



**Opto Plus LED Corp.**  
**0.52" Case Mold Type LED Display**  
**OPD-T5212W | OPD-T5213W**

● **EDIT HISTORY**

Version A : Mar. 14, 2024

Preliminary Spec.



# Opto Plus LED Corp.

## 0.52" Case Mold Type LED Display

### OPD-T5212W | OPD-T5213W

## ● FEATURES

- 0.52 inch (13.2 mm) Digit Height.
- Low current operation.
- Case mold type.
- RoHS compliant, Pb Free.

## ● DESCRIPTION

The device are 0.52 inch (13.2 mm) height triple digit 7-segment displays.

The device is Opto Plus LED Corp standard LED Display.

This device utilizes Super Bright White SMD type LED chip which are made from InGaN on a transparent GaN substrate.

The device has face and segment option, please refer to **PRODUCT APPEARANCE**.

## ● DEVICE

| PART NO. |               | DESCRIPTION                                 |
|----------|---------------|---------------------------------------------|
|          | OPD-T5212W-GW | Common Anode   Gray face   White segment    |
|          | OPD-T5213W-GW | Common Cathode   Gray face   White segment  |
|          | OPD-T5212W-BW | Common Anode   Black face   White segment   |
|          | OPD-T5213W-BW | Common Cathode   Black face   White segment |

**RoHS Compliance**



**Pb Free.**

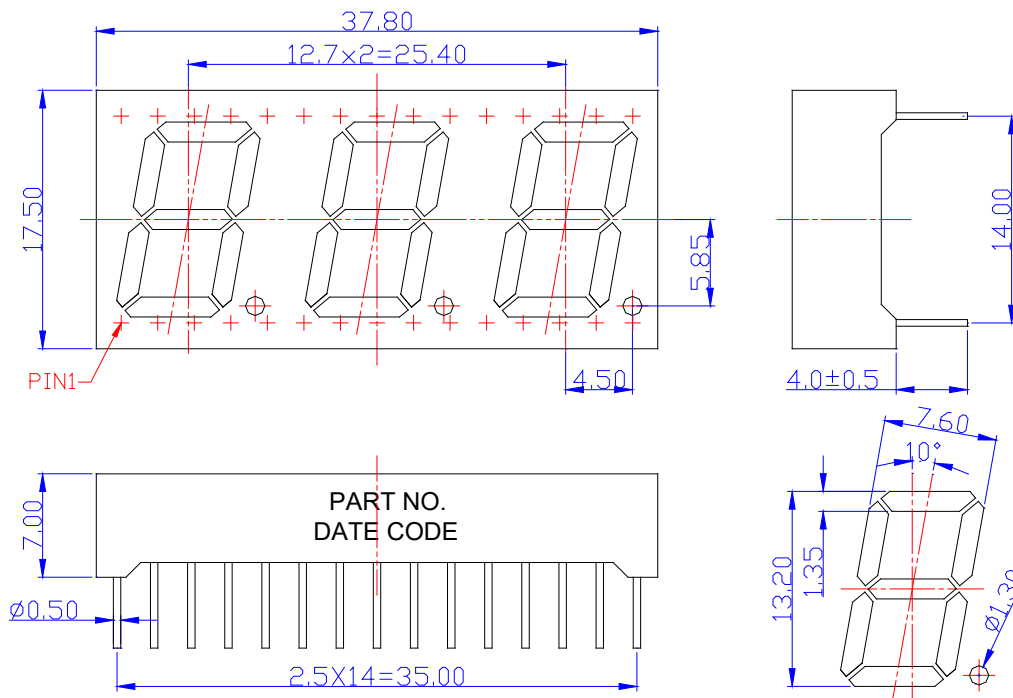


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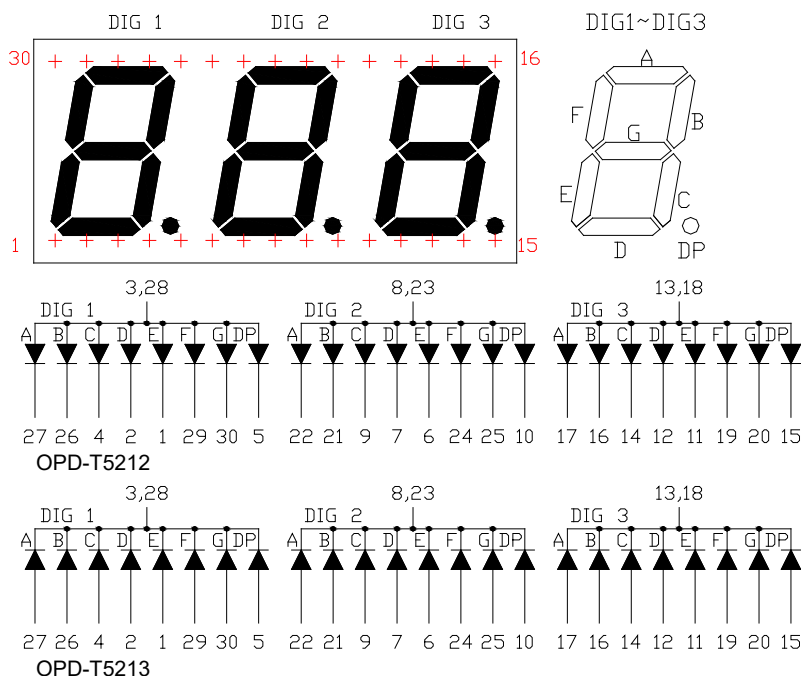
#### MECHANICAL DIMENSIONS



NOTES: Dimension is in millimeters. Tolerance is  $\pm 0.25$  mm unless otherwise noted.

#### TYPICAL INTERNAL EQUIVALENT CIRCUIT

Turn On Color



※EMITTED COLOR : SUPER BRIGHT WHITE



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#### ● W: SUPER BRIGHT WHITE (InGaN/GaN)

ABSOLUTE MAXIMUM RATING AT Ta=25°C

| Parameter                                     | Symbol           | Maximum Rating | Unit |
|-----------------------------------------------|------------------|----------------|------|
| Power dissipation per SMD                     | P <sub>AD</sub>  | 33             | mW   |
| Continuous forward current per SMD            | I <sub>AF</sub>  | 10             | mA   |
| Peak current per dice (duty cycle 1/10, 1kHz) | I <sub>PF</sub>  | 60             | mA   |
| Reverse voltage per SMD                       | V <sub>R</sub>   | 5              | V    |
| Operating temperature                         | T <sub>OPR</sub> | -25 to +85     | °C   |
| Storage temperature                           | T <sub>STG</sub> | -25 to +85     | °C   |

ELECTRICAL - OPTICAL CHARACTERISTICS AT Ta=25°C

| Characteristic                     | Symbol         | Condition           | Min. | Typ.  | Max. | Unit |
|------------------------------------|----------------|---------------------|------|-------|------|------|
| Forward Voltage per SMD            | V <sub>F</sub> | I <sub>F</sub> =5mA | -    | 2.9   | 3.2  | V    |
| Reverse Current                    | I <sub>R</sub> | V <sub>R</sub> =5V  | -    | -     | 10   | μA   |
| Peak Wavelength per SMD            | λ <sub>P</sub> | I <sub>F</sub> =5mA | X    | 0.285 | -    | nm   |
|                                    |                |                     | Y    | 0.275 | -    |      |
| Average Luminous Intensity per SMD | I <sub>v</sub> | I <sub>F</sub> =5mA | -    | 180   | -    | mcd  |
| Spectrum Radiation Bandwidth       | Δλ             | I <sub>F</sub> =5mA | -    | 30    | -    | nm   |



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#### ● WHITE: BIN GRADE (Unit : mcd / I<sub>v</sub>=5mA)

| 1           | 2           | 3           | 4           | 5           | 6           | 7           | 8           |
|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 112.5-126.0 | 126.0-140.0 | 140.0-160.0 | 160.0-180.0 | 180.0-202.0 | 202.0-226.0 | 226.0-255.5 | 255.5-285.0 |
| R11         | R12         | R21         | R22         | S11         | S12         | S21         | S22         |

#### ● COLOR BIN

| AA2  |      | BB1  |      | BB2  |      | CC2  |      | DD1  |      | DD2  |      |
|------|------|------|------|------|------|------|------|------|------|------|------|
| X    | Y    | X    | Y    | X    | Y    | X    | Y    | X    | Y    | X    | Y    |
| 0.27 | 0.24 | 0.28 | 0.25 | 0.29 | 0.26 | 0.27 | 0.25 | 0.28 | 0.26 | 0.29 | 0.27 |
| 0.27 | 0.25 | 0.28 | 0.26 | 0.29 | 0.27 | 0.27 | 0.26 | 0.28 | 0.27 | 0.29 | 0.28 |
| 0.28 | 0.26 | 0.29 | 0.27 | 0.3  | 0.28 | 0.28 | 0.27 | 0.29 | 0.28 | 0.3  | 0.29 |
| 0.28 | 0.25 | 0.29 | 0.26 | 0.3  | 0.27 | 0.28 | 0.26 | 0.29 | 0.27 | 0.3  | 0.28 |
| EE2  |      | FF1  |      | FF2  |      | GG2  |      | HH1  |      | HH2  |      |
| X    | Y    | X    | Y    | X    | Y    | X    | Y    | X    | Y    | X    | Y    |
| 0.27 | 0.26 | 0.28 | 0.27 | 0.29 | 0.28 | 0.27 | 0.27 | 0.28 | 0.28 | 0.29 | 0.29 |
| 0.27 | 0.27 | 0.28 | 0.28 | 0.29 | 0.29 | 0.27 | 0.28 | 0.28 | 0.29 | 0.29 | 0.3  |
| 0.28 | 0.28 | 0.29 | 0.29 | 0.3  | 0.3  | 0.28 | 0.29 | 0.29 | 0.3  | 0.3  | 0.31 |
| 0.28 | 0.27 | 0.29 | 0.28 | 0.3  | 0.29 | 0.28 | 0.28 | 0.29 | 0.29 | 0.3  | 0.3  |

#### ● AVAILABLE BIN / HUE TABLE

|     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1A2 | 1B1 | 1B2 | 1C2 | 1D1 | 1D2 | 1E2 | 1F1 | 1F2 | 1G2 | 1H1 | 1H2 |
| 2A2 | 2B1 | 2B2 | 2C2 | 2D1 | 2D2 | 2E2 | 2F1 | 2F2 | 2G2 | 2H1 | 2H2 |
| 3A2 | 3B1 | 3B2 | 3C2 | 3D1 | 3D2 | 3E2 | 3F1 | 3F2 | 3G2 | 3H1 | 3H2 |
| 4A2 | 4B1 | 4B2 | 4C2 | 4D1 | 4D2 | 4E2 | 4F1 | 4F2 | 4G2 | 4H1 | 4H2 |
| 5A2 | 5B1 | 5B2 | 5C2 | 5D1 | 5D2 | 5E2 | 5F1 | 5F2 | 5G2 | 5H1 | 5H2 |
| 6A2 | 6B1 | 6B2 | 6C2 | 6D1 | 6D2 | 6E2 | 6F1 | 6F2 | 6G2 | 6H1 | 6H2 |
| 7A2 | 7B1 | 7B2 | 7C2 | 7D1 | 7D2 | 7E2 | 7F1 | 7F2 | 7G2 | 7H1 | 7H2 |
| 8A2 | 8B1 | 8B2 | 8C2 | 8D1 | 8D2 | 8E2 | 8F1 | 8F2 | 8G2 | 8H1 | 8H2 |

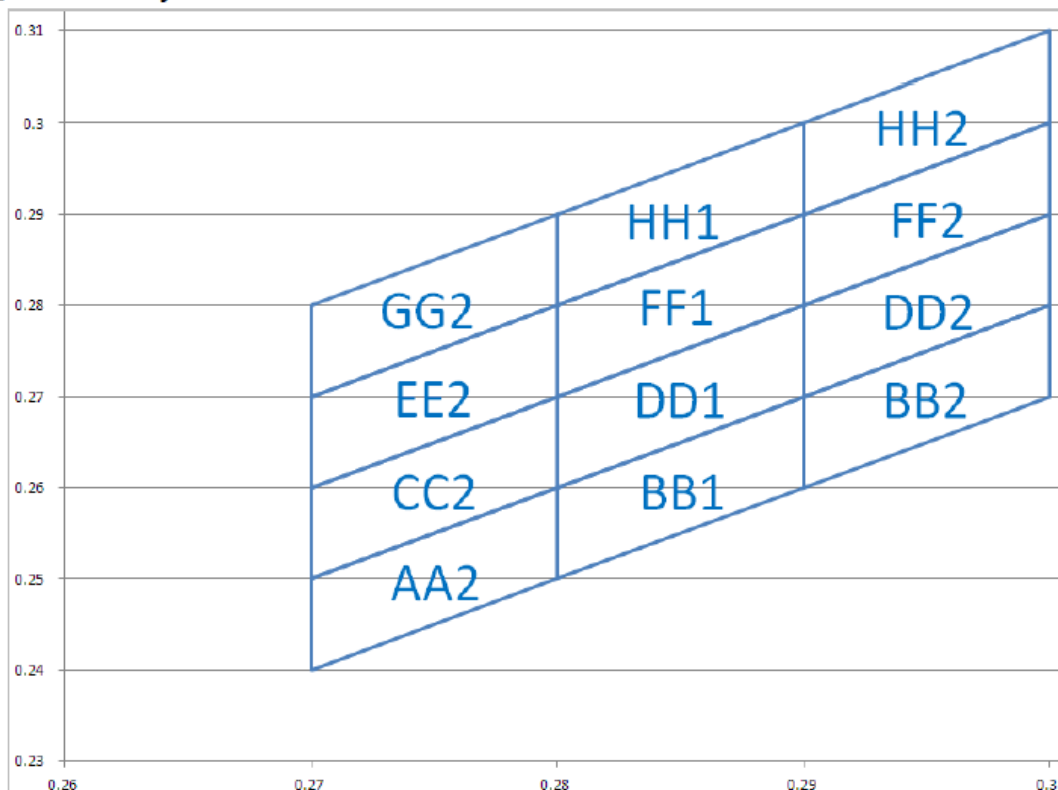
Note: It maintains a tolerance of x,y ±0.007

# Opto Plus LED Corp.

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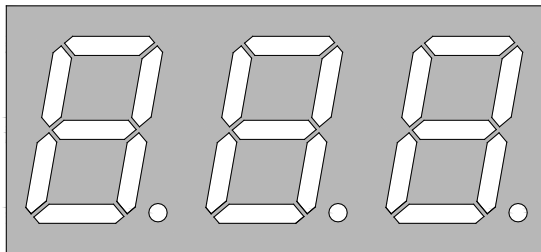
### OPD-T5212W | OPD-T5213W

■ Chromaticity Coordinate



## ● PRODUCT APPEARANCE

The most common reflector color and segment color are show in below diagram.

| -GW                                                                               | -BW                                                                                |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|  |  |
| ※ REFLECTOR COLOR: Gray<br>※ SEGMENT COLOR: White                                 | ※ REFLECTOR COLOR: Black<br>※ SEGMENT COLOR: White                                 |

Opto Plus can customize reflector and segment colors by customer's request. If you have these request please visit [www.opledtw.com](http://www.opledtw.com) or contact [sales@opledtw.com](mailto:sales@opledtw.com) for more **Standard Product Customization** information.

Part NO. related to reflector and segment colors show as table below.

| PART NO.      | DESCRIPTION                                 |
|---------------|---------------------------------------------|
| OPD-T5212W-GW | Common Anode   Gray face   White segment    |
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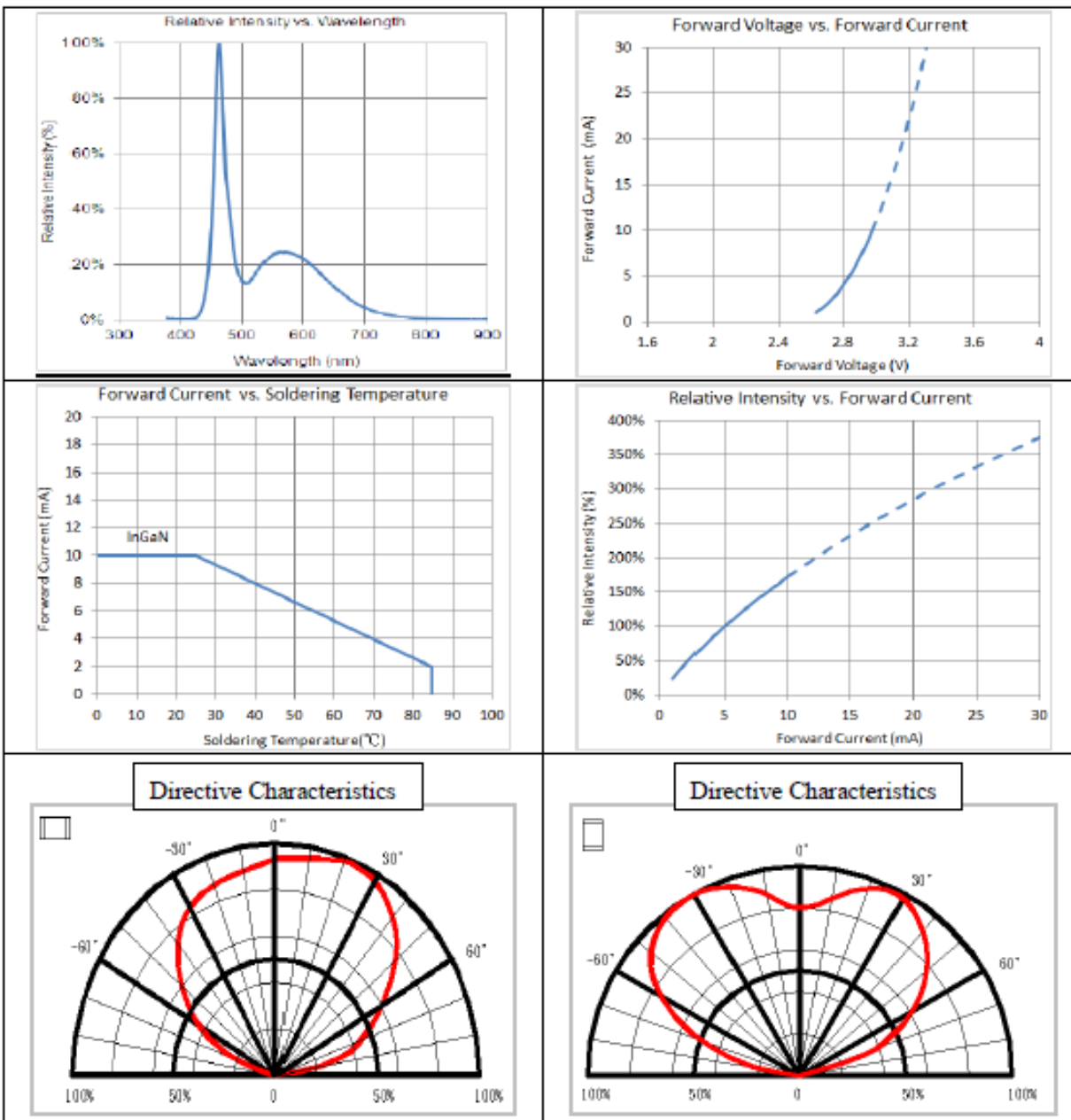
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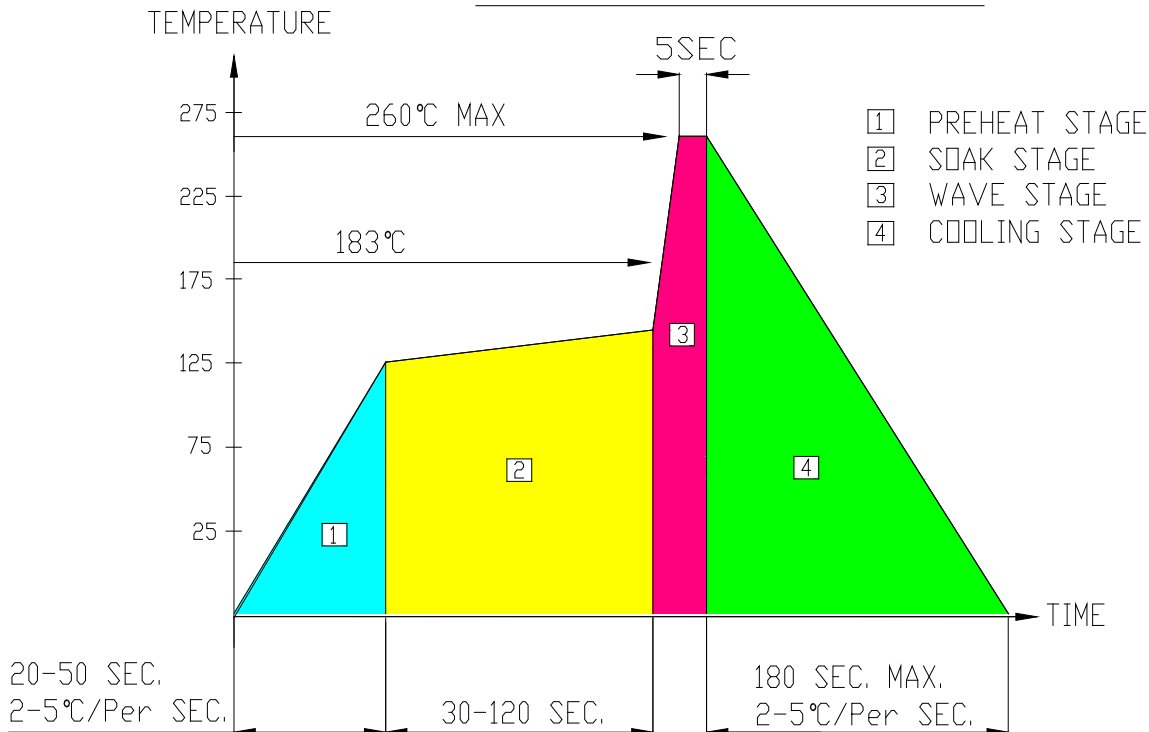
#### ● W: SUPER BRIGHT WHITE (InGaN/GaN) CURVE

Typical Electro-optical Characteristic Curves  
(25 °C Free Air Temperature Unless Otherwise Specified)



## ● RECOMMEND SOLDERING PROFILE

### WAVE SOLDER PROFILE



## ● Note:

- Recommend pre-heat temperature of 105°C or less (as measured with a thermocouple attached to the LED pins) prior to immersion in the solder wave with a maximum solder bath temperature of 260°C
- Peak wave soldering temperature between 245°C ~ 225°C for 3 sec (5 sec max)
- No more than one wave soldering pass

## ● SOLDERING IRON

Basic spec is  $\leq 4$  sec when 260°C. If temperature is higher, time should be shorter (+10°C → 1 sec). Power dissipation of Iron should be smaller than 15W, and temperature should be controllable. Surface temperature of the device should be under 230°C.

## ● REWORK

Customer must finish rework within  $\leq 3$  sec under 350°C.  
 The head of soldering iron cannot touch copper foil.

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## LIFE TIME

25°C 5mA

