



Pb-free  
HEAT



# UW3803X

Φ3 Flush Mount Type White LED

## Features

|                          |                                                                                                                                                                                                                                                                                 |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Package                  | Φ3 Flush Mount Type. Water clear resin                                                                                                                                                                                                                                          |
| Product features         | <ul style="list-style-type: none"><li>• Outer Dimension    Φ3 Flush Mount Type.</li><li>• Operation temperature range<br/>Storage Temperature    : -40℃~100℃<br/>Operating Temperature   : -40℃~85℃</li><li>• Lead-free soldering compatible</li><li>• RoHs compliant</li></ul> |
| Chromaticity coordinates | x = 0.31TYP., y = 0.32TYP.<br>(Condition : I <sub>F</sub> =20mA)                                                                                                                                                                                                                |
| Spatial distribution     | 25 deg.                                                                                                                                                                                                                                                                         |
| Die materials            | InGaN                                                                                                                                                                                                                                                                           |
| Rank grouping parameter  | Sorted by luminous intensity rank and chromaticity rank                                                                                                                                                                                                                         |
| Soldering methods        | TTW (Through The Wave) soldering and manual soldering                                                                                                                                                                                                                           |
| ESD                      | 1kV (HBM)                                                                                                                                                                                                                                                                       |
| Packing                  | Bulk : 200pcs(MIN.)                                                                                                                                                                                                                                                             |

## Recommended Applications

Amusement Equipment, OA/FA, Other General Applications



# UW3803X

Φ3 Flush Mount Type White LED

## Color and Luminous Intensity

(T<sub>a</sub>=25°C)

| Part No. | Material | Emitted Color | Lens Color  | Luminous Intensity   |       |                |
|----------|----------|---------------|-------------|----------------------|-------|----------------|
|          |          |               |             | I <sub>v</sub> (mcd) |       |                |
|          |          |               |             | MIN.                 | TYP.  | I <sub>f</sub> |
| UW3803X  | InGaN    | White         | Water Clear | 1,400                | 2,400 | 20             |

# Absolute Maximum Ratings

**(T<sub>a</sub>=25℃)**

| Item                                        | Symbol           | Absolute Maximum Ratings | Unit |
|---------------------------------------------|------------------|--------------------------|------|
| Power Dissipation                           | P <sub>d</sub>   | 107                      | mW   |
| Forward Current                             | I <sub>F</sub>   | 25                       | mA   |
| Pulse Forward Current ※1                    | I <sub>FRM</sub> | 60                       | mA   |
| Derating<br>(T <sub>a</sub> =25℃ or higher) | $\Delta I_F$     | 0.33                     | mA/℃ |
| Reverse Voltage                             | V <sub>R</sub>   | 5                        | V    |
| Operating Temperature                       | T <sub>opr</sub> | -40 ~ +85                | ℃    |
| Storage Temperature                         | T <sub>stg</sub> | -40 ~ +100               | ℃    |

※1 I<sub>FRM</sub> Measurement condition : Pulse Width  $\leq 1$ ms., Duty  $\leq 1/20$ .

# Electro-Optical Characteristics

**(T<sub>a</sub>=25℃)**

| Item                     | Condition            | Symbol            | Characteristics |      | Unit          |
|--------------------------|----------------------|-------------------|-----------------|------|---------------|
|                          |                      |                   |                 |      |               |
| Forward Voltage          | I <sub>F</sub> =20mA | V <sub>F</sub>    | TYP.            | 3.7  | V             |
|                          |                      |                   | MAX.            | 4.2  |               |
| Reverse Current          | V <sub>R</sub> =5V   | I <sub>R</sub>    | MAX.            | 100  | <del>μA</del> |
| Half Intensity Angle     | I <sub>F</sub> =20mA | <del>2θ 1/2</del> | TYP.            | 25   | deg.          |
| Chromaticity Coordinates | I <sub>F</sub> =20mA | x                 | TYP.            | 0.31 | -             |
|                          |                      | y                 | TYP.            | 0.32 | -             |

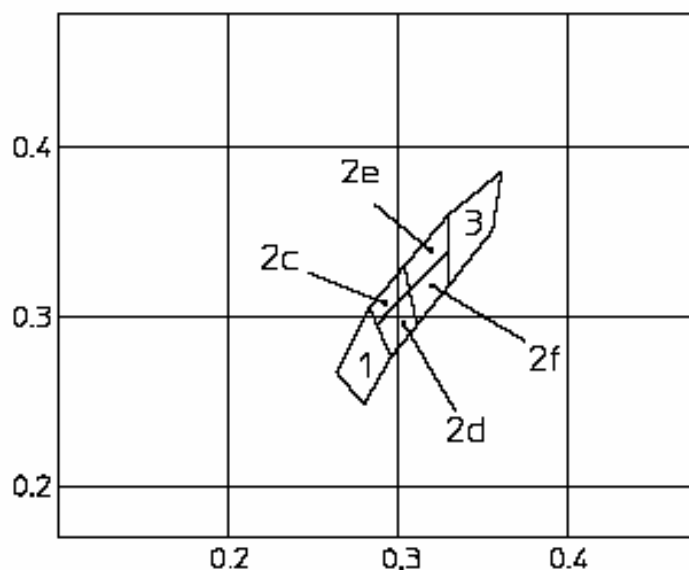
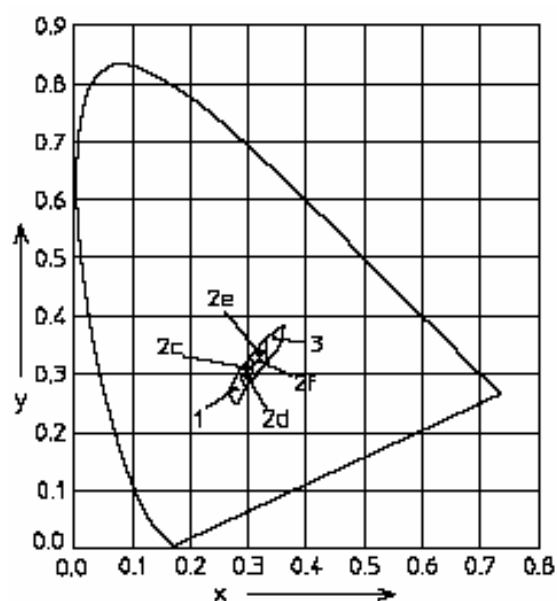
# Luminous Intensity Rank

**(T<sub>a</sub>=25℃)**

| Rank | I <sub>v</sub> (mcd) |       | Condition            |
|------|----------------------|-------|----------------------|
|      | MIN.                 | MAX.  |                      |
| A    | 1,400                | 2,800 | I <sub>F</sub> =20mA |
| B    | 2,000                | 4,000 |                      |
| C    | 2,800                | 5,600 |                      |
| D    | 4,000                | 8,000 |                      |
| E    | 5,600                | -     |                      |

※ Please contact our sales staff concerning rank designation.

## Sorting Chart for Chromaticity Coordinates



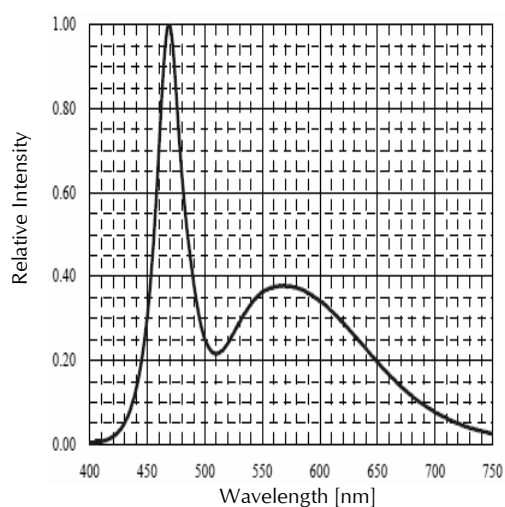
|      | LEFT DOWN point |       | LEFT UP point |       | RIGHT UP point |       | RIGHT UP point |       | Conditions           |
|------|-----------------|-------|---------------|-------|----------------|-------|----------------|-------|----------------------|
| Rank | x               | y     | x             | y     | x              | y     | x              | y     |                      |
| 1    | 0.280           | 0.248 | 0.264         | 0.267 | 0.283          | 0.305 | 0.296          | 0.276 | I <sub>F</sub> =20mA |
| 2c   | 0.287           | 0.295 | 0.283         | 0.305 | 0.304          | 0.330 | 0.307          | 0.315 |                      |
| 2d   | 0.296           | 0.276 | 0.287         | 0.295 | 0.307          | 0.315 | 0.311          | 0.294 |                      |
| 2e   | 0.307           | 0.315 | 0.304         | 0.330 | 0.330          | 0.360 | 0.330          | 0.339 |                      |
| 2f   | 0.311           | 0.294 | 0.307         | 0.315 | 0.330          | 0.339 | 0.330          | 0.318 |                      |
| 3    | 0.330           | 0.318 | 0.330         | 0.360 | 0.361          | 0.385 | 0.356          | 0.351 |                      |

Chromaticity Coordinates Tolerance Each Rank : +/-0.02

※Please contact our sales staff concerning rank designation.

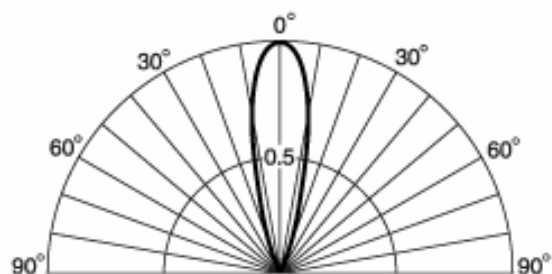
## Technical Data

**Spectral Distribution**  
Relative Intensity vs. Wavelength  
Condition :  $T_a = 25^\circ\text{C}$ ,  $I_F = 20\text{mA}$

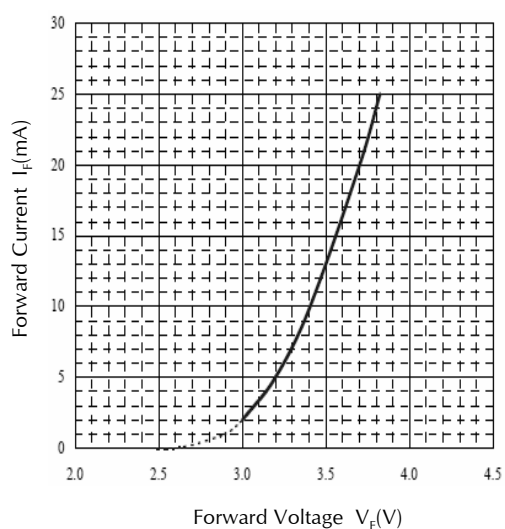


**Spatial Distribution Example**

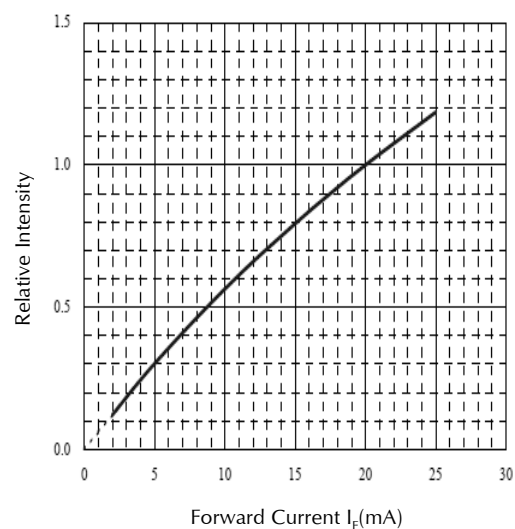
Condition :  $T_a = 25^\circ\text{C}$ ,  $I_F = 20\text{mA}$



**Forward Voltage vs. Forward Current**  
Condition :  $T_a = 25^\circ\text{C}$



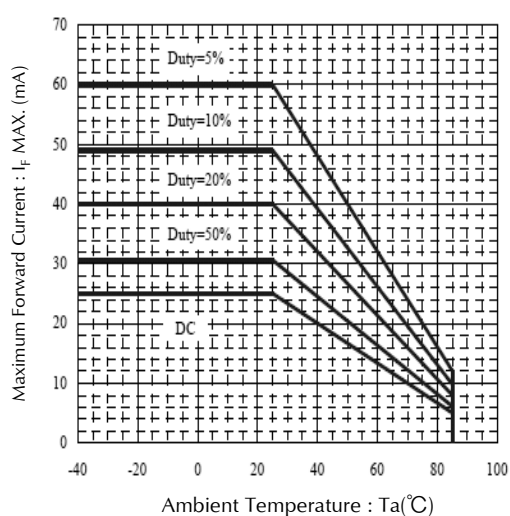
**Forward Current vs. Relative Intensity**  
Condition :  $T_a = 25^\circ\text{C}$



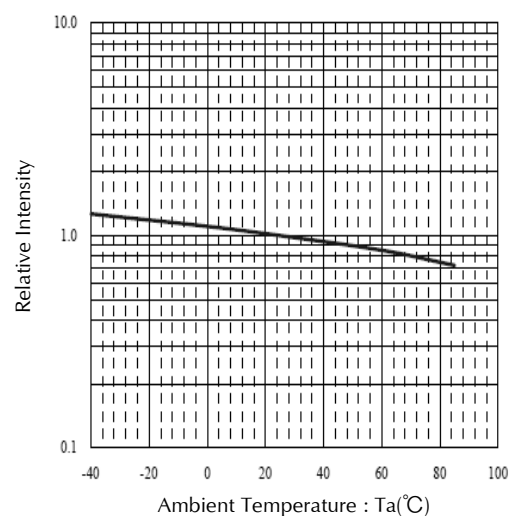
## Technical Data

### Derating

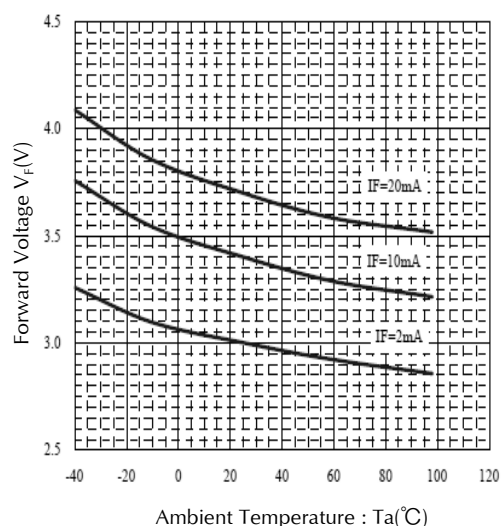
Ambient Temperature vs. Maximum Forward Current  
Repetition Frequency :  $f \geq 50\text{Hz}$



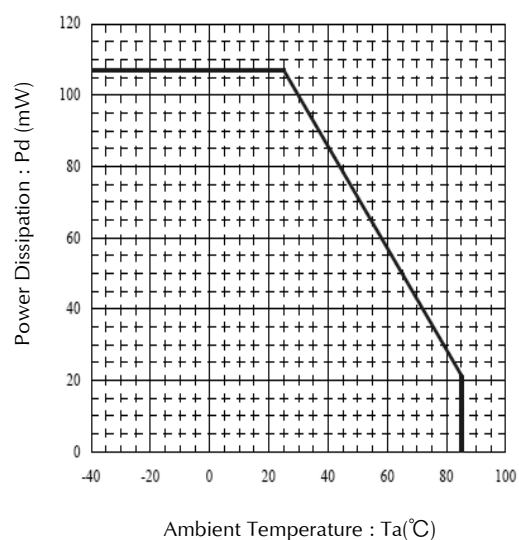
### Ambient Temperature vs. Relative Intensity



### Ambient Temperature vs. Forward Voltage



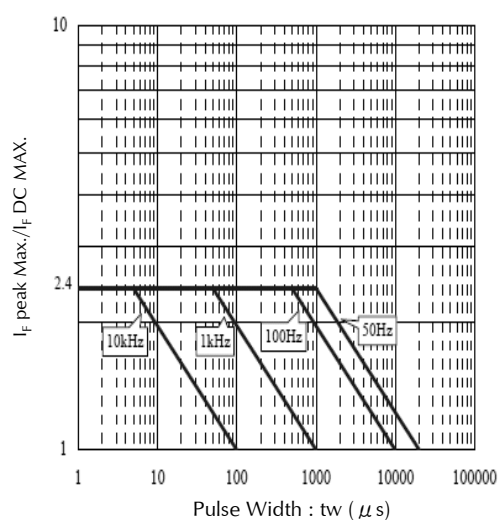
### Power Dissipation vs. Ambient Temperature



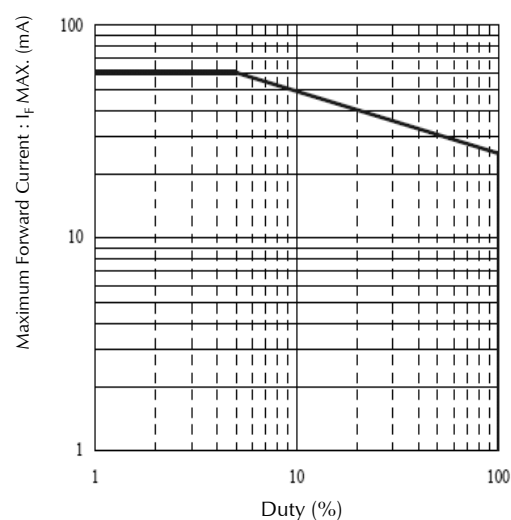


## Technical Data

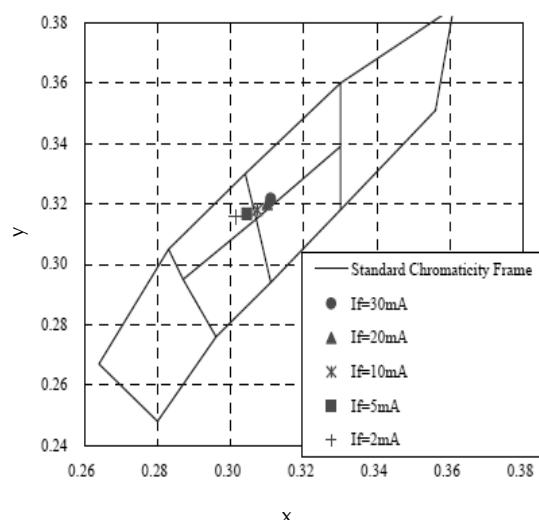
**Pulse Width vs. Maximum Tolerable Peak Current**  
Condition :  $T_a = 25^\circ\text{C}$



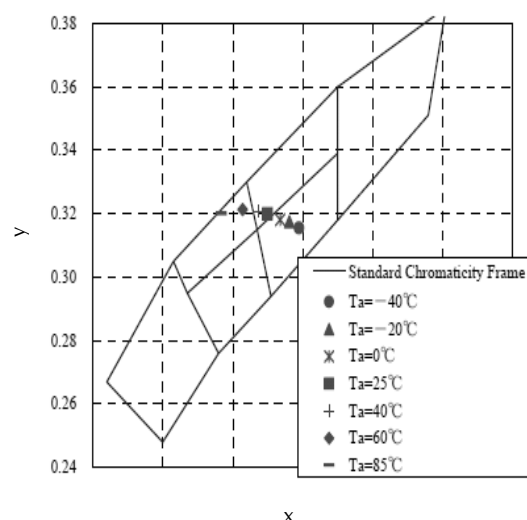
**Dynamic Drive Rating**  
Duty cycle vs. Maximum Forward Current



**Forward Current vs. Chromaticity (typ. value)**  
Condition :  $T_a = 25^\circ\text{C}$



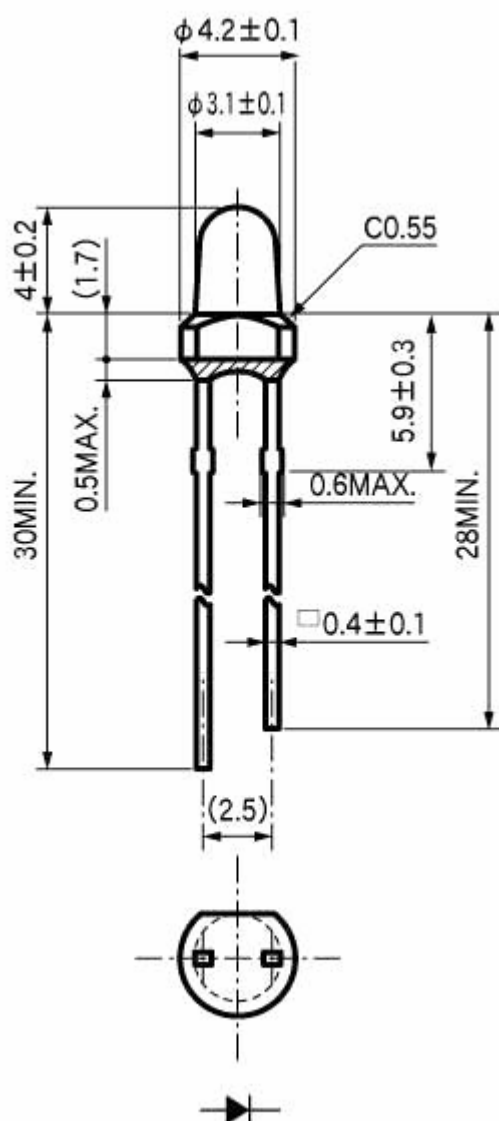
**Ambient Temperature vs. Chromaticity (typ. value)**  
Condition :  $I_F = 20\text{mA}$



## Package Dimensions

(Unit: mm)

Weight: (0.16)g



## TTW (Through The Wave) soldering Conditions

|                   |        |        |
|-------------------|--------|--------|
| Pre-heating       | 100 °C | (MAX.) |
| Solder Bath Temp. | 265°C  | (MAX.) |
| Dipping Time      | 5 s    | (MAX.) |

- 1) The dip soldering process shall be 2 times maximum.
  - 2) The product shall be cooled to room temp. before the second dipping process.
- ※The detail is described to LED and Photodetector handling precautions of home page:  
"Mounting through-hole Type Devices" and "Soldering", and use it after the confirmation, please.

## Manual Soldering Conditions

|                              |         |        |
|------------------------------|---------|--------|
| Iron tip temp.               | 400°C   | (MAX.) |
| Soldering time and frequency | 3 s     | (MAX.) |
|                              | 2 times | (MAX.) |

※The detail is described to LED and Photodetector handling precautions of home page:  
"Mounting through-hole Type Devices" and "Soldering", and use it after the confirmation, please.

## Reliability Testing Result

| Reliability Testing Result    | Applicable Standard   | Testing Conditions                                                                                                                                | Duration | Failure |
|-------------------------------|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|----------|---------|
| Room Temp. Operating Life     | EIAJ ED-4701/100(101) | Ta = 25°C, If = Maximum Rated Current                                                                                                             | 1,000 h  | 0/25    |
| Resistance to Soldering Heat  | EIAJ ED-4701/300(302) | 260±5°C, 1.6mm from package base                                                                                                                  | 10s      | 0/25    |
| Temperature Cycling           | EIAJ ED-4701/100(105) | Minimum Rated Storage Temperature(30min)<br>~Normal Temperature(15min)<br>~Maximum Rated Storage Temperature(30min)<br>~Normal Temperature(15min) | 5 cycles | 0/25    |
| Wet High Temp. Storage Life   | EIAJ ED-4701/100(103) | Ta = 60±2°C, RH = 90±5%                                                                                                                           | 1,000 h  | 0/25    |
| High Temp. Storage Life       | EIAJ ED-4701/200(201) | Ta = Maximum Rated Storage Temperature                                                                                                            | 1,000 h  | 0/25    |
| Low Temp. Storage Life        | EIAJ ED-4701/200(202) | Ta = Minimum Rated Storage Temperature                                                                                                            | 1,000 h  | 0/25    |
| Lead Tension                  | EIAJ ED-4701/400(401) | 10N, 1time (□0.4 and Flat Package : 5N)                                                                                                           | 10s      | 0/10    |
| Vibration, Variable Frequency | EIAJ ED-4701/400(403) | 98.1m/s <sup>2</sup> (10G), 100 ~ 2KHz sweep for 20min., XYZ each direction                                                                       | 2 h      | 0/10    |

## Failure Criteria

| Items               | Symbols        | Conditions                                          | Failure criteria                                                |
|---------------------|----------------|-----------------------------------------------------|-----------------------------------------------------------------|
| Luminous Intensity  | Iv             | If Value of each product<br>Luminous Intensity      | Testing Min. Value < Spec. Min. Value x 0.5                     |
| Forward Voltage     | V <sub>F</sub> | If Value of each product<br>Forward Voltage         | Testing Max. Value ≥ Spec. Max. Value x 1.2                     |
| Reverse Current     | I <sub>R</sub> | V <sub>R</sub> = Maximum Rated<br>Reverse Voltage V | Testing Max. Value ≥ Spec. Max. Value x 2.5                     |
| Cosmetic Appearance | -              | -                                                   | Occurrence of notable decoloration,<br>deformation and cracking |

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