



55B PC55H16 V0

Product Specification *Preliminary*

Approval Sheet

PC55H16 V0

Product Specification

RoHS

| | |
|-------------|---------------|
| Product | White SMD LED |
| Part Number | PC55H16 V0 |
| Issue Date | 2017/11/20 |



Feature

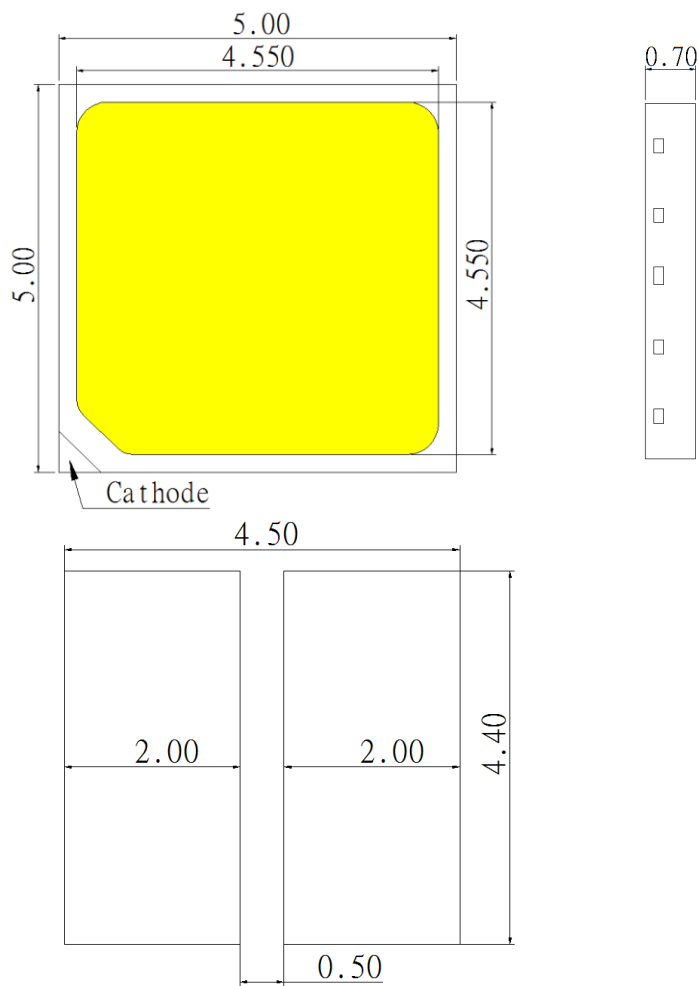
- ✓ White SMD LED (L x W x H) of 5.0 x 5.0 x 0.7 mm
- ✓ ANSI binning
- ✓ Dice Technology : InGaN
- ✓ Qualified according to JEDEC moisture sensitivity Level 3
- ✓ Environmental friendly ; RoHS compliance
- ✓ Packing : 500 pcs/reel

Applications

- ✓ MR16, GU10
- ✓ General lighting
- ✓ Outdoor lighting

Outline Dimension

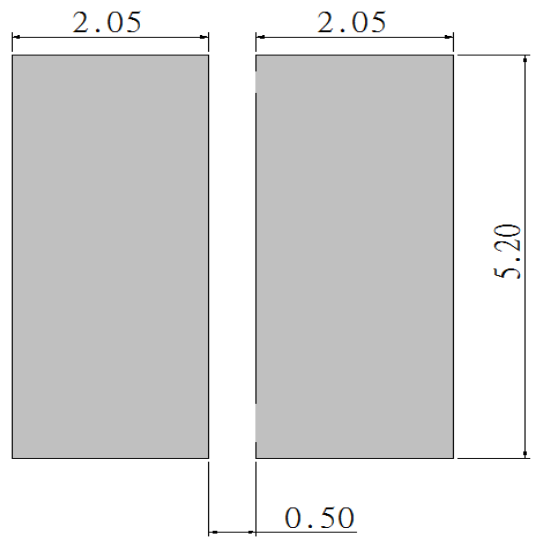
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Unit: mm,

Tolerance: $\pm 0.1\text{mm}$

■ Recommended Soldering Pad



Performance

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

| Parameter | Symbol | Condition | Min. | Typ. | Max. | Unit |
|--------------------------------------|-----------------|-------------------------|------|------|------|------|
| Forward Voltage ⁽¹⁾ | V _F | I _F = 150 mA | 35.7 | 36.8 | 38.7 | V |
| Color Rendering Index ⁽²⁾ | R _a | | 80 | - | - | - |
| Color Rendering Index ⁽³⁾ | R ₉ | | 0 | | | |
| View Angle | θ | | - | 120 | - | deg |
| Thermal Resistance ⁽⁴⁾ | R _{th} | | - | 2 | - | °C/W |

(1) The Forward Voltage tolerance is ±3%

(2) The Color Rendering Index is measured at Ta=85°C and tolerance is ±2

(3) The R₉ is measured at Ta=85°C and tolerance is ±6.

(4) Thermal resistance is calculated from junction to solder

■ Luminous Flux (Ta=25°C)

| CCT | Condition | Rank | Typ. | Unit |
|-------------|-------------------------|-------|------|------|
| 2600K~3500K | I _F = 150 mA | GR,GS | 780 | lm |
| 4000K~7000K | | GS,GT | 820 | |

* The luminous flux tolerance is ± 7%

■ Absolute Maximum Ratings

| Parameter | Symbol | value | Unit |
|--------------------------------------|------------------|------------------|------|
| DC Forward Current ⁽¹⁾ | I _F | 200 | mA |
| Power Dissipation | P _D | 8 | W |
| Pulse Forward Current ⁽²⁾ | I _{FP} | 300 | mA |
| Storage Temperature | T _{stg} | -40 ~ 100 | °C |
| Operating Temperature | T _{opr} | -40 ~ 100 | °C |
| Junction Temperature | T _J | 125 | °C |
| Assembly Temperature | - | 260 (max. 10sec) | °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

Ordering Code

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P C 5 5 H 1 6 0 - A 2 7 1 3 0 G P G S 1 2 - 0 0 0

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|--|---|----|----|----|----|----|----|----|----|----|----|----|--|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|--|---|----|----|----|----|----|----|----|----|----|----|----|--|----|----|----|

| Item | | Pos. | Code | Spec |
|---------------------------------|----------|--------|---------------------|--------------------|
| Model Name | | 1-8 | PC55H160 | PC55H16 V0 |
| CIE Center Point | | 9 | A | ANSI 1931 on B.B.L |
| CCT | | 10,11 | 27 | 27 = 2700K |
| | | | 30 | 30 = 3000K |
| | | | 40 | 40 = 4000K |
| | | | 50 | 50 = 5000K |
| | | | 65 | 65 = 6500K |
| R9 | | 12 | 1 | R9 > 0 |
| CIE Bin Group ⁽¹⁾ | | 13,14 | 30 | 273 |
| | | | 50 | 273,275 |
| IV Bin Group | | 15,16, | GR,GS | Bin code : GR,GS |
| | | 17,18 | GS,GT | Bin code : GS,GT |
| Vf Bin Group | | 19,20 | 12 | Bin code : 1,2 |
| Kitting Rules | 21,22,23 | 000 | No requirements. | Kitting Rules |

(1) The first two digits 27 means CCT in 2700K, can be replaced to 30, 40, 50 for different CCT requirements.

■ **Standard Ordering Code:**

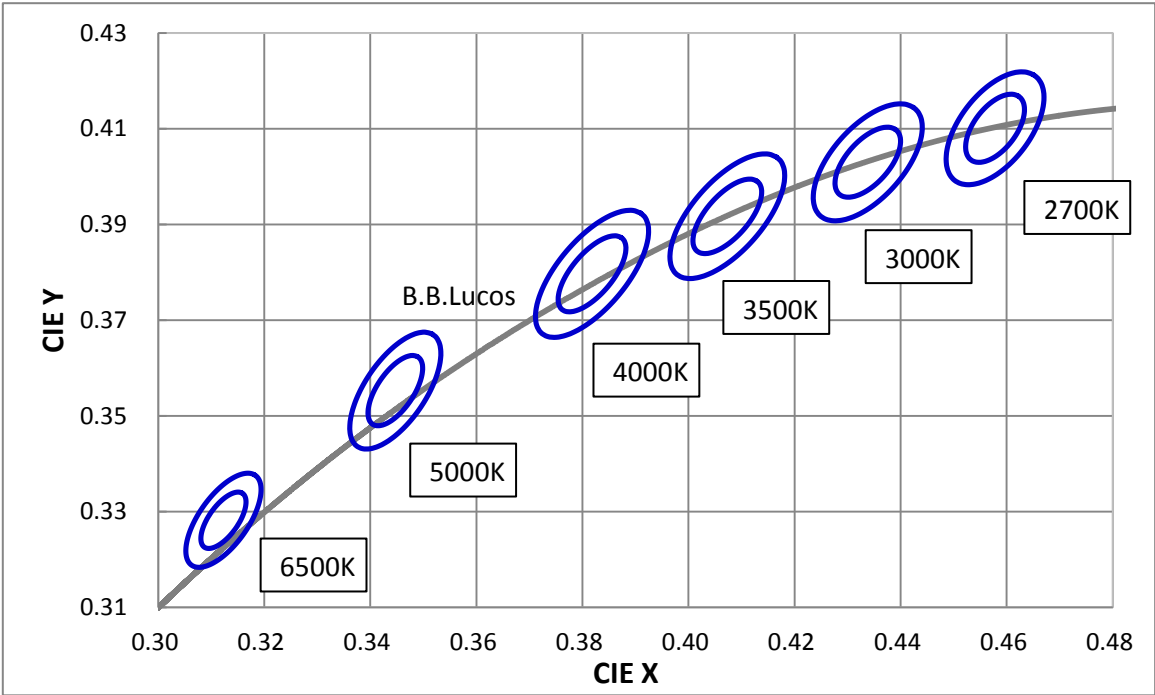
| CCT | Ordering Code ⁽¹⁾ | CIE Bin Group | IV Bin Group | Vf Bin Group |
|-------|------------------------------|------------------|-----------------|-----------------|
| 2700K | PC55H160-A27130GRGS12-000 | 30 | GR,GS | 12 |
| | PC55H160-A27150GRGS12-000 | 50 | | |
| 3000K | PC55H160-A30130GRGS12-000 | 30 | GR,GS | 12 |
| | PC55H160-A30150GRGS12-000 | 50 | | |
| 4000K | PC55H160-A40130GSGT12-000 | 30 | GS, GT | 12 |
| | PC55H160-A40150GSGT12-000 | 50 | | |
| 5000K | PC55H160-A50130GSGT12-000 | 30 | GS, GT | 12 |
| | PC55H160-A50150GSGT12-000 | 50 | | |
| 6500K | PC55H160-A65130GSGT12-000 | 30 | GS, GT | 12 |
| | PC55H160-A65150GSGT12-000 | 50 | | |

(1) Only under an agreement between customer and Lextar Electronics, Ordering codes not in “Standard Ordering Code Definitions” can be supplied.

Binning

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Chromaticity Coordinates(Ta=85°C)



| Items | Center Point, Cx | Center Point, Cy | 3 Step | | 5 Step | | Rotation Angle |
|-------|------------------|------------------|---------------|---------------|---------------|---------------|----------------|
| | | | Major Axis, a | Minor Axis, b | Major Axis, a | Minor Axis, b | |
| 2700K | 0.4578 | 0.4101 | 0.0081 | 0.0042 | 0.0135 | 0.007 | 53.7 |
| 3000K | 0.4338 | 0.4030 | 0.0083 | 0.0040 | 0.0139 | 0.0068 | 53.2 |
| 4000K | 0.3818 | 0.3797 | 0.0093 | 0.0040 | 0.0156 | 0.0040 | 53.7 |
| 5000K | 0.3447 | 0.3553 | 0.0082 | 0.0035 | 0.0137 | 0.0059 | 59.6 |
| 6500K | 0.3123 | 0.3282 | 0.0067 | 0.0029 | 0.0111 | 0.0048 | 58.6 |

■ **Bin code definition**

| V _F Rank | Luminous Flux Rank | CIE Rank |
|---------------------|--------------------|----------|
| 1 | GR | 273S |

| V _F Rank | Condition | Min. | Max. |
|---------------------|-------------------------|------|------|
| 1 | I _F = 150 mA | 35.7 | 37.2 |
| 2 | | 37.2 | 38.7 |

| Luminous Flux Rank | Condition | Min. | Max. |
|--------------------|-------------------------|------|------|
| GR | I _F = 150 mA | 660 | 726 |
| GS | | 726 | 799 |
| GT | | 799 | 879 |

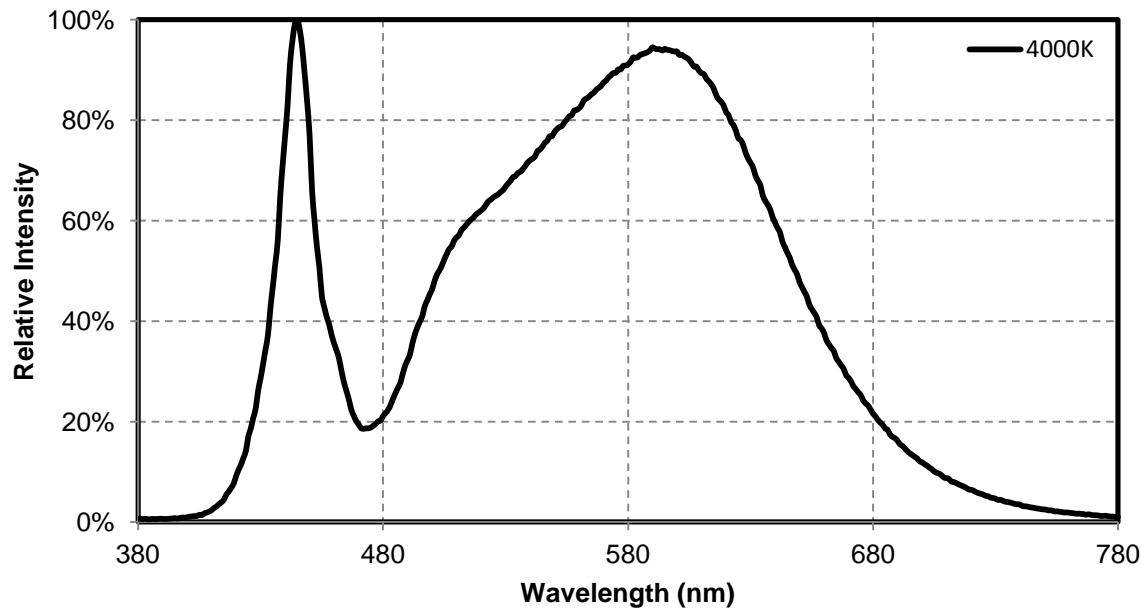
Note:

- (1) Correlated color Temperature is derived from the CIE 1931 Chromaticity diagram
- (2) CIE Measurement tolerance is ± 0.005
- (3) The luminous flux tolerance is $\pm 7\%$
- (4) The Forward Voltage tolerance is $\pm 3\%$

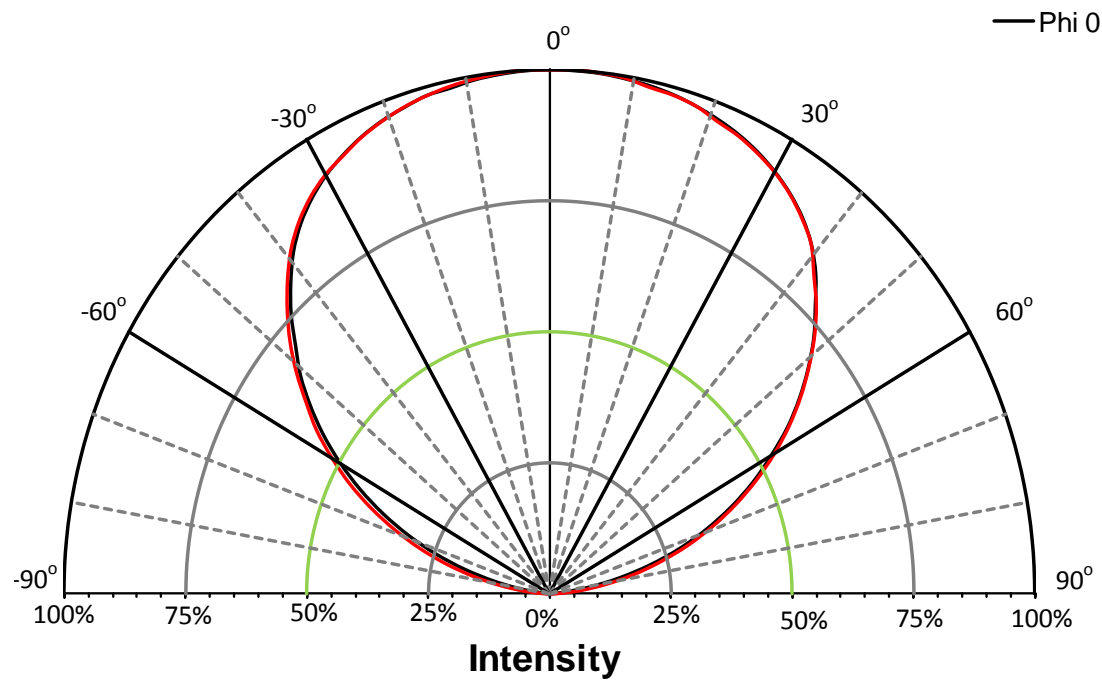
Characteristics

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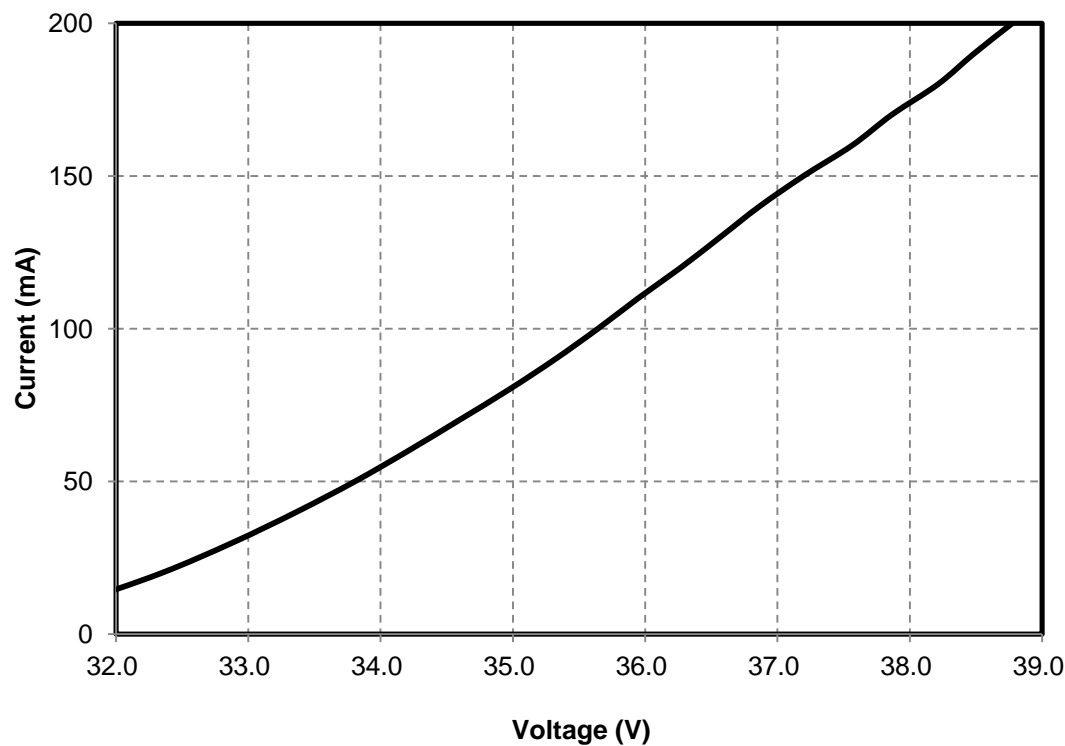
Radiation Pattern



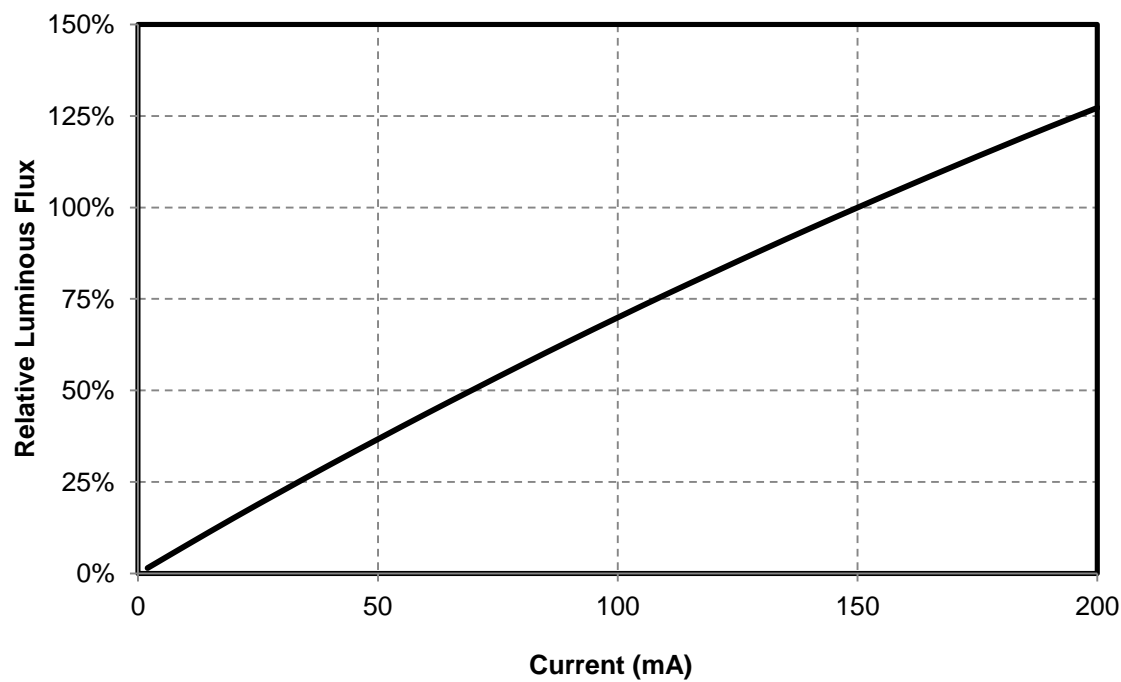
Radiation Pattern



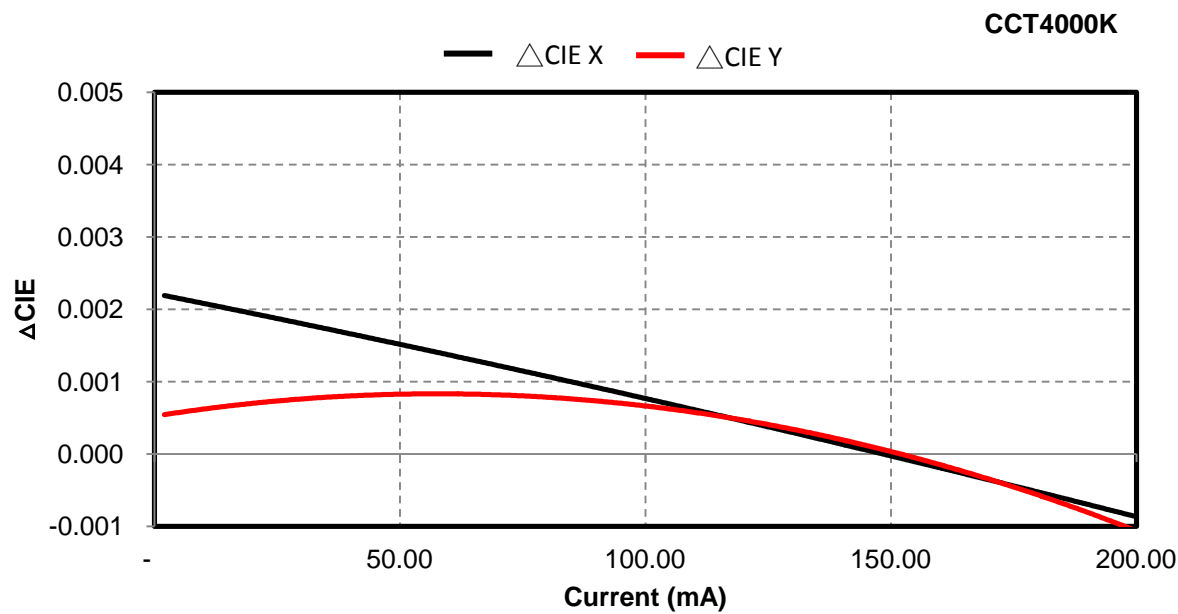
■ Forward Voltage vs. Forward Current



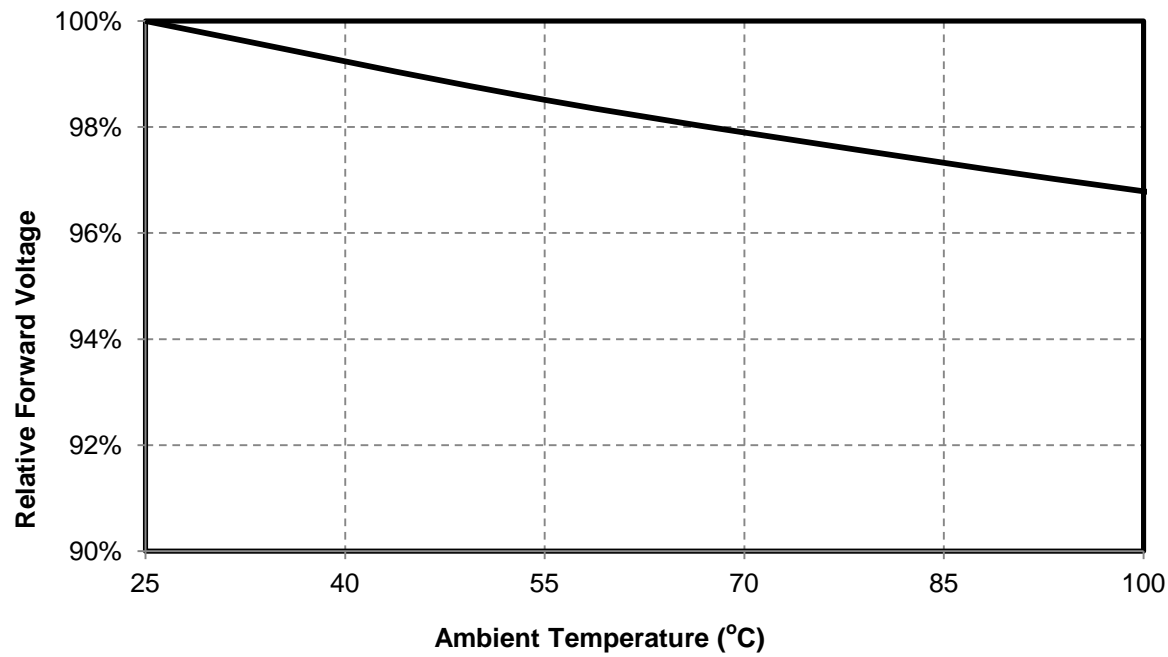
■ Forward Current vs. Relative Luminosity



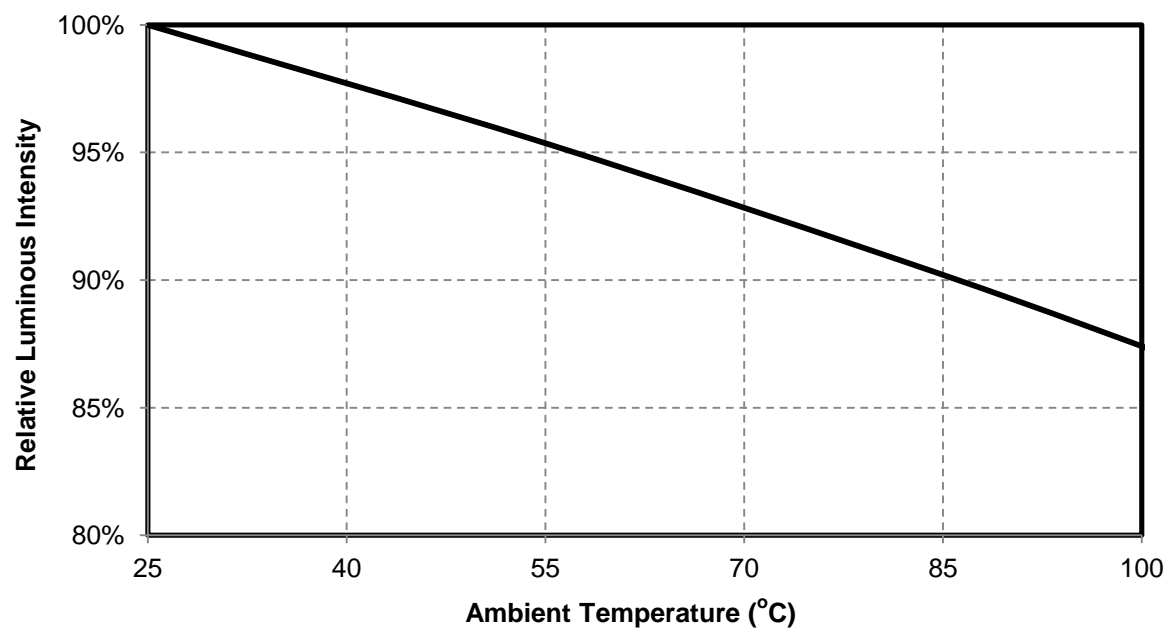
Forward Current vs. Chromaticity Coordinate



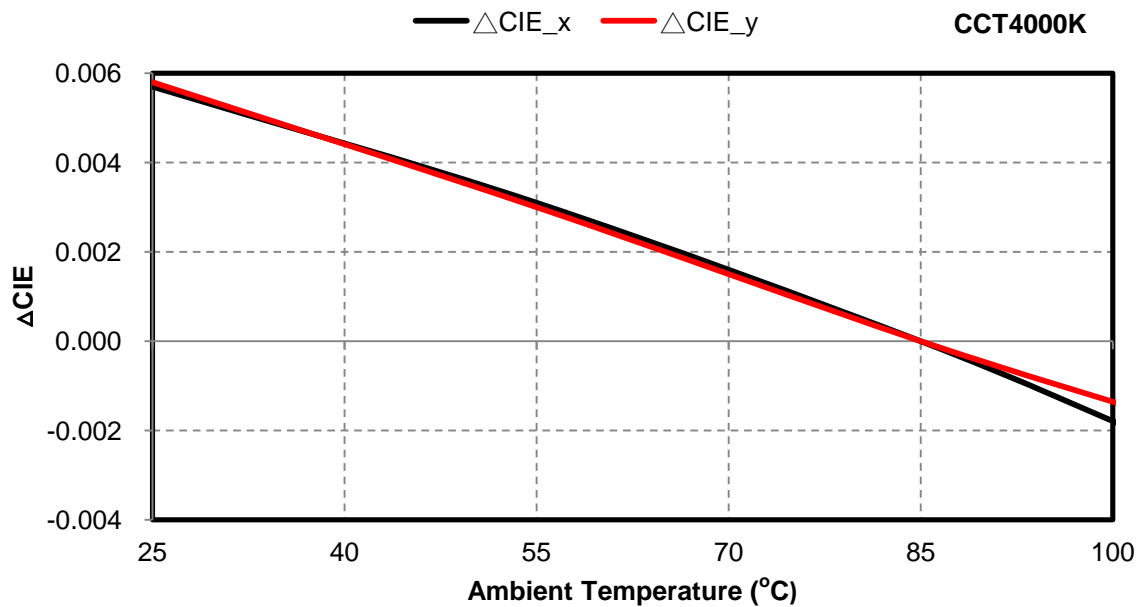
Relative Forward Voltage vs. Ambient Temperature



■ Relative Luminous Intensity vs. Ambient Temperature



■ Chromaticity vs. Ambient Temperature



Reliability

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Reliability test

| Item | Condition | Time/Cycle |
|---|---|------------|
| Steady State Operating Life of Low Temperature -40℃ | -40℃ Operating | 1000 Hrs |
| Steady State Operating Life of High Temperature 60℃ | 60℃ Operating | 1000 Hrs |
| Steady State Operating Life of High Temperature 85℃ | 85℃ Operating | 1000 Hrs |
| Steady State Operating Life of High Temperature 100℃ | 105℃ Operating | 1000 Hrs |
| Low temperature storage -40℃ | -40℃ Storage | 1000 Hrs |
| High temperature storage 100℃ | 105℃ Storage | 1000 Hrs |
| Steady State Operating Life of High Humidity Heat 60℃ 90% | 60℃/90% Operating | 1000 Hrs |
| Resistance to soldering heat on PCB (JEDEC MSL3) | pre-store@60℃, 60%RH for 52hrs Tsltd max.=260℃ 10sec | 3 Times |
| Thermal shock | -40℃/20minr ~5minr ~ 100℃/20min | 300 Cycles |
| ESD | -1KV | Pass |

Judgment Criteria

| Item | Symbol | Test Condition | Judgment Criteria |
|-----------------|--------|----------------|----------------------|
| Forward Voltage | Vf | 150mA | $\Delta V_f < 10 \%$ |
| Luminous Flux | Iv | 150mA | $\Delta I_v < 30 \%$ |

Packing

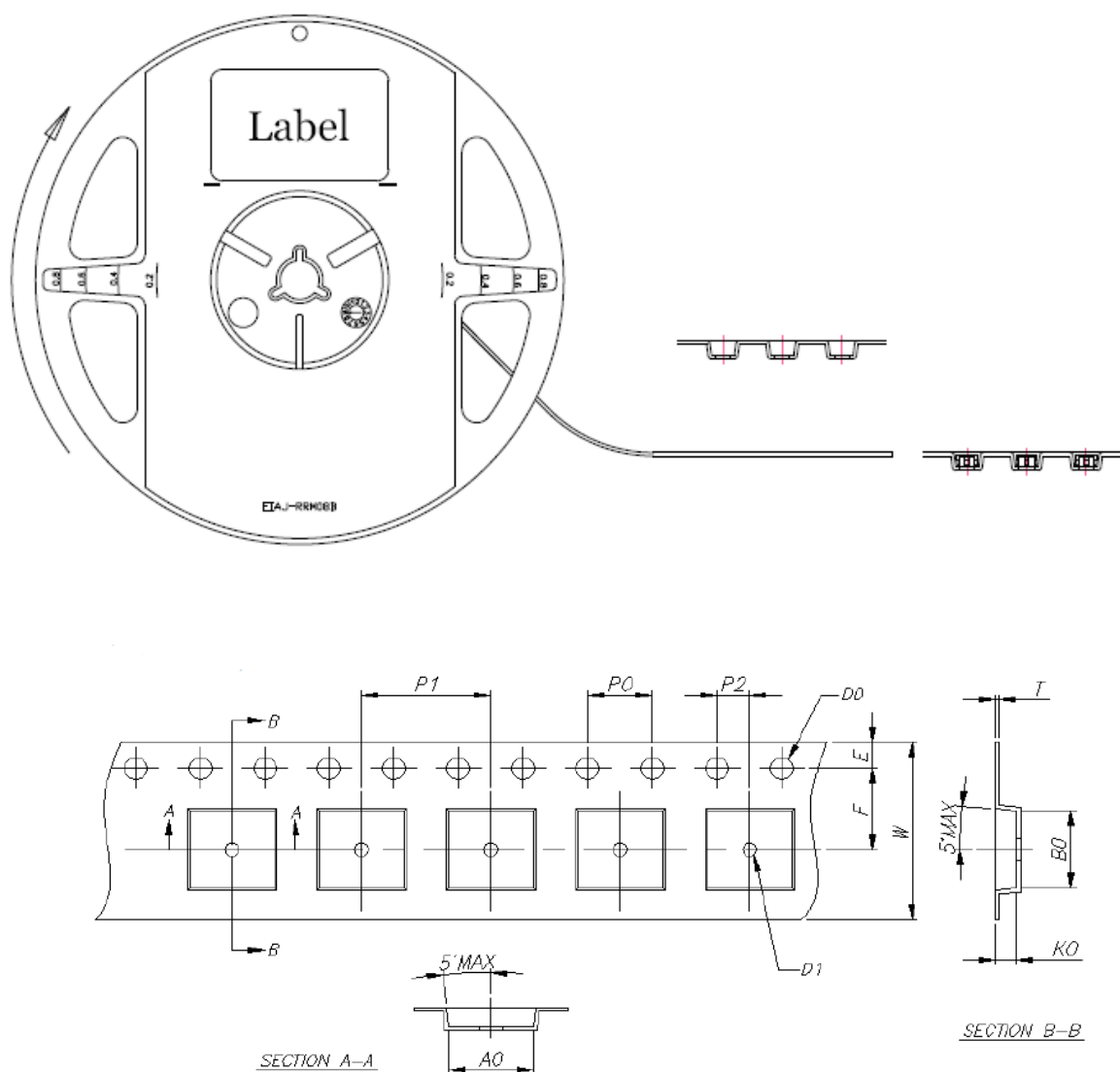
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Label



Carrier Taping

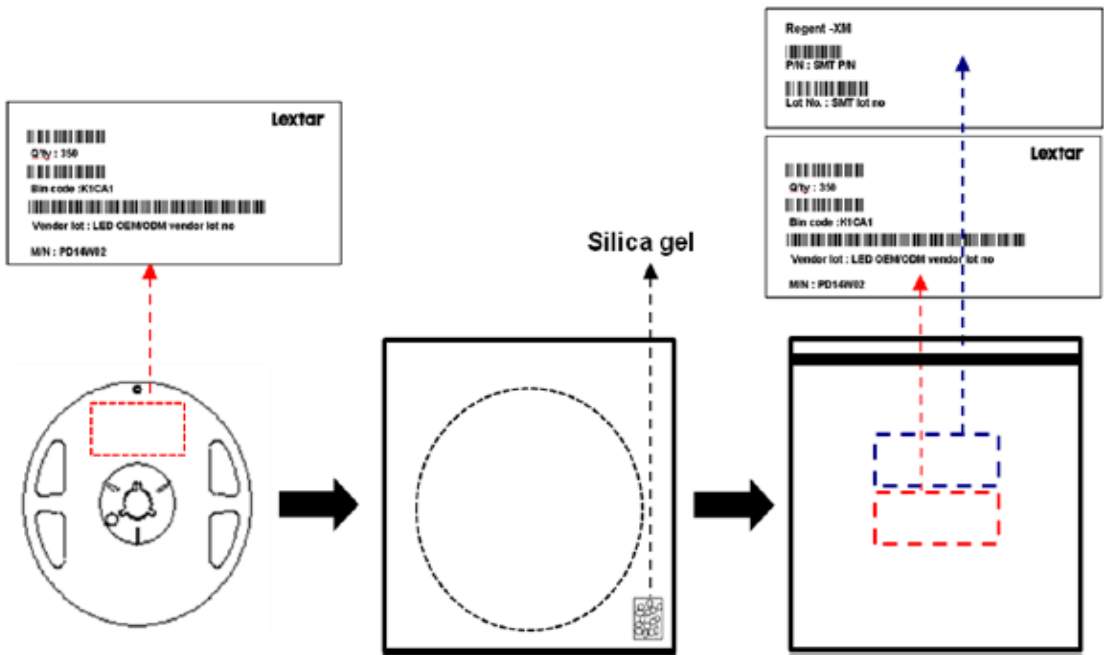


PS : unit : mm

| Item | Specification | Tol. (+/-) |
|---------|---------------|------------|
| W | 12.00 | ± 0.20 |
| E | 1.75 | ± 0.10 |
| F | 5.50 | ± 0.10 |
| D0 | 1.50 | ± 0.10 |
| D1 | 1.50 | ± 0.10 |
| P0 | 4.00 | ± 0.10 |
| P1 | 8.00 | ± 0.10 |
| P2 | 2.00 | ± 0.05 |
| P0 x 10 | 40.00 | ± 0.20 |

| Item | Specification | Tol. (+/-) |
|------|---------------|------------|
| t | 0.25 | ± 0.02 |
| A0 | 5.25 | ± 0.10 |
| B0 | 5.25 | ± 0.10 |
| K0 | 1.10 | ± 0.10 |

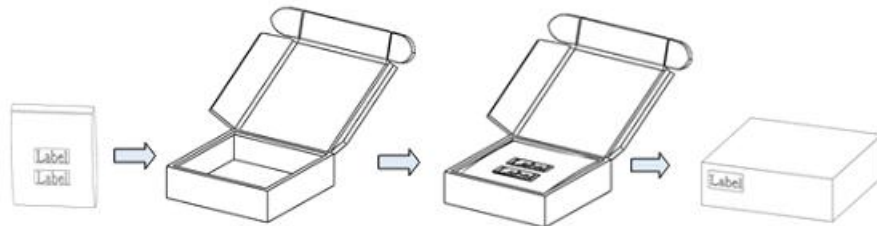
Shield Bag Taping



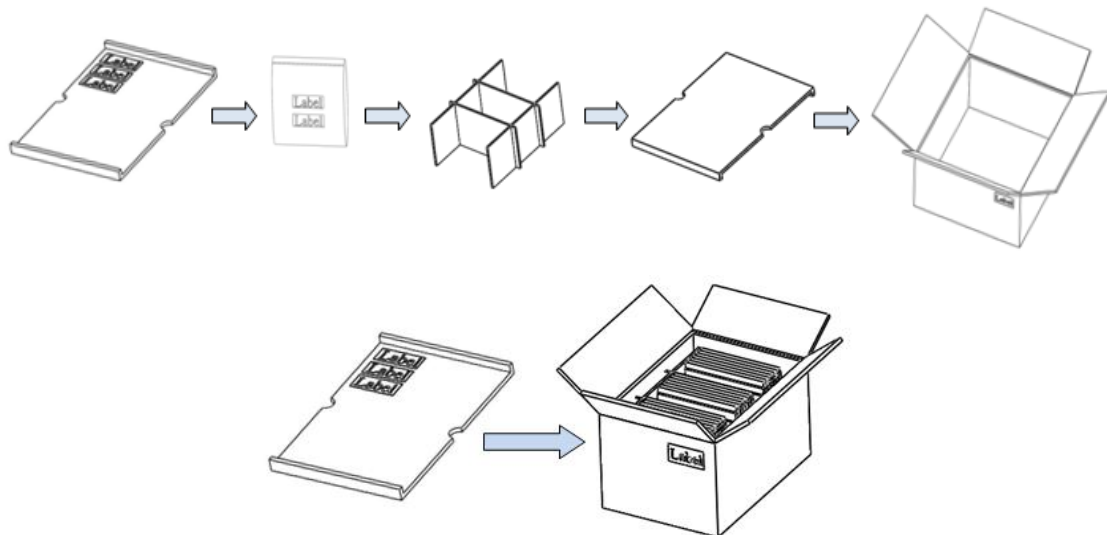
■ Packing Box

| Type | Large Box | | Medium Box | | Small Box | |
|---------------|---------------|------|---------------|------|--------------|-----|
| Dimension | 541X511X276mm | | 385X303X260mm | | 283X235x70mm | |
| Maximum Reels | 7"X12mm Reel | 64/R | 7"X12mm Reel | 21/R | 7"X12mm Reel | 4/R |
| Minimum Reels | 7"X12mm Reel | 32/R | 7"X12mm Reel | 9/R | 7"X12mm Reel | 1/R |

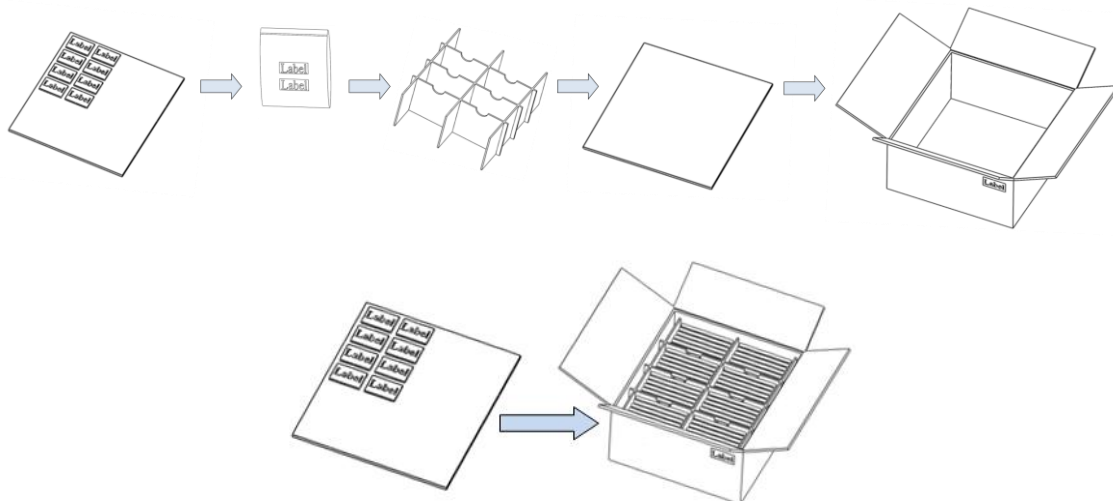
■ Small Box



■ Medium Box



■ Large Box



Precautions

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■ Safety Precautions

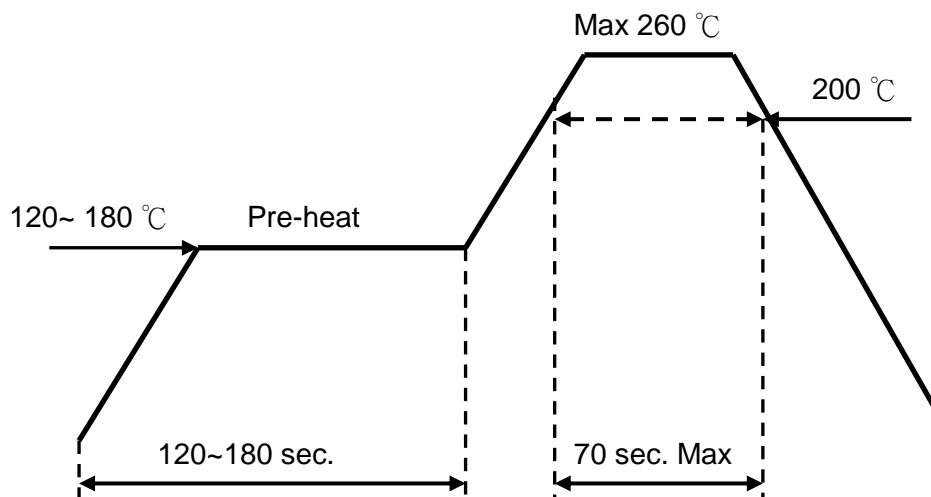
- The LED light output is too strong for human eyes without shield. Prevent eye contact directly more than seconds.
- Ensure operating under maximum rating.

■ Storage

- Before opening the package, the LEDs should storage under 30°C , 60% RH.
- After opening the package bag, the LEDs should be keep under 30°C , 60% RH.
Recommend to use within 168 hrs. 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 150 °C max , 180 sec. max.
Peak 260 °C max , 10 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.

■ Use Applications

- The products are not intended to military, aircraft, automotive, medical, life sustaining or life saving applications or any other application which can result in human injury or death. Please be noted that a different product may be required. If you have any concerns, please contact us before using the products in your desired application.
- This specification guarantees the quality and performance of the products as an individual component. Do not use the products beyond the use case and use environment that the specification has described in this document. We assume no responsibility and liability for any lost and damage resulting from the use or operation of the products which do not comply with any absolute maximum ratings, warnings, restriction and instructions recited in these specification sheets or other forms of notices from us or resulting from the use or operation of the products under non-standard environment or non-regular operations.

■ Miscellaneous

- All measurement data is taken from standard experiment procedure and environment with conditions on each discrete product, which is not integrated with other components and materials which are not provided by us. Therefore the measurement result is just provided for reference and evaluation. The products should always be cautiously used with other parts not supplied by us. It is your or your customer's responsibility to perform sufficient verification under your expected environment prior to use the products with other parts to ensure that the lifetime and other quality characteristics required for

the intended use in real life are met. It is recommended to consult with us instantly while there is any concern or inconsistency about the LED operation under certain environment and procedure. It is highly possible to cause malfunctions or damages to the products or risks of life or health under non-standard environment and operations.

- You will not reverse engineer, disassemble or otherwise attempt to extract knowledge/design information from the products. In the case of any incident or quality concern that appears to be in breach of these specifications, the products in question must be reported to our local sales representatives to discuss instructions on how to precede while ensuring that the products in question are not dissembled or removed from the PCBs(if any). The determination of whether the products in question are defective and are required for any corrective action thereafter shall be made by us in accordance with our cause analysis procedure. If you do not agree with our cause analysis result for a quality issue, you may request us to send the products in question to a mutually agreed third party for inspection. The cost of such third party inspection shall be borne by you unless it is determined by such third party that said quality issue is solely attributable to us. In the above case, our sole and exclusive obligation shall be, either to repair, replace or refund the products in question to the extent commercially practicable with the products without such quality issue.
- All previous negotiation and agreements not specifically incorporated herein are superseded and rendered null and avoid. We assume no liability with respect to defects and/or issues of the products caused by:
 - (a) alternation, modification or change of the products by someone other than us;
 - (b) attempt by someone other than us to repair the products;
 - (c) not our negligent, gross negligent, reckless, or other improper use of the LEDs;
 - (d) installation, operation, or maintenance of the products by someone other than us and not in a manner described in the instruction manual, if applicable; and
 - (e) combination of products by someone other than us with those not supplied by us.

■ LIMITED WARRANTY

The applicable warranty period is ____ months from the date that the products are manufactured.

■ DISCLAIMERS:

- REPAIR, REPLACE OR REFUND OF THE PRODUCTS SHALL CONSTITUTE THE EXCLUSIVE REMEDY FOR A BREACH OF THIS LIMITED WARRANTY, AND WE WILL NOT BE LIABLE FOR ANY CONSEQUENTIAL DAMAGES, PERSONAL INJURY, LOSSES, DAMAGES, OR EXPENSES DIRECTLY OR INDIRECTLY RESULTING

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- BOTH PARTIES INTEND TO AGREE ON THE OFFICIAL SPECIFICATIONS FOR THE SUPPLIED PRODUCTS BEFORE ANY PROGRAMS ARE OFFICIALLY LAUNCHED SUCH AS BEFORE THE MASS PRODUCTION LAUNCHED. WITHOUT THIS CONSENT AGREEMENT IN WRITING (I.E. PRODUCT SPECIFICATION), THE CONTENT OF THIS SPECIFICATION SHALL BE DEEMED SUBJECT TO CHANGE WITHOUT NOTICE FROM US.

Revision History

PC55H16 V0
Product Specification

| Date | Contents | Writer | Approved |
|------------|-------------|------------|--------------|
| 2017.11.23 | New version | Abigale Wu | Berris Huang |
| 2018.05.21 | Add CCT | Chin | Louis |

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.