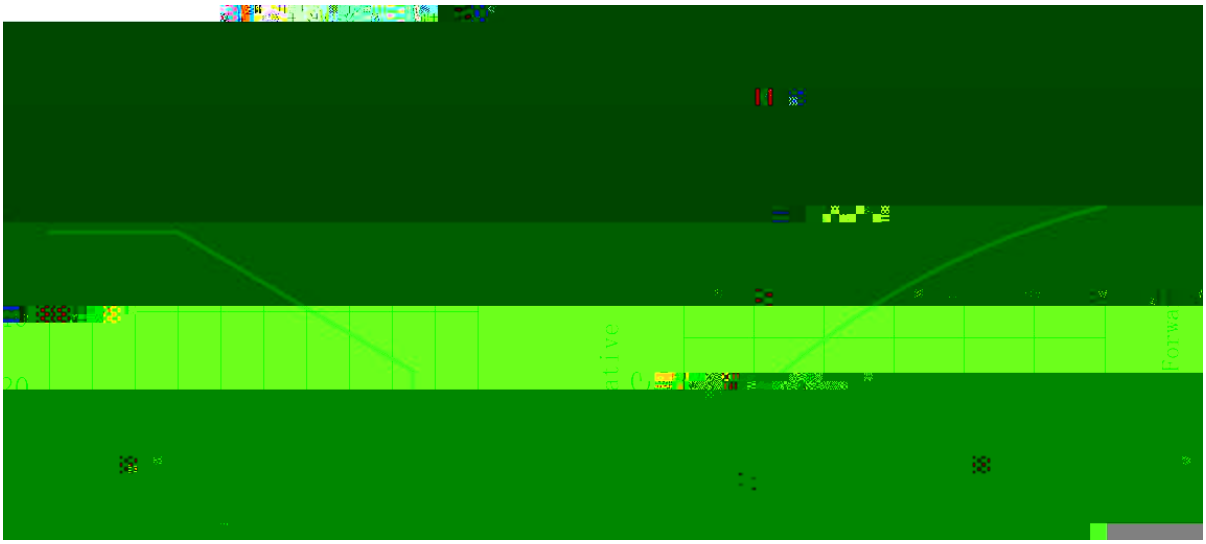
# 典型特性曲线

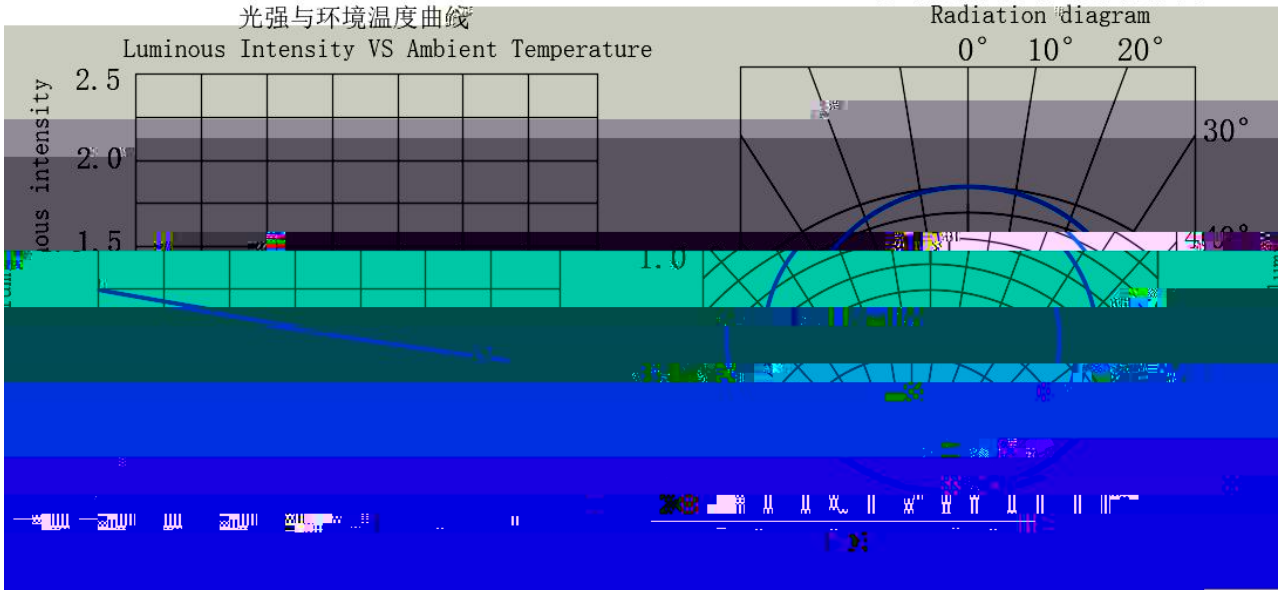
## Typical Characteristics Curves

光谱分布曲线
Relative Spectral Distribution

伏安特性
Volt-ampere Characteristic



光强与环境温度曲线
Luminous Intensity VS Ambient Temperature




相对辐射强度与空间角度关系
Radiation diagram




25 ± 5 /Note If not otherwise indicated the test environment temp erature is 25 ± 5

# 可靠性试验

## Reliability Test Items And Conditions

| Class | Test item | Testing environment | Testing time | Reference standard |
|---|---|---|---|---|
| Endurance test | Working life | 20mA Continuous lighting at the maximum rated current at room | 1000 hours +72 -24hours | MIL-STD-750D:1026<br>MIL-STD-883D:1005<br>JIS C 7021:B-1 |
| | High temperature and high humidity | IR-Reflow In-Board, 2 Times Ta= 85±5 , RH= 90 95% | 240hours ± 2hours) | MIL-STD-202F:103B<br>JIS C 7021:B-11 |
| | High-temperature storage | Ta= 85±5 | 1000 hours -24 +72 ) | MIL-STD-883D:1008<br>JIS C 7021:B-10 |
| | Low temperature | Ta= -40±5 | -24hours+72hours | JIS C 7021:B-12 |
| | Cold and hot cycle | 105 25 -55 25<br>30mins 5mins 30mins 5mins | 100<br>100 Circles | MIL-STD-202F:107D<br>MIL-STD-750D:1051<br>MIL-STD-883D:1010 |
| | Hot and cold impact | IR-Reflow In-Board, 2 Times 100± 5 -40 ± 5 20mins 20mins | 100<br>100 Circles | MIL-STD-202F:107D<br>MIL-STD-750D:1051<br>MIL-STD-883D:1011 |
| | Anti-tin test | T.sol= 260 ± 5 | 10 ± 1secs<br>2 2times | MIL-STD-202F:210A<br>MIL-STD-750D:2031 |
| | Infrared reflowwelding There is lead process | heat up speed(183 ) 3 / keep temperature 125(±25) 120 keep temperature 183 60-150 maximum temperature 235 +5/-0 keep 235 +5/-0 10-15 cooling rate | -------- | MIL-STD-750D:2031.2<br>J-STD-020C |
| | Infrared reflow welding Lead-free process | heat up speed(217 ) 3 / keep temperature 175(±25) 180 keep temperature 217 60-120 maximum temperature 255 +0/-5 keep 255 +0/-5 5-10 cooling rate 6 | -------- | MIL-STD-750D:2031.2<br>J-STD-020C |
| | Weldability test | Soldering temperature T.sol= 235 ± 5 Immersion speed 25±2.5 mm/ 95% Tin loading rate ≥ 95% pad area | Immersion *: Immersion time: 2 ± 0.5 seconds | |

# 使用注意事项（2）

## Precautions (2)

**3. 设计建议**

**Design Consideration**

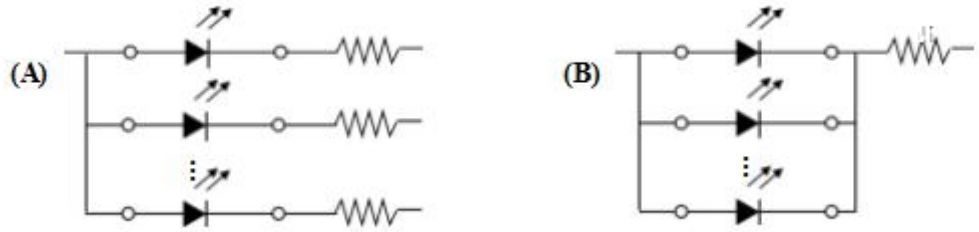
LED

A LED B

LED $V_F$ LED

In designing a circuit, the current through each LED must not exceed the absolute maximum rating specified for each LED. In the meanwhile, resistors for protection should be applied, otherwise slight voltage shift will cause big current change, burn out may happen.

It is recommended to use Circuit A which regulates the current flowing through each LED rather than Circuit B. When driving LEDs with a constant voltage in Circuit B, the current through the LEDs may vary due to the variation in Forward Voltage($V_F$) of the LEDs. In the worst case, some LED may be subjected to stresses in excess of the Absolute Maximum Rating.




LED LED

Thermal Design is paramount importance