

## LIGHT LED M08 CoB Product Series

### 1. Description

The LiteON CoB Product series is a revolutionary, energy efficient and ultra-compact new light source, combining the lifetime and reliability advantages of Light Emitting Diodes with the brightness of conventional lighting. It gives you total design freedom and unmatched brightness, creating a new opportunities for solid state lighting to displace conventional lighting technologies.

#### 1.1 Features

- Compact high flux density light source
- Uniform high quality illumination
- Streamlined thermal path
- MacAdam compliant binning structure  
More energy efficient than incandescent, halogen and fluorescent lamps
- Instant light with unlimited dimming
- RoHS compliant and Pb free

#### 1.2 Benefits Features

- Enhanced optical control
- Clean white light without pixilation
- Uniform consistent white light
- Significantly reduced thermal resistance and increased operating temperatures
- Lower operating costs
- Reduced maintenance costs

#### 1.3 Naming Rule

|          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| <b>L</b> | <b>T</b> | <b>P</b> | <b>L</b> | <b>-</b> | <b>M</b> | <b>0</b> | <b>8</b> | <b>2</b> | <b>X</b> | <b>X</b> | <b>Z</b> | <b>S</b> | <b>X</b> | <b>X</b> | <b>-</b> | <b>X</b> | <b>X</b> |
| Code1    |          | Code2    |          |          | Code3    |          | Code4    |          | Code5    |          | Code6    |          | Code7    |          |          |          |          |

##### Code 1: Product Line

PL: High Power LED

##### Code 2: Package Type/Platform

M08: Metal substrate with 13.5x13.5mm square.

##### Code 3: Light Emitting Surface

2: 9.5mm excluding dam

##### Code 4: Product Series

06: 06 Series

10: 10 Series

18: 18 Series

##### Code5: Emission Color Characteristics

Z: White Color Rendering Index 80 Min.

Q: White Color Rendering Index 90 Min.

##### Code6: Color Temperature

27: 2700K at 85degC

30: 3000K at 85degC

40: 4000K at 85degC

Note: The Color Temperature follow ANSI C78.377A Doc.

##### Code7: Hue Bin by MacAdam Ellipses Step

T0: 2700~4000K MacAdam Ellipse / ANSI Bin

## LIGHT LED M08 CoB Product Series

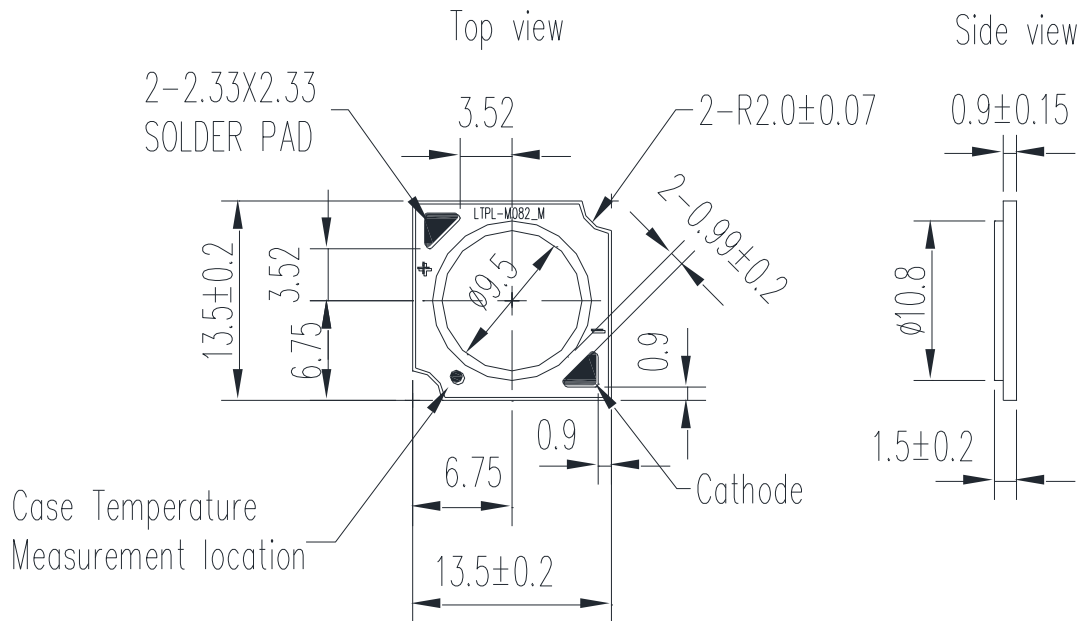
### 1.4 Product List

| PN                 | Series | CCT   | CRI | Color Bin |       |      | Lumen Bin |           |
|--------------------|--------|-------|-----|-----------|-------|------|-----------|-----------|
|                    |        |       |     | 3SDCM     | 5SDCM | ANSI | -8%~+8%   | -15%~+15% |
| LTPL-M08206ZS27-T0 | 6      | 2700K | 80  | ☆         | ☆     | ☆    | ☆         | ☆         |
| LTPL-M08206ZS30-T0 | 6      | 3000K | 80  | ☆         | ☆     | ☆    | ☆         | ☆         |
| LTPL-M08206ZS40-T0 | 6      | 4000K | 80  | ☆         | ☆     | ☆    | ☆         | ☆         |
| LTPL-M08210ZS27-T0 | 10     | 2700K | 80  | ☆         | ☆     | ☆    | ☆         | ☆         |
| LTPL-M08210ZS30-T0 | 10     | 3000K | 80  | ☆         | ☆     | ☆    | ☆         | ☆         |
| LTPL-M08210ZS40-T0 | 10     | 4000K | 80  | ☆         | ☆     | ☆    | ☆         | ☆         |
| LTPL-M08218ZS27-T0 | 18     | 2700K | 80  | ☆         | ☆     | ☆    | ☆         | ☆         |
| LTPL-M08218ZS30-T0 | 18     | 3000K | 80  | ☆         | ☆     | ☆    | ☆         | ☆         |
| LTPL-M08218ZS40-T0 | 18     | 4000K | 80  | ☆         | ☆     | ☆    | ☆         | ☆         |
| LTPL-M08206QS30-T0 | 6      | 3000K | 90  | ☆         | ☆     | ☆    | ☆         | ☆         |
| LTPL-M08210QS30-T0 | 10     | 3000K | 90  | ☆         | ☆     | ☆    | ☆         | ☆         |
| LTPL-M08218QS30-T0 | 18     | 3000K | 90  | ☆         | ☆     | ☆    | ☆         | ☆         |

## LIGHT LED M08 CoB Product Series

### 2. Outline Dimensions

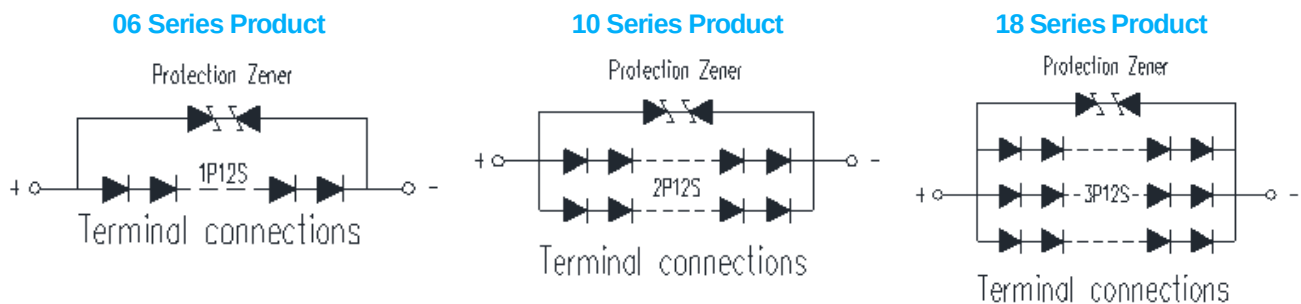
#### 2.1 Form Factor of M082 series CoB



#### Notes

1. All dimensions are in millimeters.
2. Tolerance is  $\pm 0.3\text{mm}$  unless otherwise noted.

#### 2.2 Internal Equivalent Circuit



#### Notes

1. LED of equivalent circuit means all series/parallel in CoB package.

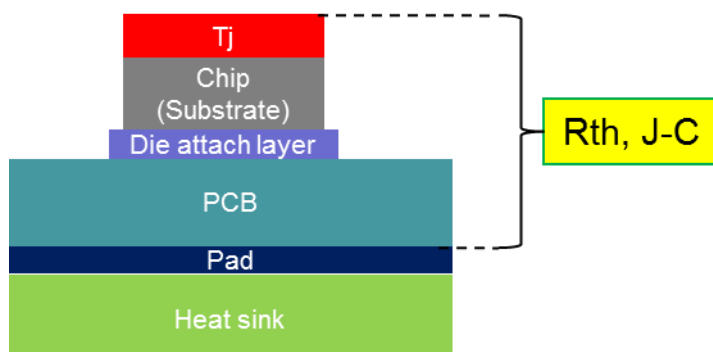
## LIGHT LED M08 CoB Product Series

### 3. Absolute Maximum Ratings at Ta=25°C

| Parameter                         | Symbol               | Product Series | Rating     | Unit |
|-----------------------------------|----------------------|----------------|------------|------|
| Power Dissipation                 | P <sub>O</sub>       | 6              | 8          | W    |
|                                   |                      | 10             | 16         |      |
|                                   |                      | 18             | 24         |      |
| Forward Current                   | I <sub>F</sub>       | 6              | 200        | mA   |
|                                   |                      | 10             | 400        |      |
|                                   |                      | 18             | 600        |      |
| Junction Temperature              | T <sub>j</sub>       |                | 125        | °C   |
| Thermal Resistance, Junction-Case | R <sub>th, J-C</sub> | 6              | 2.04       | °C/W |
|                                   |                      | 10             | 1.2        |      |
|                                   |                      | 18             | 0.9        |      |
| Operating Temperature Range       | T <sub>opr</sub>     |                | -40 to 85  | °C   |
| Storage Temperature Range         | T <sub>stg</sub>     |                | -40 to 100 | °C   |

#### Notes

1. The pulse mode condition is 1/10 duty cycle with 100 msec. pulse width.
2. Forbid to be operated at reverse voltage condition.
3. The unit of R<sub>th</sub> is °C/W electrical.
4. The M08 CoB is recommended soldering temperature under 350degC and could not over 3.5sec.



## LIGHT LED M08 CoB Product Series

### 4. Electro-Optical Characteristics

#### 4.1 Typical Performance

| Dominant CCT | Product Series | CRI min. | Current (mA) | V <sub>F</sub> (V) @25°C | Flux(lm) @25°C | V <sub>F</sub> (V) @85°C | Flux(lm) @85°C | Eff.(lm/W) @25°C | Eff.(lm/W) @85°C |
|--------------|----------------|----------|--------------|--------------------------|----------------|--------------------------|----------------|------------------|------------------|
| 2700K        | 6              | 80       | 120          | 37.0                     | 596            | 35.8                     | 531            | 134              | 124              |
|              | 10             | 80       | 240          | 37.0                     | 1121           | 35.8                     | 998            | 126              | 116              |
|              | 18             | 80       | 360          | 37.0                     | 1720           | 35.8                     | 1531           | 129              | 119              |
| 3000K        | 6              | 80       | 120          | 37.0                     | 621            | 35.8                     | 553            | 140              | 129              |
|              | 10             | 80       | 240          | 37.0                     | 1168           | 35.8                     | 1040           | 132              | 121              |
|              | 18             | 80       | 360          | 37.0                     | 1792           | 35.8                     | 1595           | 135              | 124              |
| 4000K        | 6              | 80       | 120          | 37.0                     | 658            | 35.8                     | 586            | 148              | 136              |
|              | 10             | 80       | 240          | 37.0                     | 1238           | 35.8                     | 1102           | 139              | 128              |
|              | 18             | 80       | 360          | 37.0                     | 1900           | 35.8                     | 1691           | 143              | 131              |
| 5000K        | 6              | 90       | 120          | 37.0                     | 515            | 35.8                     | 459            | 116              | 107              |
|              | 10             | 90       | 240          | 37.0                     | 969            | 35.8                     | 863            | 109              | 100              |
|              | 18             | 90       | 360          | 37.0                     | 1487           | 35.8                     | 1324           | 112              | 103              |

#### Notes

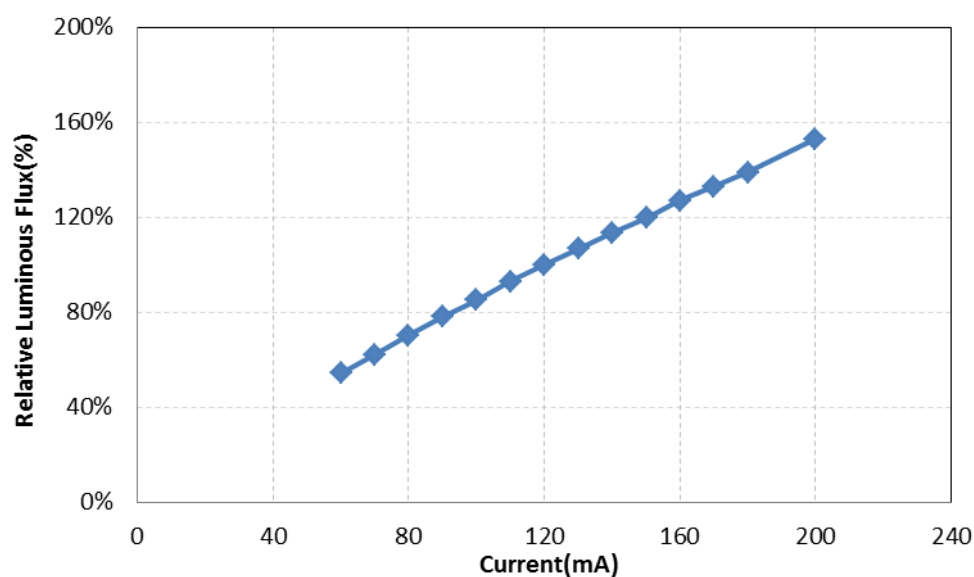
1. All of V<sub>F</sub> value are typical, the real bin range please refer page 16 "V<sub>F</sub> Binning Parameter".
2. All of flux value are typical, the real bin range please refer page 13 "Flux Binning Parameter".
3. Tolerance of flux is ±7%, tolerance of CCX/CCY is ±0.007, tolerance of CRI is ±2, and tolerance of V<sub>F</sub> is ±3%.
4. Typical viewing angle is 120deg.

## LIGHT LED M08 CoB Product Series

### 4.2 Forward Current vs. Lumen Voltage

#### ■ 06 Series Product

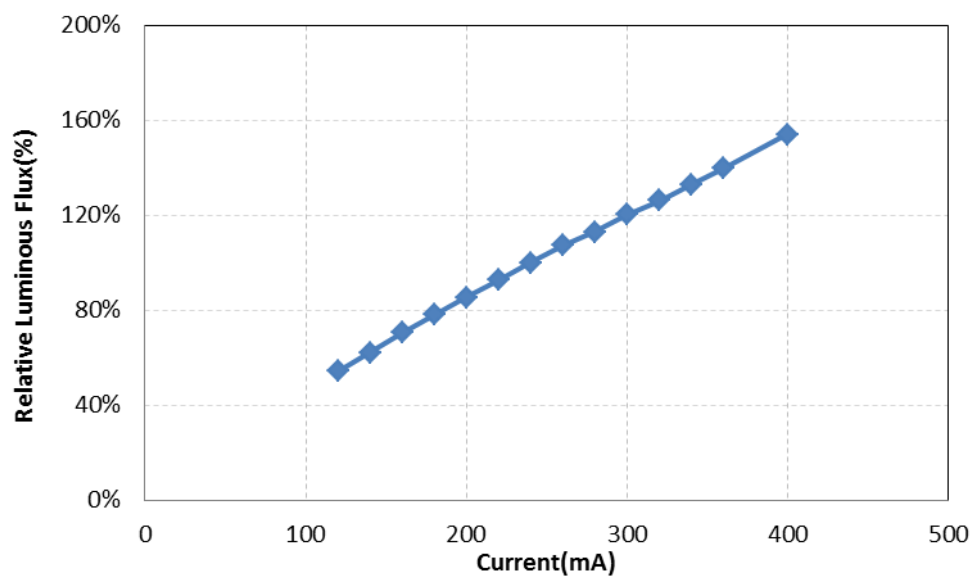
| Current | VF   | Lumen (lm) |       |       |        |
|---------|------|------------|-------|-------|--------|
|         |      | CRI 80     |       |       | CRI 90 |
| (mA)    | (V)  | 2700K      | 3000K | 4000K | 3000K  |
| 60      | 34.5 | 323        | 337   | 357   | 280    |
| 70      | 34.9 | 371        | 387   | 410   | 321    |
| 80      | 35.3 | 419        | 436   | 462   | 362    |
| 90      | 35.7 | 466        | 485   | 514   | 403    |
| 100     | 36.1 | 507        | 529   | 560   | 439    |
| 110     | 36.6 | 554        | 577   | 611   | 479    |
| 120     | 37.0 | 596        | 621   | 658   | 515    |
| 130     | 37.4 | 636        | 663   | 702   | 550    |
| 140     | 37.8 | 677        | 705   | 747   | 585    |
| 150     | 38.2 | 714        | 744   | 788   | 617    |
| 160     | 38.7 | 757        | 788   | 836   | 654    |
| 170     | 39.1 | 793        | 826   | 875   | 686    |
| 180     | 39.5 | 829        | 863   | 915   | 716    |
| 200     | 40.3 | 912        | 950   | 1007  | 789    |



## LIGHT LED M08 CoB Product Series

### ■ 10 Series Product

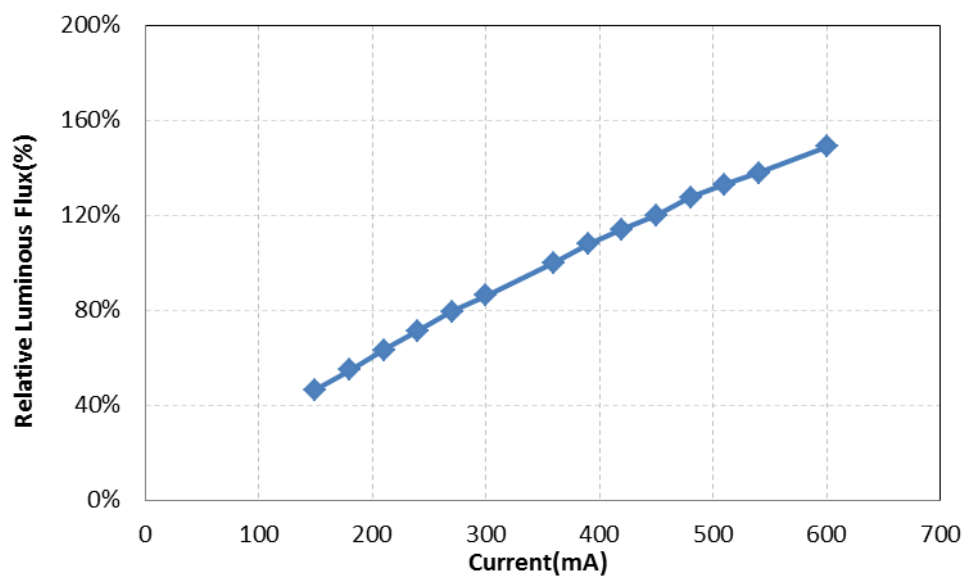
| Current | VF   | Lumen (lm) |       |       |        |
|---------|------|------------|-------|-------|--------|
|         |      | CRI 80     |       |       | CRI 90 |
| (mA)    | (V)  | 2700K      | 3000K | 4000K | 3000K  |
| 120     | 34.5 | 608        | 634   | 672   | 526    |
| 140     | 34.9 | 698        | 727   | 771   | 603    |
| 160     | 35.3 | 790        | 822   | 872   | 683    |
| 180     | 35.7 | 877        | 913   | 968   | 758    |
| 200     | 36.1 | 956        | 996   | 1056  | 827    |
| 220     | 36.6 | 1040       | 1084  | 1149  | 900    |
| 240     | 37.0 | 1121       | 1168  | 1238  | 969    |
| 260     | 37.4 | 1204       | 1254  | 1330  | 1041   |
| 280     | 37.8 | 1266       | 1318  | 1397  | 1094   |
| 300     | 38.2 | 1347       | 1403  | 1487  | 1164   |
| 320     | 38.7 | 1415       | 1474  | 1562  | 1223   |
| 340     | 39.1 | 1490       | 1552  | 1645  | 1288   |
| 360     | 39.5 | 1567       | 1633  | 1731  | 1355   |
| 400     | 40.3 | 1727       | 1799  | 1907  | 1493   |



## LIGHT LED M08 CoB Product Series

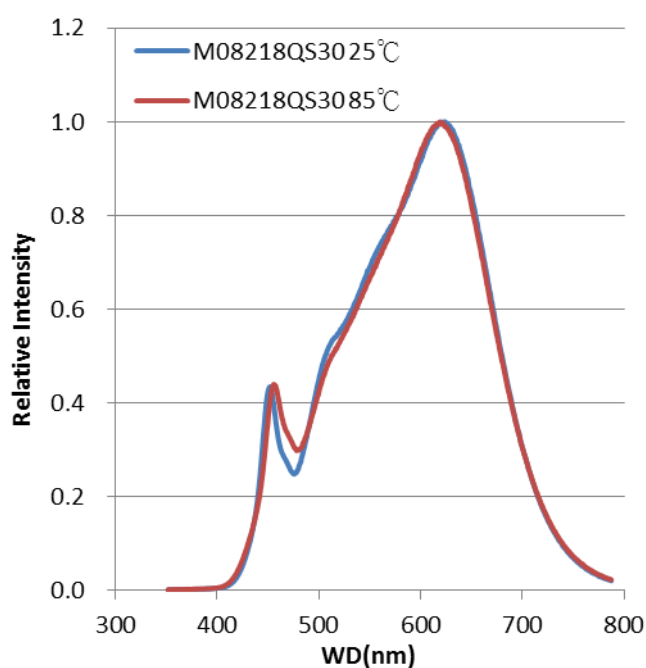
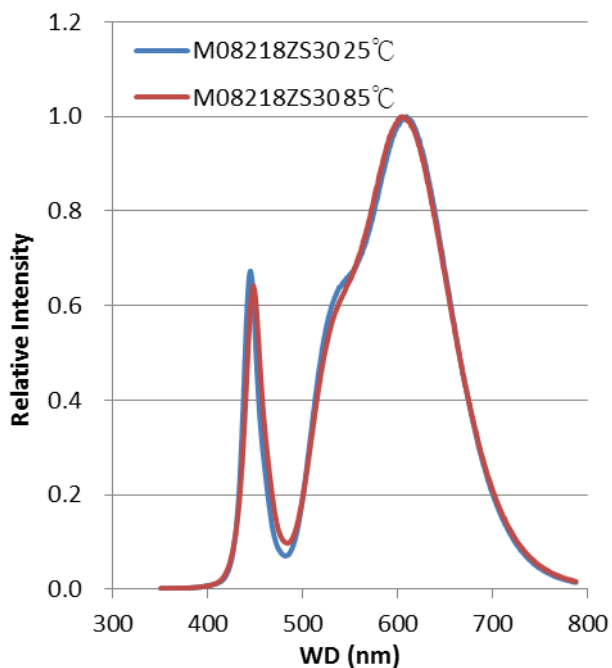
### ■ 18 Series Product

| Current | VF   | Lumen (lm) |       |       |        |
|---------|------|------------|-------|-------|--------|
|         |      | CRI 80     |       |       | CRI 90 |
| (mA)    | (V)  | 2700K      | 3000K | 4000K | 3000K  |
| 150     | 34.0 | 800        | 833   | 883   | 691    |
| 180     | 34.5 | 943        | 983   | 1042  | 816    |
| 210     | 34.9 | 1089       | 1134  | 1202  | 941    |
| 240     | 35.3 | 1229       | 1280  | 1357  | 1062   |
| 270     | 35.7 | 1366       | 1423  | 1508  | 1181   |
| 300     | 36.1 | 1482       | 1544  | 1637  | 1282   |
| 360     | 37.0 | 1720       | 1792  | 1900  | 1487   |
| 390     | 37.4 | 1853       | 1931  | 2046  | 1602   |
| 420     | 37.8 | 1961       | 2043  | 2166  | 1696   |
| 450     | 38.2 | 2065       | 2151  | 2280  | 1785   |
| 480     | 38.7 | 2193       | 2284  | 2421  | 1896   |
| 510     | 39.1 | 2288       | 2383  | 2526  | 1978   |
| 540     | 39.5 | 2373       | 2472  | 2620  | 2051   |
| 600     | 40.3 | 2563       | 2670  | 2830  | 2216   |

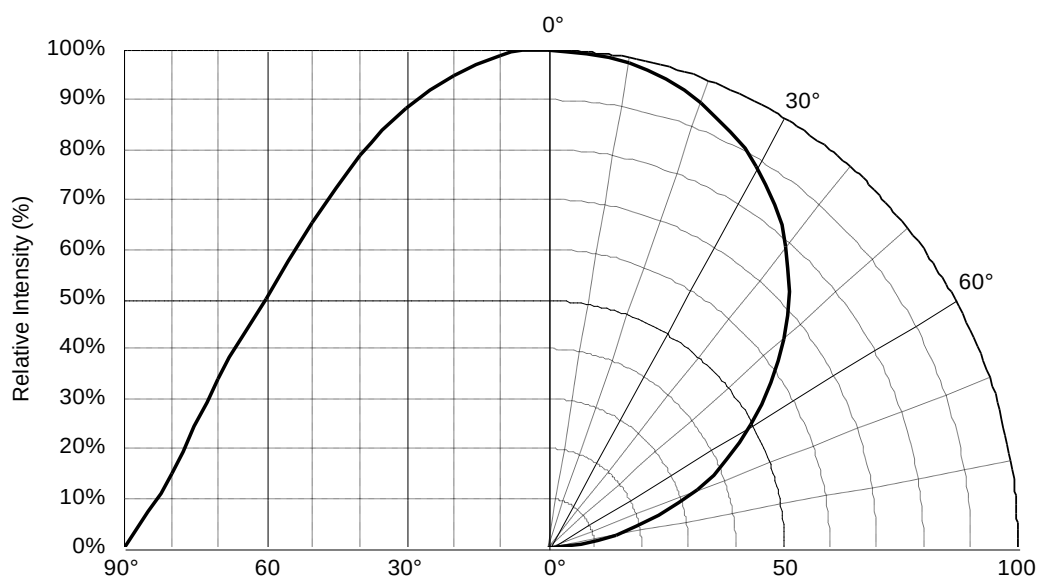


## LIGHT LED M08 CoB Product Series

### 4.3 Relative Spectral Power Distribution at Typical Current

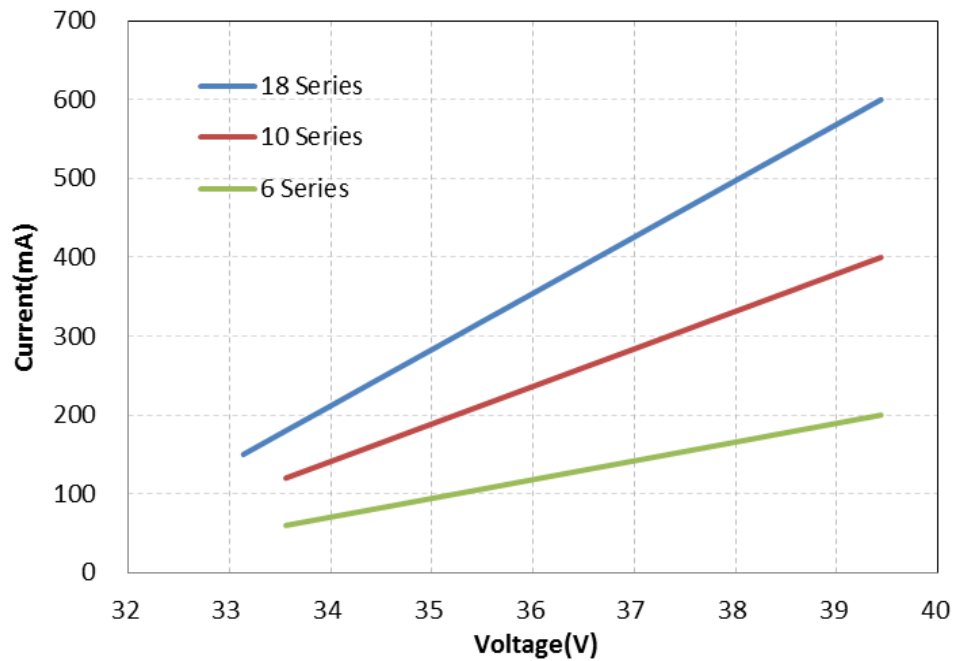


### 4.4 Radiation Characteristics

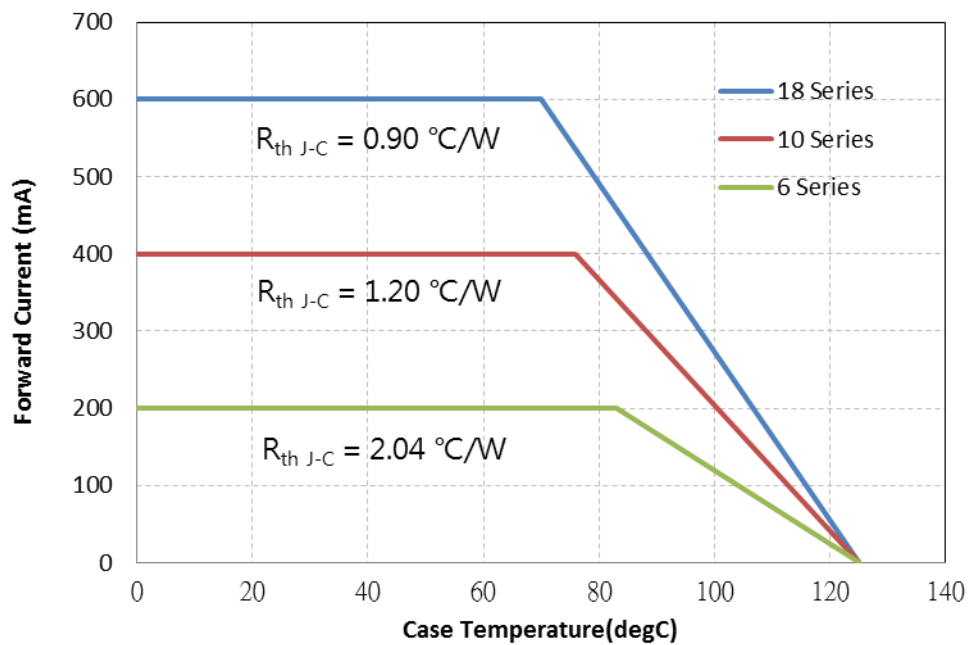


# LIGHT LED M08 CoB Product Series

## 4.5 Forward Current vs. Forward Voltage

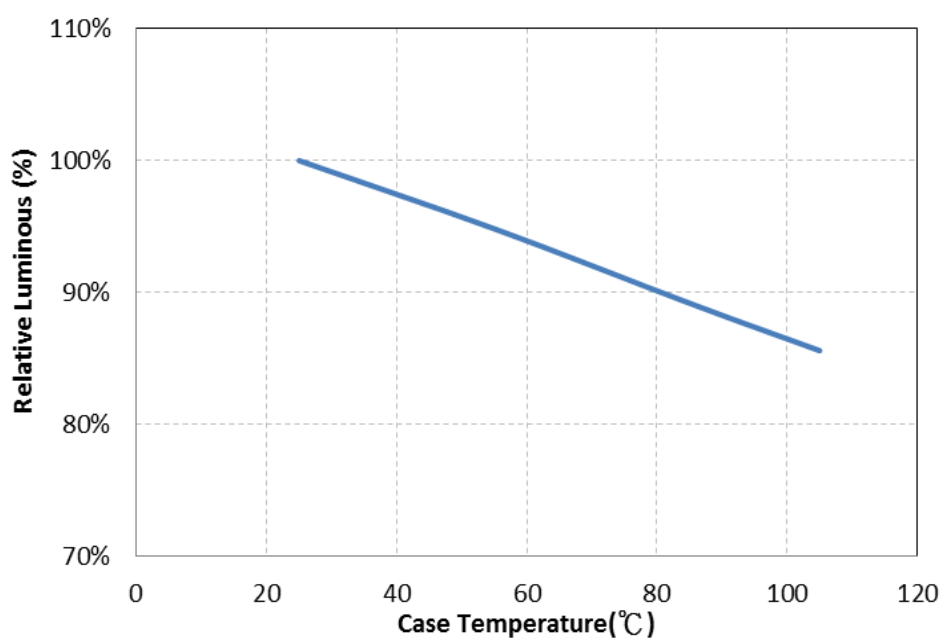


## 4.6 Forward Current Degrading Curve

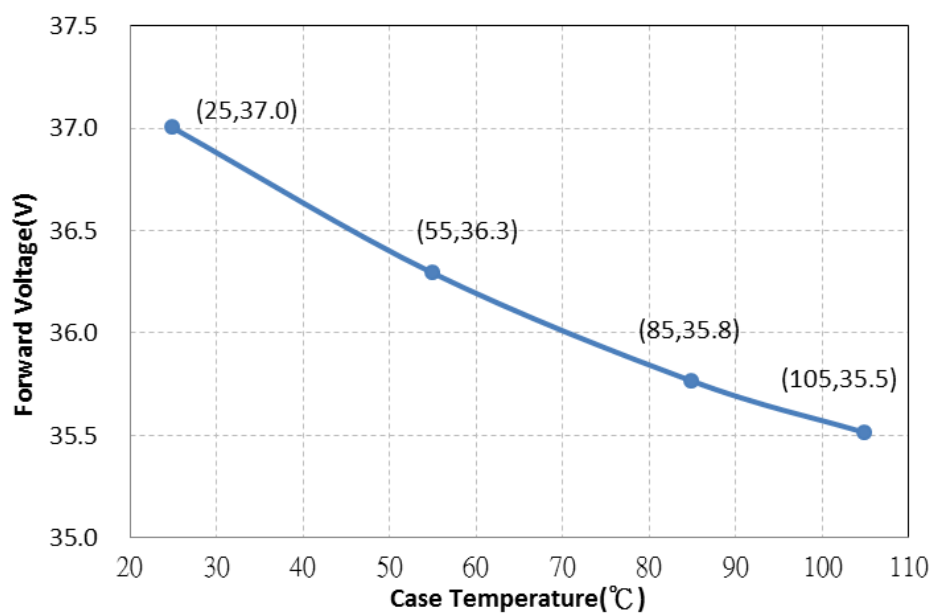


## LIGHT LED M08 CoB Product Series

### 4.7 Relative Intensity vs. Case Temperature



### 4.8 Forward Voltage vs. Case Temperature



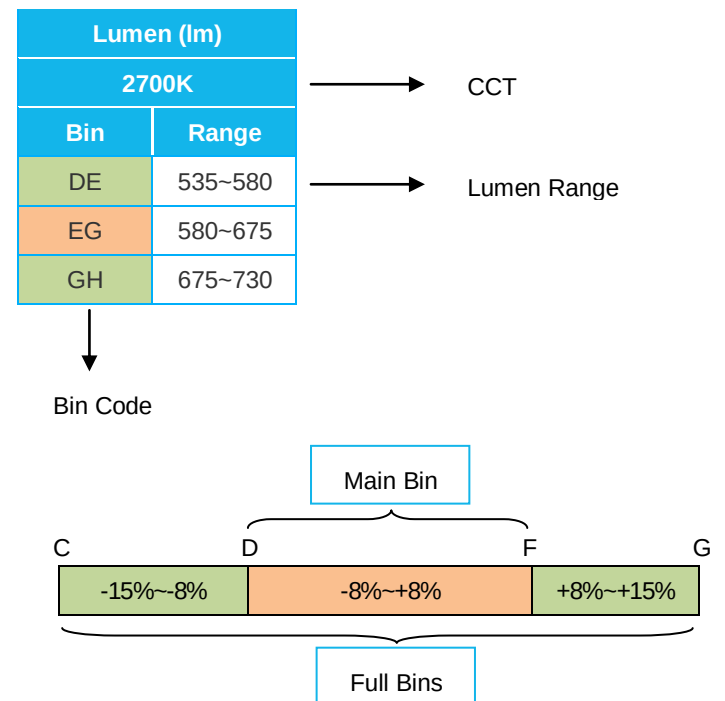
## LIGHT LED M08 CoB Product Series

### 5. CoB Binning Definition

#### ■ Flux Binning Parameter (25degC)

| Lumen <b>CODE</b> List of M08 Series Product |      |      |       |
|----------------------------------------------|------|------|-------|
| Parameter                                    | Code | Unit | Lumen |
| Luminous<br>Flux                             | C    | lm   | 495   |
|                                              | D    |      | 535   |
|                                              | E    |      | 580   |
|                                              | F    |      | 625   |
|                                              | G    |      | 675   |
|                                              | H    |      | 730   |
|                                              | I    |      | 790   |
|                                              | J    |      | 850   |
|                                              | K    |      | 920   |
|                                              | L    |      | 990   |
|                                              | M    |      | 1070  |
|                                              | N    |      | 1155  |
|                                              | O    |      | 1245  |
|                                              | P    |      | 1345  |
|                                              | Q    |      | 1455  |
|                                              | R    |      | 1570  |
|                                              | S    |      | 1695  |
|                                              | T    |      | 1830  |
|                                              | U    |      | 1975  |
|                                              | V    |      | 2130  |

#### ■ Example of M08 Series Product Bin (2700K 06 series)



## LIGHT LED M08 CoB Product Series

### ■ 06 Series Lumen Bin

| Lumen (lm) |         |       |         |       |         |        |         |
|------------|---------|-------|---------|-------|---------|--------|---------|
| CRI 80     |         |       |         |       |         | CRI 90 |         |
| 2700K      |         | 3000K |         | 4000K |         | 3000K  |         |
| Bin        | Range   | Bin   | Range   | Bin   | Range   | Bin    | Range   |
| DE         | 535~580 | DE    | 535~580 | EF    | 580~625 | BC     | 460~495 |
| EG         | 580~675 | EG    | 580~675 | FH    | 625~730 | CE     | 495~580 |
| GH         | 675~730 | GH    | 675~730 | HI    | 730~790 | EF     | 580~625 |

### ■ 10 Series Lumen Bin

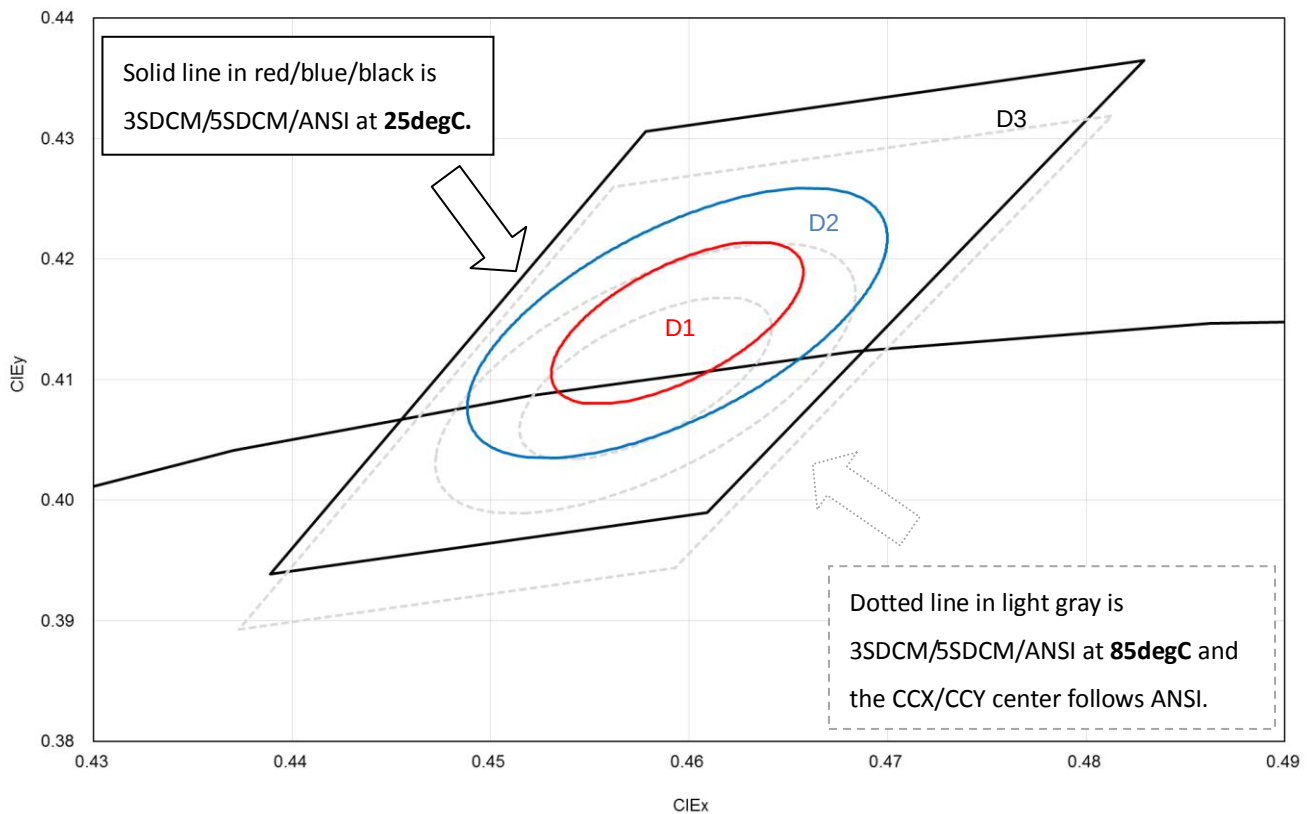
| Lumen (lm) |           |       |           |       |           |        |           |
|------------|-----------|-------|-----------|-------|-----------|--------|-----------|
| CRI 80     |           |       |           |       |           | CRI 90 |           |
| 2700K      |           | 3000K |           | 4000K |           | 3000K  |           |
| Bin        | Range     | Bin   | Range     | Bin   | Range     | Bin    | Range     |
| LM         | 990~1070  | LM    | 990~1070  | MN    | 1070~1155 | JK     | 850~920   |
| MO         | 1070~1245 | MO    | 1070~1245 | NP    | 1155~1345 | KM     | 920~1070  |
| OP         | 1245~1345 | OP    | 1245~1345 | PQ    | 1345~1455 | MN     | 1070~1155 |

### ■ 18 Series Lumen Bin

| Lumen (lm) |           |       |           |       |           |        |           |
|------------|-----------|-------|-----------|-------|-----------|--------|-----------|
| CRI 80     |           |       |           |       |           | CRI 90 |           |
| 2700K      |           | 3000K |           | 4000K |           | 3000K  |           |
| Bin        | Range     | Bin   | Range     | Bin   | Range     | Bin    | Range     |
| QR         | 1455~1570 | RS    | 1570~1695 | RS    | 1570~1695 | OP     | 1245~1345 |
| RT         | 1570~1830 | SU    | 1695~1975 | SU    | 1695~1975 | PR     | 1345~1570 |
| TU         | 1830~1975 | UV    | 1975~2130 | UV    | 1975~2130 | RS     | 1570~1695 |

## LIGHT LED M08 CoB Product Series

### ■ Example of LiteOn CoB MacAdam Ellipse Color Definition (EX: 2700K)



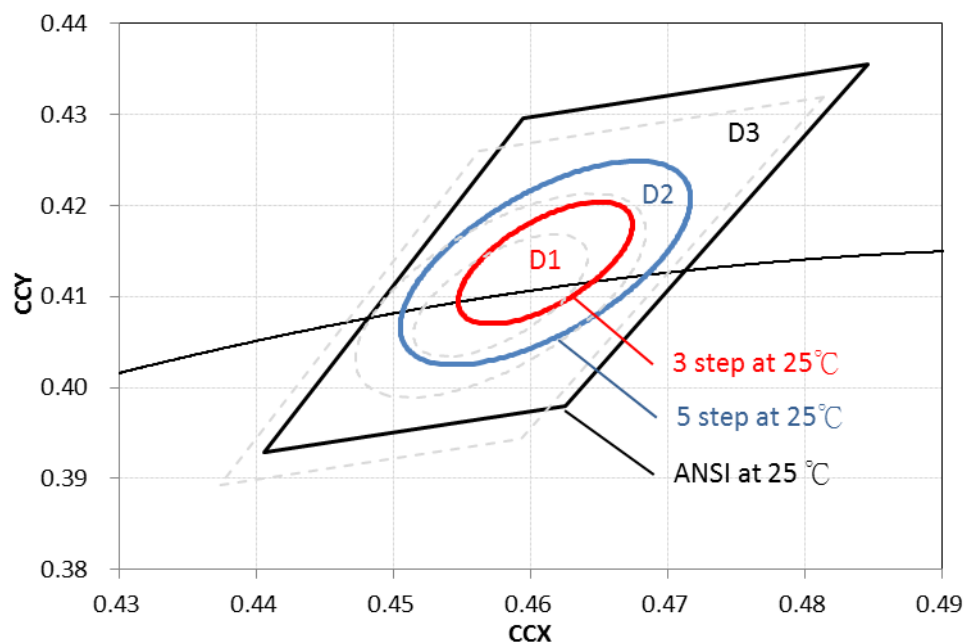
| CIE Center Point |                       |        |               |        |                 |         |
|------------------|-----------------------|--------|---------------|--------|-----------------|---------|
| CCT              | 25degC (LiteOn Spec.) |        | 85degC (ANSI) |        | Hot/Cold Factor |         |
|                  | CCX                   | CCY    | CCX           | CCY    | CCX             | CCY     |
| 2700             | 0.4611                | 0.4137 | 0.4578        | 0.4101 | -0.0033         | -0.0036 |
| 3000             | 0.4381                | 0.4077 | 0.4338        | 0.4030 | -0.0043         | -0.0047 |
| 4000             | 0.3869                | 0.3860 | 0.3818        | 0.3797 | -0.0051         | -0.0063 |

### Notes

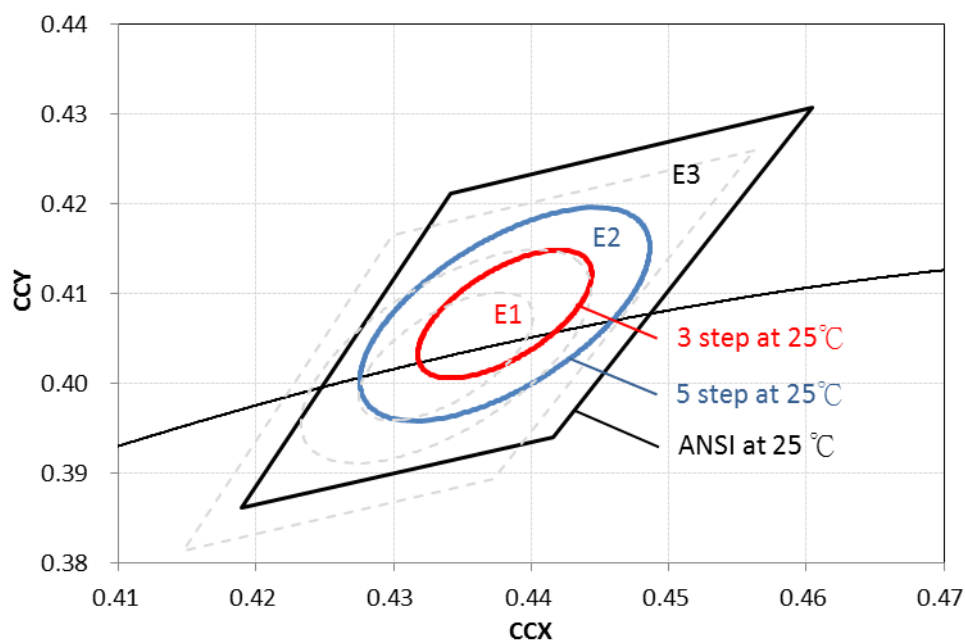
1. LiteOn tester and shipping spec follow the color bin with 25degC CCX/CCY center.
2. The Hot/Cold factor means the CCX/CCY shift from 25degC to 85degC.
3. The Hot/Cold shift is measured by LiteOn CAS 140B instrument system.
4. The ellipse equation expression:  $SDCM = (g11 \cdot (x-x_0)^2 + 2 \cdot g12 \cdot (x-x_0) \cdot (y-y_0) + g22 \cdot (y-y_0)^2)^{0.5}$

# LIGHT LED M08 CoB Product Series

## ■ M08 2700K

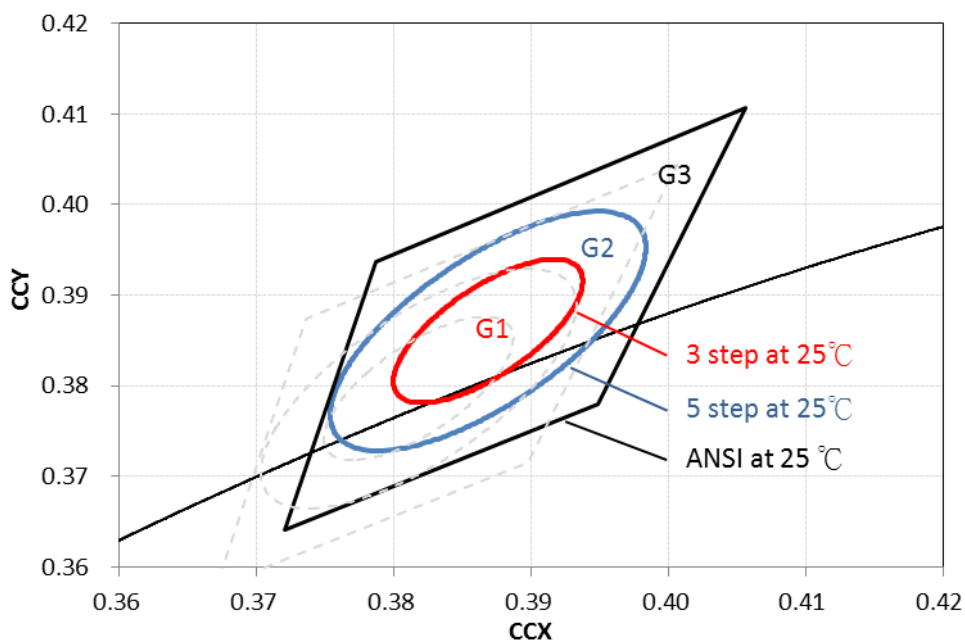


## ■ M08 3000K



## LIGHT LED M08 CoB Product Series

### ■ M08 4000K



### ■ Forward Voltage Binning Parameter (25degC)

| Parameter       | Bin | Symbol | Min | Max  | Unit | Condition              |
|-----------------|-----|--------|-----|------|------|------------------------|
| Forward Voltage | V1  | $V_F$  | 33  | 42.0 | V    | $I_F$ =Typical Current |

#### Note:

1. Full Rank on Label. ( Example: V1/EG/D1 )

| Forward Voltage Rank | Luminous Flux Rank | Color Rank |
|----------------------|--------------------|------------|
| V1                   | EG                 | D1         |

## LIGHT LED M08 CoB Product Series

### 6. Reliability Test Plan

| No | Test item                           | Condition                                                                                                                  | Duration                                  | Result |
|----|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|--------|
| 1  | High Temperature Operating Life     | Tc=85°C, IF=Typical Current                                                                                                | 1K hours                                  | Pass   |
| 2  | Wet High Temperature Operating Life | 60°C/90%RH, IF=Typical Current(DC)<br>30 min ON/OFF                                                                        | 1K hours                                  | Pass   |
| 3  | Thermal Shock                       | -40°C to 125°C, 15minutes dwell, <10 seconds transfer, measurement in every 250 cycle                                      | 500 cycles                                | Pass   |
| 4  | Fast Switch Cycling Test            | 40000cycles, 2 mins On/Off, Room temperature(25°C+/-5C), measurement in every 5000 cycle                                   | 40K cycles                                | Pass   |
| 5  | High Temperature Storage Life       | Ta=120°C                                                                                                                   | 1K hours                                  | Pass   |
| 6  | Low Temperature Storage Life        | Ta=-55°C                                                                                                                   | 1K hours                                  | Pass   |
| 7  | Mechanical Shock                    | 1500G, 0.5ms pulse, 5 shocks each 6 axis                                                                                   | 30 Times (5 shocks each 6 axis)           | Pass   |
| 8  | Variable Vibration Frequency        | 10-2000-10 Hz, log or linear sweep rate, 20G for approximately minute 1.5mm, each applied three times per axis over 6 hrs. | 18 hrs (three times per axis over 6 hrs.) | Pass   |

Criteria for Judging the Damage

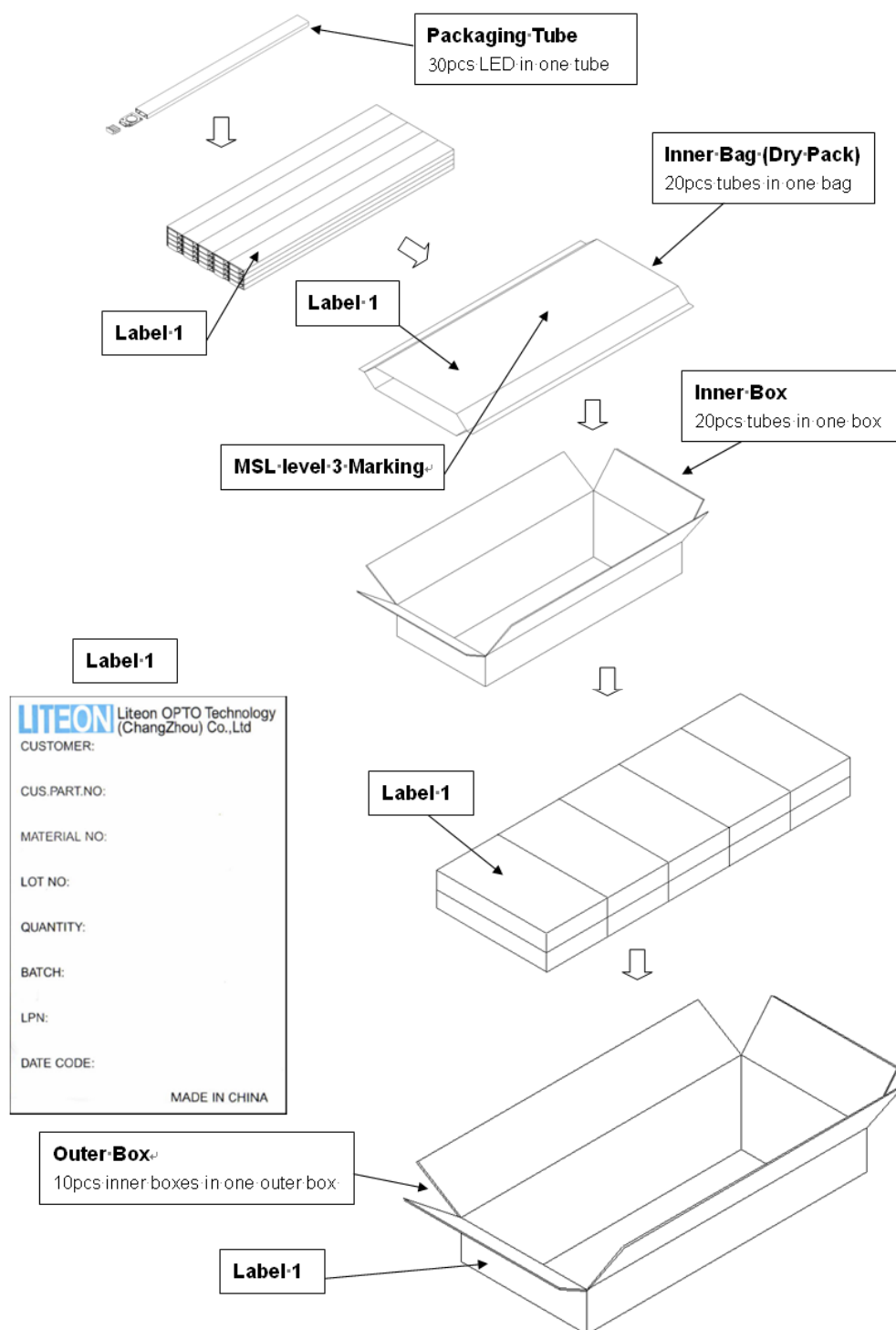
| Item            | Symbol | Test Condition     | Criteria for Judgment |              |
|-----------------|--------|--------------------|-----------------------|--------------|
|                 |        |                    | Min.                  | Max.         |
| Forward Voltage | Vf     | IF=Typical Current |                       | U.S.L. x 1.1 |
| Luminous Flux   | Lm     | IF=Typical Current | L.S.L. x 0.7          |              |
| CCX&CCY         | X,Y    | IF=Typical Current |                       | Shift<0.02   |

Notes:

1. Operating life test are mounted on thermal heat sink
2. Storage item are only component, not put on heat sink.

## LIGHT LED M08 CoB Product Series

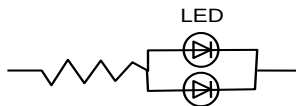
### 7. Packing Specifications



## LIGHT LED M08 CoB Product Series

### 8. Cautions

**8.1** 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 below.



(A) Recommended circuit.

(B) The brightness of each LED might appear different due to the differences in the I-V characteristics of those LEDs.

**8.2** Do not put any pressure on the light emitting surface either by finger or any hand tool and do not stack the COB products. Stress or pressure may cause damage to the wires of the LED array.

**8.3** This product is not designed for the use under any of the following conditions, please confirm the performance and reliability are well enough if you use it under any of the following conditions

- Do not use sulfur-containing materials in commercial products including the materials such as seals and adhesives that may contain sulfur.
- Do not put this product in a place with a lot of moisture (over 85% relative humidity), dew condensation, briny air, and corrosive gas (Cl, H<sub>2</sub>S, NH<sub>3</sub>, SO<sub>2</sub>, NOX, etc.), exposure to a corrosive environment may affect silver plating.

### ESD (Electrostatic Discharge)

Static Electricity or power surge will damage the LED. Suggestions to prevent ESD damage:

- Use of 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 LED's plastic lens as a result of friction between LEDs during storage and handling.

ESD-damaged LEDs will exhibit abnormal characteristics such as high reverse leakage current, low forward voltage, or "no light up" at low currents.

To verify for ESD damage, check for "light up" and  $V_F$  of the suspect LEDs at low currents.



**Стандарт  
Электрон  
Связь**

Мы молодая и активно развивающаяся компания в области поставок электронных компонентов. Мы поставляем электронные компоненты отечественного и импортного производства напрямую от производителей и с крупнейших складов мира.

Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

Собственная эффективная логистика и склад в обеспечивает надежную поставку продукции в точно указанные сроки по всей России.

Мы осуществляем техническую поддержку нашим клиентам и предпродажную проверку качества продукции. На все поставляемые продукты мы предоставляем гарантию .

Осуществляем поставки продукции под контролем ВП МО РФ на предприятия военно-промышленного комплекса России , а также работаем в рамках 275 ФЗ с открытием отдельных счетов в уполномоченном банке. Система менеджмента качества компании соответствует требованиям ГОСТ ISO 9001.

Минимальные сроки поставки, гибкие цены, неограниченный ассортимент и индивидуальный подход к клиентам являются основой для выстраивания долгосрочного и эффективного сотрудничества с предприятиями радиоэлектронной промышленности, предприятиями ВПК и научно-исследовательскими институтами России.

С нами вы становитесь еще успешнее!

**Наши контакты:**

**Телефон:** +7 812 627 14 35

**Электронная почта:** [sales@st-electron.ru](mailto:sales@st-electron.ru)

**Адрес:** 198099, Санкт-Петербург,  
Промышленная ул, дом № 19, литера Н,  
помещение 100-Н Офис 331