Kingbright



# APT1608ZGC

1.6 x 0.8 mm SMD Chip LED Lamp

## DESCRIPTIONS

- The Green source color devices are made with InGaN on Sapphire Light Emitting Diode
- Electrostatic discharge and power surge could damage the LEDs
- It is recommended to use a wrist band or anti-electrostatic glove when handling the LEDs
- All devices, equipments and machineries must be electrically grounded

## FEATURES

- 1.6 mm x 0.8 mm SMD LED, 0.75 mm thickness
- Low power consumption
- Wide viewing angle
- Ideal for backlight and indicator
- Package: 2000 pcs / reel
- Moisture sensitivity level: 3
- Halogen-free
- RoHS compliant

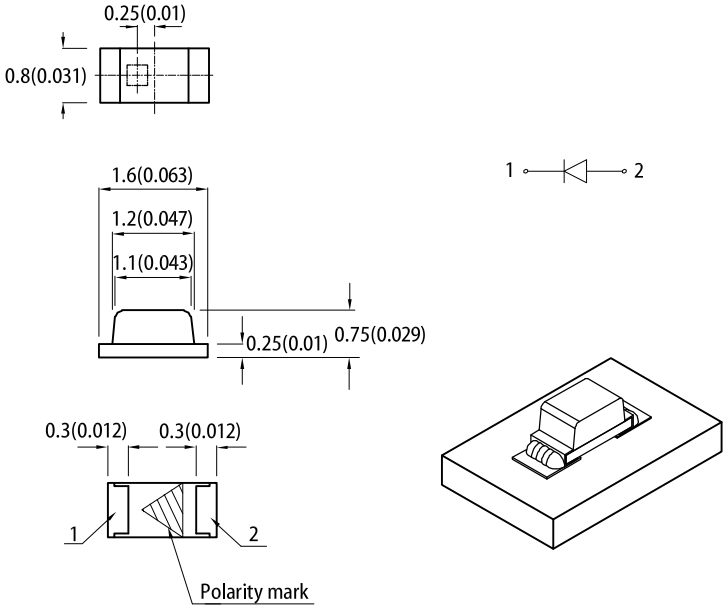
## APPLICATIONS

- Backlight
- Status indicator
- Home and smart appliances
- Wearable and portable devices
- Healthcare applications

## ATTENTION

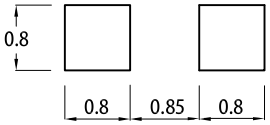
Observe precautions for handling electrostatic discharge sensitive devices

## PACKAGE DIMENSIONS




**RECOMMENDED SOLDERING PATTERN**

(units : mm; tolerance : ± 0.1)




*Notes:*
*1. All dimensions are in millimeters (inches).*
*2. Tolerance is ±0.1(0.004") unless otherwise noted.*
*3. The specifications, characteristics and technical data described in the datasheet are subject to change without prior notice.*
*4. The device has a single mounting surface. The device must be mounted according to the specifications.*

## SELECTION GUIDE

| Part Number | Emitting Color (Material) | Lens Type | Iv (mcd) @ 20mA [2] | | Viewing Angle [1] |
|---|---|---|---|---|---|
| | | | Min. | Typ. | 2θ1/2 |
| APT1608ZGC | Green (InGaN) | Water Clear | 300 | 600 | 130° |

*Notes:*
*1. θ1/2 is the angle from optical centerline where the luminous intensity is 1/2 of the optical peak value.*
*2. Luminous intensity / luminous flux: +/-15%.*
*3. Luminous intensity value is traceable to CIE127-2007 standards.*

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## ELECTRICAL / OPTICAL CHARACTERISTICS at $T_A$=25°C

| Parameter | Symbol | Emitting Color | Value | | Unit |
|---|---|---|---|---|---|
| | | | Typ. | Max. | |
| Wavelength at Peak Emission $I_F$ = 20mA | $\lambda_{peak}$ | Green | 515 | - | nm |
| Dominant Wavelength $I_F$ = 20mA | $\lambda_{dom}$ [1] | Green | 525 | - | nm |
| Spectral Bandwidth at 50% Φ REL MAX $I_F$ = 20mA | Δλ | Green | 30 | - | nm |
| Capacitance | C | Green | 45 | - | pF |
| Forward Voltage $I_F$ = 20mA | $V_F$ [2] | Green | 3.3 | 4.1 | V |
| Reverse Current ($V_R$ = 5V) | $I_R$ | Green | - | 50 | μA |
| Temperature Coefficient of $\lambda_{peak}$ $I_F$ = 20mA, -10°C ≤ T ≤ 85°C | $TC_{\lambda peak}$ | Green | 0.05 | - | nm/°C |
| Temperature Coefficient of $\lambda_{dom}$ $I_F$ = 20mA, -10°C ≤ T ≤ 85°C | $TC_{\lambda dom}$ | Green | 0.03 | - | nm/°C |
| Temperature Coefficient of $V_F$ $I_F$ = 20mA, -10°C ≤ T ≤ 85°C | $TC_V$ | Green | -2.9 | - | mV/°C |

*Notes:*
*1. The dominant wavelength (λd) above is the setup value of the sorting machine. (Tolerance λd : ±1nm. )*
*2. Forward voltage: ±0.1V.*
*3. Wavelength value is traceable to CIE127-2007 standards.*
*4. Excess driving current and / or operating temperature higher than recommended conditions may result in severe light degradation or premature failure.*

## ABSOLUTE MAXIMUM RATINGS at $T_A$=25°C

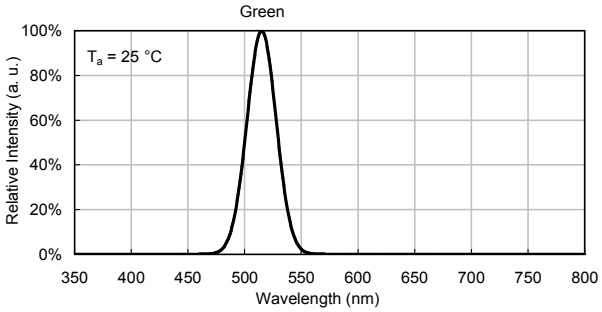
| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Power Dissipation | $P_D$ | 102.5 | mW |
| Reverse Voltage | $V_R$ | 5 | V |
| Junction Temperature | $T_j$ | 115 | °C |
| Operating Temperature | $T_{op}$ | -40 to +85 | °C |
| Storage Temperature | $T_{stg}$ | -40 to +85 | °C |
| DC Forward Current | $I_F$ | 25 | mA |
| Peak Forward Current | $I_{FM}$ [1] | 150 | mA |
| Electrostatic Discharge Threshold (HBM) | - | 450 | V |
| Thermal Resistance (Junction / Ambient) | $R_{th\ JA}$ [2] | 570 | °C/W |
| Thermal Resistance (Junction / Solder point) | $R_{th\ JS}$ [2] | 380 | °C/W |

*Notes:*
*1. 1/10 Duty Cycle, 0.1ms Pulse Width.*
*2. $R_{th\ JA}$ ,$R_{th\ JS}$ Results from mounting on PC board FR4 (pad size ≥ 16 $mm^2$ per pad).*
*3. Relative humidity levels maintained between 40% and 60% in production area are recommended to avoid the build-up of static electricity – Ref JEDEC/JESD625-A and JEDEC/J-STD-033.*

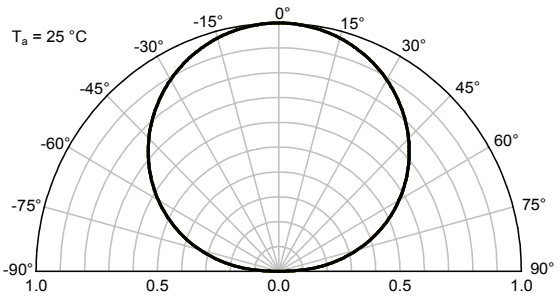
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## TECHNICAL DATA

### RELATIVE INTENSITY vs. WAVELENGTH

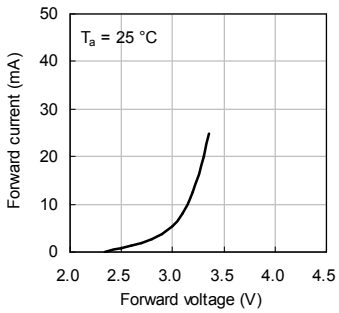



### SPATIAL DISTRIBUTION

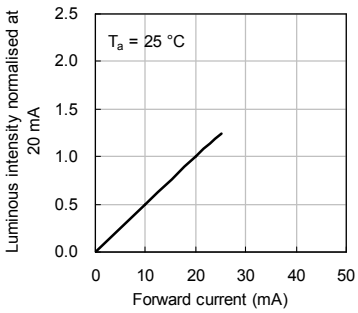



## GREEN

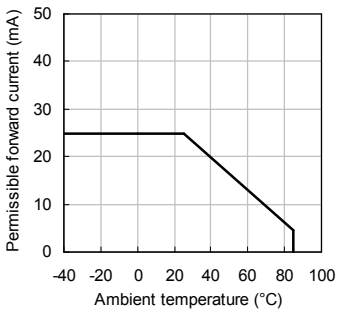
### Forward Current vs. Forward Voltage



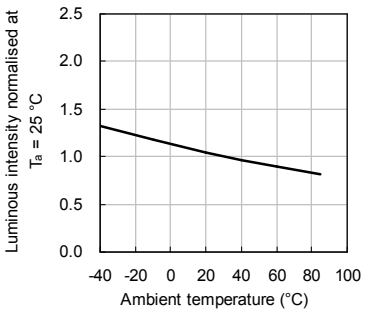

### Luminous Intensity vs. Forward Current



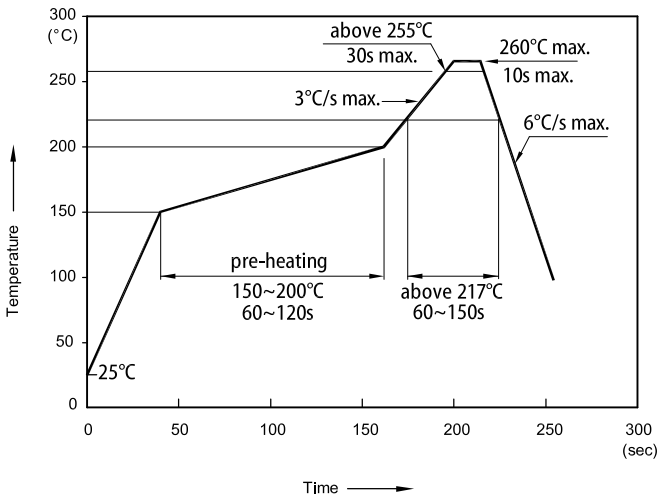

### Forward Current Derating Curve




### Luminous Intensity vs. Ambient Temperature

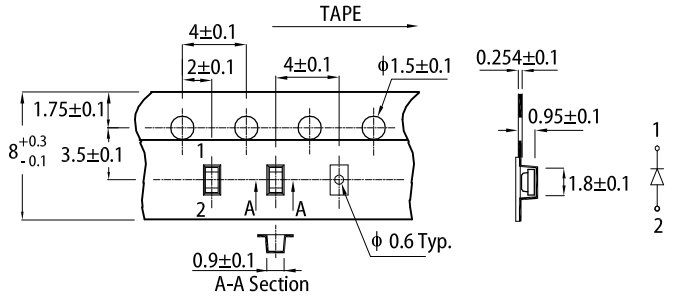



### REFLOW SOLDERING PROFILE for LEAD-FREE SMD PROCESS

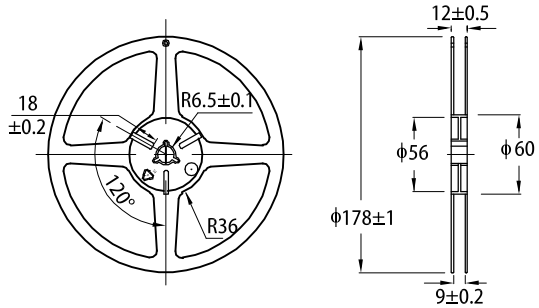



*Notes:*
1. *Don't cause stress to the LEDs while it is exposed to high temperature.*
2. *The maximum number of reflow soldering passes is 2 times.*
3. *Reflow soldering is recommended. Other soldering methods are not recommended as they might cause damage to the product.*

### TAPE SPECIFICATIONS (units : mm)

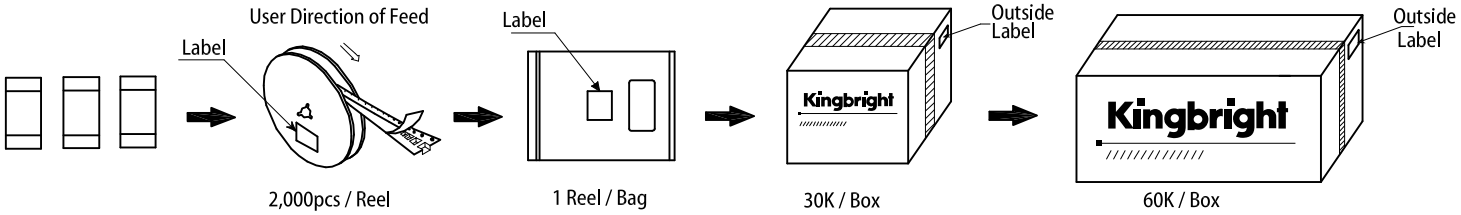


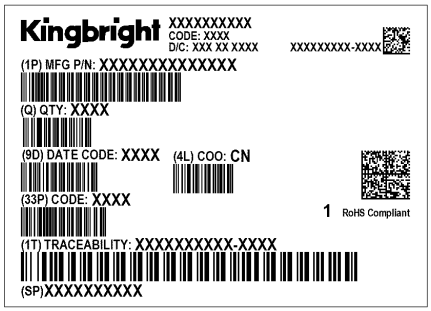

### REEL DIMENSION (units : mm)




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## PACKING & LABEL SPECIFICATIONS




**PRECAUTIONARY NOTES**

1. The information included in this document reflects representative usage scenarios and is intended for technical reference only.
2. The part number, type, and specifications mentioned in this document are subject to future change and improvement without notice. Before production usage customer should refer to the latest datasheet for the updated specifications.
3. When using the products referenced in this document, please make sure the product is being operated within the environmental and electrical limits specified in the datasheet. If customer usage exceeds the specified limits, Kingbright will not be responsible for any subsequent issues.
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