                  | 3       | 3                        |
| WH       | 9                          | 12  | 1                  | 3       | 3                        |
| WI       | 12                         | 15  | 1                  | 3       | 3                        |
| WJ       | 15                         | 18  | 1                  | 3       | 3                        |
| WK       | 18                         | 21  | 1                  | 3       | 3                        |
| WL       | 21                         | 24  | 1                  | 3       | 3                        |
| WM       | 24                         | 27  | 1                  | 3       | 3                        |
| WN       | 27                         | 30  | 2                  | 3       | 3                        |
| WO       | 30                         | 34  | 2                  | 4       | 4                        |
| WP       | 34                         | 38  | 2                  | 4       | 4                        |
| WQ       | 38                         | 42  | 2                  | 4       | 4                        |

## Packaging cartons



## Information

### - With Stopper

|                                                                                     |               |
|-------------------------------------------------------------------------------------|---------------|
| CPN:<br>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

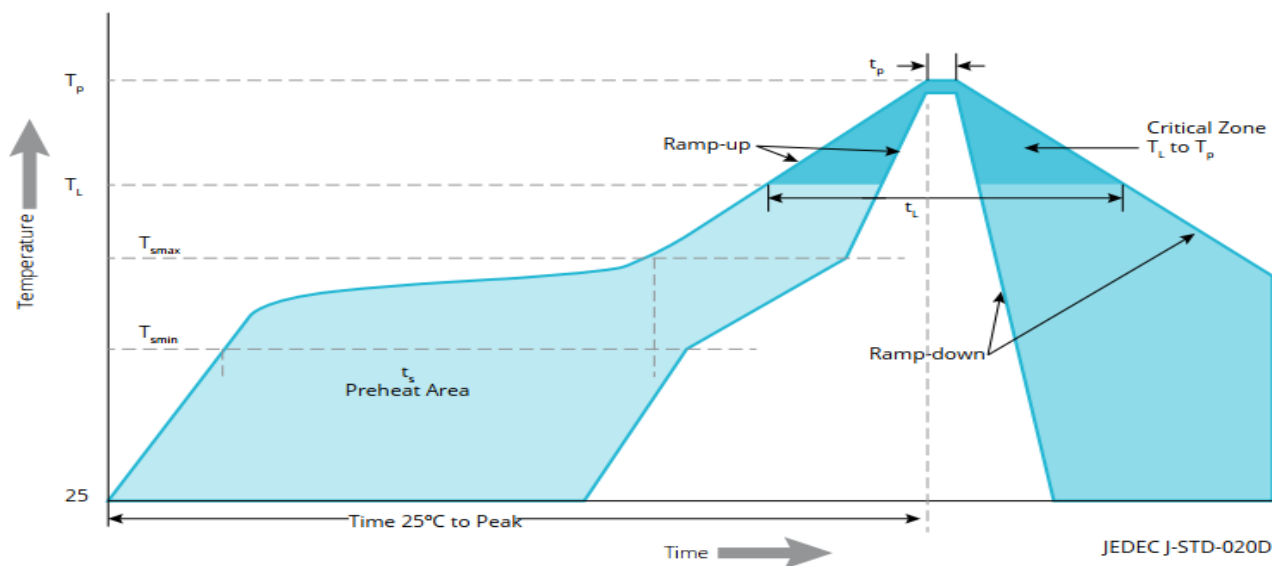
CPN:Customer's Product Number  
P/N:Product Number  
QTY:Packing Quantity  
LOT NO:Lot Number  
VF:Forward Voltage Rank  
IV:Luminous Intensity Rank  
WLD:Dom. Wavelength Rank  
BIN:BIN Code  
DATE:Date Of Dispatch

## Packing Quantity

1. 1000 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   |
|--------------------------------------------------------------------|----------------------|
| Reheat Minimum Temperature (T <sub>smin</sub> )                    | 150°C                |
| Preheat Maximum Temperature (T <sub>smax</sub> )                   | 200°C                |
| Preheat Time (t <sub>smin</sub> to t <sub>smax</sub> )             | 60 to 120 seconds    |
| Ramp-Up Rate (T <sub>L</sub> to T <sub>p</sub> )                   | 3°C / second maximum |
| Liquidus Temperature (T <sub>L</sub> )                             | 217°C                |
| Time Maintained Above Temperature T <sub>L</sub> (t <sub>L</sub> ) | 60 to 150 seconds    |
| Peak / Classification Temperature (T <sub>p</sub> )                | 260°C                |
| Time Within 5°C of Actual Temperature (t <sub>p</sub> )            | 20 to 40 seconds     |
| Ramp-Down Rate (T <sub>p</sub> to T <sub>L</sub> )                 | 6°C / second maximum |
| Time 25°C to P                                                     | 8 minutes maximum    |

### JEDEC Moisture Sensitivity

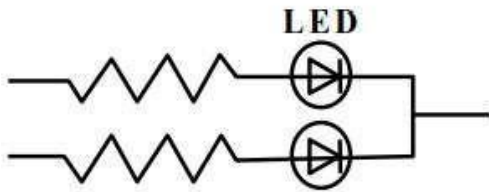
Moisture sensitivity levels for LEDs Line

| level | Floor life |                | soak requirements standard |               |
|-------|------------|----------------|----------------------------|---------------|
|       | time       | conditions     | time                       | conditions    |
| 1     | Unlimited  | ≤30°C / 85% RH | 168 Hours +5 / -0          | 85°C / 85% RH |

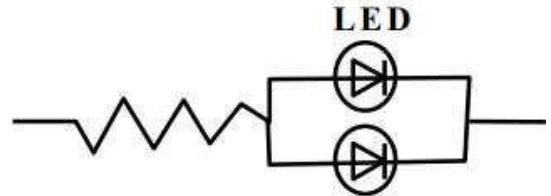
## Drive Method

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.