




PRODUCT SPECIFICATION

Model No : CSHV-xL60xxG4-A0

| Descriptions: | |
|------------------|----------------------------|
| • LED Type | : High Power VEGA |
| • LED Package | : Lambertian |
| • Emitting Color | : Standard Colors |
| • Viewing Angle | : AllnGaP:120° /InGaN:140° |
| • Encapsulating | : Silicone LENS |



| CUSTOMER APPROVED SIGNATURES | APPROVED BY | CHECKED BY | PREPARED BY |
|------------------------------|---|--|---|
| |  |  |  |

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■ Features –

1. High Luminous Output
2. Silicone Encapsulation
3. RoHs Compliant
4. Compatible Lead-Free Reflow Solder
5. ESD>8KV(HBM)
6. Standard Collimator Compatible
7. Low thermal resistance (junction to Case) : 10 °C/W

■ Device Selection Guide –

| Part No. | Chip | | LED Lens |
|------------------|----------------|---------------|-------------------|
| | Material | Emitted Color | |
| CSHV-NL60PBG4-A0 | InGaN/Sapphire | Purple Blue | Water Transparent |
| CSHV-NL60SBG4-A0 | | Standard Blue | |
| CSHV-NL60TGG4-A0 | | True Green | |
| CSHV-UL60HRG4-A0 | AlInGaP/Si | Red | |
| CSHV-UL60YLG4-A0 | | Yellow | |
| CSHV-UL60DRG4-A0 | | Deep Red | |

■ Absolute Maximum Rating –

InGaN:Blue;Green

(Ta=25°C)

| Parameter | Symbol | Rating | Unit |
|------------------------|-------------|------------|------|
| Power Dissipation | Pd | 2 | W |
| Forward Current (DC) | IF | 500 | mA |
| Peak Forward Current * | IFP | 700 | mA |
| Reverse Voltage | VR | 5 | V |
| Operating Temp. | Topr | -40 ~ +85 | °C |
| Storage Temp. | Tstg | -40 ~ +100 | °C |

* Pulse width ≤ 0.1 msec. duty $\leq 1/10$

AllnGaP:Red;Yellow;

(Ta=25°C)

| Parameter | Symbol | Rating | Unit |
|------------------------|-------------|------------|------|
| Power Dissipation | Pd | 1.4 | W |
| Forward Current (DC) | IF | 350 | mA |
| Peak Forward Current * | IFP | 500 | mA |
| Reverse Voltage | VR | 5 | V |
| Operating Temp. | Topr | -40 ~ +85 | °C |
| Storage Temp. | Tstg | -40 ~ +100 | °C |

 * Pulse width ≤ 0.1 msec. duty $\leq 1/10$
■ Electrical / Optical Characteristics –
InGaN:Blue;Green

(Ta=25°C)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Condition |
|-----------------|---------------|------|------|------|------|-----------------|
| Forward Voltage | VF | | 3.4 | 4 | V | IF=350mA |
| Viewing Angle | 2θ 1/2 | | 140 | | deg | |
| Reverse Current | IR | | | 50 | μA | VR=5V |

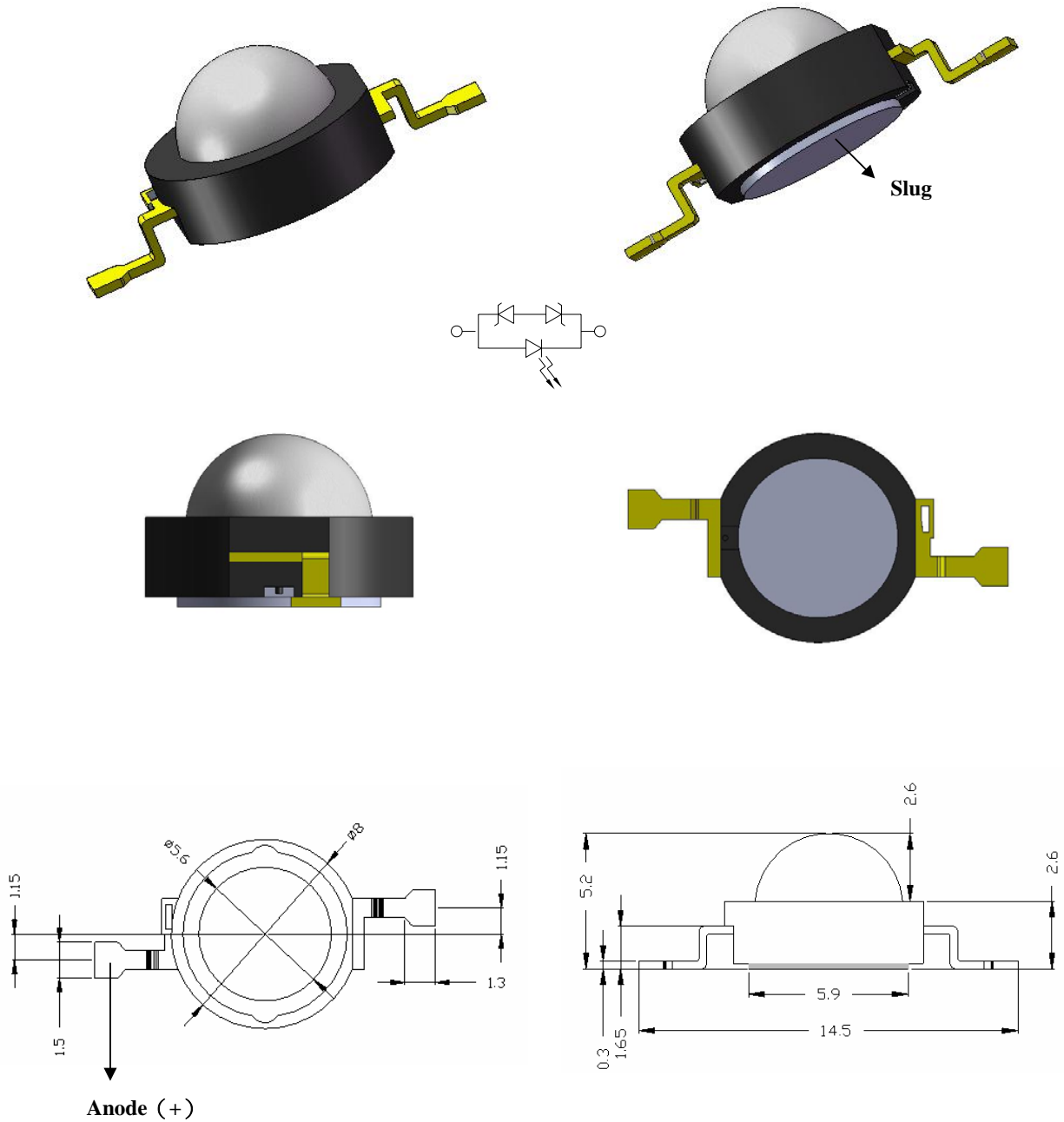
AllnGaP:Red;Yellow

(Ta=25°C)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Condition |
|-----------------|---------------|------|------|------|------|-----------------|
| Forward Voltage | VF | | 2.4 | 3 | V | IF=350mA |
| Viewing Angle | 2θ 1/2 | | 120 | | deg | |
| Reverse Current | IR | | | 50 | μA | VR=5V |

| | |
|-----------|-------------|
| Spec. No. | PS-0905-007 |
| Rev. | A |

■ Package Outline Dimensions –



Notes: Tolerance of measurement of Dimension: $\pm 0.25\text{mm}$



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|------------------|-------------|
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■ **Dominant Wavelength Rank Limits (IF = 350mA)**

| Dominant Wavelength Part No. | 445-450 | 450-455 | 455-460 | 460-465 | 465-470 | 470-475 |
|---------------------------------|---------|---------|---------|---------|---------|---------|
| CSHV-NL60PBG4-A0 | B2 | B3 | | | | |
| CSHV-NL60SBG4-A0 | | | | B5 | B6 | B7 |

| Dominant Wavelength Part No. | 515-520 | 520-525 | 525-530 | 530-535 |
|---------------------------------|---------|---------|---------|---------|
| CSHV-NL60TGG4-A0 | TG1 | TG2 | TG3 | TG4 |

| Dominant Wavelength Part No. | 620-625 | 625-630 | 630-635 | |
|---------------------------------|---------|---------|---------|--|
| CSHV-UL60HRG4-A0 | R1 | R2 | R3 | |

| Dominant Wavelength Part No. | 584.5-587.0 | 587.0-589.5 | 589.5-592.0 | 592.0-594.5 | 594.5-597 |
|---------------------------------|-------------|-------------|-------------|-------------|-----------|
| CSHV-UL60YLG4-A0 | Y1 | Y2 | Y3 | Y4 | Y5 |

■ **Peak Wavelength Rank Limits (IF = 350mA)**

| Peak Wavelength Part No. | 650-660 | 660-670 | | |
|-----------------------------|---------|---------|--|--|
| CSHV-UL60DRG4-A0 | DR1 | DR2 | | |



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| Rev. | A |

■ **Luminous Flux Rank Limits (IF = 350mA)**

unit : lm

| Luminous Flux Part No. | 7-9 | 9-12 | 12-16 | 16-21 |
|---|-----|------|-------|-------|
| CSHV-NL60PBG4-A0 | B | C | D | |
| CSHV-NL60SBG4-A0 | | C | D | E |

| Luminous Flux Part No. | 45-58 | 58-70 | 70-80 | 80-90 |
|---|-------|-------|-------|-------|
| CSHV-NL60TGG4-A0 | J | K | L | M |

| Luminous Flux Part No. | 35-45 | 45-58 | 58-70 | |
|---|-------|-------|-------|--|
| CSHV-UL60HRG4-A0 | H | J | K | |
| CSHV-UL60YLG4-A0 | H | J | K | |

| Luminous Flux Part No. | 12-16 | 16-21 | 21-27 | |
|---|-------|-------|-------|--|
| CSHV-UL60DRG4-A0 | D | E | F | |

Notes :

1. Tolerance of measurement of luminous Flux : $\pm 10\%$
2. Tolerance of measurement of Color Coordinates : ± 0.01
3. All data are measured by CSC's test equipment.
4. Please confirm with CSC sales , if your request different from standard specification.

■ **Typical Electrical / Optical Characteristics Curves –**
 (Ta = 25°C Unless Otherwise Noted)

Figure 1. Relative Luminous FLux vs. Forward Current

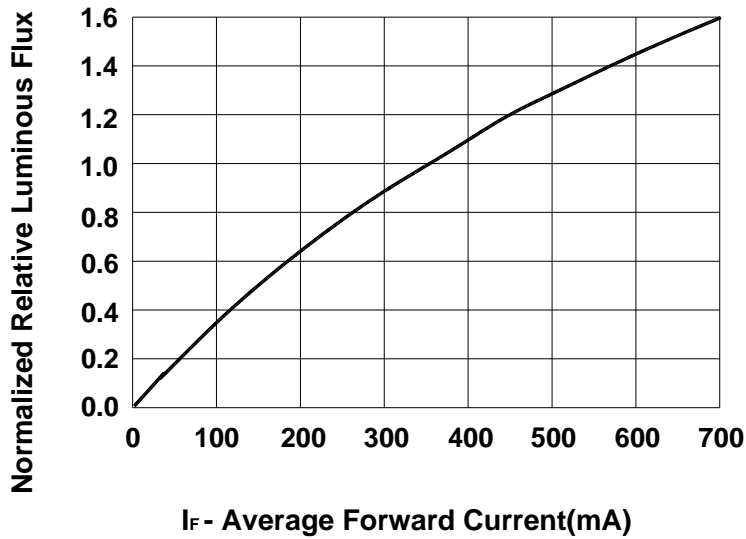


Figure 2. Forward Current vs. Forward Voltage

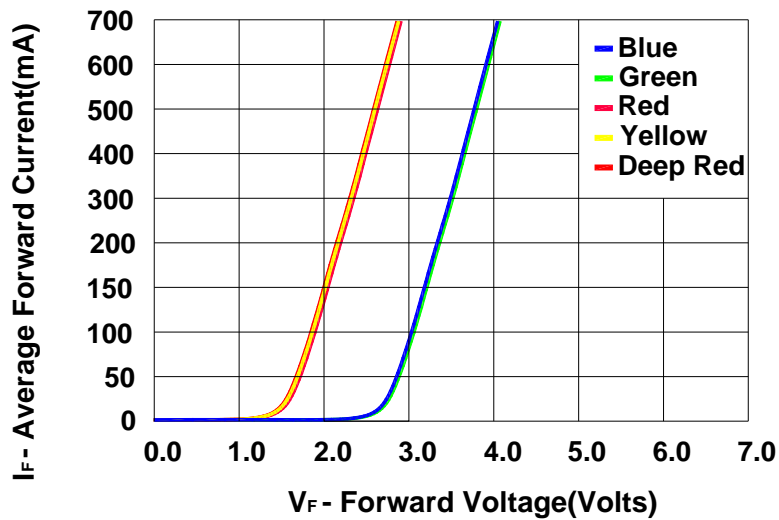


Figure 3. Maximum Forward Current vs. Ambient Temperature.
Derating based on $T_{JMAX}=120^{\circ}C$

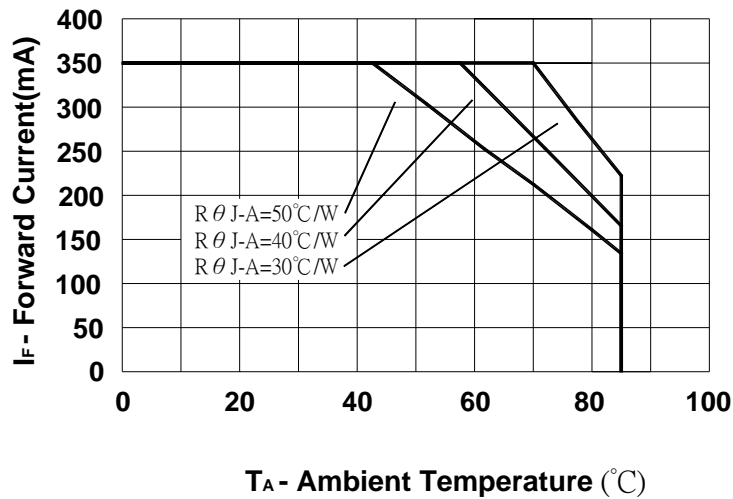


Figure 4. Relative Light Output vs. Junction Temperature

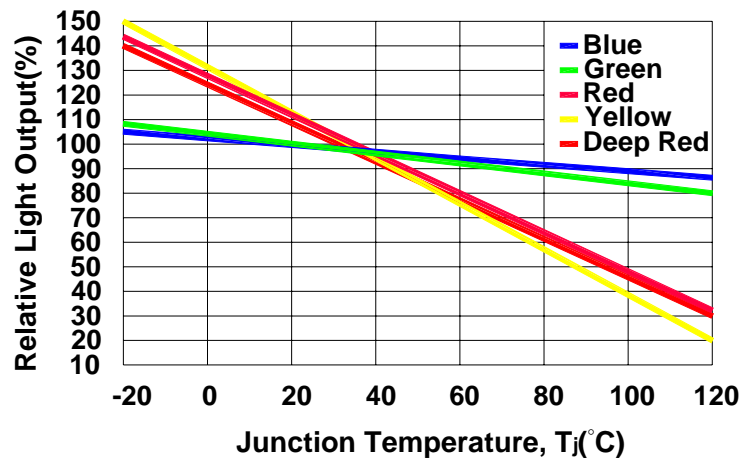


Figure 5. Relative Spectral Power Distribution vs. Wavelength

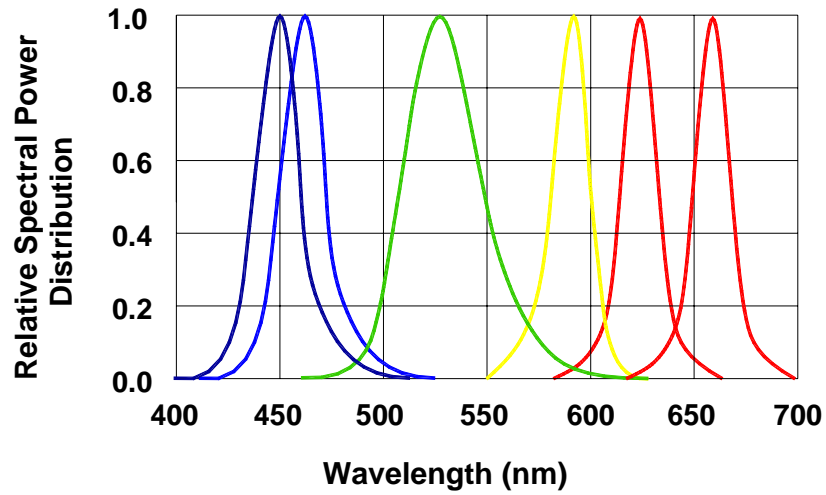
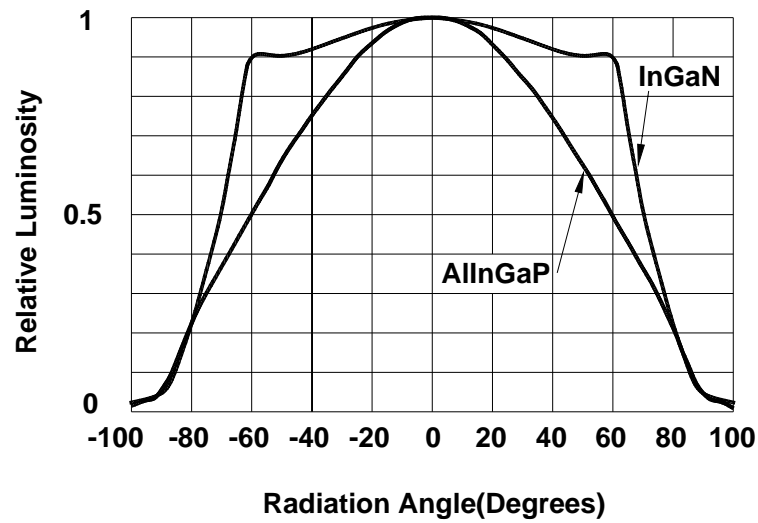
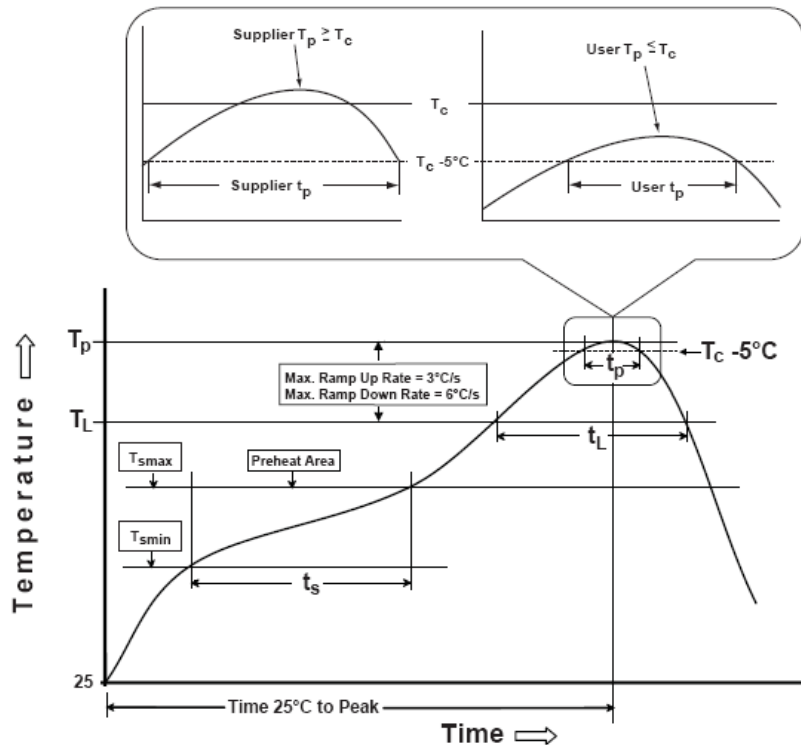


Figure 6. Relative Luminosity vs. Radiation Angle



■ Reflow Soldering Characteristics –



| Profile Feature | Sn-Pb Eutectic Assembly | Pb-Free Assembly |
|---|---|---|
| Preheat & Soak | | |
| Temperature Min (T_{smin}) | 100°C | 150°C |
| Temperature Max (T_{smax}) | 150°C | 200°C |
| Time (ts) from (T_{smin} to T_{smax}) | 60-120 seconds | 60-120 seconds |
| Ramp-up rate (T_L to T_p) | 3°C/second max. | 3°C/second max. |
| Liquidous temperature (T_L) | 183°C | 217°C |
| Time (t_L) maintained above T_L | 60-150 seconds | 60-150 seconds |
| Peak package body temperature (T_p) | For users T_p must not exceed the Classification temp in Table 4-1. For suppliers T_p must equal or exceed the Classification temp in Table 4-1. | For users T_p must not exceed the Classification temp in Table 4-2. For suppliers T_p must equal or exceed the Classification temp in Table 4-2. |
| Time (t_p)* within 5°C of the specified classification temperature (T_c), see Figure 5-1. | 20* seconds | 30* seconds |
| Ramp-down rate (T_p to T_L) | 6°C/second max. | 6°C/second max. |
| Time 25°C to peak temperature | 6 minutes max. | 8 minutes max. |
| *Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum | | |

■ Hand Soldering Characteristics –

| | |
|------------------------------|--------------|
| Soldering temperature | 260°C |
| Soldering time | 5 sec |

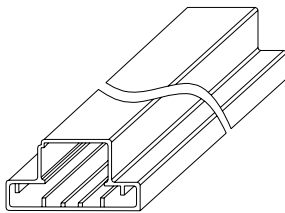
Notes : All temperatures refer to solder Pad


| | |
|------------------|-------------|
| Spec. No. | PS-0905-007 |
| Rev. | A |

■ **Package –**

1. Tube : 50pcs/tube

CSC P/N : CSC Production number
 Flux : Intensity grade
 Color : Color grade
 Q'ty : Quantity

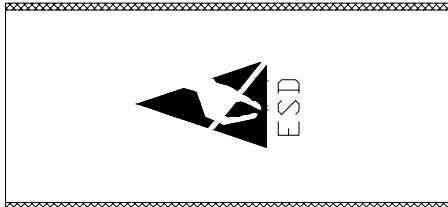



| |
|--|
| Part No : |
| Flux : Color: VF: Q'ty: pcs |
|  |

on tube

2. Anti-electrostatic bag : 10 tubes/bag

Product type : Vega Power
 CSC P/N : CSC Production number
 Flux : Intensity grade
 Color : Color grade
 Lot No : Lot Number
 Date code : Production time
 Q'ty : Quantity

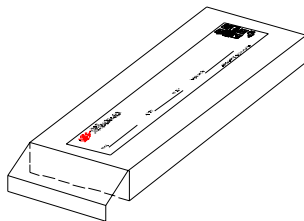




| | |
|--|-----------|
| Product Type : | Part No : |
| Flux : Color: VF: Q'ty: PCS | RoHS |
| Lot No : Date code : | QC : |
|  | |

on anti-electrostatic bag

3. Carton: 2 anti-electrostatic bags/carton

CSC P/N : CSC Production number
 Q'ty : Quantity
 Date code : Production time



| | | |
|--|---|-----------------|
|  CSC OPTOELECTRONICS A DIVISION OF CHINA SEMICONDUCTOR CORP |  | |
| | P / N _____ QTY _____ PCS _____ | Data code _____ |
| SIZE:49.5X9.5X4.5cm | | |

on carton

■ **Precautions for use –**

1 . Please use LEDES refer to JEDEC 2a(Industry Best Moisture Sensitivity Level) as below

| Floor life | | Standard | | Accelerated Environment | |
|------------|--------------|------------------------|------------|-------------------------|------------|
| time | conditions | time | conditions | time | conditions |
| 4 | ≤ 30°C/60%RH | (hours) | 30°C/60%RH | (hours) | 60°C/60%RH |
| weeks | | 696 ² +5/-0 | | 120+1/-0 | |

Notes : The standard soak time includes a default value of 24 hours for semiconductor exposure time between bake and bag and includes the maximum time allowed out of bag at the distributor's facility.

- 2 . Please confirm the moisture card in the anti-electrostatic bag after opening package.
If it shows 50%RH, LEDs should be performed baking treatment before used.
(bake condition: At 125°C +5/-0 for 24 hours)
- 3 . Any mechanical force or any excess vibration on LENS should be avoid during operating.
- 4 . LED should be stored below 60%RH after opening package.
- 5 . Please refer to Fig.3 of Page 8 to choose current drive to use. Ambient temperature will affect current.

Notes : The specifications are subject to change without notice. Please contact us for updated information.