



PRODUCT SPECIFICATION

Model No: BOH-NWS4-60

For reference only.

Subject to change maybe necessary in a limited number of cases

Descriptions:

- Double Chip on AlN Model
- AlN Substrate
- Emitting Color : White
- Viewing Angle : 120°



LED 胶体为软硅胶封装，请避免外力碰撞。

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

- Automotive Headlamp
- Day time running light
- Fog lamp
- Working lamp
- Cornering light

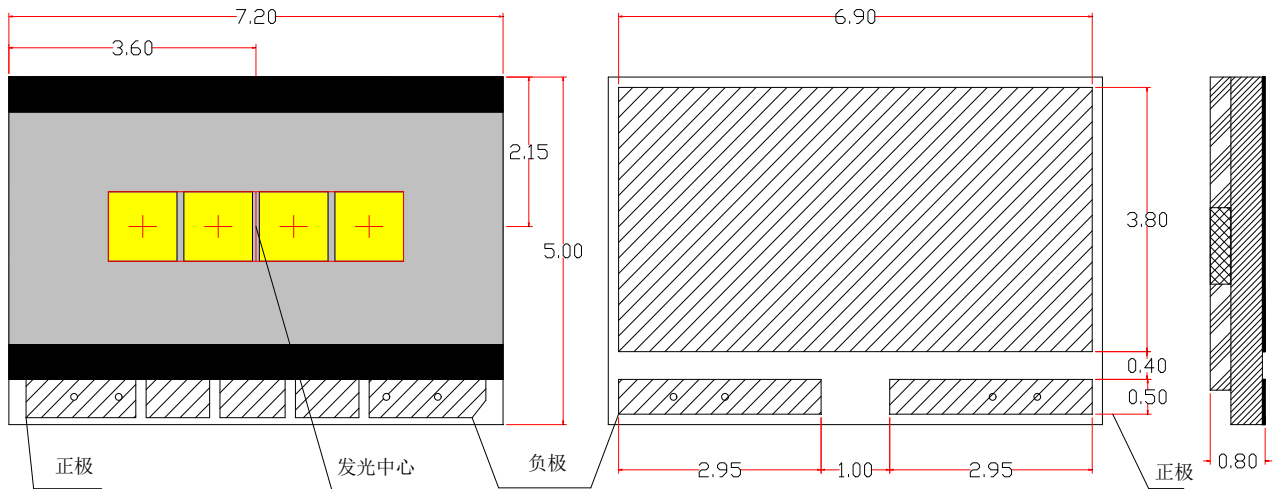
■ Device Selection Guide

| Model No. | Chip | | Epoxy Color |
|-------------|----------|----------------|-----------------|
| | Material | Emitting Color | |
| BOH-NWS4-60 | InGaN | White | Yellow Diffused |

LED 胶体为软硅胶封装，运输、装配避免外力碰撞白色胶体和黄色荧光片。

■ Package Outline Dimensions

Dimensions: 7.2 (L) × 5.0 (W) × 0.8 (H) mm.



Emitting area: 1.0*4.3 ± 0.1mm

Note:

1. Dimensions are in millimeters.
2. Tolerances unless mentioned are ± 0.2mm.



■ Absolute Maximum Ratings (Ta=25° C)

| Items | Symbol | Absolute Maximum Ratings | Unit |
|------------------------------------|-------------|--------------------------|------|
| Power Dissipation | P_d | 14 | W |
| Junction Temperature | T_j | 150 | °C |
| Forward Current (DC)* | I_F | 100~1200 | mA |
| Operation Temperature | T_{opr} | -40 ~ +125 | °C |
| Storage Temperature | T_{stg} | -40 ~ +125 | °C |
| Wavelength | λ_p | 435 ~ 460 | nm |
| Wavelength | λ_d | 450 ~ 600 | nm |
| Ra | Ra | ≥65 | -- |
| Thermal resistance junction/board* | Rth | Typ 0.8 (max 1.2) | k/w |
| ESD (IEC-61000-4-2) | ESD | 8 | KV |
| Lead Soldering Temperature | T_{sol} | 260°C for 10 Seconds | |

NOTE: For long-term performance, the drive currents between 100 mA and 1000 mA are recommended, $T_s < 125^\circ\text{C}$.

If the the drive currents is different with our condition ,Please contact our customer service.

PCB temperature assurance < 125°C, test point distance within 2 mm LED solder.

PCB 温度确保<125°C, 测试点距离 LED 焊锡 2mm 内。

■ Typical Electrical & Optical Characteristics (Ta=25° C)

| Items | Symbol | Condition | Min. | Typ. | Max. | Unit |
|-------------------------|-----------------|---------------------|-----------|-------------|-----------------|---------------|
| Forward Voltage | V_F | $I_F=1000\text{mA}$ | 10.8 | 12.8 | 14 | V |
| Reverse Current | I_R | $V_R=-5\text{V}$ | --- | --- | 5 | μA |
| Chromaticity Coordinate | (x, y) | $I_F=1000\text{mA}$ | 0.31/0.31 | 0.325/0.335 | 0.345/ 0.367 | --- |
| Color Temperature | CCT | $I_F=1000\text{mA}$ | 5000 | 6000 | --- | K |
| Luminous Flux | Φ_v | $I_F=1000\text{mA}$ | 1000 | 1320 | --- | Lm |
| 50% Power Angle | $2\theta_{1/2}$ | $I_F=1000\text{mA}$ | | 120 | | Deg |

■ Ranks Combination ($I_F = 1000\text{mA}$)

| Rank | L7 | L8 | L9 |
|--------------------|-------------|-------------|-------------|
| Luminous Flux (Lm) | 1080 ~ 1200 | 1200 ~ 1440 | 1440 ~ 1800 |



Notes:

- *Tolerance of measurement of Luminous Flux is $\pm 15\%$;
- *Tolerance of measurement of forward voltage is $\pm 0.5V$;
- *Chromaticity Coordinate s measurement allowance: ± 0.015 .

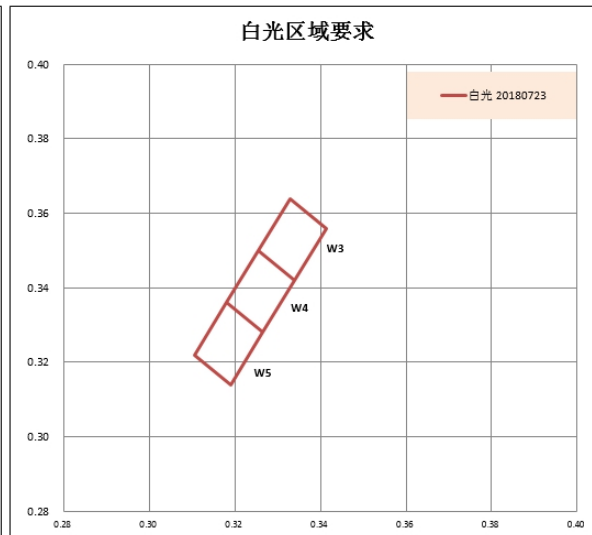
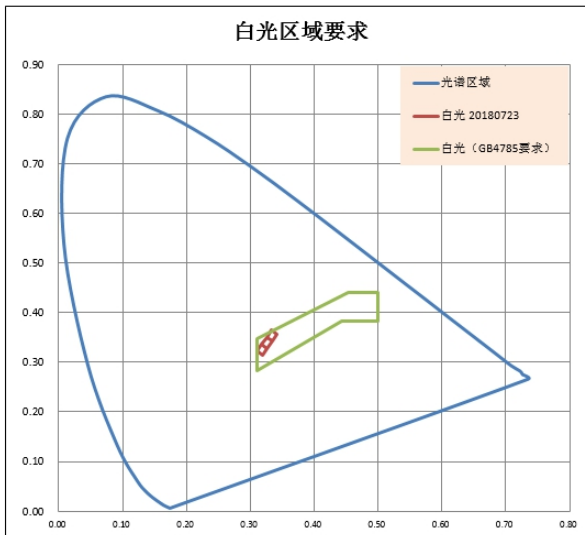
■ Chromaticity coordinate (IF=1000mA)

白光

| | x | y |
|----|--------|-------|
| W3 | 0.343 | 0.359 |
| | 0.3345 | 0.367 |
| | 0.327 | 0.353 |
| | 0.3355 | 0.345 |
| | 0.343 | 0.359 |
| W4 | 0.3355 | 0.345 |
| | 0.327 | 0.353 |
| | 0.3195 | 0.339 |
| | 0.328 | 0.331 |
| | 0.3355 | 0.345 |

| | x | y |
|----|--------|-------|
| W5 | 0.328 | 0.331 |
| | 0.3195 | 0.339 |
| | 0.312 | 0.325 |
| | 0.3205 | 0.317 |
| | 0.328 | 0.331 |

■ CIE Graph



Note:

- 1、Percentage of red: >5% acc. to GB 25991 regulation.
- 2、Percentage of UV: <10-5 W/lm acc. to GB 25991 regulation.
- 3、Acc. to white area GB 4785.



■ Reliability

1) Test Items and Results:

| Classification | Test Item | Standard Test Method | Test Conditions | Duration | Units Tested | Number Of Damaged |
|------------------|--------------------------|---|--|-------------|--------------|-------------------|
| Life Test | Operating Life Test * | JIS7021:B4 MIL-STD-202:107D MIL-STD-750:1026 | Ta=85±5°C, IF=1200mA * | 1000 Hrs | 11 | 0/11 |
| | | JESD22-A101 | Ta=85±5°C RH=85±5%RH IF=1200mA * | 1000 Hrs | 11 | 0/11 |
| Environment Test | High Temperature Storage | JIS7021:B10 MIL-STD-202:210A MIL-STD-750:2031 | Ta=125±5°C | 1000 Hrs | 11 | 0/11 |
| | Temp. & Humidity Test | JIS7021:B11 MIL-STD-202:103D | Ta=85±5°C RH=85±5%RH | 1000Hrs | 11 | 0/11 |
| | Thermal Shock Test | JIS7021B4 MIL-STD-202:107D MIL-STD-750:1026 | -40°C ← - → 125°C 15min 10sec 15min | 1000 Cycles | 11 | 0/11 |
| | ESD | MIL-STD-105E HBM | 8Kv | 10 Cycles | 11 | 0/11 |
| Soldering Test | Resistance to soldering | - | Tsol=260±5°C, 10sec | Twice | 22 | 0/22 |

* Reliability items are tested under good thermal management with Tj<150°C, Ts<125°C.

PCB temperature assurance < 125°C, test point distance within 2 mm LED solder.

PCB 温度确保<125°C，测试点距离 LED 焊锡 2mm 内。

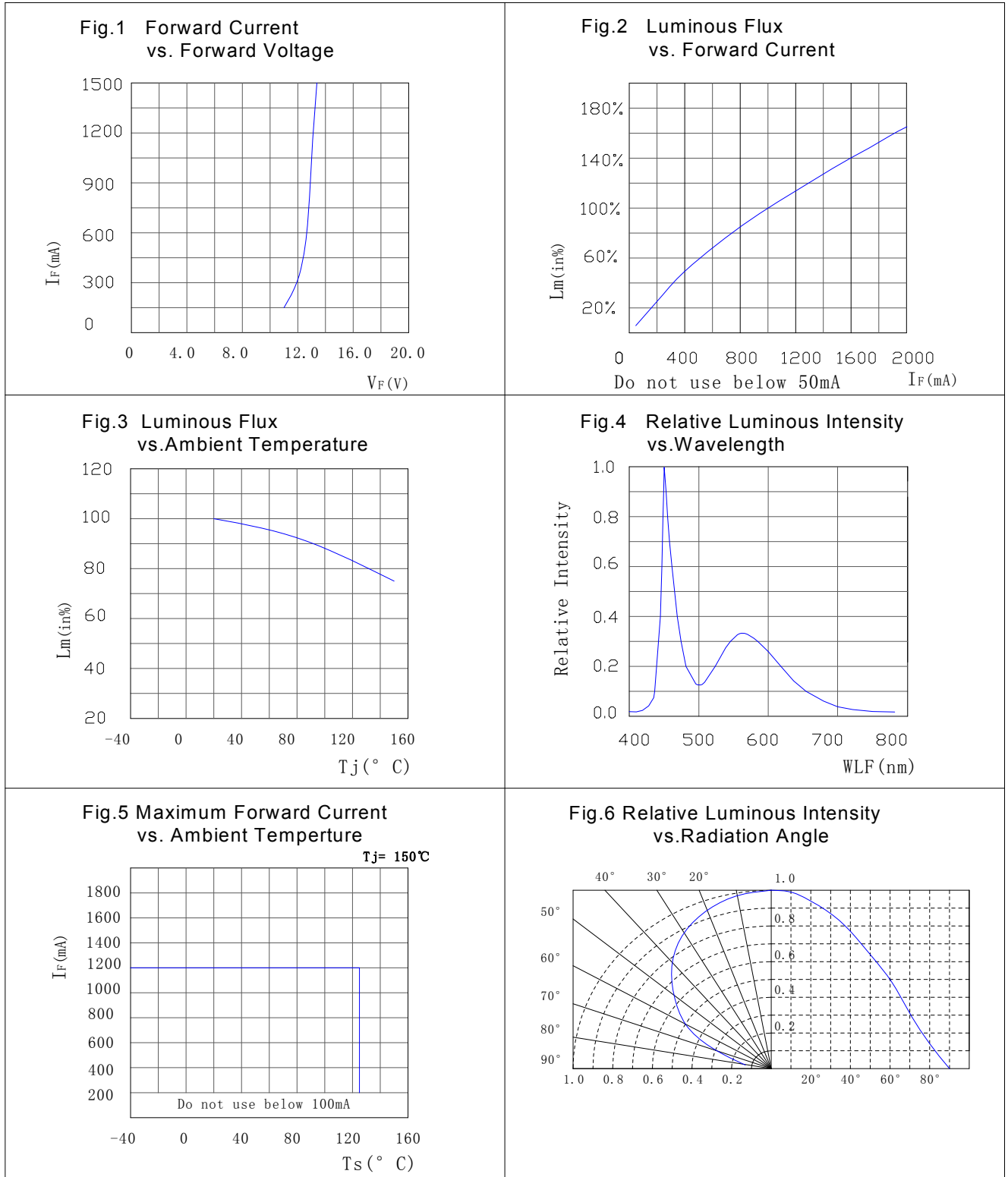
■ 2) Criteria for Judge The Damage:

| Items | Symbol | Condition | Criteria for Judge | |
|--------------------|----------------|------------------------|----------------------|------------------------------------|
| | | | Min. | Max. |
| Forward Voltage | V _F | I _F =1000mA | --- | initial value x 1.2 |
| Reverse Current | I _R | V _R =5V | --- | not designed for reverse operation |
| Luminous Flux (Lm) | I _V | I _F =1000mA | initial value x 0.85 | --- |

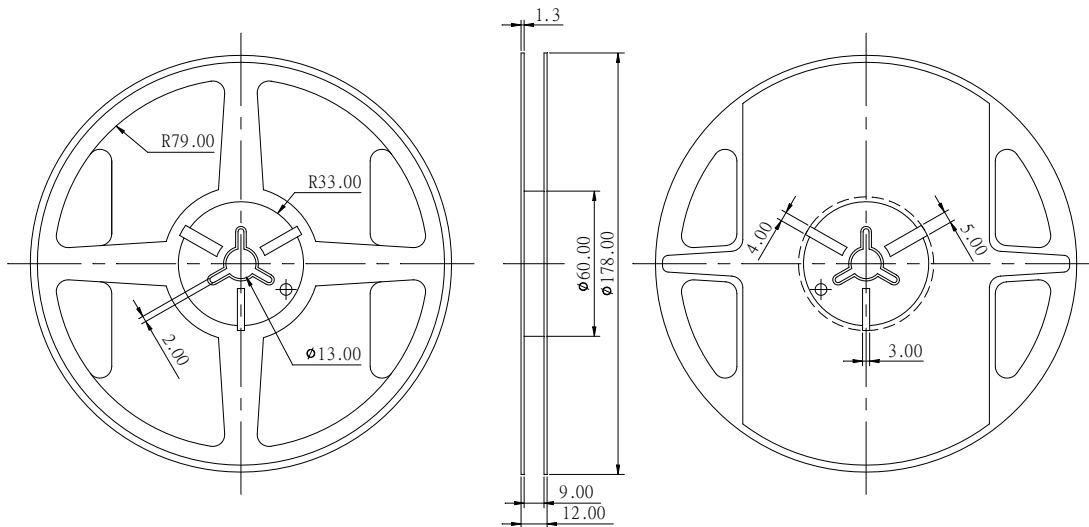


■ Typical Electrical / Optical Characteristics Curves

(Ta = 25°C Unless Otherwise Noted)

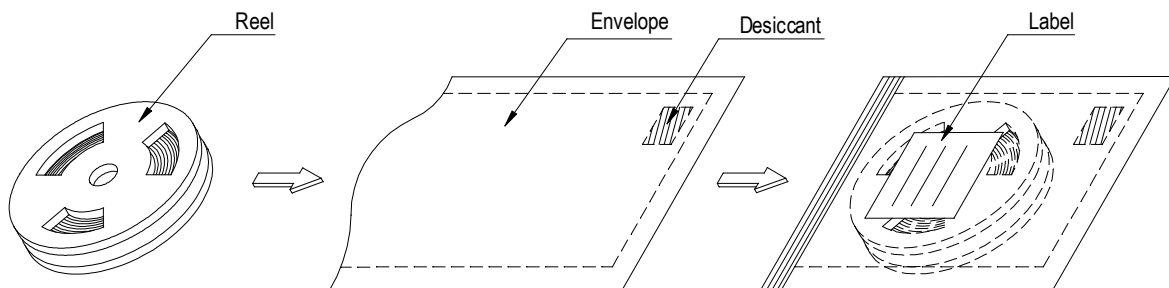


■ Reel Specification:
(10344921-00, 圆盘_Φ7×16m 图纸)



■ Taping Specification - (200, 500 , 1000, 2000pcs / reel)

■ Packing Type



■Precautions For Use

1. Over - current - proof

Customer must apply resistors for protection, otherwise slight voltage shift will cause big current change (Burn out will happen)

2. Storage

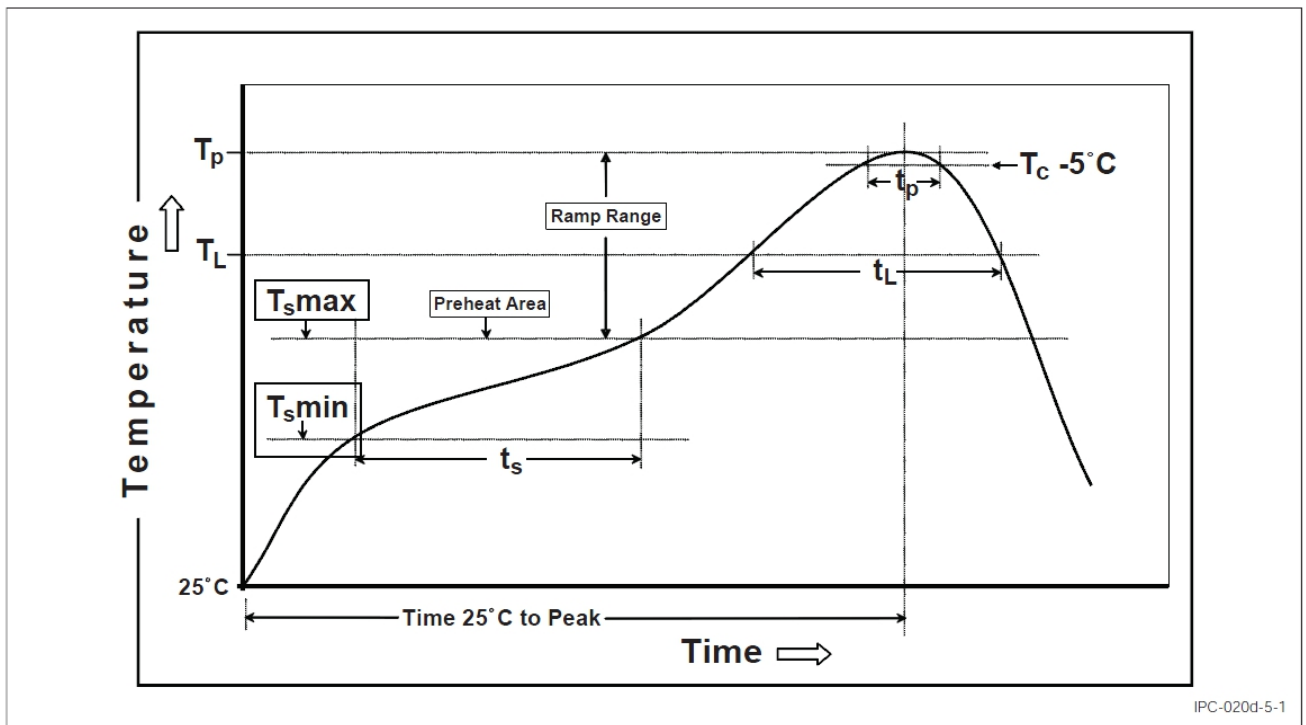
2.1 Do not open moisture proof bag before the products are ready to use.

2.2 The LEDS should be kept at 30°C or less and 70%RH or less, and the storage life limits are 12 months

2.3 Product complies to MSL Level 2 acc. to JEDEC J-STD-020E.

3. Soldering

3.1 Reflow Soldering / Time





| Profile Feature | Sn-Pb Eutectic Assembly | Pb-Free Assembly |
|--|-------------------------|-----------------------|
| Preheat & Soak | | |
| Temperature Min (T _{min}) | 100° C | 150° C |
| Temperature Max (T _{max}) | 150° C | 200° C |
| Time (T _{min} to T _{max}) (ts) | 60-120 seconds | 60-120 seconds |
| Average ramp-up rate (T _{max} to T _p) | 3° C/second max. | 3° C/second max. |
| Liquidous Temperature (TL) Time at Liquidous (tL) | 183° C/60-150 seconds | 217° C/60-150 seconds |
| Peak Package Body Temperature (T _p)* | 235° C max. | 260° C max. |
| Time (tp)** within 5° C of the specified classification Temperature (T _c) | 10 seconds max | 10 seconds max |
| Average ramp-down Rate (T _p to T _{max}) | 6° C/second max. | 6° C/second max. |
| Time 25° C to Peak Temperature | 6 minutes max. | 8 minutes max. |

3.2 Reflow soldering should not be done more than two times;

3.3 While soldering, do not put stress on the LEDs during heating;

3.4 After soldering, do not warp the circuit board.

4. Caution in ESD

4.1 Electrostatic discharge (ESD) and surge current (EOS) can damage LEDs.

4.2 An ESD wrist strap, ESD shoe strap or antistatic gloves must be worn whenever handling LEDs

4.3 All devices equipment and machinery must be properly grounded.

5. Other

5.1 Above specification may be changed without notice. BYD will reserve authority on material change for above specification

5.2 When using this product, please observe the absolute maximum ratings and the instructions for using outlined in these specification. BYD assumes no responsibility for any damage resulting from use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification



RESTRICTIONS ON PRODUCT USE

- The information contained herein is subject to change without notice.

- **BYD Semiconductor Company Limited** exerts the greatest possible effort to ensure high quality and reliability. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing products, to comply with the standards of safety in making a safe design for the entire system, including redundancy, fire-prevention measures, and malfunction prevention, to prevent any accidents, fires, or community damage that may ensue. In developing your designs, please ensure that products are used within specified operating ranges as set forth in the most recent products specifications.

- The products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of