

PC38U02 V0 (Preliminary) Product Specification

Approval Sheet

PC38U02 V0

Product Specification

RoHS

| | |
|--------------------|---------------|
| Product | White SMD LED |
| Part Number | PC38U02 V0 |
| Issue Date | 2018/08/06 |



■ Feature

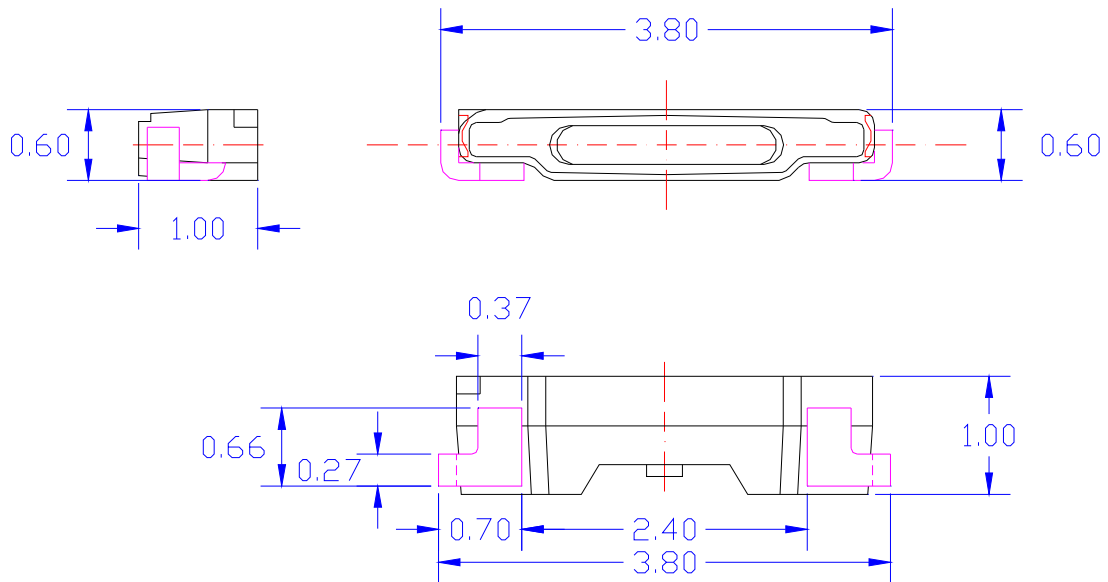
- ✓ White SMD LED (L x W x H) of 3.8 x 0.6 x 1 mm
- ✓ ASNI Binning
- ✓ Dice Technology : InGaN
- ✓ Qualified according to JEDEC moisture sensitivity Level 3
- ✓ Environmental friendly ; RoHS compliance
- ✓ Packing : 2000 or 4000 pcs/reel

■ Applications

- ✓ Portable flashlight
- ✓ Reading lights
- ✓ Security / garden lighting
- ✓ General lighting
- ✓ Indoor and outdoor commercial lighting

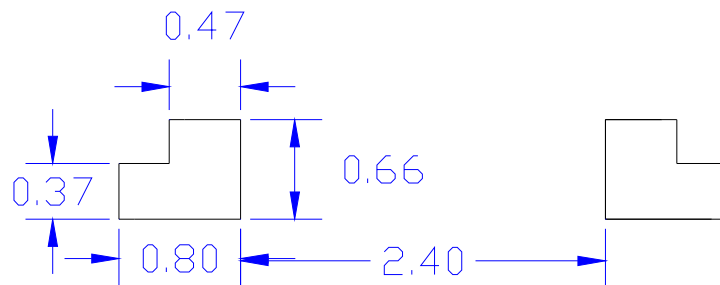
Outline Dimension

PC38U02 V0
Product Specification



Unit: mm, Tolerance: ± 0.1 mm

■ Recommended Soldering Pad:



Performance

PC38U02 V0

Product Specification

■ Electro-Optical Characteristics (Ta=25°C)

| Parameter | Symbol | Condition | Min. | Typ. | Max. | Unit |
|--------------------------------------|-----------------|------------------------|------|------|------|------|
| Forward Voltage ⁽¹⁾ | V _F | I _F = 20 mA | 2.6 | 2.8 | 3.1 | V |
| Color Rendering Index ⁽²⁾ | R _a | | 80 | - | - | - |
| View Angle | θ | | - | 120 | - | deg |
| Thermal Resistance ⁽³⁾ | R _{th} | | - | 105 | - | °C/W |

(1) The Forward Voltage tolerance is ±0.1V

(2) The CRI tolerance is ±2.

(3) Thermal resistance is calculated from junction to solder

■ Luminous Flux (Ta=25°C)

| CCT | Condition | Rank |
|-------------|------------------------|-------------|
| 2600K~3700K | I _F = 20 mA | F9 FA FB FC |
| 3700K~7000K | | FA FB FC FD |

* The luminous flux tolerance is ± 7%

■ Absolute Maximum Ratings

| Parameter | Symbol | value | Unit |
|--------------------------------------|------------------|------------------|------|
| DC Forward Current ⁽¹⁾ | I _F | 25 | mA |
| Power Dissipation | P _d | 0.7 | W |
| Pulse Forward Current ⁽²⁾ | I _{FP} | 50 | mA |
| Storage Temperature | T _s | -40 ~ 100 | °C |
| Operating Temperature | T _{opr} | -40 ~ 85 | °C |
| Junction Temperature | T _J | 120 | °C |
| Soldering Temperature | T _{sol} | 260 (max. 5 sec) | °C |

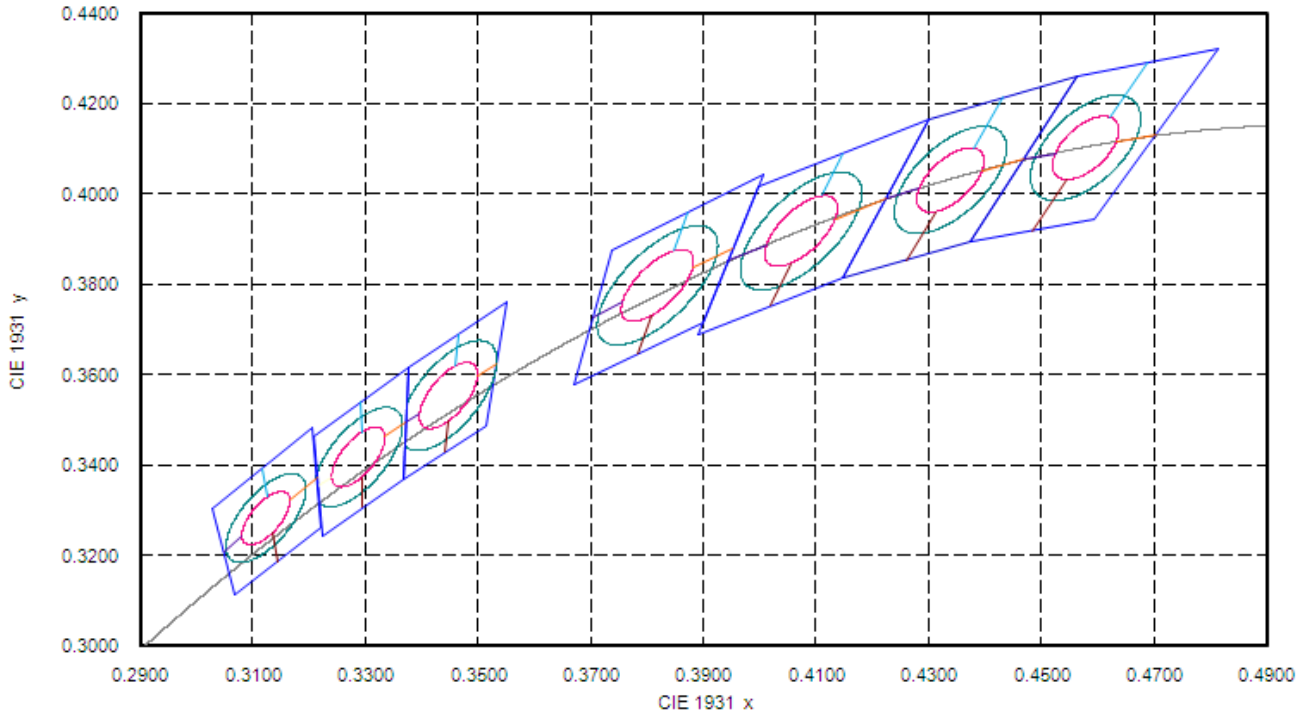
(1) Proper current rating must be observed to maintain junction temperature below maximum at all time

(2) IFP Condition: Duty 1/10, Pulse within 10msec

Binning

PC38U02 V0
 Product Specification

Chromaticity Coordinates



Bin code definition

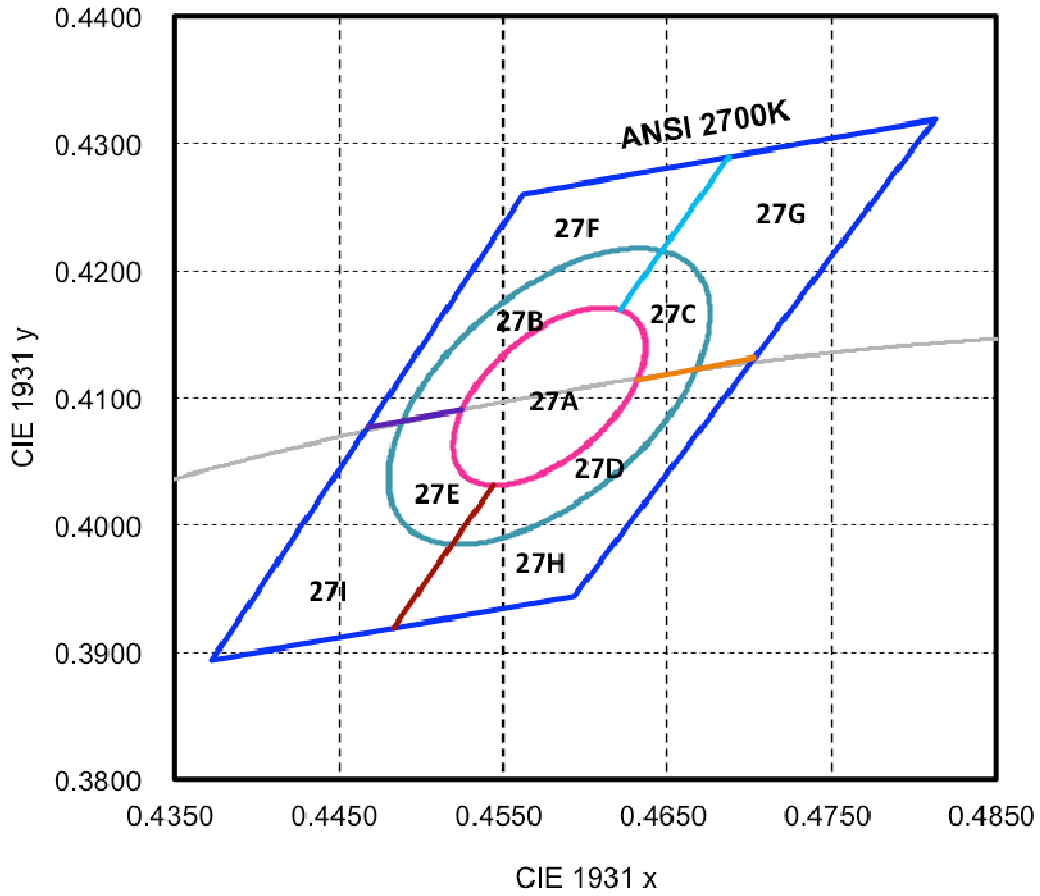
| V _F Rank | Luminous Flux Rank | CIE Rank |
|---------------------|--------------------|----------|
| 0 | FD | 27A |

| V _F Rank | Condition | Min. | Max. |
|---------------------|-----------------------|------|------|
| 8 | $I_F = 20 \text{ mA}$ | 2.6 | 2.7 |
| 9 | | 2.7 | 2.8 |
| 0 | | 2.8 | 2.9 |
| 1 | | 2.9 | 3.0 |
| 2 | | 3.0 | 3.1 |
| 3 | | 3.1 | 3.2 |

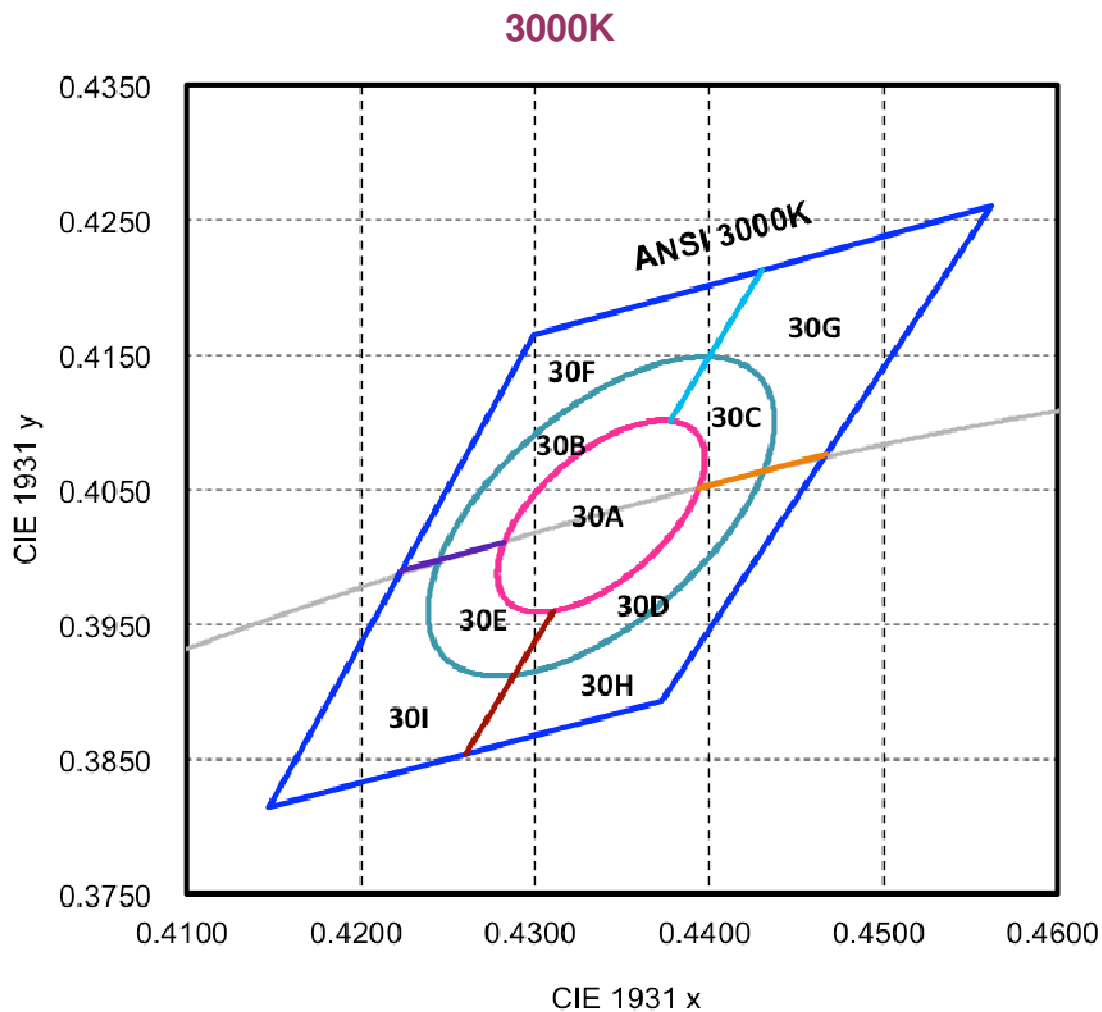
| Luminous Flux Rank | Condition | Min. | Max. | Unit |
|--------------------|-----------------------|------|------|------|
| F7 | $I_F = 20 \text{ mA}$ | 5 | 5.5 | lm |
| F8 | | 5.5 | 6 | |
| F9 | | 6 | 6.5 | |
| FA | | 6.5 | 7 | |
| FB | | 7 | 7.5 | |
| FC | | 7.5 | 8 | |
| FD | | 8 | 8.5 | |
| FE | | 8.5 | 9 | |
| FF | | 9 | 9.5 | |
| FG | | 9.5 | 10 | |
| FH | | 10 | 10.5 | |
| FI | | 10.5 | 11 | |
| FJ | | 11 | 11.5 | |
| FK | 11.5 | 12 | | |

■ **Bin code definition**

2700K

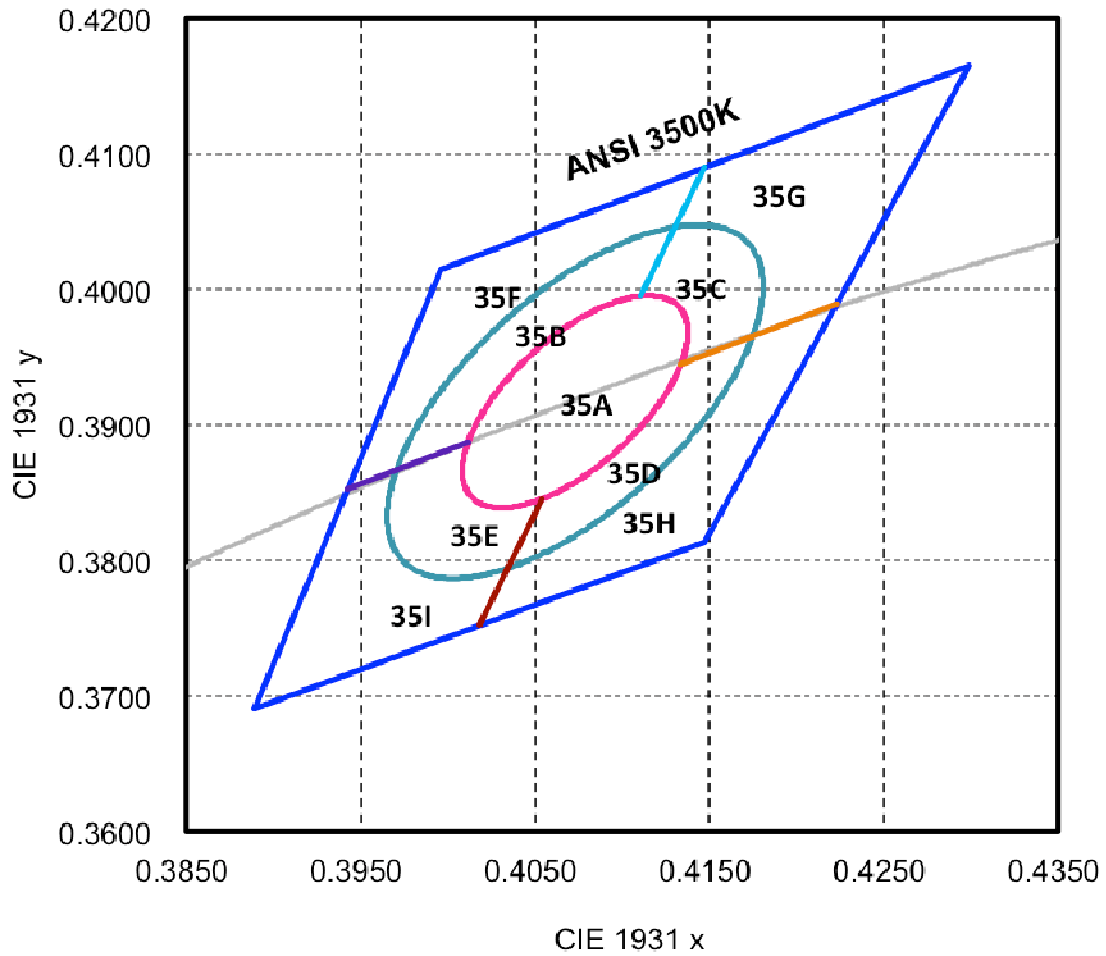


| Nominal ANSI CCT | Color Space | Target Center Point (cx, cy) | Major Axis, a | Minor Axis, b | Ellipse Rotation Angle |
|------------------|-------------------------------|------------------------------|---------------|---------------|------------------------|
| 2700K | Single 3-step MacAdam ellipse | (0.4578, 0.4101) | 0.00810 | 0.00420 | 53.70° |
| 2700K | Single 5-step MacAdam ellipse | (0.4578, 0.4101) | 0.01350 | 0.00700 | 53.70° |



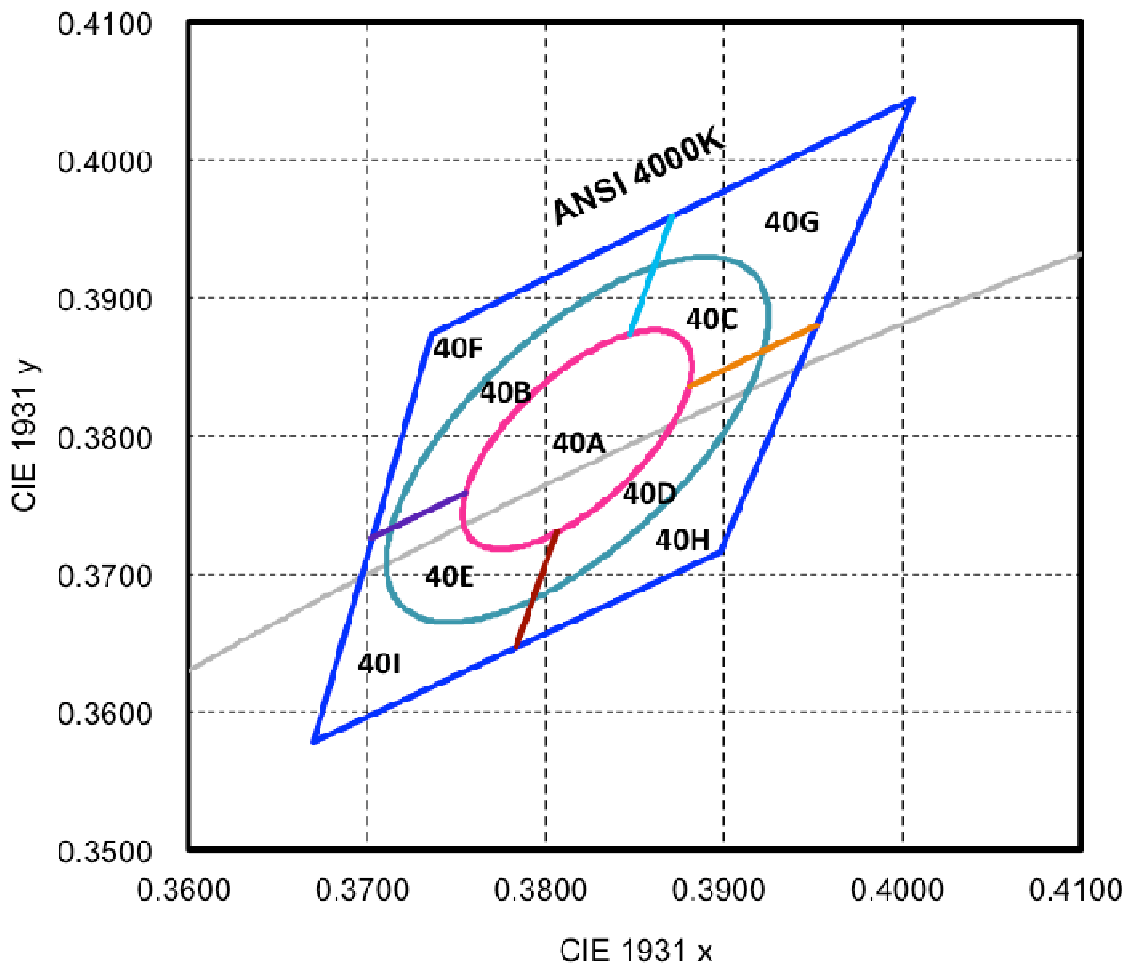
| Nominal ANSI CCT | Color Space | Target Center Point (cx, cy) | Major Axis, a | Minor Axis, b | Ellipse Rotation Angle |
|------------------|-------------------------------|------------------------------|---------------|---------------|------------------------|
| 3000K | Single 3-step MacAdam ellipse | (0.4338, 0.403) | 0.00834 | 0.00408 | 53.22° |
| 3000K | Single 5-step MacAdam ellipse | (0.4338, 0.403) | 0.01390 | 0.00680 | 53.22° |

3500K

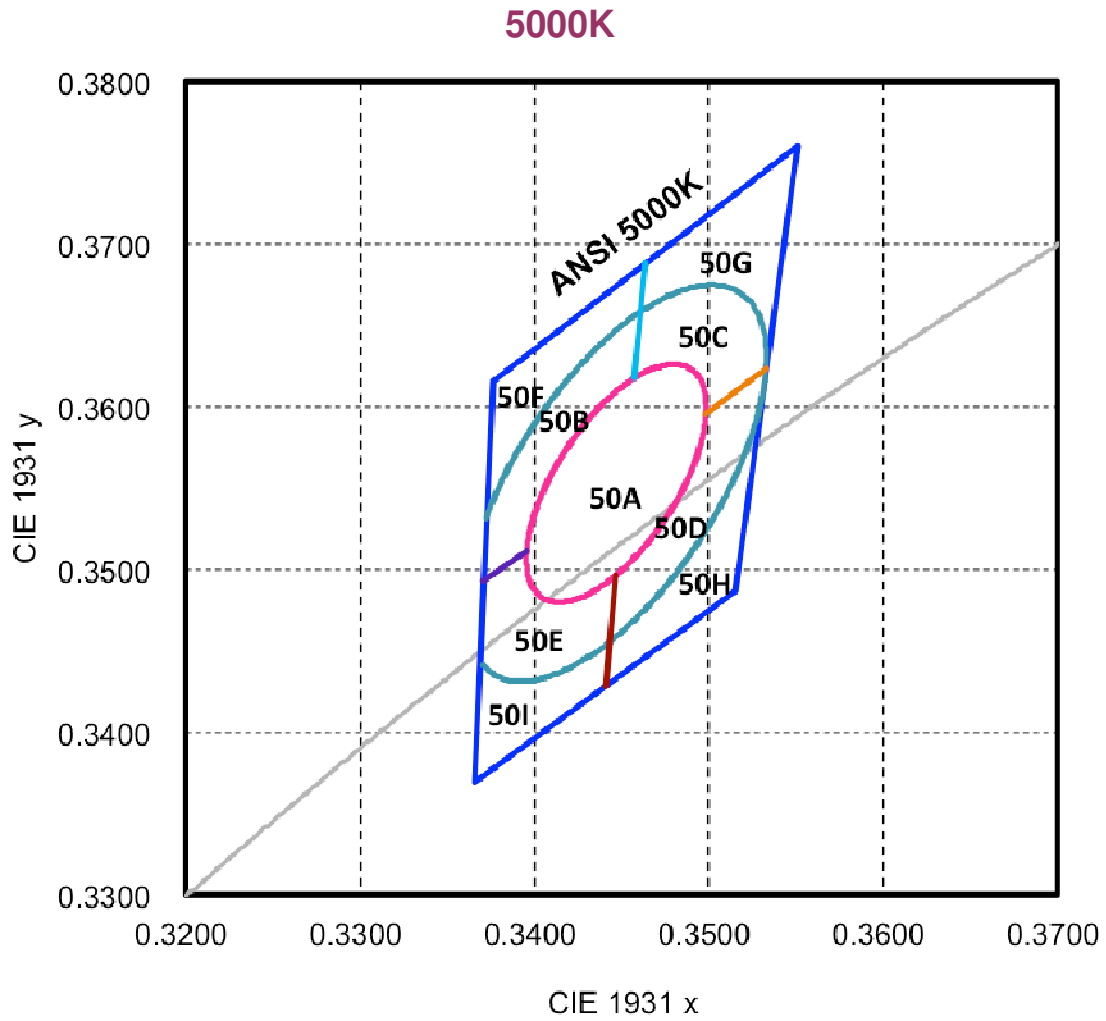


| Nominal ANSI CCT | Color Space | Target Center Point (cx, cy) | Major Axis, a | Minor Axis, b | Ellipse Rotation Angle |
|------------------|-------------------------------|------------------------------|---------------|---------------|------------------------|
| 3500K | Single 3-step MacAdam ellipse | (0.4073, 0.3917) | 0.00927 | 0.00414 | 53.22° |
| 3500K | Single 5-step MacAdam ellipse | (0.4073, 0.3917) | 0.01545 | 0.00690 | 53.22° |

4000K

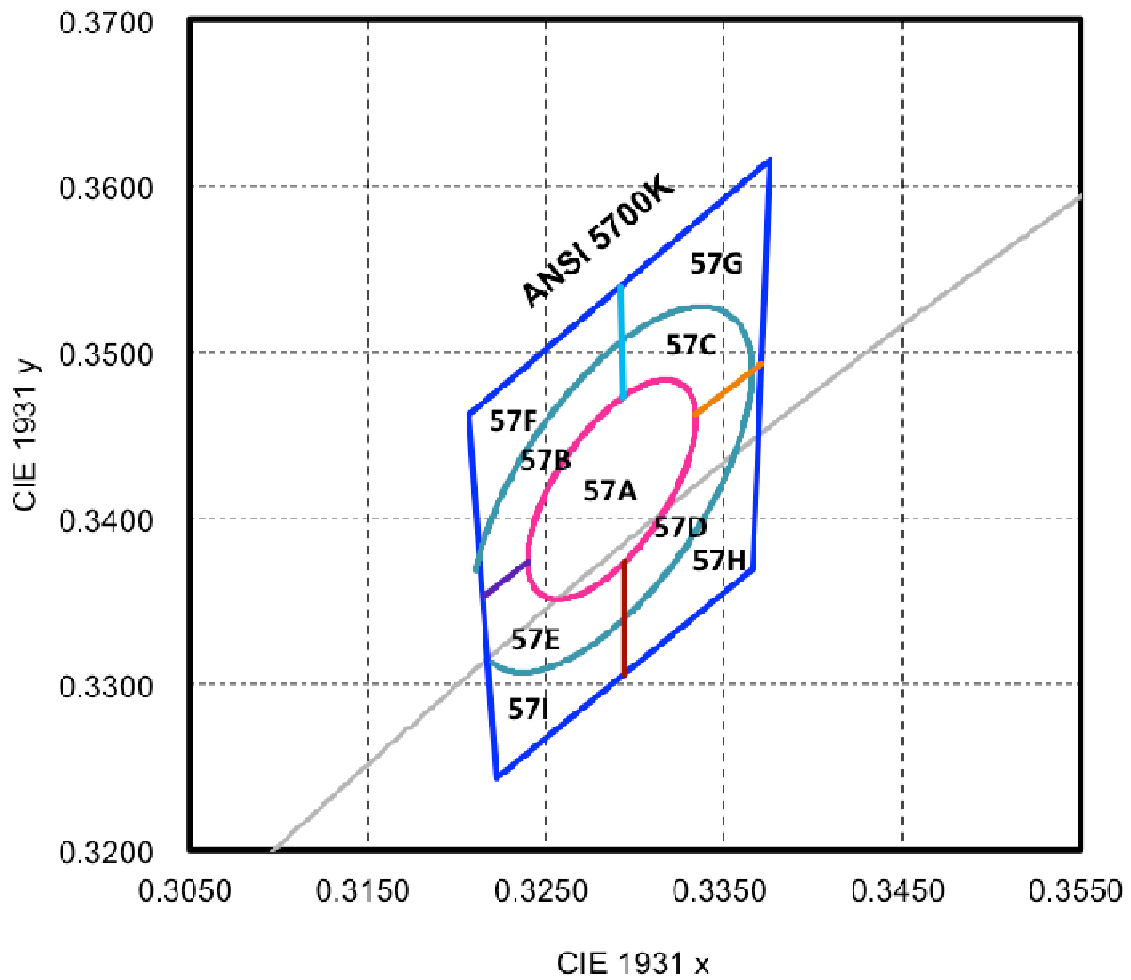


| Nominal ANSI CCT | Color Space | Target Center Point (cx, cy) | Major Axis, a | Minor Axis, b | Ellipse Rotation Angle |
|------------------|-------------------------------|------------------------------|---------------|---------------|------------------------|
| 4000K | Single 3-step MacAdam ellipse | (0.3818, 0.3797) | 0.00939 | 0.00402 | 53.72° |
| 4000K | Single 5-step MacAdam ellipse | (0.3818, 0.3797) | 0.01565 | 0.00670 | 53.72° |

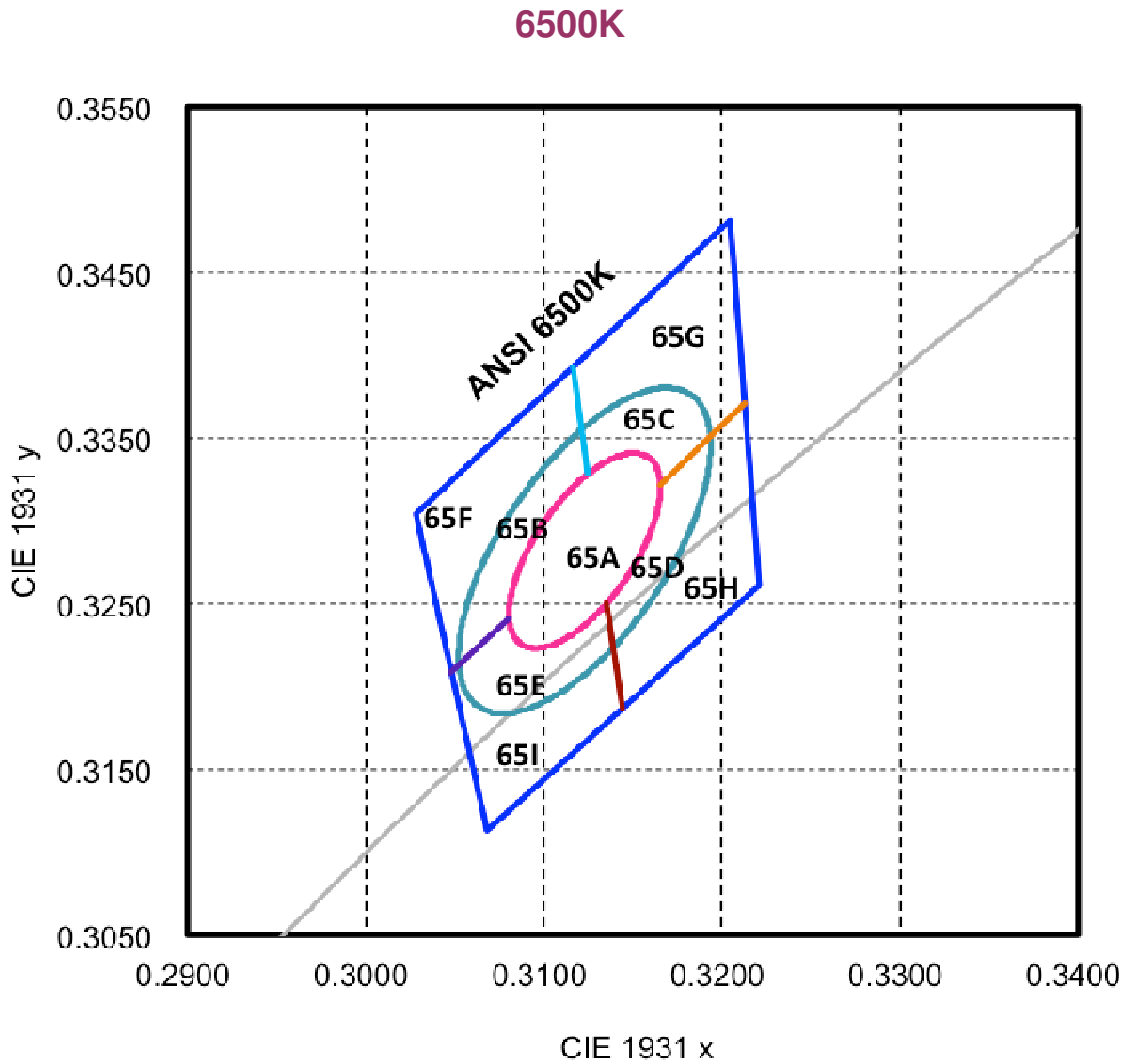


| Nominal ANSI CCT | Color Space | Target Center Point (cx, cy) | Major Axis, a | Minor Axis, b | Ellipse Rotation Angle |
|------------------|-------------------------------|------------------------------|---------------|---------------|------------------------|
| 5000K | Single 3-step MacAdam ellipse | (0.3447, 0.3553) | 0.00822 | 0.00354 | 59.62° |
| 5000K | Single 5-step MacAdam ellipse | (0.3447, 0.3553) | 0.01370 | 0.00590 | 59.62° |

5700K



| Nominal ANSI CCT | Color Space | Target Center Point (cx, cy) | Major Axis, a | Minor Axis, b | Ellipse Rotation Angle |
|------------------|-------------------------------|------------------------------|---------------|---------------|------------------------|
| 5700K | Single 3-step MacAdam ellipse | (0.3287, 0.3417) | 0.00746 | 0.00320 | 59.09° |
| 5700K | Single 5-step MacAdam ellipse | (0.3287, 0.3417) | 0.01243 | 0.00533 | 59.09° |



| Nominal ANSI CCT | Color Space | Target Center Point (cx, cy) | Major Axis, a | Minor Axis, b | Ellipse Rotation Angle |
|------------------|-------------------------------|------------------------------|---------------|---------------|------------------------|
| 6500K | Single 3-step MacAdam ellipse | (0.3123, 0.3282) | 0.00669 | 0.00285 | 58.57° |
| 6500K | Single 5-step MacAdam ellipse | (0.3123, 0.3282) | 0.01115 | 0.00475 | 58.57° |

Note:

- (1) Correlated color Temperature is derived from the CIE 1931 Chromaticity diagram
- (2) Measurement tolerance is ± 0.005

Characteristics

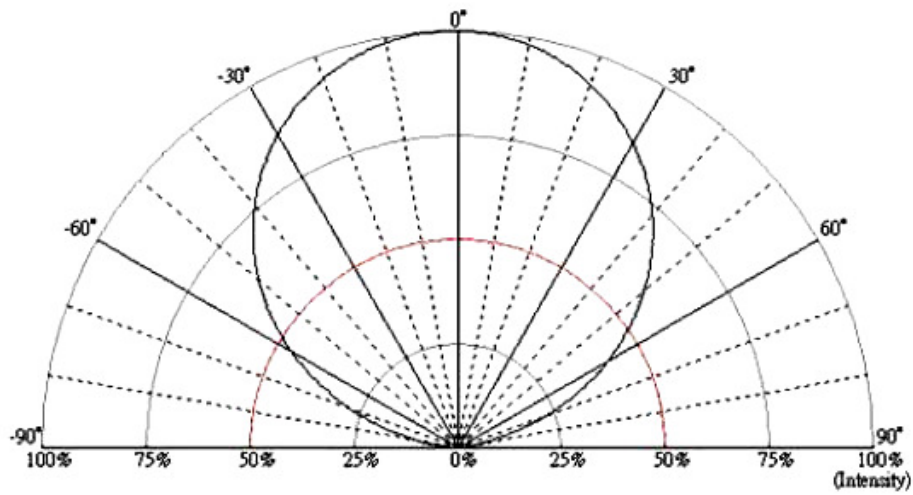
PC38U02 V0

Product Specification

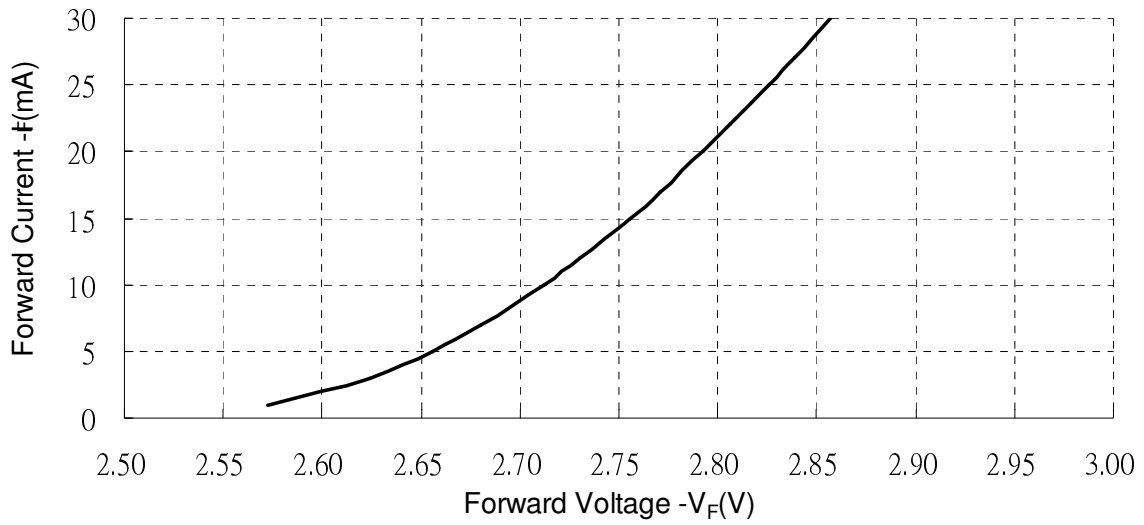
■ Spectrum

TBD

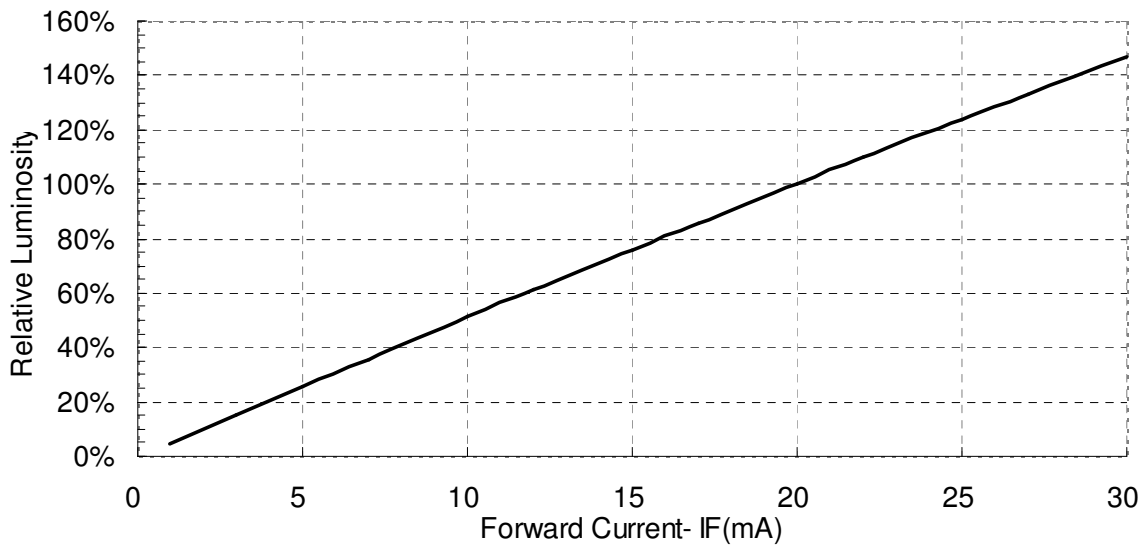
■ Radiation Pattern



■ **Forward Voltage vs. Forward Current**



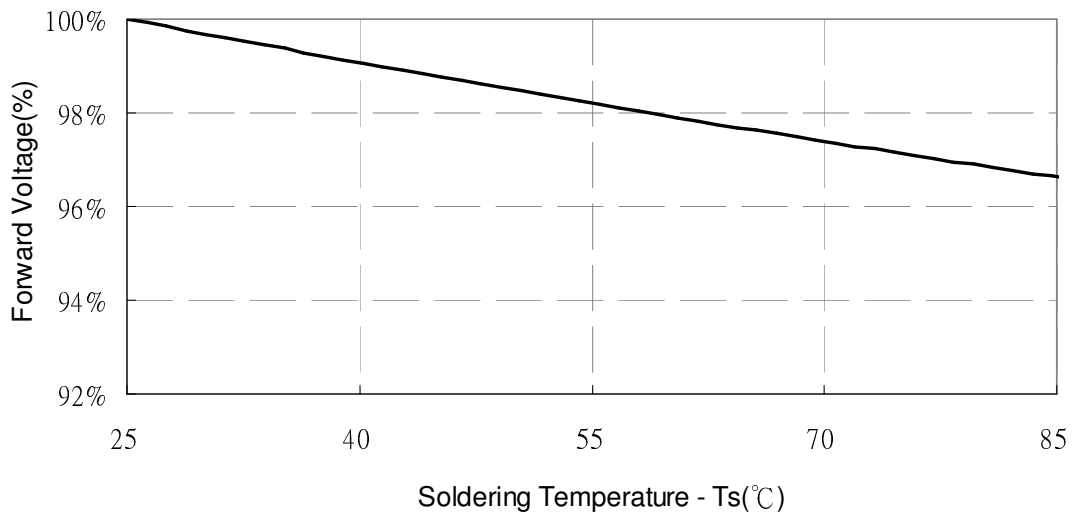
■ **Forward Current vs. Relative Luminosity**



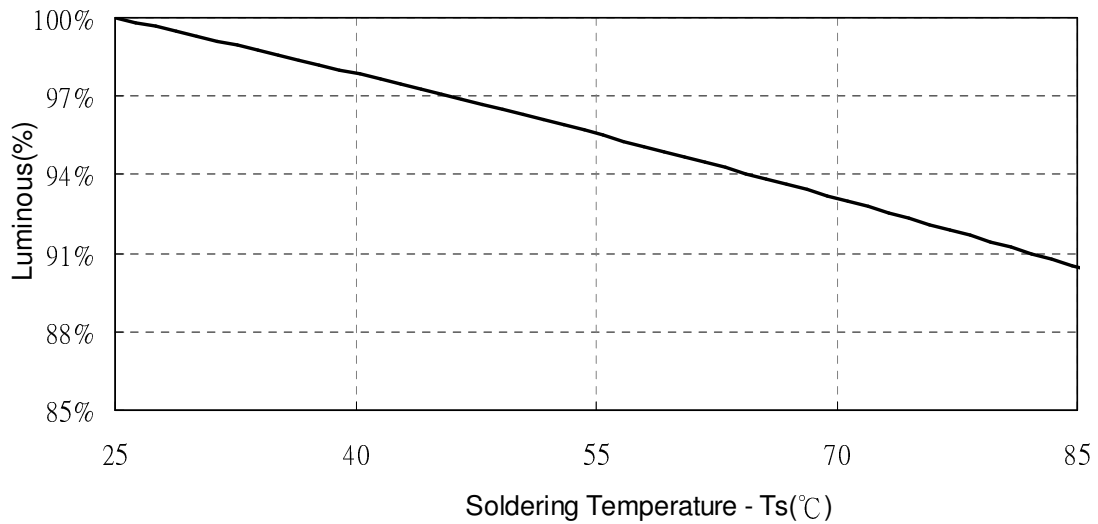
■ **Forward Current vs. Chromaticity Coordinate**

TBD

■ **Relative Forward Voltage vs. Ambient Temperature**



■ **Relative Luminous Intensity vs. Ambient Temperature**



■ **Chromaticity vs. Ambient Temperature**

TBD

Reliability

PC38U02 V0
 Product Specification

Reliability test

| Item | Condition | Time/Cycle |
|--|--|--------------------|
| Steady State Operating Life of Low Temperature -40°C | -40°C Operating | 1000 Hrs |
| Steady State Operating Life of High Temperature 60°C | 60°C Operating | 1000 Hrs |
| Steady State Operating Life of High Temperature 85°C | 85°C Operating | 1000 Hrs |
| Low temperature storage -40°C | -40°C Storage | 1000 Hrs |
| High temperature storage 100°C | 100°C Storage | 1000 Hrs |
| Steady State Operating Life of High Humidity Heat 60°C 90% | 60°C/90% Operating | 1000 Hrs |
| Resistance to soldering heat on PCB (JEDEC MSL3) | pre-store@60°C, 60%RH for 52hrs Tsltd max.=260°C 10sec | 1 cycle 3 Times |
| Thermal shock | -40°C/20minr ~5minr ~ 100°C/20min | 300 Cycles |

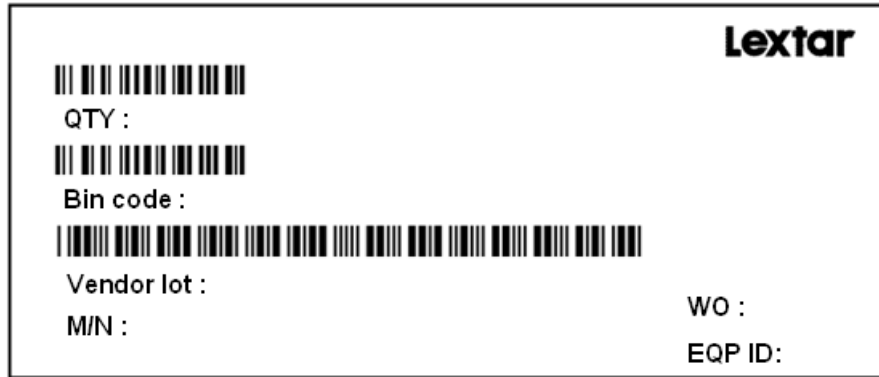
Judgment Criteria

| Item | Symbol | Test Condition | Judgment Criteria |
|-----------------|--------|----------------|----------------------|
| Forward Voltage | Vf | 20 mA | $\Delta V_f < 10 \%$ |
| Luminous Flux | Iv | 20 mA | $\Delta I_v < 30 \%$ |

Packing

PC38U02 V0
Product Specification

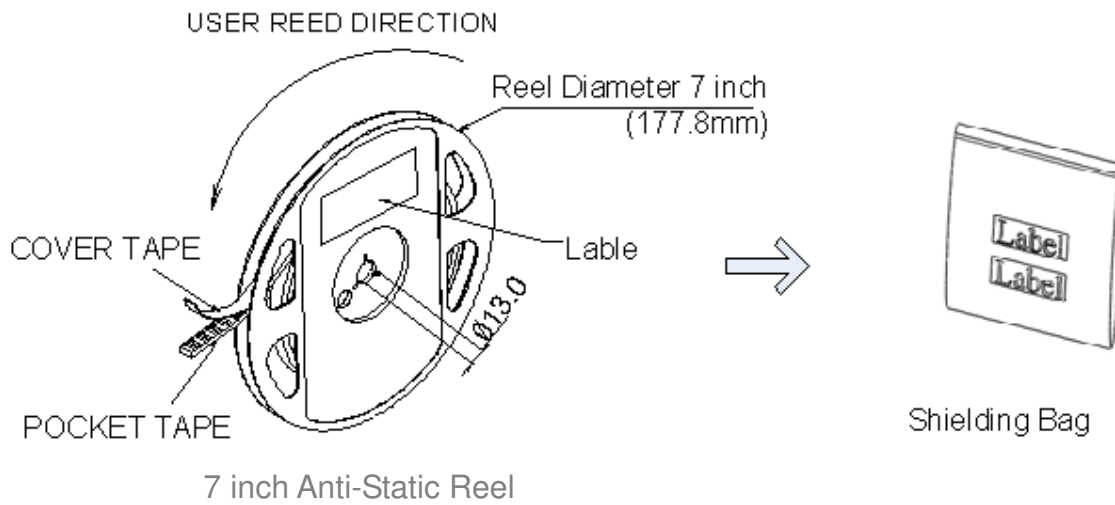
■ Reel Label



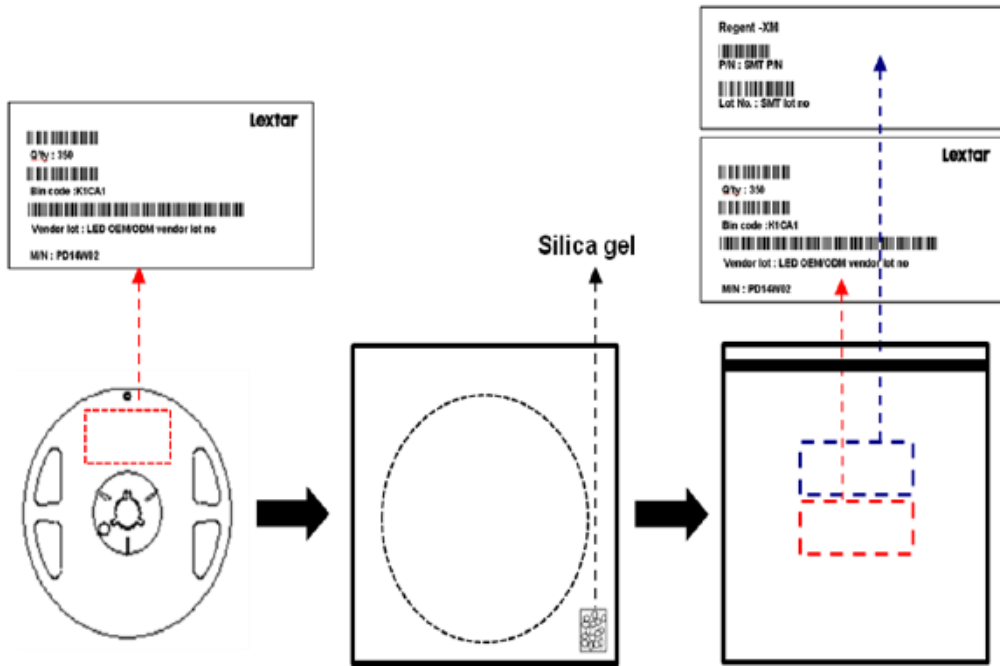
■ Carrier Tape Dimension

TBD

■ Package



■ **Shield Bag Taping**



■ **Packing Box**

| Type | Large Box | |
|---------------|---------------|------|
| Dimension | 465X257X255mm | |
| Maximum Reels | 7"X8mm Reel | 40/R |
| Minimum Reels | 7"X8mm Reel | 20/R |

Precautions

PC38U02 V0

Product Specification

■ Safety Precautions

- The LED light output is too strong for human eyes without shield. Prevent eye contact directly more than seconds.
- Ensure operating under maximum rating.

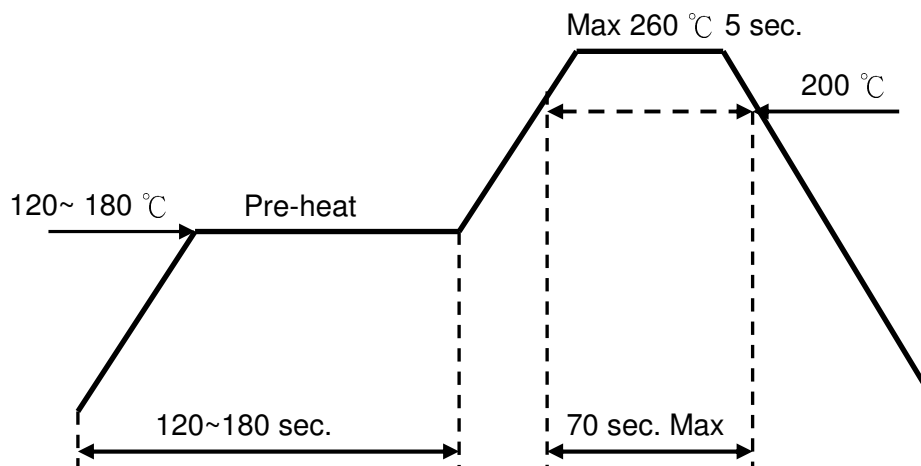
■ Storage

- Before opening the package, the LEDs should storage under 30°C, 70% RH.
- After opening the package bag, the LEDs should be keep under 30°C, 70% RH. Recommend to use within 168 hours. If unused LEDs remain, suggest to store into moisture proof bag or original package bag with moisture absorbent material such as silica gel. Reseal well is necessary.
- If the product exceeded the storage period or the moisture absorbent material faded away, baking treatment should be done by following conditions.

Bake condition: 60°C, 12hours (One time only).

■ Soldering Notice and Conditions

- When soldering LEDs,
- Do not solder/reflow the same LED over two times.
- Recommend soldering conditions:
Hand soldering: 350 °C max , 3 sec. max.
Reflow soldering: Pre-heat 180 °C max , 180 sec. max.
Peak 260°C max , 5 sec. max.
- Reflow temperature profile as below: (lead-free solder)



- When soldering, don't put stress on the LEDs
- After LEDs have been soldered, strongly recommend not to repair to keep the LEDs performance.

■ Static Electricity

- LED package is extremely sensitive to static electricity. It's recommended that anti-electrostatic glove and wrist band is necessary when handling the LEDs. All devices are also be grounded properly as well.
- Protection devices design should be considered in the LED driving circuit.

■ Cleaning

- If washing is required, recommend to use alcohol as a solvent.
- Recommend to avoid cleaning the LEDs by ultrasonic. If necessary, pre-test the LED is necessary to confirm whether any damage occur after the process.

Revision History

PC38U02 V0
Product Specification

| Date | Contents | Writer | Approved |
|------------|-------------|------------|--------------|
| 2018.08.06 | Preliminary | Ching Chen | Berris Huang |

Smart Lighting Amazing Life

Lextar Electronics Corp. is the leading LED (Light Emitting Diode) maker integrating upper stream epitaxial, middle stream chip, and downstream package, SMT and LED lighting applications. Founded in May, 2008, Lextar is a subsidiary of AU Optronics, the leading TFT-LCD and solar PV manufacturer. Lextar's product applications include lighting and LCD backlight. Lextar's manufacturing sites include Hsinchu and Chunan in Taiwan, and Suzhou in China. The company turnover in 2010 is 266 million USD.