

# SPECIFICATION FOR APPROVAL

## (PRELIMINARY)

**Customer Name :**

**Customer Item :**

**Part No. : PE-S7018LM-WHC3IN**

**Product Description :**

**Draw Date :**

- 1.Accessory:**    **Samples**    **Samples Data**  
**2.Customer's Proposal :**    **Agree**    **Disagree**  
**Reason :**



| Rev.             | Draw by :   | Checked by : | Approved by : |
|------------------|-------------|--------------|---------------|
| 1.2.1            | Steven Chen | Gray Huang   | Caren         |
| Customer Approve |             |              |               |
|                  |             |              |               |

**Features**

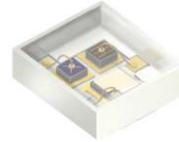
1.8mmx2.0mm SMD LED, 0.6mm thickness

Low power consumption

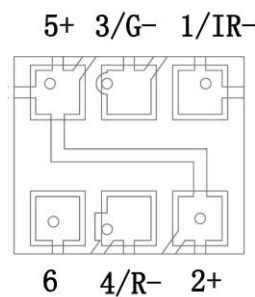
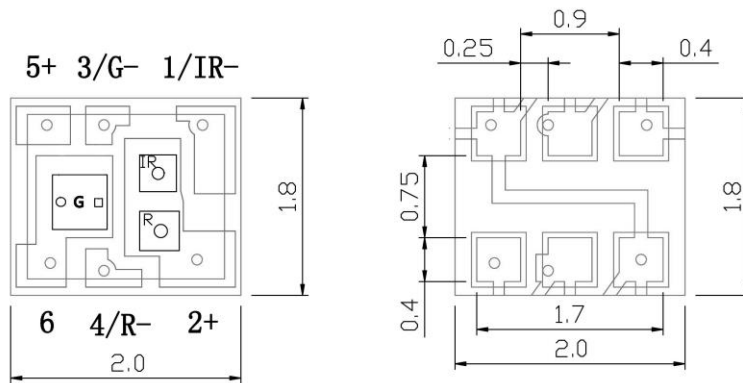
Wide view angle

Package: 4000pcs/reel

RoHS Compliant



**Package outlines/ Recommend Pad Layout**



| Part No.          | Emitted color | Dice        | Lens color        |
|-------------------|---------------|-------------|-------------------|
| PE-S7018LM-WHC3IN | Green/Red/IR  | GaN/AlGaInP | Water transparent |

Notes:

1. All dimensions are in millimeters (inches);
2. Tolerances are  $\pm 0.1\text{mm}$  (0.004inch) unless otherwise noted.

### Green Emitter

#### Absolute Maximum Ratings (Ta=25°C)

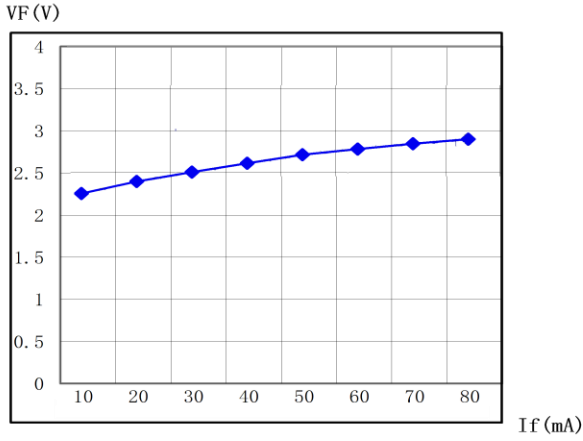
| Parameter                              | Symbol | Value     | Unit |
|--|--------|-----------|------|
| Forward current                        | If     | 50        | mA   |
| Reverse voltage                        | Vr     | 5         | V    |
| Power dissipation                      | Pd     | 150       | mW   |
| Operating temperature                  | Top    | -40 ~+100 | °C   |
| ESD(Human-body mode)                   | --     | 2         | Kv   |
| Storage temperature                    | Tstg   | -40 ~+100 | °C   |
| Peak pulsing current (1/8 duty f=1kHz) | Ifp    | 260       | mA   |

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

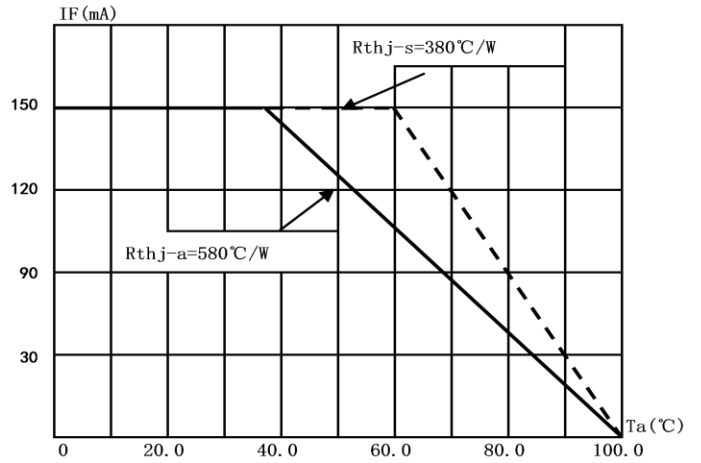
| Parameter                   | Test Condition | Symbol           | Value |     |     | Unit    |
|-----------------------------|----------------|------------------|-------|-----|-----|---------|
|                             |                |                  | Min   | Typ | Max |         |
| Wavelength at peak emission | If=50mA        | $\lambda_p$      | --    | 525 | --  | nm      |
| Spectral half bandwidth     | If=50mA        | $\Delta\lambda$  | --    | 20  | --  | nm      |
| Dominant wavelength         | If=50mA        | $\lambda_d$      | --    | --  | --  | nm      |
| Forward voltage             | If=50mA        | Vf               | 1.8   | --  | 2.8 | V       |
| Luminous intensity          | If=50mA        | Iv               | --    | 26  | --  | mW      |
| Viewing angle at 50% Iv     | If=50mA        | 2 $\theta_{1/2}$ | --    | 120 | --  | Deg     |
| Reverse current             | Vr=5V          | Ir               | --    | --  | 10  | $\mu$ A |

### Radiation Characteristics

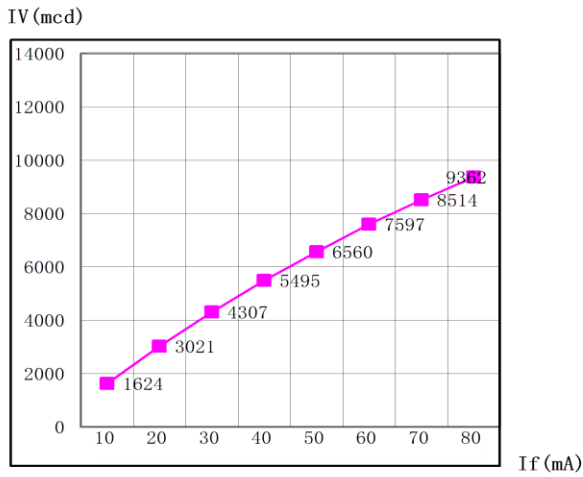
IF=50mA, Ta=25°C



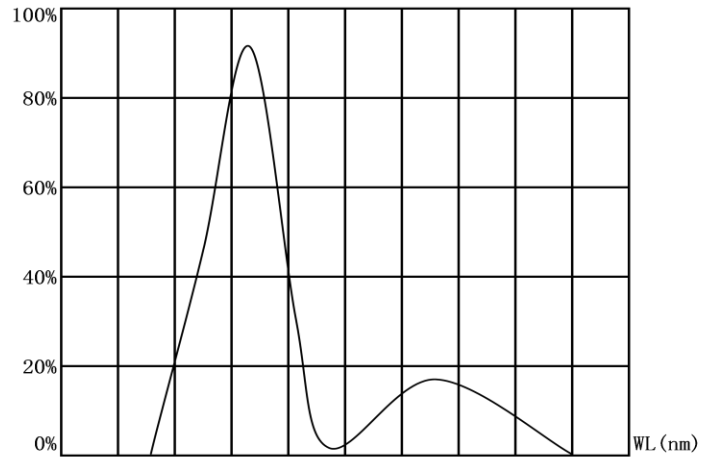
FORWARD CURRENT VS. FORWARD VOLTAGE



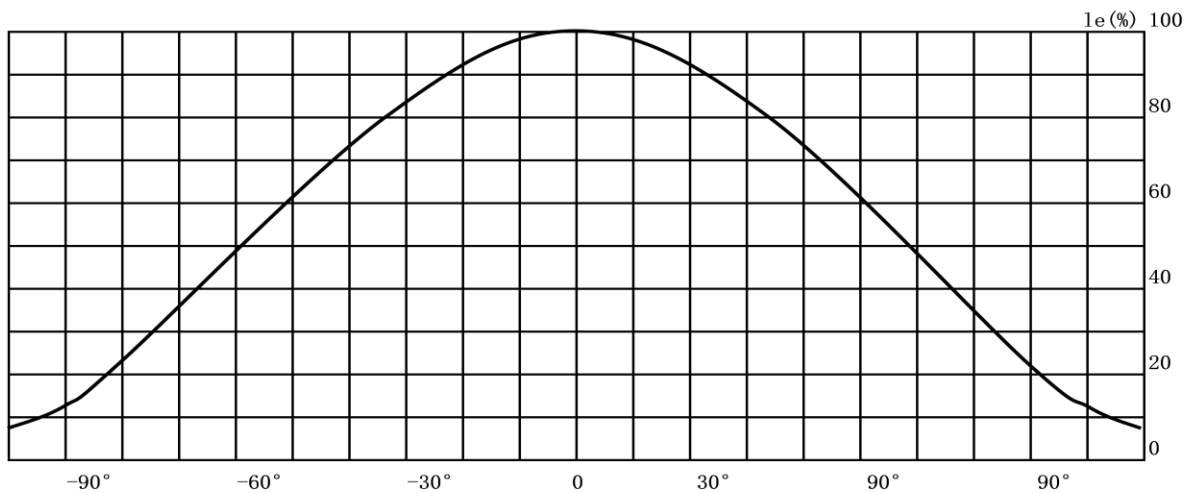
FORWARD CURRENT VS. DERATING CURVE



RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT



RELATIVE INTENSITY VS. WAVELENGTH



SPATIAL DISTRIBUTION

### Red Emitter

#### Absolute Maximum Ratings (Ta=25°C)

| Parameter                              | Symbol | Value    | Unit |
|--|--------|----------|------|
| Forward current                        | If     | 50       | mA   |
| Reverse voltage                        | Vr     | 5        | V    |
| Power dissipation                      | Pd     | 135      | mW   |
| Operating temperature                  | Top    | -40 ~+85 | °C   |
| ESD(Human-body mode)                   | --     | 2        | KV   |
| Storage temperature                    | Tstg   | -40 ~+85 | °C   |
| Peak pulsing current (1/8 duty f=1kHz) | Ifp    | 120      | mA   |

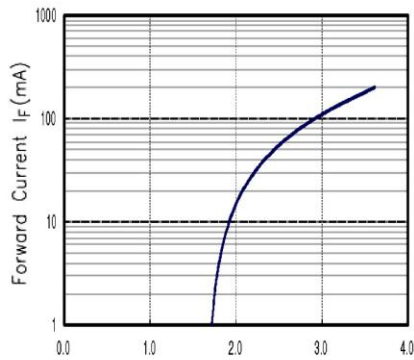
#### Electro-Optical Characteristics (Ta=25°C)

| Parameter                   | Test Condition | Symbol           | Value |     |     | Unit    |
|-----------------------------|----------------|------------------|-------|-----|-----|---------|
|                             |                |                  | Min   | Typ | Max |         |
| Wavelength at peak emission | If=50mA        | $\lambda_p$      | --    | 660 | --  | nm      |
| Spectral half bandwidth     | If=50mA        | $\Delta\lambda$  | --    | 20  | --  | nm      |
| Dominant wavelength         | If=50mA        | $\lambda_d$      | --    | --  | --  | nm      |
| Forward voltage             | If=50mA        | Vf               | 1.8   | 2.2 | 2.4 | V       |
| Luminous intensity          | If=50mA        | Iv               | --    | 28  | --  | mW      |
| Viewing angle at 50% Iv     | If=50mA        | 2 $\theta_{1/2}$ | --    | 120 | --  | Deg     |
| Reverse current             | Vr=5V          | Ir               | --    | --  | 10  | $\mu$ A |

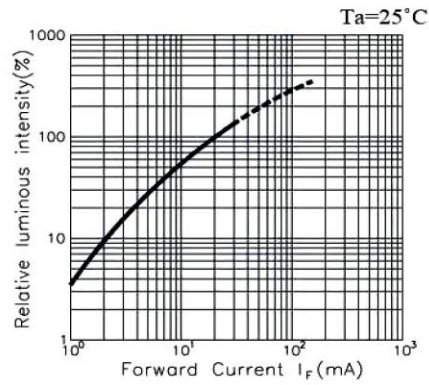
## Radiation Characteristics

$I_F=50\text{mA}, T_a=25^\circ\text{C}$

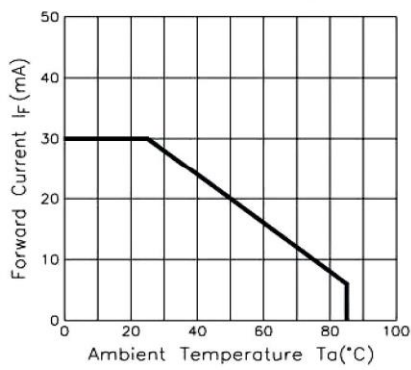
Forward Current Vs. Forward Voltage



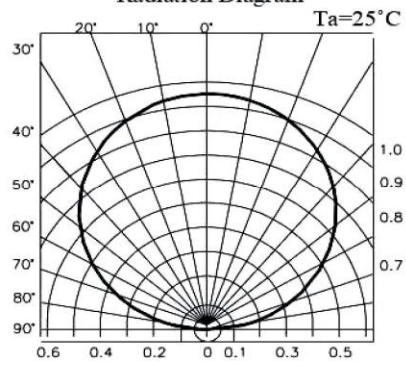
Luminous Intensity Vs. Forward Current



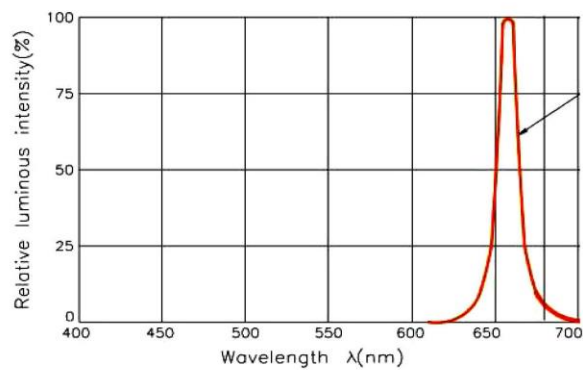
Forward Current Derating Curve



Radiation Diagram



Spectrum Distribution



### IR Emitter

#### Absolute Maximum Ratings (Ta=25°C)

| Parameter                              | Symbol | Value    | Unit |
|--|--------|----------|------|
| Forward current                        | If     | 50       | mA   |
| Reverse voltage                        | Vr     | 5        | V    |
| Power dissipation                      | Pd     | 110      | mW   |
| Operating temperature                  | Top    | -40 ~+85 | °C   |
| ESD(Human-body mode)                   | --     | 2        | KV   |
| Storage temperature                    | Tstg   | -40 ~+85 | °C   |
| Peak pulsing current (1/8 duty f=1kHz) | Ifp    | 200      | mA   |

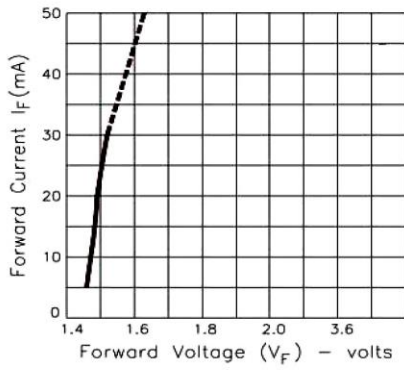
#### Electro-Optical Characteristics (Ta=25°C)

| Parameter                   | Test Condition | Symbol         | Value |     |     | Unit    |
|-----------------------------|----------------|----------------|-------|-----|-----|---------|
|                             |                |                | Min   | Typ | Max |         |
| Wavelength at peak emission | If=50mA        | $\lambda_p$    | 920   | 940 | 960 | nm      |
| Forward voltage             | If=50mA        | Vf             | 1.2   | 1.6 | 1.8 | V       |
|                             | If=100mA       | Vf             | --    | --  | 2.0 | V       |
| Luminous intensity          | If=50mA        | Iv             | --    | 24  | --  | mw      |
| Viewing angle at 50% Iv     | If=50mA        | 2 $\theta$ 1/2 | --    | 120 | --  | Deg     |
| Reverse current             | Vr=5V          | Ir             | --    | --  | 10  | $\mu$ A |

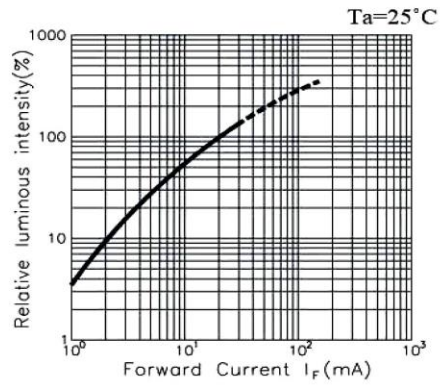
## Radiation Characteristics

$I_F=50\text{mA}, T_a=25^\circ\text{C}$

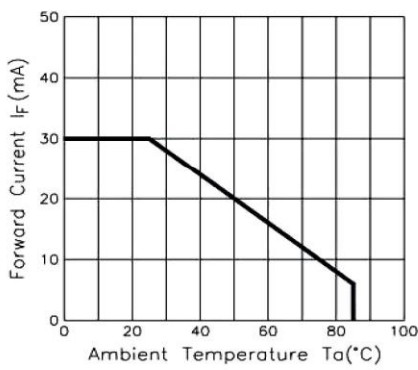
Forward Current Vs. Forward Voltage



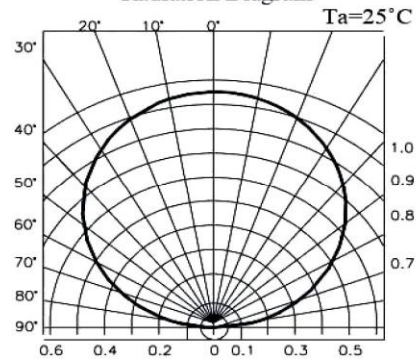
Luminous Intensity Vs. Forward Current



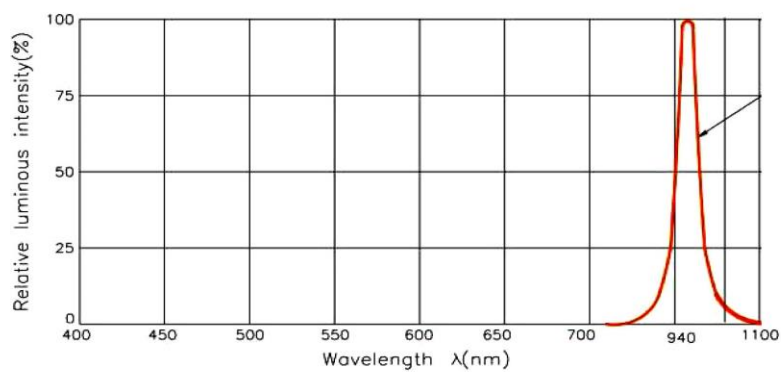
Forward Current Derating Curve



Radiation Diagram



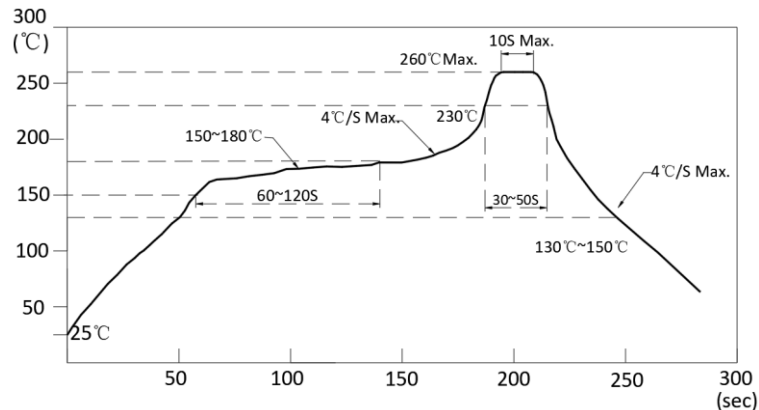
Spectrum Distribution





## Reflow Profile

### ■ Reflow Temp/Time



### Notes:

1. We recommend the reflow temperature 245°C (±5°C).
2. The maximum soldering temperature should be limited to 260°C.
3. Don't cause stress to the epoxy resin while it is exposed to high temperature.
4. Number of reflow process shall be 2 times or less.

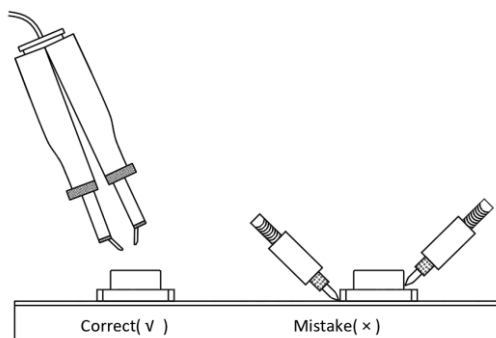
### ■Soldering iron

Basic spec is  $\frac{6}{\lambda}$  5sec when 320°C (±20°C). If temperature is higher, time should be shorter (+10°C → -1sec).

Power dissipation of iron should be smaller than 20W, and temperatures should be controllable. Surface temperature of the device should be under 350°C.

### ■Rework

1. Customer must finish rework within 5 sec under 340°C.
2. The head of iron cannot touch copper foil
3. Twin-head type is preferred.

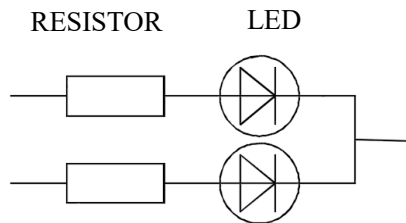


- Avoid rubbing or scraping the resin by any object, during high temperature, for example reflow solder etc.

## Handling precautions

### 1. Drive Method

A 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.



### 2. Storage

2.1 Do not open moisture proof bag before the products are ready to use.

2.2 Before opening the package: The LEDs should be kept at 30°C or less and 60% RH or less.

2.3 After the package is opened, the products should be used within a week or they should be kept to store at  $\leq 20$  R.H. with zip-lock sealed.

### 3. Baking

It is recommended to baking before soldering when the pack is unsealed after 72hrs. The Conditions are as followings:

3.1  $60\pm 3^{\circ}\text{C}$  x (12~24hrs) and  $< 5\%$ RH, taped reel type

3.2  $100\pm 3^{\circ}\text{C}$  x (45min~1hr), bulk type

3.3  $130\pm 3^{\circ}\text{C}$  x (15~30min), bulk type

### Test Items and Results of Reliability

| Test Item                               | Test Conditions  | Standard Test Method | Note      | Number of Test |
|---|--|----------------------|-----------|----------------|
| Reflow Soldering                        | Ta=260±5°C,Time=10±2S  | JB/T 10845-2008      | 3times    | 0/22           |
| Salt Atmosphere                         | Ta=35±3°C,PH=6.5 ~ 7.2   | GB/T 2423.17-2008    | 24hrs     | 0/22           |
| Temperature Cycling                     | -40±5°C      30±1min<br>↑→(25°C/5±1min)↓<br>100±5°C      30±1min | GB/T 2423.22-2012    | 100cycles | 0/22           |
| Thermal Shock                           | Ta=-40±5°C ~ 100±5°C,<br>15±1min dwell                           | GB/T 2423.22-2012    | 100cycles | 0/22           |
| High Humidity High Temp. Cycling        | Ta=30±5°C ~ 65±5°C,<br>90±5%RH,24hrs/1cycle                      | GB/T 2423.4-2008     | 10cycles  | 0/22           |
| High Humidity High Temp. Storage Life   | Ta=85±5°C,ψ(%)=85±5%RH   | GB/T 2423.3-2006     | 1000hrs   | 0/22           |
| High Temperature Storage Life           | Ta=100±5°C,non-operating   | GB/T 2423.2-2008     | 1000hrs   | 0/22           |
| Low Temperature Storage Life            | Ta=-40±5°C,non-operating   | GB/T 2423.1-2008     | 1000hrs   | 0/22           |
| Life Test                               | Ta=26±5°C,@20mA,<br>ψ(%)=25%RH ~ 55%RH                           | --                   | 1000hrs   | 0/22           |
| High Humidity High Temp. Operating Life | Ta=85±5°C,@20mA,<br>ψ(%)=85%RH                                   | GB/T 2423.3-2006     | 500hrs    | 0/22           |
| Low Temperature Operating Life          | Ta=-20±5°C,@20mA   | GB/T 2423.1-2008     | 1000hrs   | 0/22           |