

DATA SHEET

ES-E5050-506V-XX-XXX-XX

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ES-E5050-506V-XX-XXX-XX Datasheet

This is EMC package 5050 LED Light Source is a energy efficient device which can handle high thermal and high driving current. The small package outline and high intensity make it an ideal choice for outdoor lighting LED.

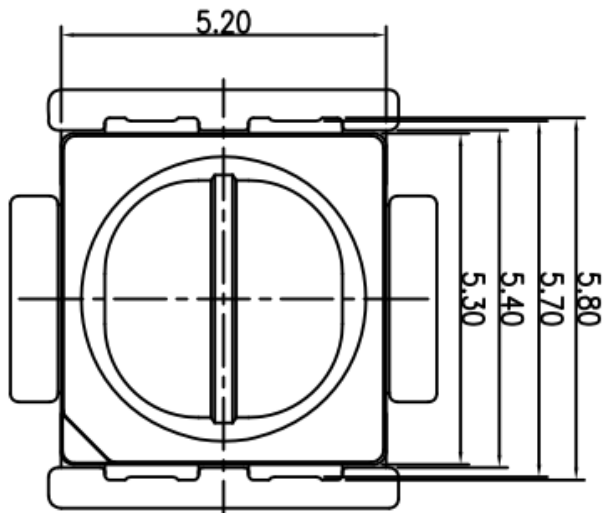
The White Power LED is available in the range of color temperature from 2700K to 6500K. This part has a foot print that is compatible to most of the same size LED in the market today.



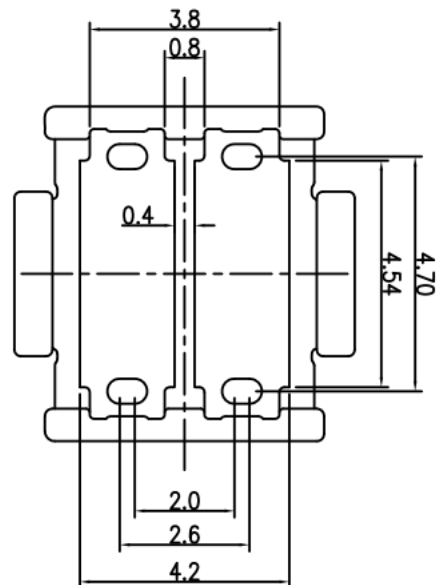
FEATURES

- Available in Cool White, Neutral White and Warm White color
- ANSI-compatible chromaticity bins
- High luminous Intensity and high efficiency
- Compatible with reflow soldering process
- Low thermal resistance
- Long operation life
- View Angle : 120°
- Silicone encapsulation
- Environmental friendly, RoHS Compliance

PACKAGE DIMENSIONS



Recommended Solder Pad Design



Notes :

All dimension units are millimeters.

All dimensional tolerances except for special markings $\pm 0.25\text{mm}$

All dimension tolerance is $\pm 0.15\text{mm}$ unless otherwise noted.

ABSOLUTE MAXIMUM RATINGS

| Item | Symbol | Absolute Maximum Rating | Unit |
|-----------------------|-----------|--|---------------------------------|
| Forward current | I_F | 750 | mA |
| Reverse Current | V_R | 10 | V |
| Power Dissipation | P_d | 5 | W |
| Operating Temperature | T_{opr} | -20°C to 80°C | °C |
| Storage Temperature | T_{stg} | -40°C to 85°C | °C |
| Soldering Temperature | T_{sld} | Reflow Soldering: 260°C Hand Soldering: 300°C | for 10 seconds for 3 seconds |

Note:

I_{FP} Conditions: Pulse Width ≤ 10 msec. and Duty $\leq 1/10$.

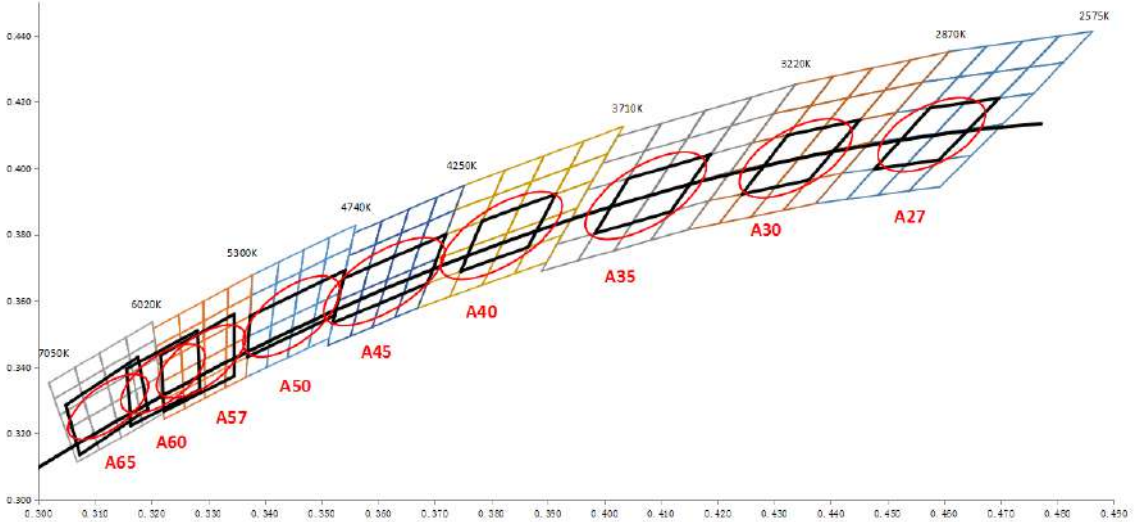
CHARACTERISTICS (T_j=25°C)

| Item | Symbol | Condition | Min | Typ | Max | Unit |
|-----------------------------------|--------------------|--------------|-----|-------|-----|------|
| Luminous Efficacy of Light Source | ϕ | $I_F=750$ mA | 130 | --- | 170 | lm/W |
| Reverse Current | I_r | $V_r=10$ V | -- | --- | 10 | uA |
| Viewing Angle | 2θ _{1/2} | $I_F=750$ mA | -- | 120 | --- | Deg |
| Junction Temperature | T_j | $I_F=750$ mA | -- | --- | 110 | °C |
| Thermal Resistance | R _{thj-s} | $I_F=750$ mA | -- | 5 | -- | °C/W |
| Antistatic Ability | ESD | | | 2000V | | |

Notes:

- Luminous flux is measured with an accuracy of $\pm 10\%$.
- Chromaticity coordinate bins are measured with an accuracy of ± 0.01 .
- CRI is measured with an accuracy of ± 2 .
- Some color and CRI bins may have limited availability, please contact us before ordering.
- All measurements were made under the standardized environment of Everstar

X/Y Rank



TYPICAL SPATIAL DISTRIBUTION

| Color | Forward Voltage | Current | CCT | Lumens | Rank | CCT Bin |
|---------------|-----------------|---------|-----------|------------|-------|---------|
| Cool White | 5.8-6.4 V | 750mA | 6500±250K | 600-650 lm | 80-85 | A65 |
| | | | | 650-700 lm | 70-75 | |
| Cool White | 5.8-6.4 V | 750mA | 6500±250K | 600-650 lm | 80-85 | A57 |
| | | | | 650-700 lm | 70-75 | |
| Cool White | 5.8-6.4 V | 750mA | 6500±250K | 600-650 lm | 80-85 | A50 |
| | | | | 650-700 lm | 70-75 | |
| Neutral White | 5.8-6.4 V | 750mA | 6500±250K | 600-650 lm | 80-85 | A40 |
| | | | | 650-700 lm | 70-75 | |
| Warm White | 5.8-6.4 V | 750mA | 6500±250K | 600-650 lm | 80-85 | A30 |
| | | | | 650-700 lm | 70-75 | |
| Warm White | 5.8-6.4 V | 750mA | 6500±250K | 600-650 lm | 80-85 | A27 |
| | | | | 650-700 lm | 70-75 | |

CHROMATICITY CHARACTERISTICS

| 27K(2700±125K) | | |
|----------------|--------|--------|
| A27 | | |
| Numbering | X | Y |
| Center point | 0.4615 | 0.416 |
| 1 | 0.4477 | 0.3998 |
| 2 | 0.4575 | 0.4182 |
| 3 | 0.4697 | 0.4211 |
| 4 | 0.4591 | 0.4025 |

| 30K(3000±150K) | | |
|----------------|--------|--------|
| A30 | | |
| Numbering | X | Y |
| Center point | 0.437 | 0.403 |
| 1 | 0.4243 | 0.3922 |
| 2 | 0.4324 | 0.4100 |
| 3 | 0.4451 | 0.4145 |
| 4 | 0.4361 | 0.3964 |

| 40K(4000±200K) | | |
|----------------|--------|--------|
| A40 | | |
| Numbering | X | Y |
| Center point | 0.4338 | 0.403 |
| 1 | 0.4562 | 0.426 |
| 2 | 0.4299 | 0.4165 |
| 3 | 0.4147 | 0.3814 |
| 4 | 0.4373 | 0.3893 |

| 50K(5000±250K) | | |
|----------------|--------|--------|
| A50 | | |
| Numbering | X | Y |
| Center point | 0.4338 | 0.403 |
| 1 | 0.4562 | 0.426 |
| 2 | 0.4299 | 0.4165 |
| 3 | 0.4147 | 0.3814 |
| 4 | 0.4373 | 0.3893 |

| 57K(5750±250K) | | |
|----------------|--------|--------|
| A65 | | |
| Numbering | X | Y |
| Center point | 0.3267 | 0.3405 |
| 1 | 0.3336 | 0.3586 |
| 2 | 0.3202 | 0.3452 |
| 3 | 0.3212 | 0.3233 |
| 4 | 0.3336 | 0.3349 |

| 65K(6500±250K) | | |
|----------------|--------|--------|
| A65 | | |
| Numbering | X | Y |
| Center point | 0.4338 | 0.403 |
| 1 | 0.4562 | 0.426 |
| 2 | 0.4299 | 0.4165 |
| 3 | 0.4147 | 0.3814 |
| 4 | 0.4373 | 0.3893 |

Typical Optical Characteristics Curves

Fig.1-Relative Luminous Intensity vs. Forward Current

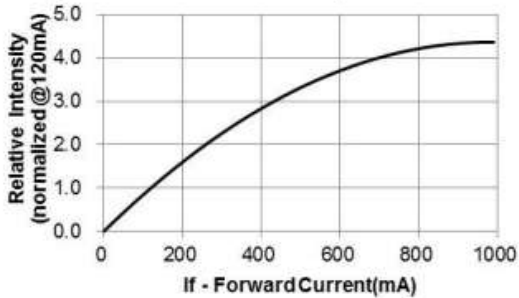


Fig.2-Forward Current vs. Forward Voltage

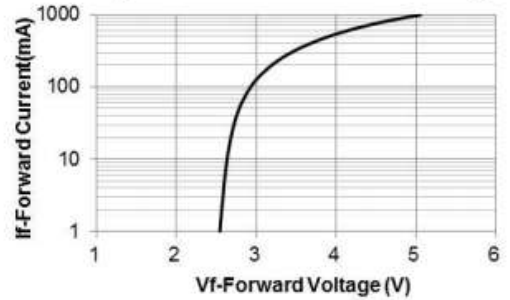


Fig.3-Relative Intensity (@120mA) vs. Ambient Temperature

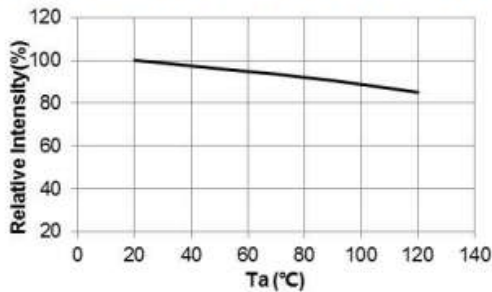


Fig.4-Forward Voltage (@120mA) vs. Ambient Temperature

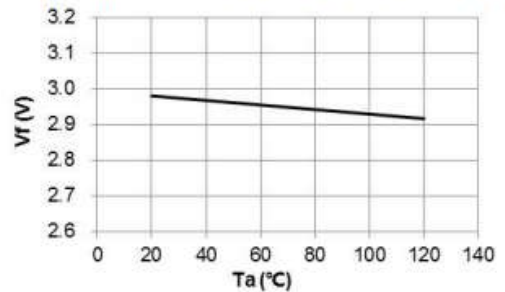


Fig.5-Dominant Wavelength (@120mA) vs. Ambient Temperature

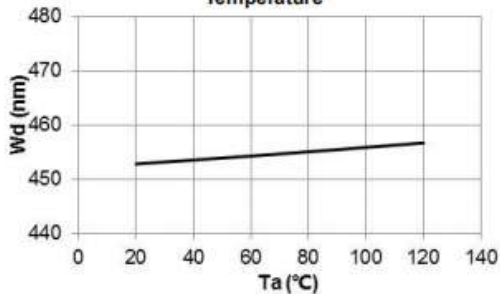
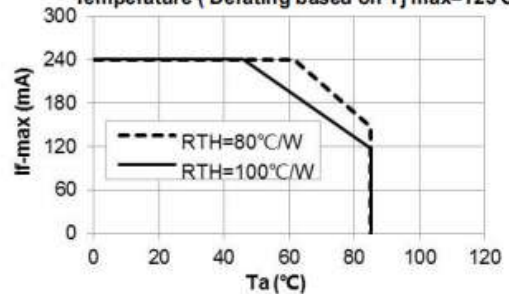
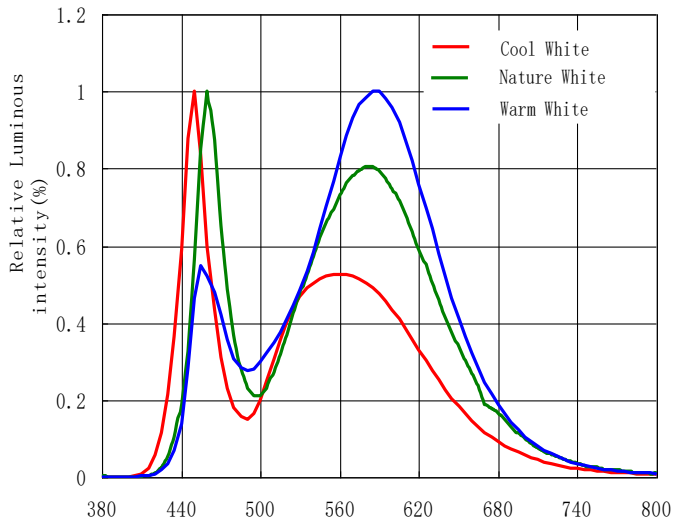


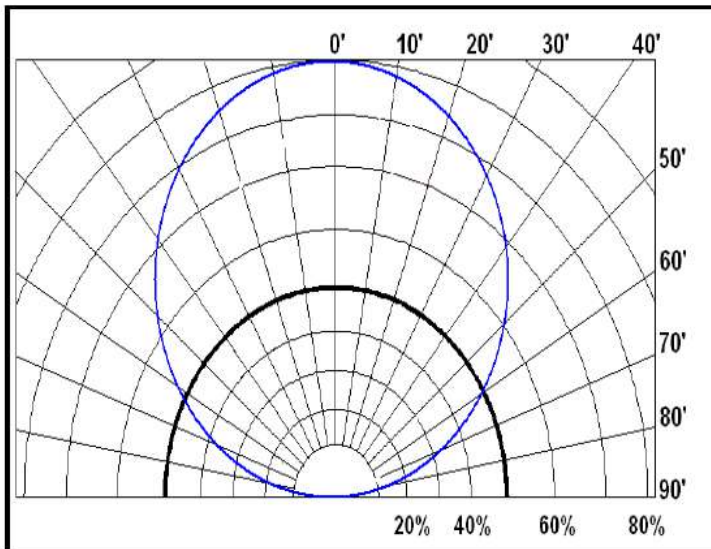
Fig.6-Maximum Driving Forward DC Current vs. Ambient Temperature (Derating based on Tj max=125°C)



Relative Spectral Distribution



Typical Spectral Distribution



Test items and results of reliability

| Test Item | Test Conditions | Duration /Cycle | Number of Damage | Reference |
|------------------------------|---|-----------------|------------------|---------------------------------|
| Temperature | -40°C 30min ↑↓ 25°C(2min) 100°C 30min | Cycle 100 times | 0/100 | JEITA ED-4701 300 303 |
| Thermal Shock | -40°C 30min ↑↓ 5 sec 110°C 30min | Cycle 100 times | 0/100 | JEITA ED-4701 200 303 |
| High Temperature Storage | Ta=100°C | 1000 hours | 0/100 | EIAJED-4701 200 201 |
| Humidity Heat Storage | Ta=85°C RH=85% | 1000 hours | 0/100 | EIAJED-4701 100 103 |
| Low Temperature Storage | Ta=40°C | 1000 hours | 0/100 | EIAJED-4701 200 202 |
| Life Test | Ta=25°C If=750mA | 1000 hours | 0/100 | Tested with Runlite standard |
| High Humidity Heat Life Test | 60°C RH=90% If=750mA | 1000 hours | 0/100 | Tested with Runlite standard |
| Low Temperature Life Test | Ta=-40°C If=750mA | 1000 hours | 0/100 | Tested with Runlite standard |

Criteria for Judging the Damage

| Test Item | Symbol | Condition | Criteria for Judgement | |
|--------------------|--------|-----------|------------------------|-----------|
| | | | MIN | MAX |
| Forward Voltage | VF | If=750mA | --- | USL*1x1.1 |
| Luminous Intensity | Iv | If=750mA | LSL*2x0.7 | --- |


Note : USL - Upper Standard Level ; LSL - Lower Specification Level

Packing Specification

Label

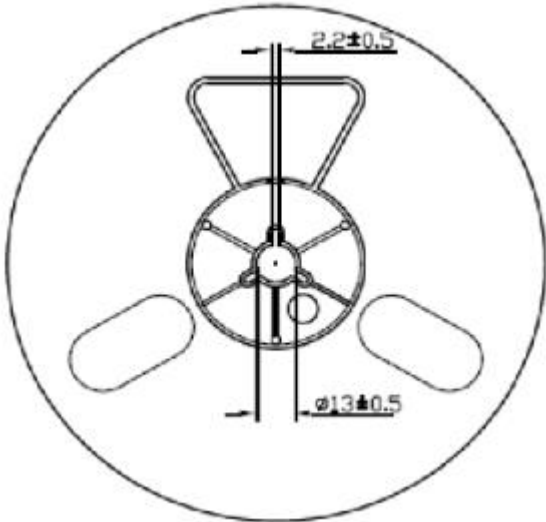
EVERSTAR

| | | | |
|----------|--|--------|------|
| NAME | | | RoHS |
| TYPE | | | |
| VF(V) | | IF(mA) | |
| Φ(lm) | | Ra | |
| CCT(k) | | BIN | |
| QTY(PCS) | | DATE | |

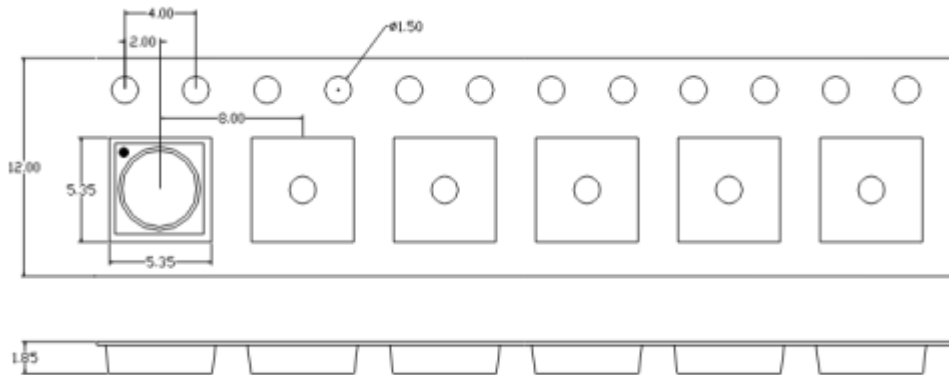


S A 2 0 1 8 1 1 0 0 0 8 3 8

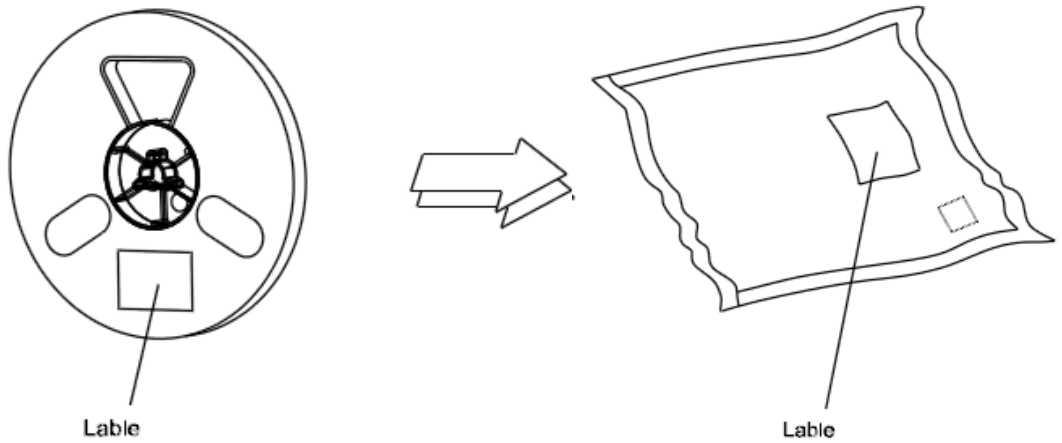
Reel Dimensions



Tape Specifications (Units : mm)

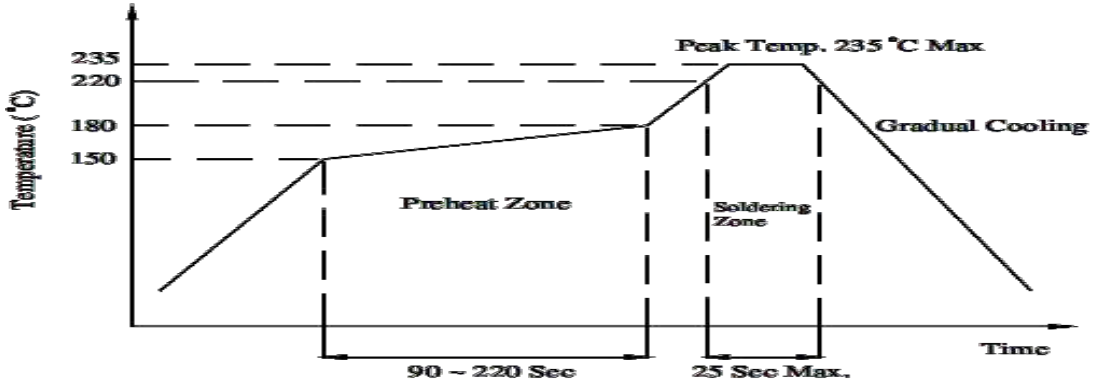


Tape Specifications (Units : mm)

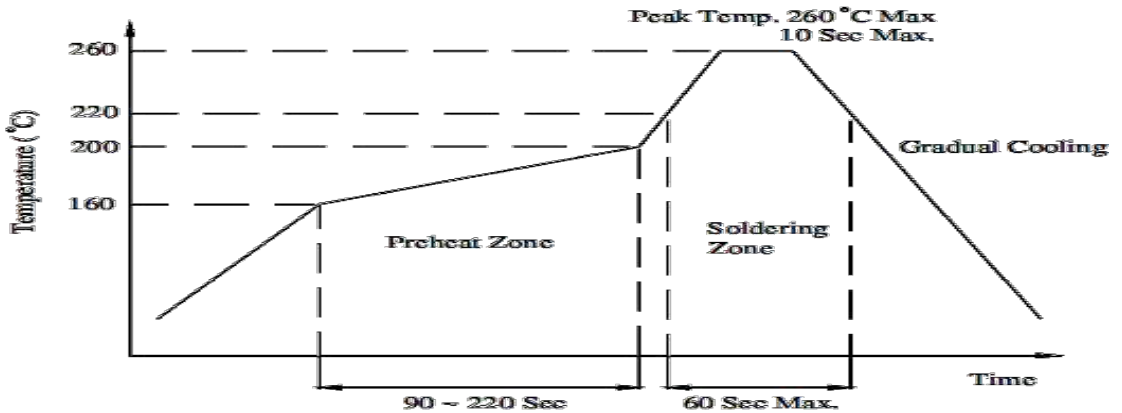


Note : The tolerances unless mentioned is ± 0.1 mm, Unit : mm

IR reflow soldering Profile



Lead Free Solder



Notes :

1. We recommend the reflow temperature $200^{\circ}\text{C}\pm 5^{\circ}\text{C}$. the maximum soldering temperature should be limited to 260°
2. Don't cause stress to the silicone resin while it is exposed to high temperature.
3. Number of reflow process shall be 1 time.

RELIABILITY TEST ITEMS

| Test Items | Test Duration | Number of Damaged |
|---|---------------|-------------------|
| Steady State Operating Life of High Temperature (HTOL) Ts=85°C, IF=Max | 1000hrs | 0/20 |
| Steady State Operating Life of Low Temperature (LTOL) Ta=-40°C, IF=Max | 1000hrs | 0/20 |
| Pulse Wet Operating Life of High Temperature (PWHTOL) 60°C/90%RH, IF30mins ON/30min OFF | 500hrs | 0/20 |
| High Temperature Storage (HTS) 100°C | 1000hrs | 0/20 |
| Low Temperature Storage (LTS) -40°C | 1000hrs | 0/20 |
| Thermal Shock (TS) -45°C~125°C 30min dwell 20sec transfer | 200cycles | 0/20 |
| Solder Resistance (SR) 265°C, 3X MSL | 5sec | 0/20 |
| Solder Ability (SA) 245°C5sec, 95% coverage | 5sec | 0/11 |
| Mechanical Shock (MS) 1500G 0.5msec pulse shock | Each6 axis | 0/6 |
| Random Vibration (RV) 6G RMS, 10-2000Hz, 10min | Per axis | 0/6 |
| Variable Vibration Frequency (VVF) 10-2000-10Hz, log or linear sweep rate, 20G for 1 min, 1.5mm each apply 3x per axis over | 6hrs | 0/6 |
| Salt Spread (SS) 35°C, 30g/m2/day | 48hrs | 0/11 |

| Item | Symbol | Test Condition | Criteria for Judgment | |
|---------------|--------|--------------------|-----------------------|------------|
| | | | Min. | Max. |
| Forward | Vf | IF=Typical Current | | U.S.L x1.1 |
| Luminous Flux | Im | IF=Typical Current | L.S.L x0.7 | |
| CCX&CCY | x,y | IF=Typical Current | | Shift<0.02 |

PRECAUTION FOR USE

- (1) This device should not be used in any type of fluid such as water, oil, organic solvent, etc. When washing is required, IPA should be used.
- (2) When the LEDs are illuminating, operating current should be decided after considering the ambient maximum temperature.
- (3) LEDs must be stored to maintain a clean atmosphere. If the LEDs are stored for 3 months or more after being shipped from EVERSTAR, a sealed container with a nitrogen atmosphere should be used for storage.
- (4) The LEDs must be used within seven days after opening the moisture proof packing. Repack unused Products with anti-moisture packing, fold to close any opening and then store in a dry place.
- (5) The appearance and specifications of the product may be modified for improvement without notice.
- (6) This LED is sensitive to the static electricity and surge. It is recommended to use a wrist Band or antielectrostatic glove when handling the LEDs.
- (7) On manual soldering, a solder tip must be needed as grounded for usage. If over voltage which exceeds the absolute maximum rating is applied to LEDs, it will cause damage LEDs and result in destruction. Damaged LEDs will show some unusual characteristics such as leak current remarkably increase ,turn-on voltage becomes lower and the LEDs get unlighted at low current.