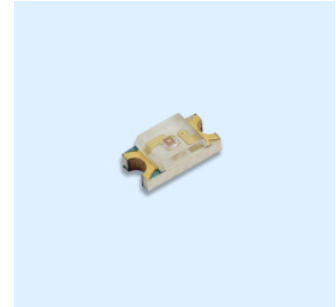


## Technical Data Sheet

### 1206 Package Chip LED

**15-21-R6C-B0Q1R2B0E-2T-AM**

#### Lead (Pb) Free Product - RoHS Compliant



#### Feature

- RoHS compliant.
- Chip LED package.
- Colorless clear resin
- Wide viewing angle 130°.
- Brightness: 71 to 180 mcd at 20 mA.
- Qualification according to AEC-Q101.
- Precondition: Bases on JEDEC J-STD 020 Level 2.
- Automotive reflow profile (IR reflow or wave soldering))

#### Applications

- Automotive backlighting or indicator: Dashboard, switch, audio and video equipments...etc.
- Backlight: LCD, switches, symbol, mobile phone and illuminated advertising.
- Display for indoor and outdoor application.
- Ideal for coupling into light guides.
- Substitution of traditional light.
- Optical indicator.
- General applications.

#### Device Selection Guide

| Chip     | Emitted Color | Resin Color |
|----------|---------------|-------------|
| Material |               |             |
| AlGaInP  | Brilliant Red | Water Clear |

**Technical Data Sheet**

**1206 Package Chip LED**

**15-21-R6C-B0Q1R2B0E-2T-AM**

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

| Parameter                                 | Symbol        | Rating  | Unit |
|---|---------------|---|------|
| Reverse Voltage                           | $V_R$         | 12  | V    |
| Forward Current                           | $I_F$         | 30  | mA   |
| Peak Forward Current<br>(Duty 1/10 @1KHz) | $I_{FP}$      | 60  | mA   |
| Power Dissipation                         | $P_d$         | 60  | mW   |
| Junction Temperature                      | $T_j$         | 125   | °C   |
| Operating Temperature                     | $T_{opr}$     | -40 ~ +100  | °C   |
| Storage Temperature                       | $T_{stg}$     | -40 ~ +110  | °C   |
| Thermal resistance                        | $R_{th\ J-A}$ | 800   | K/W  |
|   | $R_{th\ J-S}$ | 450   | K/W  |
| Soldering Temperature                     | $T_{sol}$     | Reflow Soldering : 260 °C for 30 sec.<br>Hand Soldering : 350 °C for 3 sec. |      |
| ESD<br>(Classification acc. AEC Q101)     | $ESD_{HBM}$   | 2000  | V    |
|   | $ESD_{MM}$    | 200   | V    |

## Technical Data Sheet

### 1206 Package Chip LED

#### 15-21-R6C-B0Q1R2B0E-2T-AM

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

| Parameter                              | Symbol           | Min.  | Typ.  | Max.  | Unit    | Condition  |
|--|------------------|-------|-------|-------|---------|------------|
| Luminous Intensity                     | $I_v$            | 71    | ----- | 180   | mcd     | $I_F=20mA$ |
| Viewing Angle                          | $2\theta_{1/2}$  | ----- | 130   | ----- | deg     | $I_F=20mA$ |
| Peak Wavelength                        | $\lambda_p$      | ----- | 632   | ----- | nm      | $I_F=20mA$ |
| Dominant Wavelength                    | $\lambda_d$      | 617.5 | ----  | 629.5 | nm      | $I_F=20mA$ |
| Spectrum Radiation Bandwidth           | $\Delta\lambda$  | ----- | 20    | ----- | nm      | $I_F=20mA$ |
| Forward Voltage                        | $V_F$            | 1.75  | ----  | 2.35  | V       | $I_F=20mA$ |
| Reverse Current                        | $I_R$            | ----- | ----- | 10    | $\mu A$ | $V_R=12V$  |
| Temperature coefficient of $\lambda_p$ | $TC_{\lambda_p}$ | ----- | 0.06  | ----- | nm/K    | $I_F=20mA$ |
| Temperature coefficient of $\lambda_d$ | $TC_{\lambda_d}$ | ----- | 0.4   | ----- | nm/K    | $I_F=20mA$ |
| Temperature coefficient of $V_F$       | $TC_V$           | ----- | -2.3  | ----- | mV/K    | $I_F=20mA$ |

Note:

Tolerance of Luminous Intensity:  $\pm 11\%$

Tolerance of Dominant Wavelength:  $\pm 1nm$

Tolerance of Forward Voltage:  $\pm 0.1V$

**Technical Data Sheet**

**1206 Package Chip LED**

**15-21-R6C-B0Q1R2B0E-2T-AM**

**Bin Range of Luminous Intensity**

| Bin Code | Min. | Max. | Unit | Condition            |
|----------|------|------|------|----------------------|
| Q1       | 71   | 90   | mcd  | I <sub>F</sub> =20mA |
| Q2       | 90   | 112  |      |                      |
| R1       | 112  | 140  |      |                      |
| R2       | 140  | 180  |      |                      |

Note

Tolerance of Luminous Intensity : ±11%

**Bin Range of Dominant Wavelength**

| Bin Code | Min.  | Max.  | Unit | Condition            |
|----------|-------|-------|------|----------------------|
| E4       | 617.5 | 621.5 | nm   | I <sub>F</sub> =20mA |
| E5       | 621.5 | 625.5 |      |                      |
| E6       | 625.5 | 629.5 |      |                      |

Note:

Tolerance of Dominant Wavelength: ±1nm

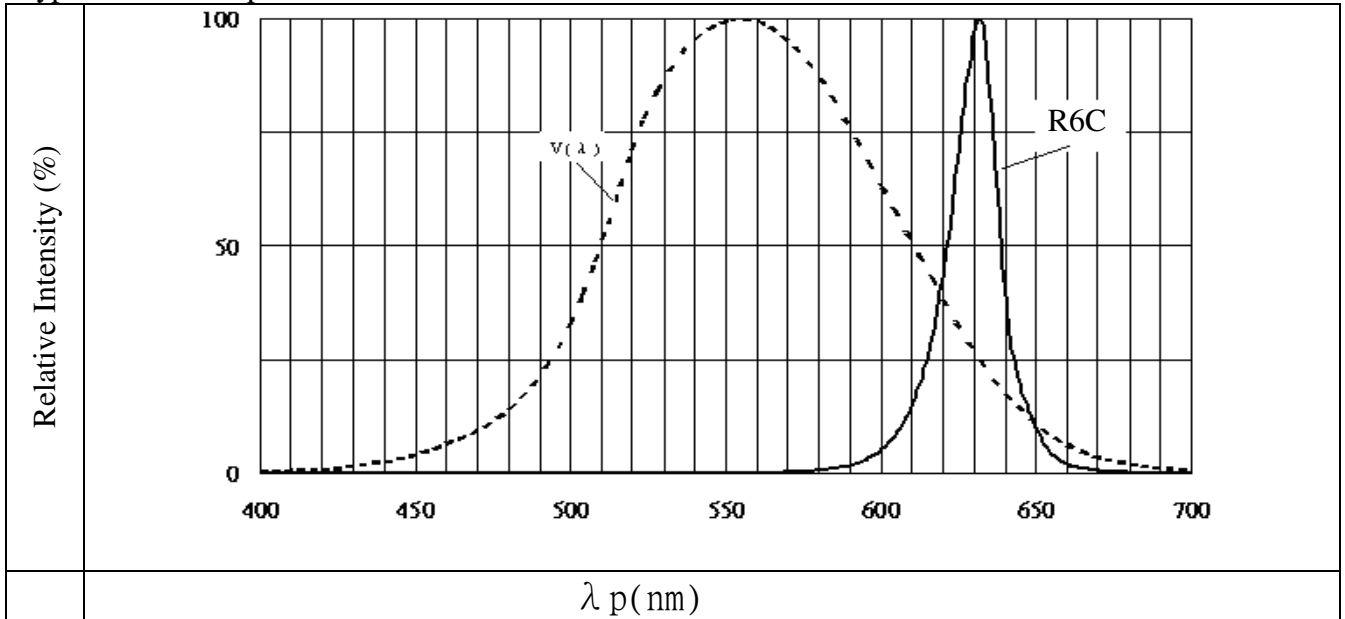
**Technical Data Sheet**

**1206 Package Chip LED**

**15-21-R6C-B0Q1R2B0E-2T-AM**

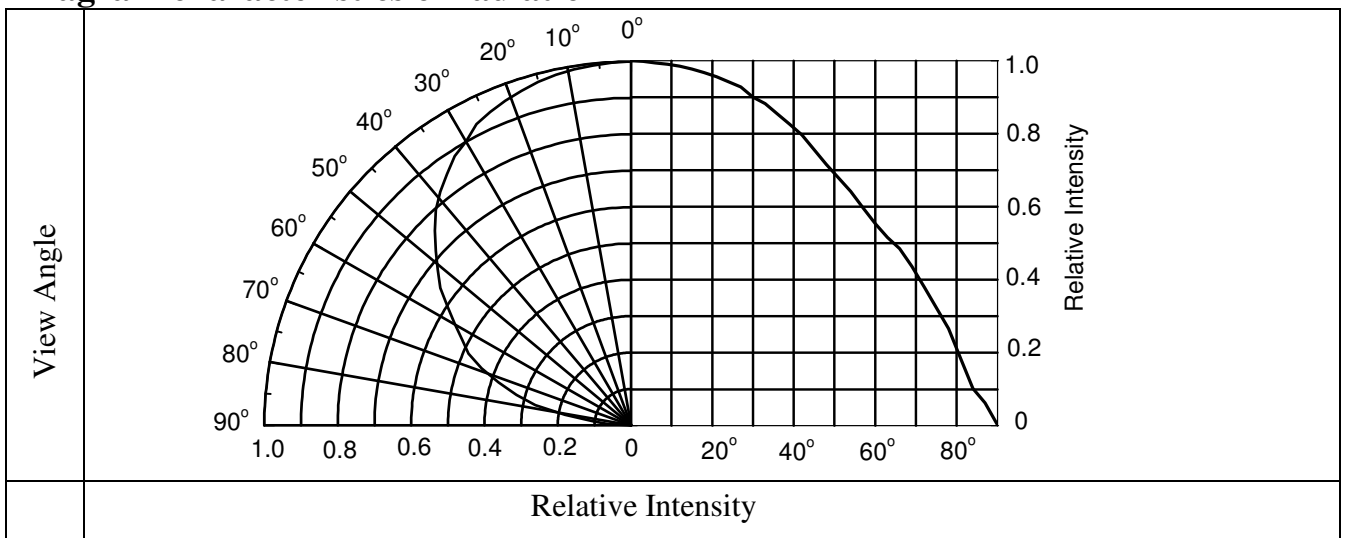
**Typical Electro-Optical Characteristics Curves**

Typical curve of spectral distribution:



Note: V(λ)=Standard eye response curve

**Diagram characteristics of radiation**



**Technical Data Sheet**

**1206 Package Chip LED**

**15-21-R6C-B0Q1R2B0E-2T-AM**

|  |                      |  |                      |
|--|----------------------|--|----------------------|
| <b>Forward Current vs. Forward Voltage</b><br><b>(Ta=25°C)</b>             |                      | <b>Dominant Wavelength vs. Forward Current</b><br><b>(Ta=25°C)</b> |                      |
| Forward Current (mA)   |                      | Dominant Wavelength (nm)   |                      |
|  | Forward Voltage (V)  |  | Forward Current (mA) |
| <b>Relative Luminous Intensity vs. Forward Current</b><br><b>(Ta=25°C)</b> |                      | <b>Max. Permissible Forwarded Current</b><br><b>(Ta=25°C)</b>      |                      |
| Relative Luminous Intensity  |                      | Forward Current (mA)   |                      |
|  | Forward Current (mA) |  | Temperature (°C)     |

**Technical Data Sheet**

**1206 Package Chip LED**

**15-21-R6C-B0Q1R2B0E-2T-AM**

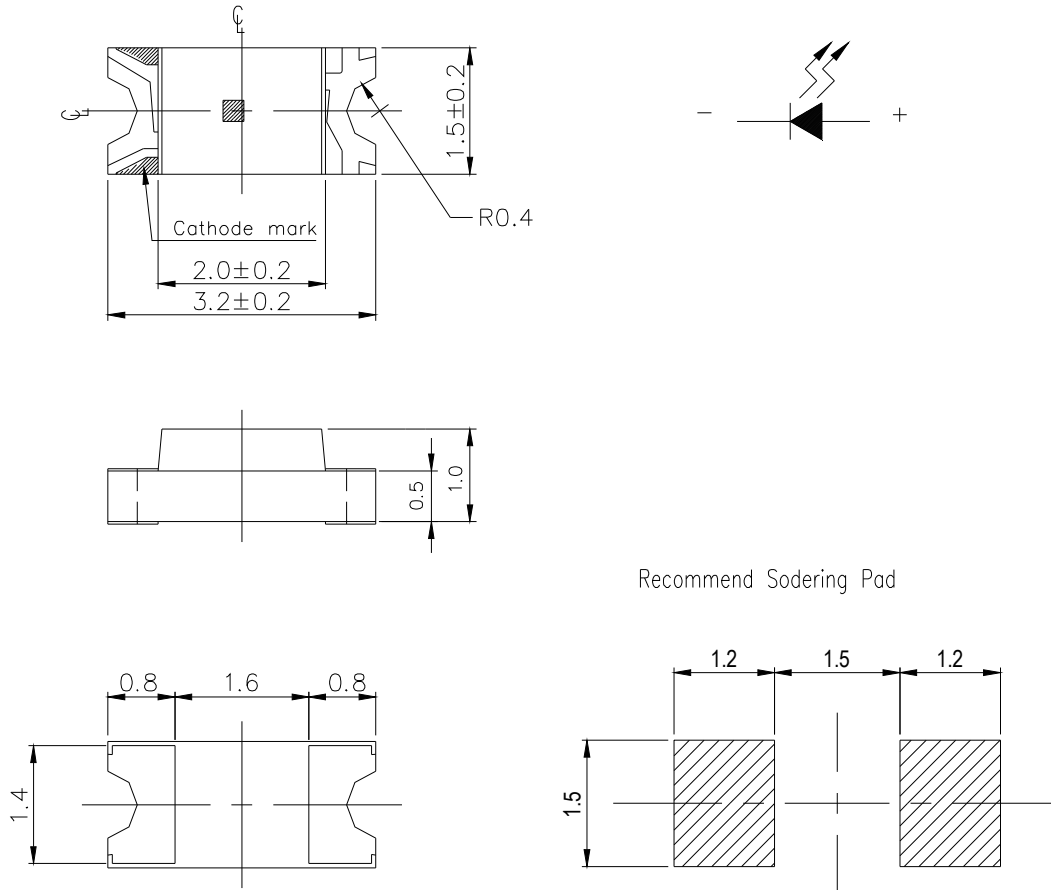
| Relative Luminous Intensity vs. Junction Temperature            |                           | Relative Forward Voltage vs. Junction Temperature                            |                           |
|---|---------------------------|--|---------------------------|
| Relative Luminous Intensity                                     |                           | Relative Luminous Intensity  |                           |
|   | Junction Temperature (°C) |  | Junction Temperature (°C) |
| Note: $f(T_j) = I_v - I_v(25^\circ\text{C}); I_F = 20\text{mA}$ |                           | Note: $\Delta V_F = V_F / V_F(25^\circ\text{C}) = f(T_j); I_F = 20\text{mA}$ |                           |

**Technical Data Sheet**

**1206 Package Chip LED**

**15-21-R6C-B0Q1R2B0E-2T-AM**

**Package Dimension**



Note: Tolerances unless mentioned  $\pm 0.1$ mm. Unit = mm

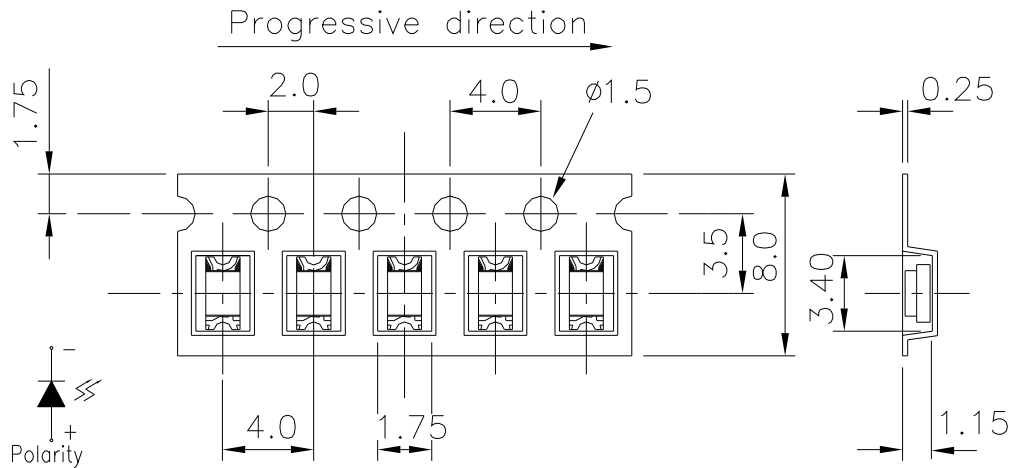


**Technical Data Sheet**

**1206 Package Chip LED**

**15-21-R6C-B0Q1R2B0E-2T-AM**

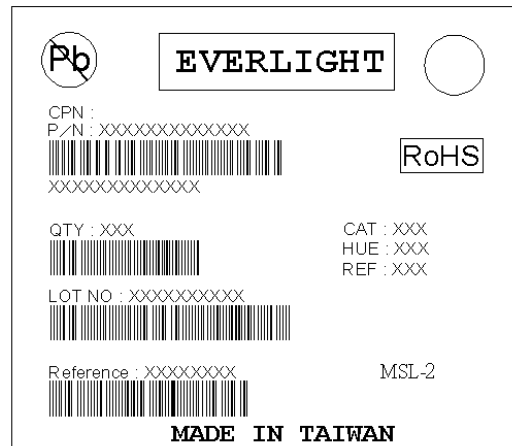
**Carrier Tape Dimensions: Loaded Quantity 2000 pcs Per Reel**



Note: Tolerances unless mentioned  $\pm 0.1$ mm. Unit = mm

**Label Explanation**

- **CPN: Customer's Product Number**
- **P/N: Product Number**
- **QTY: Packing Quantity**
- **CAT: Luminous Intensity Rank**
- **HUE: Dom. Wavelength Rank**
- **REF: Forward Voltage Rank**
- **LOT No: Lot Number**

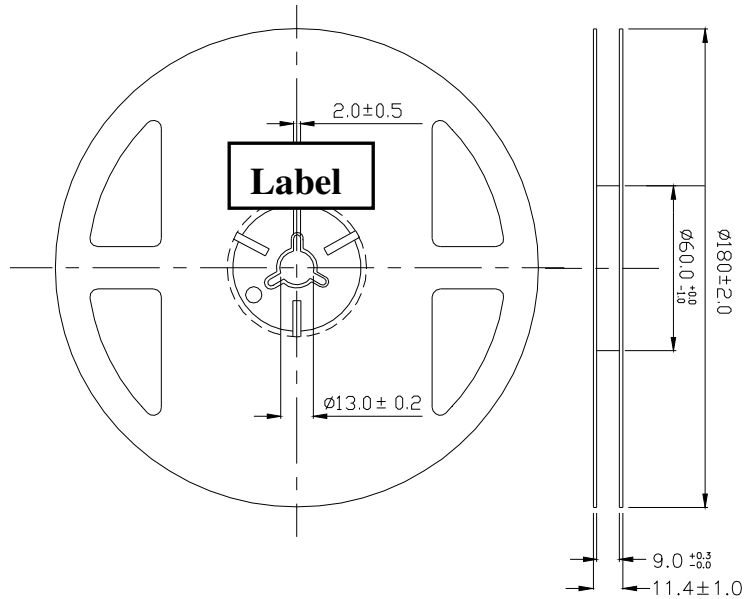


**Technical Data Sheet**

**1206 Package Chip LED**

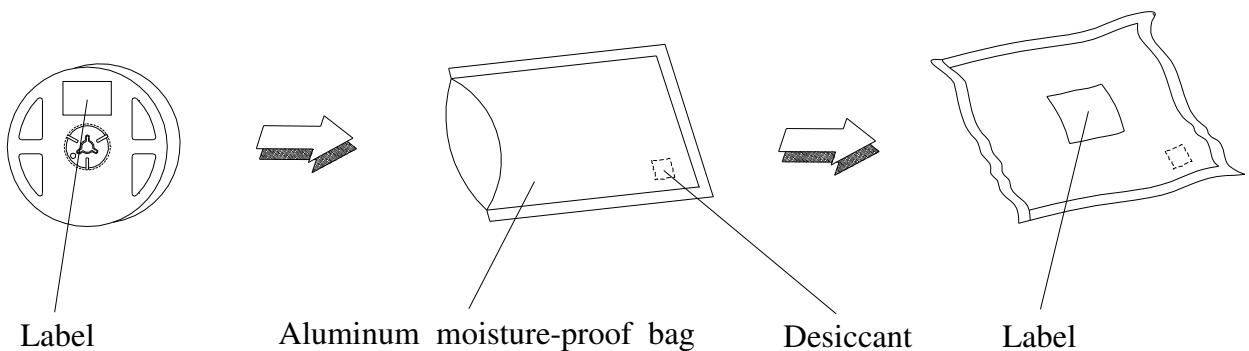
**15-21-R6C-B0Q1R2B0E-2T-AM**

**Reel Dimensions**



Note: Unit = mm

**Moisture Resistant Packaging Process and Materials**



**Technical Data Sheet**

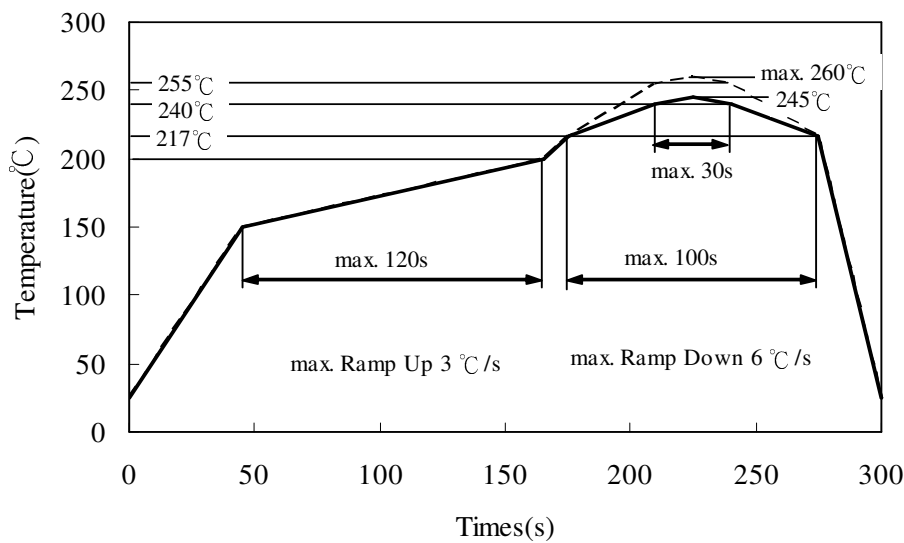
**1206 Package Chip LED**

**15-21-R6C-B0Q1R2B0E-2T-AM**

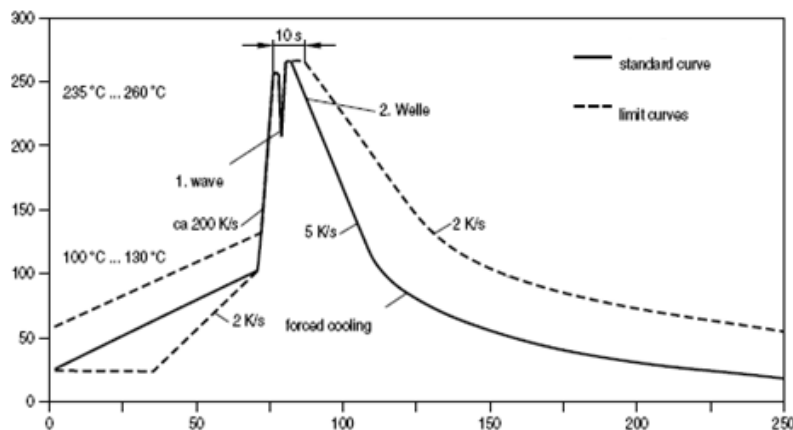
**Precautions for Use**

**1. Soldering Condition (Reference: IPC/JEDEC J-STD-020D)**

**a. IR reflow**



**b. Wave soldering reflow**

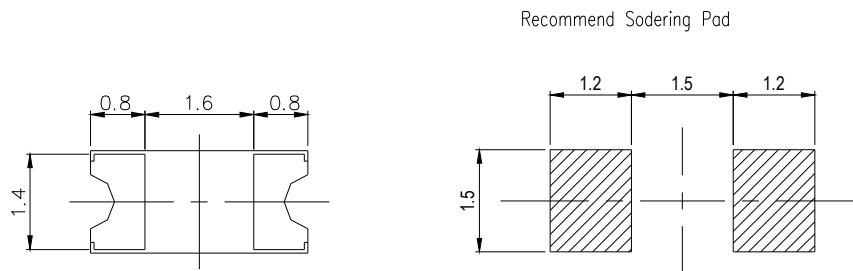


## Technical Data Sheet

### 1206 Package Chip LED

#### 15-21-R6C-B0Q1R2B0E-2T-AM

#### (B) Recommend soldering pad



Note: Tolerances unless mentioned  $\pm 0.1\text{mm}$ . Unit = mm

#### 2. Current limiting

A resistor should be used to limit current spikes that can be caused by voltage fluctuations. Otherwise damage could occur.

#### 3. Storage

3.1 Moisture proof bag should only be opened immediately prior to usage.

3.2 Environment should be less than  $30^{\circ}\text{C}$  and 60% RH when moisture proof bag is opened.

3.3 After opening the package MSL Conditions stated on page 1 of this spec should not be exceeded.

3.4 If the moisture sensitivity card indicates higher than acceptable moisture, the component should be baked at min.  $60\text{deg} \pm 5\text{deg}$  for 24 hours.

#### 4. Iron Soldering

Hand soldering is not recommended for regular production. These guidelines are for rework only. Soldering iron tip should contact each terminal no more than 3 sec at  $350^{\circ}\text{C}$ , using soldering iron with nominal power less than 25W. Allow min. 2 sec. between soldering intervals.

#### 5. Usage

Do not exceed the values given in this specification.

### Application Restrictions

- High reliability applications such as military/aerospace, automotive safety/security systems, and medical equipment may require different product. If you have any concerns, please contact Everlight before using this product in your application. This specification guarantees the quality and performance of the product as an individual component. Do not use this product beyond the specification described in this document.



**Technical Data Sheet**

**1206 Package Chip LED**

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**15-21-R6C-B0Q1R2B0E-2T-AM**

**Revision History:**

| <b>Rev.</b> | <b>Modified date</b> | <b>File modified contents</b> |
|-------------|----------------------|-------------------------------|
| 1           | 2011/6/30            | New Spec                      |
|             |                      |                               |
|             |                      |                               |
|             |                      |                               |
|             |                      |                               |
|             |                      |                               |
|             |                      |                               |