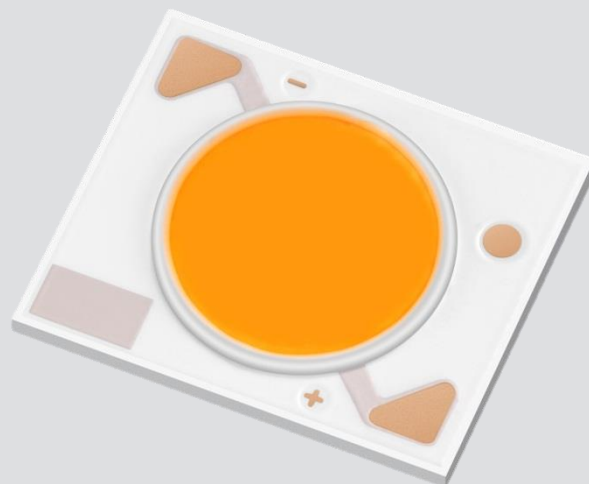


High Voltage LED Series Chip on Board - Small LES COB line-up -

LC040C



Small LES COBs are well-suited for compact spot light system

Features & Benefits

- Suitable for luminaires with narrow beam angle such as shop lighting
- Maximize Center Beam Candle Power(CBCP)
- Reduce lighting system cost with smaller optical component
- High reliability without wire-bonding



Applications

- Spotlight / Downlight
- LED Retrofit Bulbs

1. Characteristics

a) Absolute Maximum Rating

| Item | Symbol | Rating | Unit |
|---------------------------------|--------------|------------|------|
| Ambient / Operating Temperature | T_a | -40 ~ +105 | °C |
| Storage Temperature | T_{stg} | -40 ~ +120 | °C |
| Case Temperature | T_c | 105 | °C |
| LED Junction Temperature | T_j | 140 | °C |
| Forward Current | I_F | 1.62 | A |
| Minimum Current | I_{F_min} | 40 | mA |
| ESD (HBM) | - | ±2 | kV |

Notes:

- 1) Refer to 4. Outline Drawing & Dimension for T_c point.
- 2) Refer to the Derating curve for proper driving current that maintained below Maximum junction temperature.

b) Electro-optical Characteristics ($I_F = 1.08$ A, $T_J = 85$ °C)

| Item | Unit | Rank | Min. | Typ. | Max. |
|--|------|------|------|------|------|
| Forward Voltage (V_F) *1, *2 | V | - | 32.5 | 34.5 | 38.5 |
| Color Rendering Index (R_a) *1, *2 | | 5 | 80 | - | - |
| | | 7 | 90 | - | - |
| Thermal Resistance (Junction to T_c point) | °C/W | | - | 1.1 | 1.4 |
| Beam Angle | ° | | - | 115 | - |

Notes:

- 1) The COB is tested in pulsed operating condition at rated test current (10 ms pulse width) and rated temperature ($T_J = T_C = 85$ °C).
- 2) Samsung maintains measurement tolerance of: Forward Voltage = ±5 %, CRI = ±1

2. Product Code Information

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| S | P | H | W | H | 2 | H | D | N | E | 0 | 5 | Y | H | V | 3 | C | 1 |

| Digit | PKG Information | Code | Specification | | | | | | |
|-------|------------------------------|------------|----------------|-------|------------|--|--|--|--|
| 1 2 3 | Samsung Package High Power | SPH | | | | | | | |
| 4 5 | Color | WH | White | | | | | | |
| 6 | Product Version | 2 | Version | | | | | | |
| 7 8 | Form Factor | HD | COB | | | | | | |
| 9 | Lens Type | N | No lens | | | | | | |
| 10 | Internal Code | E | LC040C | | | | | | |
| 11 | Chip Type | 0 | Minor version | | | | | | |
| 12 | CRI Ra & Sorting Temperature | 5 | Min. 80 | | | | | | |
| | | 7 | Min. 90 | | | | | | |
| 13 14 | Forward Voltage (V) | YH | 32.5~38.5 | | | | | | |
| 15 | CCT (K) | W | 2700 K | | | | | | |
| | | V | 3000 K | | | | | | |
| | | U | 3500 K | | | | | | |
| | | T | 4000 K | | | | | | |
| | | R | 5000 K | | | | | | |
| | | Q | 5700 K | | | | | | |
| 16 | MacAdam / ANSI | 2 | MacAdam 2-step | | | | | | |
| | | 3 | MacAdam 3-step | | | | | | |
| | | T | ANSI bin | | | | | | |
| 17 18 | Luminous Flux | C1 | Ra min.80 | 2700K | C4, B4, A4 | | | | |
| | | | | 3000K | D4, C4, B4 | | | | |
| | | | | 3500K | E4, D4, C4 | | | | |
| | | | | 4000K | E4, D4, C4 | | | | |
| | | | | 5000K | F4, E4, D4 | | | | |
| | | | | 5700K | F4, E4, D4 | | | | |
| | | | Ra min.90 | 2700K | K3, H3, G3 | | | | |
| | | | | 3000K | L3, K3, H3 | | | | |
| | | | | 3500K | A4, L3, K3 | | | | |
| | | | | 4000K | B4, A4, L3 | | | | |

a) 40W Luminous Flux Characteristics ($I_F = 1.08 \text{ A}$)

| CRI (R_a) | Lumen Flux | | Sorting ¹⁾ @ $T_J = 85 \text{ °C}$ (lm) | | CCT | | | | | |
|---------------|------------|------|--|------|-------|-------|-------|-------|-------|-------|
| | Min. | Rank | Min. | Max. | 2700K | 3000K | 3500K | 4000K | 5000K | 5700K |
| 80 | | G | 4 | 5710 | 6110 | | | | | |
| | | F | 4 | 5340 | 5710 | | | | | |
| | | E | 4 | 4990 | 5340 | | | | | |
| | | D | 4 | 4660 | 4990 | | | | | |
| | | C | 4 | 4360 | 4660 | | | | | |
| | | B | 4 | 4070 | 4360 | | | | | |
| | | A | 4 | 3810 | 4070 | | | | | |
| | | L | 3 | 3560 | 3810 | | | | | |
| | | K | 3 | 3320 | 3560 | | | | | |
| | | H | 3 | 3110 | 3320 | | | | | |
| | | G | 3 | 2900 | 3110 | | | | | |
| | | F | 3 | 2710 | 2900 | | | | | |

| CRI (R_a) | Lumen Flux | | Sorting ¹⁾ @ $T_J = 85 \text{ °C}$ (lm) | | CCT | | | | |
|---------------|------------|------|--|------|-------|-------|-------|-------|--|
| | Min. | Rank | Min. | Max. | 2700K | 3000K | 3500K | 4000K | |
| 90 | | F | 4 | 5340 | 5710 | | | | |
| | | E | 4 | 4990 | 5340 | | | | |
| | | D | 4 | 4660 | 4990 | | | | |
| | | C | 4 | 4360 | 4660 | | | | |
| | | B | 4 | 4070 | 4360 | | | | |
| | | A | 4 | 3810 | 4070 | | | | |
| | | L | 3 | 3560 | 3810 | | | | |
| | | K | 3 | 3320 | 3560 | | | | |
| | | H | 3 | 3110 | 3320 | | | | |
| | | G | 3 | 2900 | 3110 | | | | |
| | | F | 3 | 2710 | 2900 | | | | |

Notes:

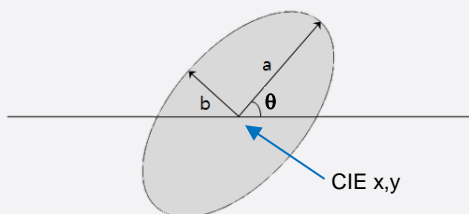
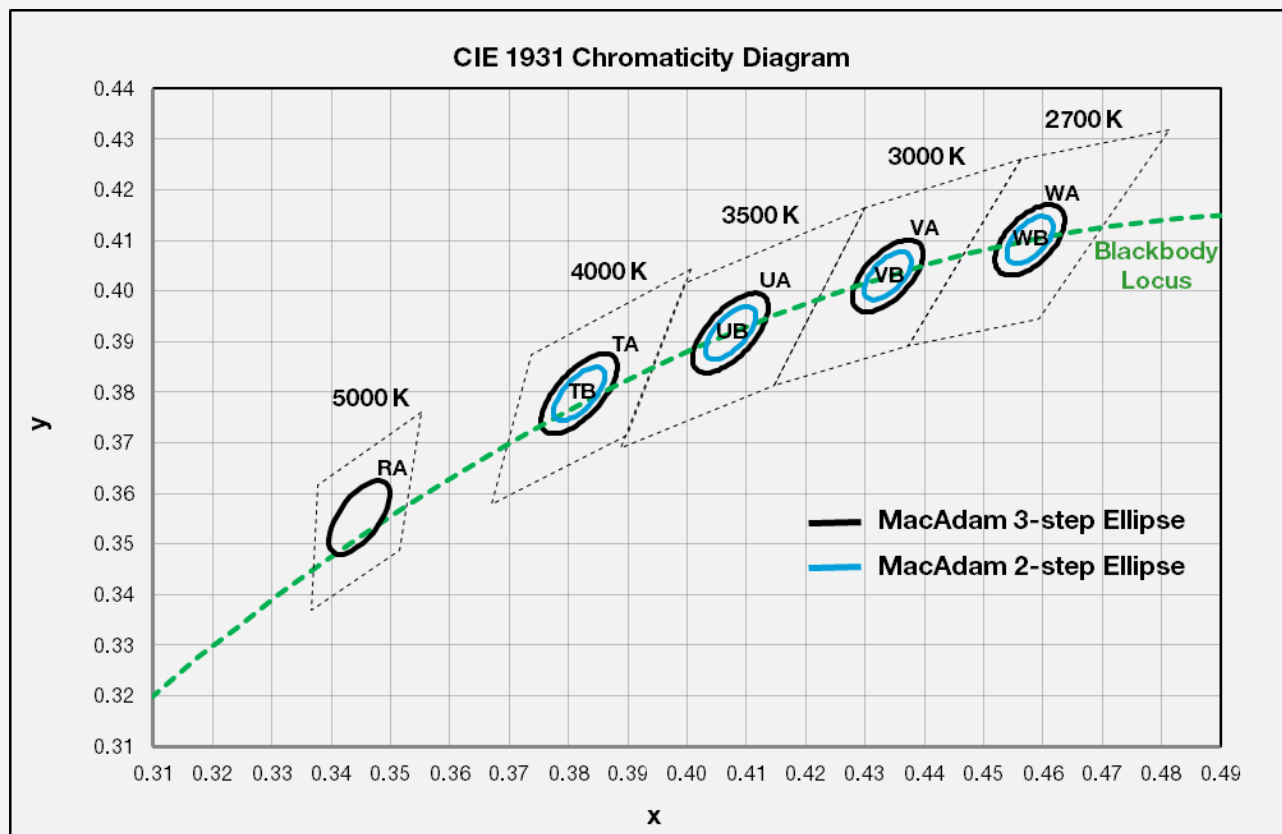
- 1) The COB is tested in pulsed operating condition at rated test current (10 ms pulse width) and rated temperature ($T_J = T_C = 85 \text{ °C}$).
- 2) Samsung maintains measurement tolerance of: Luminous flux = $\pm 7 \%$, CRI = ± 1

b) Binning Structure ($I_F = 1.08 \text{ A}$, $T_J = 85 \text{ }^\circ\text{C}$)

| CRI (R_a) Min. | Nominal CCT (K) | Product Code | V_F Rank | Color Rank | Color Bin | Flux Rank | Flux (lm) Typ. | Flux Range (Φ_v , lm) | | |
|--------------------------|--------------------|--------------------|---------------|-------------------|--------------|--------------|-------------------|-----------------------------|------|------|
| | | | | | | | | Flux Bin | Min. | Max. |
| 80 | 2700 | SPHWH2HDNE05YHW2C1 | YH | W2 | WB | C1 | 4280 | C 4 | 4360 | 4660 |
| | | | | | | | | B 4 | 4070 | 4360 |
| | | | | | | | | A 4 | 3810 | 4070 |
| | | SPHWH2HDNE05YHW3C1 | | | | | | C 4 | 4360 | 4660 |
| | | | | | | | | B 4 | 4070 | 4360 |
| | | | | | | | | A 4 | 3810 | 4070 |
| | 3000 | SPHWH2HDNE05YHV2C1 | YH | V2 | VB | C1 | 4470 | D 4 | 4660 | 4990 |
| | | | | | | | | C 4 | 4360 | 4660 |
| | | | | | | | | B 4 | 4070 | 4360 |
| | | SPHWH2HDNE05YHV3C1 | | | | | | D 4 | 4660 | 4990 |
| | | | | | | | | C 4 | 4360 | 4660 |
| | | | | | | | | B 4 | 4070 | 4360 |
| | 3500 | SPHWH2HDNE05YHU2C1 | YH | U2 | UB | C1 | 4650 | E 4 | 4990 | 5340 |
| | | | | | | | | D 4 | 4660 | 4990 |
| | | | | | | | | C 4 | 4360 | 4660 |
| | | SPHWH2HDNE05YHU3C1 | | | | | | E 4 | 4990 | 5340 |
| | | | | | | | | D 4 | 4660 | 4990 |
| | | | | | | | | C 4 | 4360 | 4660 |
| | 4000 | SPHWH2HDNE05YHT2C1 | YH | T2 | TB | C1 | 4760 | E 4 | 4990 | 5340 |
| | | | | | | | | D 4 | 4660 | 4990 |
| | | | | | | | | C 4 | 4360 | 4660 |
| | | SPHWH2HDNE05YHT3C1 | | | | | | E 4 | 4990 | 5340 |
| | | | | | | | | D 4 | 4660 | 4990 |
| | | | | | | | | C 4 | 4360 | 4660 |
| 5000 | SPHWH2HDNE05YHR3C1 | YH | R3 | RA | C1 | 5030 | F 4 | 5340 | 5710 | |
| | | | | | | | E 4 | 4990 | 5340 | |
| | | | | | | | D 4 | 4660 | 4990 | |
| | SPHWH2HDNE05YHRTC1 | | | | | | F 4 | 5340 | 5710 | |
| | | | | | | | E 4 | 4990 | 5340 | |
| | | | | | | | D 4 | 4660 | 4990 | |
| 5700 | SPHWH2HDNE05YHQTC1 | YH | QT | QW, QX, QY, QZ | C1 | 5030 | F 4 | 5340 | 5710 | |
| | | | | | | | E 4 | 4990 | 5340 | |
| | | | | | | | D 4 | 4660 | 4990 | |

b) Binning Structure ($I_F = 1.08 \text{ A}$, $T_J = 85 \text{ °C}$)

| CRI (R_a) Min. | Nominal CCT (K) | Product Code | V_F Rank | Color Rank | Color Bin | Flux Rank | Flux (lm) Typ. | Flux Range (Φ_v , lm) | | |
|--------------------------|--------------------|--------------------|---------------|---------------|--------------|--------------|-------------------|-----------------------------|------|------|
| | | | | | | | | Flux Bin | Min. | Max. |
| 90 | 2700 | SPHWH2HDNE07YHW2C1 | YH | W2 | WB | C1 | 3190 | K 3 | 3320 | 3560 |
| | | | | | | | | H 3 | 3110 | 3320 |
| | | | | | | | | G 3 | 2900 | 3110 |
| | | SPHWH2HDNE07YHW3C1 | YH | W3 | WA, WB | C1 | 3190 | K 3 | 3320 | 3560 |
| | | | | | | | | H 3 | 3110 | 3320 |
| | | | | | | | | G 3 | 2900 | 3110 |
| | 3000 | SPHWH2HDNE07YHV2C1 | YH | V2 | VB | C1 | 3470 | L 3 | 3560 | 3810 |
| | | | | | | | | K 3 | 3320 | 3560 |
| | | | | | | | | H 3 | 3110 | 3320 |
| | | SPHWH2HDNE07YHV3C1 | YH | V3 | VA, VB | C1 | 3470 | L 3 | 3560 | 3810 |
| | | | | | | | | K 3 | 3320 | 3560 |
| | | | | | | | | H 3 | 3110 | 3320 |
| 3500 | SPHWH2HDNE07YHU2C1 | YH | U2 | UB | C1 | 3700 | A 4 | 3810 | 4070 | |
| | | | | | | | L 3 | 3560 | 3810 | |
| | | | | | | | K 3 | 3320 | 3560 | |
| | SPHWH2HDNE07YHU3C1 | YH | U3 | UA, UB | C1 | 3700 | A 4 | 3810 | 4070 | |
| | | | | | | | L 3 | 3560 | 3810 | |
| | | | | | | | K 3 | 3320 | 3560 | |
| 4000 | SPHWH2HDNE07YHT2C1 | YH | T2 | TB | C1 | 3900 | B 4 | 4070 | 4360 | |
| | | | | | | | A 4 | 3810 | 4070 | |
| | | | | | | | L 3 | 3560 | 3810 | |
| | SPHWH2HDNE07YHT3C1 | YH | T3 | TA, TB | C1 | 3900 | B 4 | 4070 | 4360 | |
| | | | | | | | A 4 | 3810 | 4070 | |
| | | | | | | | L 3 | 3560 | 3810 | |

c) Chromaticity Region & Coordinates ($T_J = 85^\circ\text{C}$)

| MacAdam Ellipse (WA, WB) | | | | | |
|--------------------------|--------|--------|----------|--------|--------|
| Step | CIE x | CIE y | θ | a | b |
| 2-step | 0.4578 | 0.4101 | 53.70 | 0.0054 | 0.0028 |
| 3-step | 0.4578 | 0.4101 | 53.70 | 0.0081 | 0.0042 |

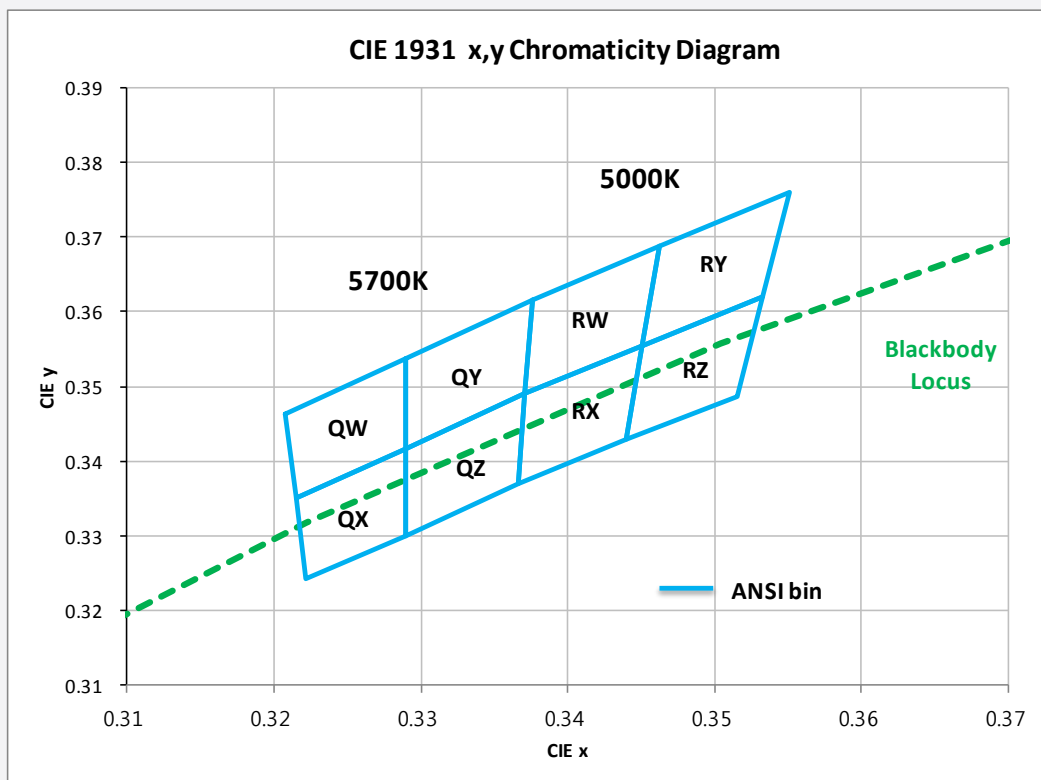
| MacAdam Ellipse (VA, VB) | | | | | |
|--------------------------|--------|--------|----------|--------|--------|
| Step | CIE x | CIE y | θ | a | b |
| 2-step | 0.4338 | 0.4030 | 53.22 | 0.0056 | 0.0027 |
| 3-step | 0.4338 | 0.4030 | 53.22 | 0.0083 | 0.0041 |

| MacAdam Ellipse (UA, UB) | | | | | |
|--------------------------|--------|--------|----------|--------|--------|
| Step | CIE x | CIE y | θ | a | b |
| 2-step | 0.4073 | 0.3917 | 54.00 | 0.0062 | 0.0028 |
| 3-step | 0.4073 | 0.3917 | 54.00 | 0.0093 | 0.0041 |

| MacAdam Ellipse (TA, TB) | | | | | |
|--------------------------|--------|--------|----------|--------|--------|
| Step | CIE x | CIE y | θ | a | b |
| 2-step | 0.3818 | 0.3797 | 53.72 | 0.0063 | 0.0027 |
| 3-step | 0.3818 | 0.3797 | 53.72 | 0.0094 | 0.0040 |

| MacAdam Ellipse (RA) | | | | | |
|----------------------|--------|--------|----------|--------|--------|
| Step | CIE x | CIE y | θ | a | b |
| 3-step | 0.3447 | 0.3553 | 59.62 | 0.0082 | 0.0035 |

Note : Samsung maintains measurement tolerance of: $C_x, C_y = \pm 0.005$

d) Chromaticity Region & Coordinates ($T_J = 85^\circ\text{C}$)

| Region | CIE x | CIE y | Region | CIE x | CIE y |
|------------------------|--------|--------|--------|--------|--------|
| R rank (5000 K) | | | | | |
| RW | 0.3376 | 0.3616 | RY | 0.3463 | 0.3687 |
| | 0.3463 | 0.3687 | | 0.3551 | 0.3760 |
| | 0.3451 | 0.3554 | | 0.3533 | 0.3620 |
| | 0.3371 | 0.3490 | | 0.3451 | 0.3554 |
| RX | 0.3371 | 0.3490 | RZ | 0.3451 | 0.3554 |
| | 0.3451 | 0.3554 | | 0.3533 | 0.3620 |
| | 0.3440 | 0.3428 | | 0.3515 | 0.3487 |
| | 0.3366 | 0.3369 | | 0.3440 | 0.3428 |

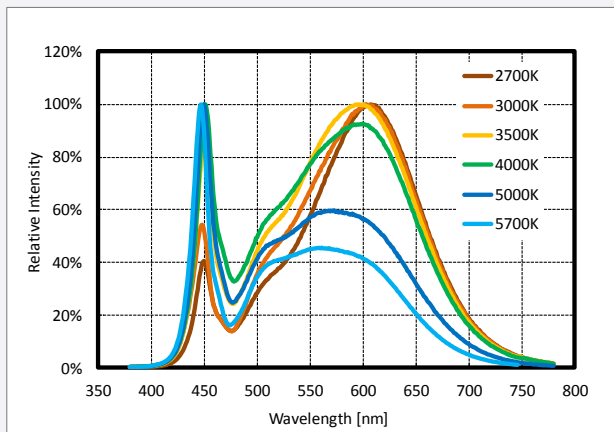
| Region | CIE x | CIE y | Region | CIE x | CIE y |
|------------------------|--------|--------|--------|--------|--------|
| Q rank (5700 K) | | | | | |
| QW | 0.3207 | 0.3462 | QY | 0.3290 | 0.3538 |
| | 0.3290 | 0.3538 | | 0.3376 | 0.3616 |
| | 0.3290 | 0.3417 | | 0.3371 | 0.3490 |
| | 0.3215 | 0.3350 | | 0.3290 | 0.3417 |
| QX | 0.3215 | 0.3350 | QZ | 0.3290 | 0.3417 |
| | 0.3290 | 0.3417 | | 0.3371 | 0.3490 |
| | 0.3290 | 0.3300 | | 0.3366 | 0.3369 |
| | 0.3222 | 0.3243 | | 0.3290 | 0.3300 |

Note : Samsung maintains measurement tolerance of: $C_x, C_y = \pm 0.005$

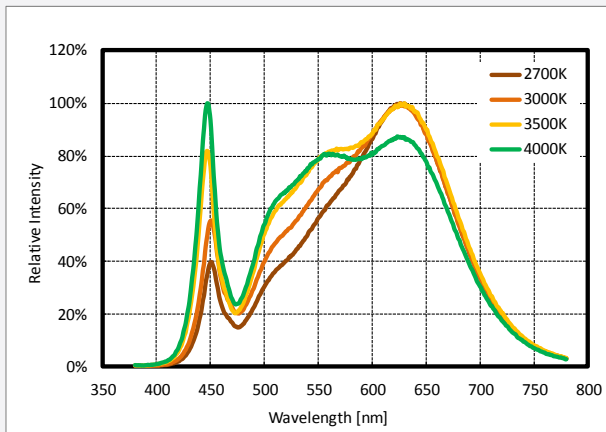
3. Typical Characteristics Graphs

a) Spectrum Distribution ($I_F = 1.08 \text{ A}$, $T_J = 85 \text{ }^\circ\text{C}$)

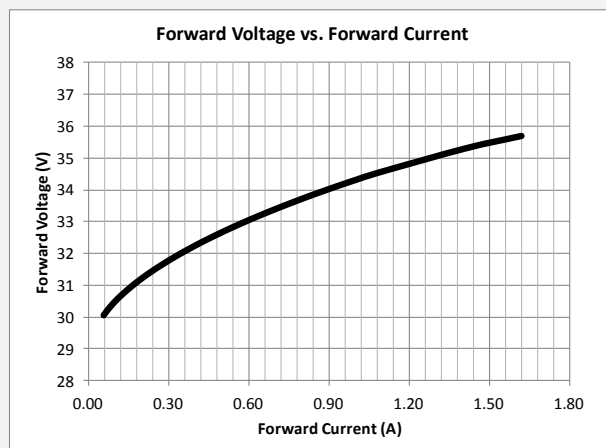
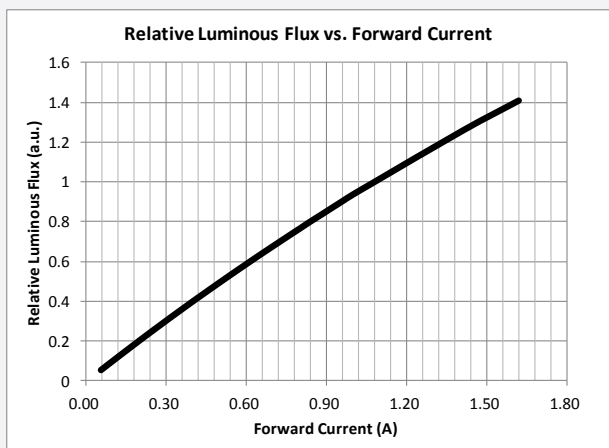
CRI Ra 80+



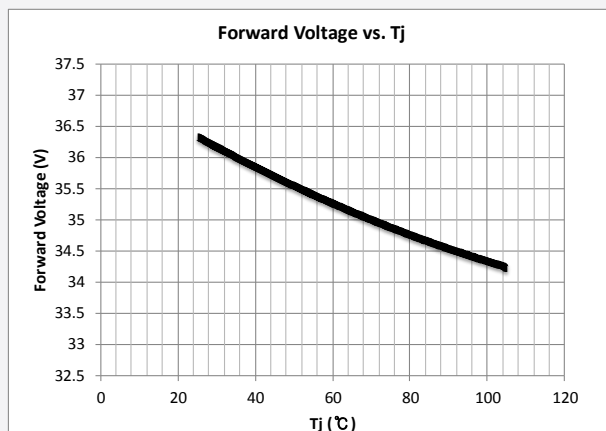
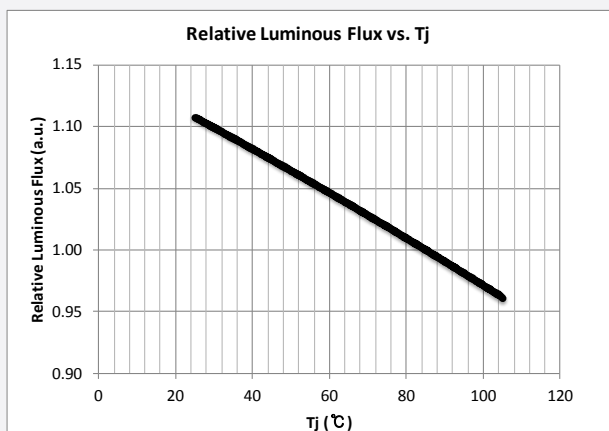
CRI Ra 90+



b) Forward Current Characteristics ($T_J = 85 \text{ }^\circ\text{C}$)



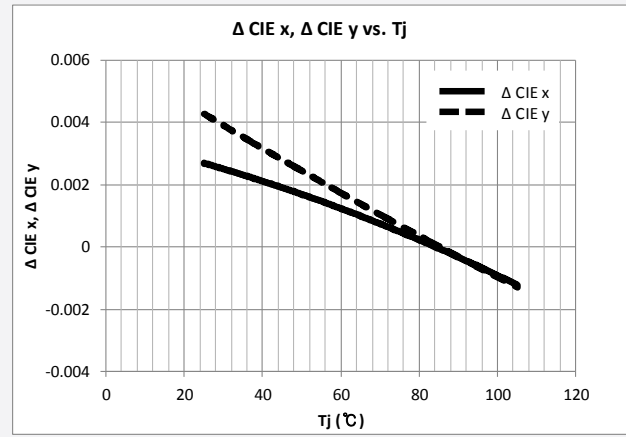
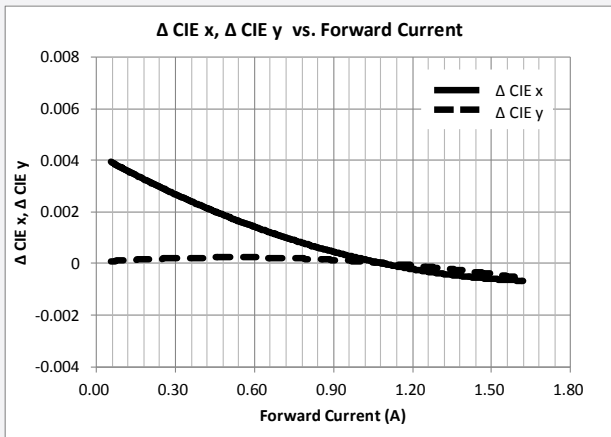
c) Temperature Characteristics ($I_F = 1.08 \text{ A}$)



d) Color Shift Characteristics

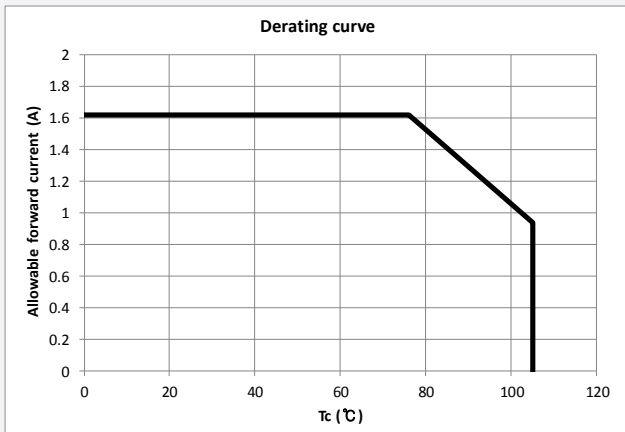
$T_J = 85^\circ\text{C}$

$I_F = 1.08\text{A}$

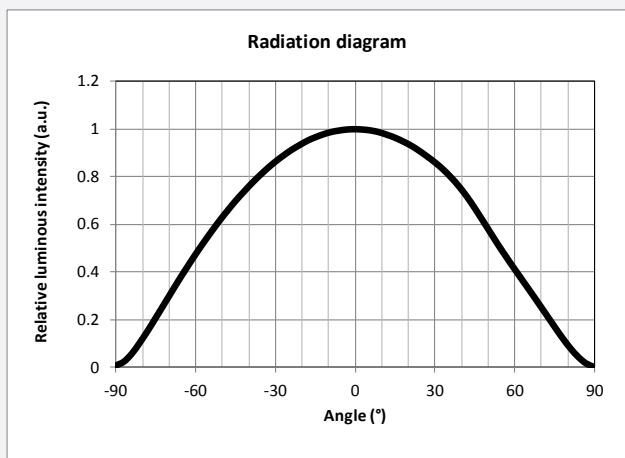


e) Derating Characteristics

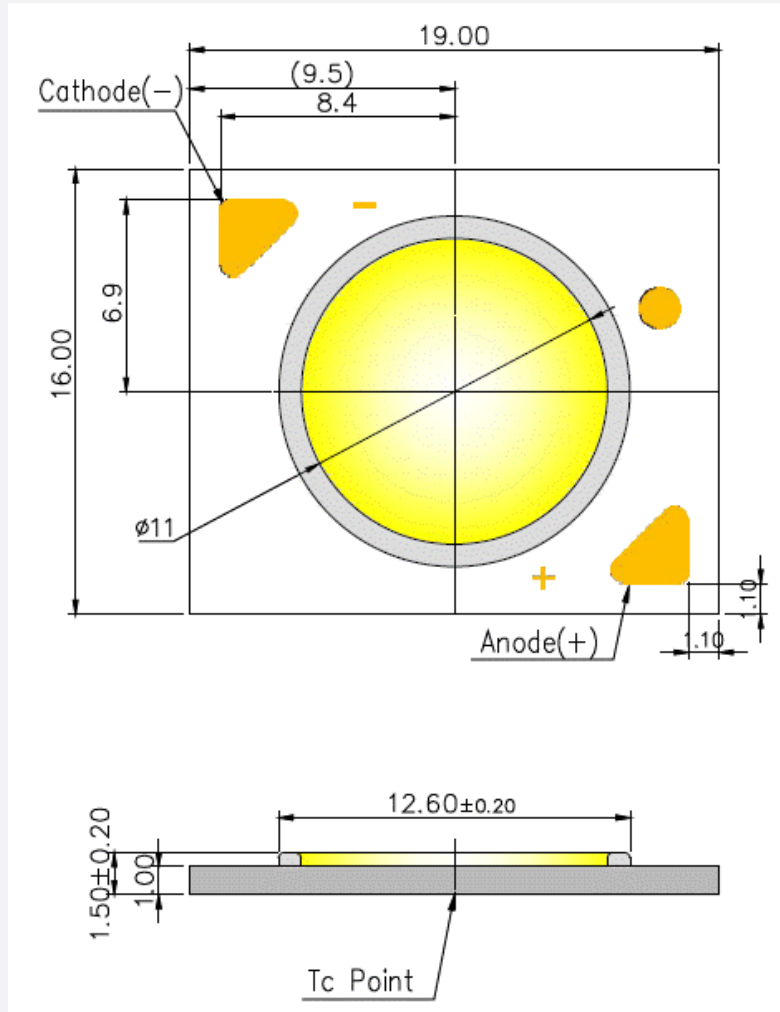
Case temperature vs. Allowable Forward Current



f) Beam Angle Characteristics ($I_F = 1.08\text{ A}$, $T_a = 25^\circ\text{C}$)



4. Outline Drawing & Dimension



1. Unit: mm
2. Tolerance: ± 0.20 mm

1. Unit: mm
2. Tolerance: ± 0.2 mm

Note : Tc point : The Center of the back side of substrate.

| Item | Dimension | Tolerance | Unit |
|---------------------------------------|-----------|------------|------|
| Length | 19.00 | ± 0.20 | mm |
| Width | 16.00 | ± 0.20 | mm |
| Height | 1.50 | ± 0.20 | mm |
| Light Emitting Surface (LES) Diameter | 11 | ± 0.15 | mm |

5. Reliability Test Items & Conditions

a) Test Items

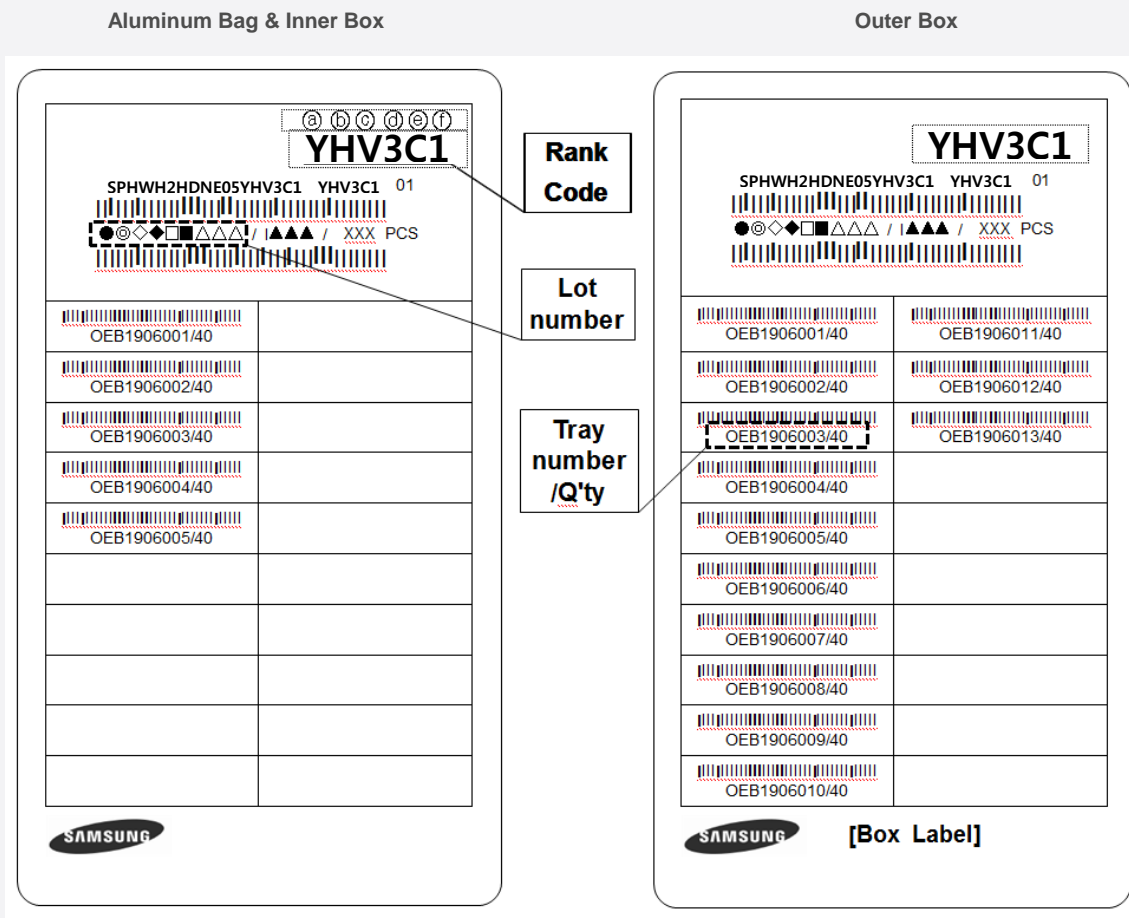
| Test Item | Test Condition | Test Hour / Cycle |
|-------------------------------------|---|-------------------|
| High Temperature Humidity Life Test | 60 °C, 90 % RH,, DC Derating, I_F | 1000 h |
| High Temperature Life Test | 85 °C, DC Derating, I_F | 1000 h |
| Low Temperature Life Test | -40 °C, DC I_F Max | 1000 h |
| Pulsed Operating Life Test | 55 °C, Pulse width 100 μ s, duty cycle 3 % | 1000 h |
| High Temperature Storage | 120 °C | 1000 h |
| Low Temperature Storage | -40 °C | 1000 h |
| Temperature Humidity Storage | 60 °C, 90% RH | 1000h |
| Thermal Cycle | -45 °C / 15 min \leftrightarrow 125 °C / 15 min temperature change in 5 min | 800 cycles |
| Temperature Cycle On/Off Test | -40 °C / 85 °C each 20 min, 30 min transfer power on/off each 5 min, DC Derating, I_F = max | 100 cycles |
| ESD (HBM) | R ₁ : 10 M Ω R ₂ : 1.5 k Ω C: 100 pF V: \pm 2 kV | 5 times |
| ESD (MM) | R ₁ : 10 M Ω R ₂ : 0 k Ω C: 200 pF V: \pm 0.2 kV | 5 times |
| Vibration Test | 20 ~ 80 Hz (displacement: 0.06 inch, max. 20 g) 80 ~ 2 kHz (max. 20 g) min. frequency \leftrightarrow max. frequency 4 min transfer | 4 times |
| Mechanical Shock Test | 1500 g, 0.5 ms each of the 6 surfaces (3 axis x 2 sides) | 5 times |
| Sulfur Resistance | 25 °C, 75%, H2S 15 ppm | 504h |

b) Criteria for Judging the Damage

| Item | Symbol | Test Condition ($T_c = 25$ °C) | Limit | |
|-----------------|----------|------------------------------------|--------------|--------------|
| | | | Min. | Max. |
| Forward Voltage | V_F | $I_F = 1.08$ A | L.S.L. * 0.9 | U.S.L. * 1.1 |
| Luminous Flux | Φ_v | $I_F = 1.08$ A | L.S.L * 0.7 | U.S.L * 1.3 |

6. Label Structure

a) Label Structure



Note: Denoted rank code and product code above is only an example (see description on page 6)

Rank Code:

- ⒶⒷ: Forward Voltage rank (refer to page 3)
- ⒸⒹ: Chromaticity bin (refer to page 5-6)
- ⒺⒻ: Luminous Flux bin (refer to page 4)

b) Lot Number

The lot number is composed of the following characters:

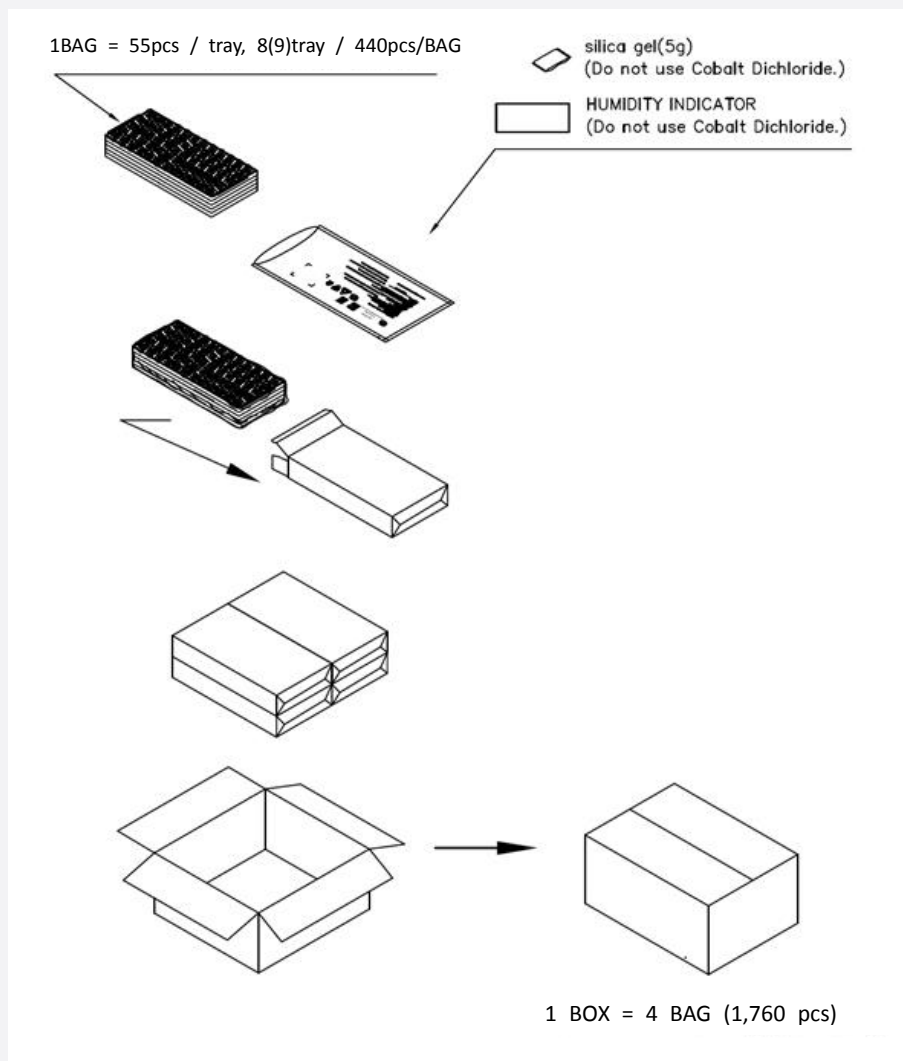
●◎◇◆□■△△△ / 1▲▲▲ / xxx PCS

- : Production site (S: Giheung, Korea, G: Tianjin, China)
- ◎ : L (LED)
- ◇ : Product state (A: Normal, B: Bulk, C: First Production, R: Reproduction, S: Sample)
- ◆ : Year (Y: 2014, Z: 2015, A: 2016, ...)
- : Month (1~9, A, B, C)
- : Day (1~9, A, B~V)
- △△△ : Product serial number (001 ~ 009)
- ▲▲▲ : Tray number (001 ~ 999)

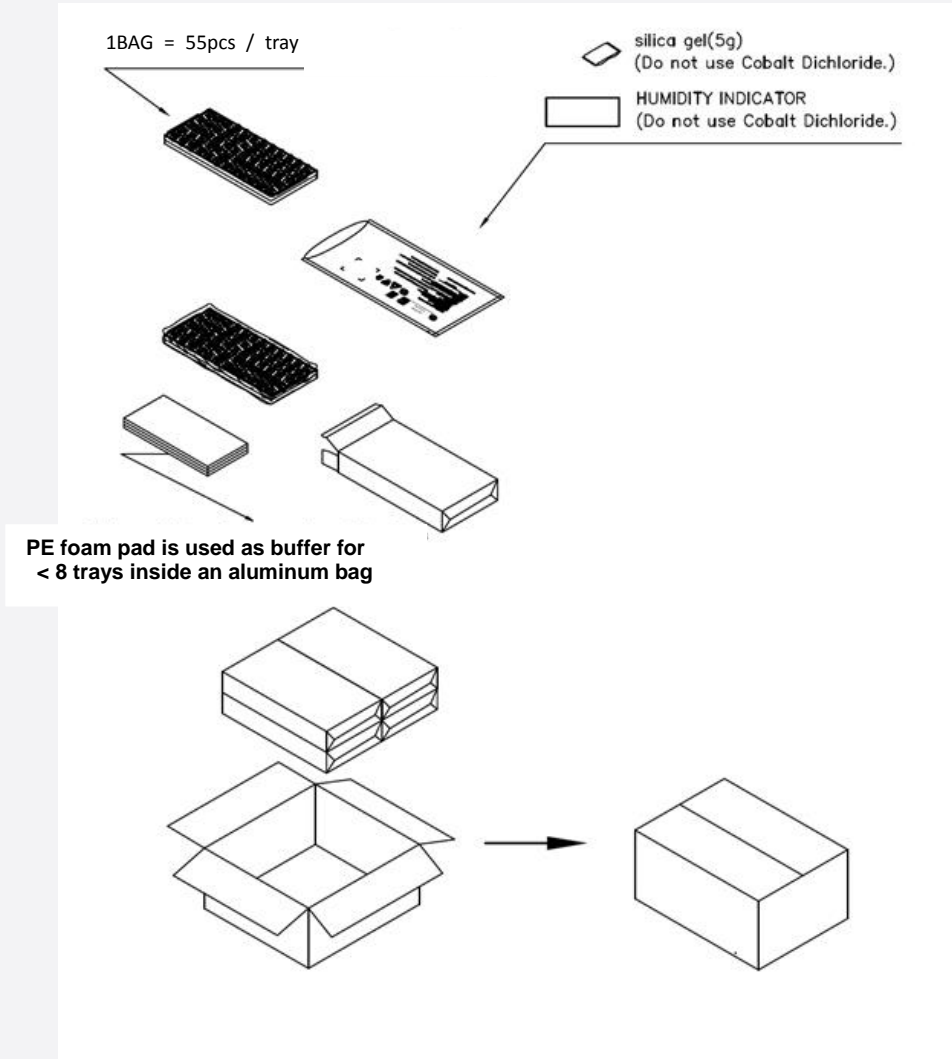
7. Packing Structure

| Packing material | Max. quantity in pcs of COB | Dimension (mm) | | | |
|------------------|-----------------------------|----------------|-------|--------|-----------|
| | | Length | Width | Height | Tolerance |
| Tray | 55 | 322.6 | 135.9 | 11 | 0.25 |
| Aluminum Bag | 440 (8 trays) | 450 | 230 | - | 10 |
| PE Foam Pad | - | 280 | 130 | 10 | 2 |
| Inner Box | 440 (1 aluminum bag) | 338 | 148 | 55 | 2 |
| Outer Box | 1,760 (4 inner boxes) | 351 | 308 | 120 | 5 |
| Pallet | 98,560 (56 outer boxes) | 1000 | 1000 | 970 | 10 |

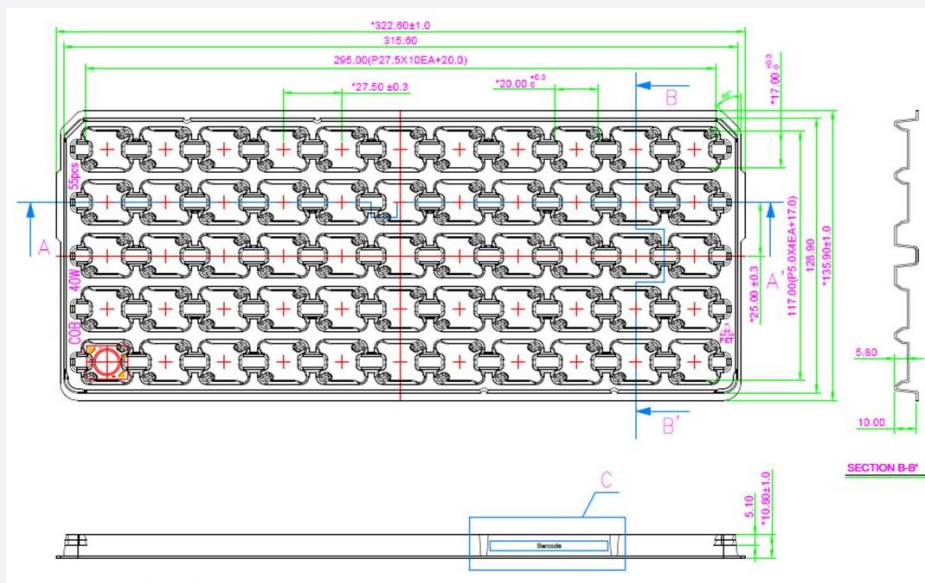
a) Packing Structure for 8 trays inside Aluminum Bag



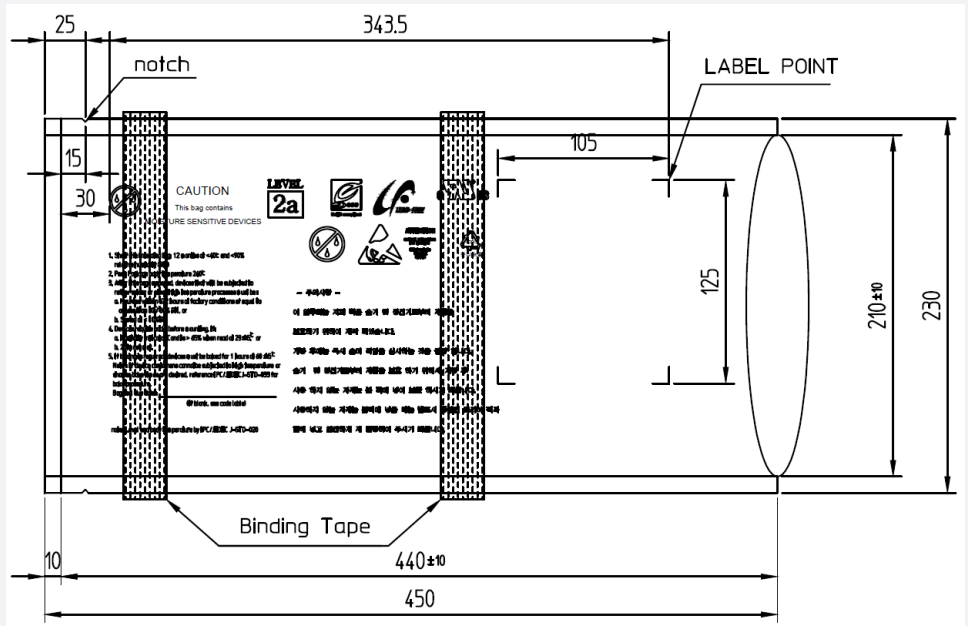
b) Packing Structure for <8 trays inside Aluminum Bag



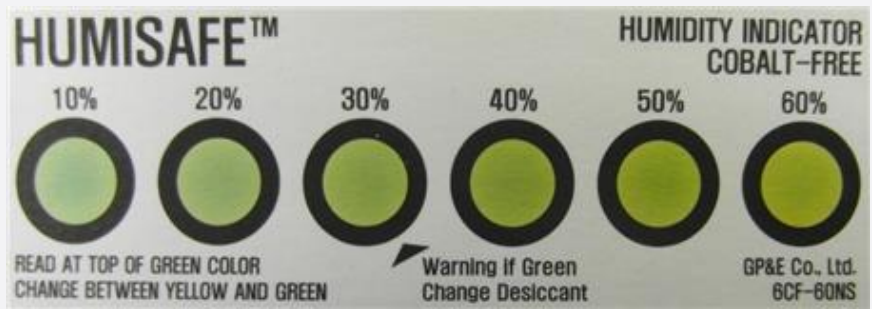
c) Tray



d) Aluminum Vinyl Packing Bag



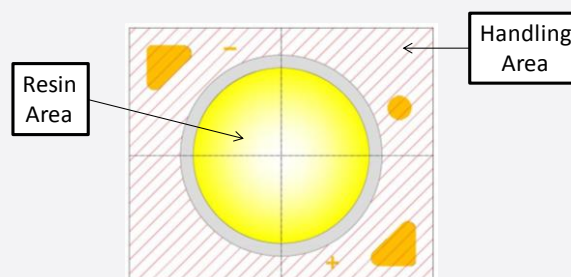
e) Silica Gel & Humidity Indicator Card inside Aluminum Vinyl Packing Bag



8. Precautions in Handling & Use

- 1) This device should not be used in any type of fluid such as water, oil, organic solvent, etc. When cleaning is required, IPA is recommended as the cleaning agent. Some solvent-based cleaning agent may damage the silicone resins used in the device.
- 2) LEDs must be stored in a clean environment. If the LEDs are to be stored for three months or more after being shipped from Samsung, they should be packed with a nitrogen-filled container (shelf life of sealed bags is 12 months at temperature 0~40 °C, 0~90 % RH).
- 3) After storage bag is opened, device subjected to soldering or other high temperature processes must be:
 - a. Mounted within 672 hours (28 days) at an assembly line with a condition of no more than 30 °C / 60 % RH, or
 - b. Stored at <10 % RH
- 4) Repack unused products with anti-moisture packing, fold to close any opening and then store in a dry place.
- 5) Devices require baking before mounting, if humidity card reading is >60 % at 23 ± 5 °C.
- 6) Devices must be baked for 1 hour at 60 ± 5 °C, if baking is required.
- 7) The LEDs are sensitive to the static electricity and surge current. It is recommended to use a wrist band or anti-electrostatic glove when handling the LEDs. If voltage exceeding the absolute maximum rating is applied to LEDs, it may cause damage or even destruction to LED devices. Damaged LEDs may show some unusual characteristics such as increase in leakage current, lowered turn-on voltage, or abnormal lighting of LEDs at low current.
- 8) The thermal management is one of the most critical factors for the LED lighting system. Especially the LED junction temperature should not exceed the absolute maximum rating while operation of LED lighting system.
For more information, please refer to Application Note 'Mechanical & Thermal Guide for COB'.
- 9) In case of driving the LC040C around the minimum current level (I_{f_min}), chips might exhibit different brightness due to the variation in I-V characteristics of each one. This is normal and does not adversely affect the performance of product.
- 10) VOCs (Volatile Organic Compounds) can be generated from adhesives, flux, hardener or organic additives used in luminaires (fixtures). Transparent LED silicone encapsulant is permeable to those chemicals and they may lead to a discoloration of encapsulant when they exposed to heat or light. This phenomenon can cause a significant loss of light emitted (output) from the luminaires. In order to prevent these problems, we recommend users to know the physical properties of materials used in luminaires and they must be carefully selected.
- 11) The resin area is very sensitive, please do not handle, press, touch, rub, clean, or pick by with tweezers on it. Instead, please pick at the handling area as indicated below.

For more information, please refer to Application Note 'LED Handling Guide'.



Legal and additional information.

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