



**Opto Plus LED Corp.**  
**0.39" SMD Type LED Display**  
**OPS-Q4010SPG-GW**  
**OPS-Q4011SPG-GW**

● **EDIT HISTORY**

Version A: Oct. 28, 2015

Preliminary spec.

| Manufacture | Examination | Approving |
|-------------|-------------|-----------|
|             |             |           |

Version: A Date: 10/28/2015

Opto Plus LED Corp. 7F-3, No.496, Bannan Road, Zhonghe Dist., New Taipei City 235, Taiwan (R.O.C)

Website: [www.opled.com.tw](http://www.opled.com.tw) E-mail: [sales@opled.com.tw](mailto:sales@opled.com.tw) Tel: 886-2-2222-5698 Fax: 886-2-2222-2566



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● **FEATURES**

- 0.4 inch (10.16 mm) Digit Height.
- SMD type.
- Low current operation.
- Gray face, White segment.
- RoHS compliant, Pb Free.

● **DESCRIPTION**

The OPS-Q4010SPG-GW & OPS-Q4011SPG-GW are 0.4 inch (10.16mm) height Quadruple digit 7-segment displays.

This device utilizes Pure Green LED chip which are made from InGaN on a Transparent GaN, substrate.

The display has Gray face, White segment.

● **DEVICE**

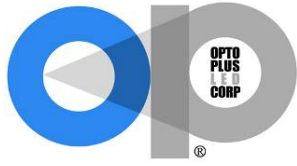
| PART NO         | DESCRIPTION    |
|-----------------|----------------|
| OPS-Q4010SPG-GW | Common Anode   |
| OPS-Q4011SPG-GW | Common Cathode |

**RoHS Compliance**



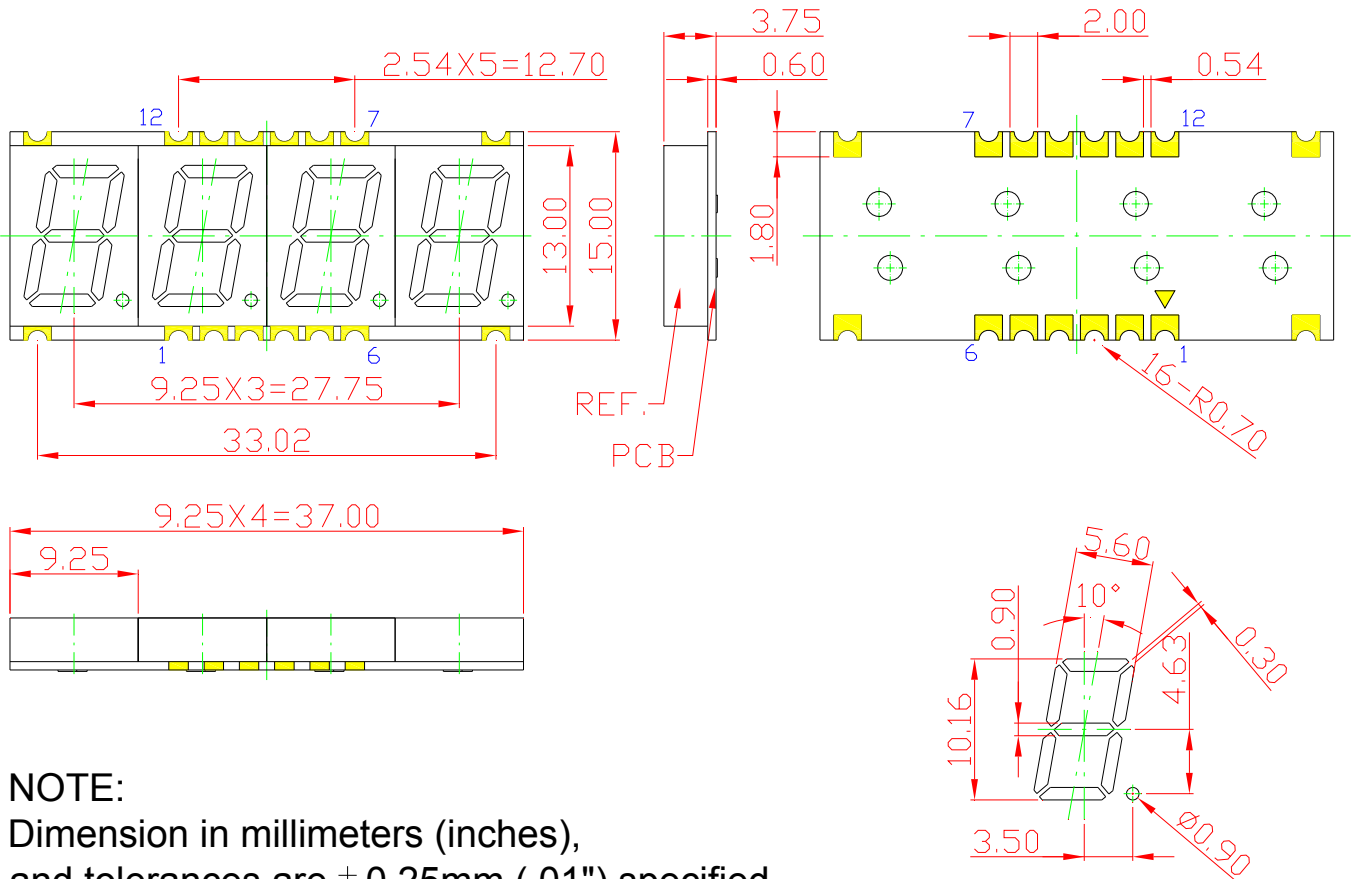
**Pb free.**



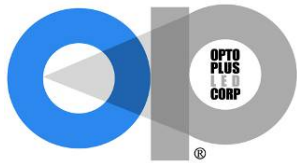


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● **MECHANICAL DIMENSIONS**

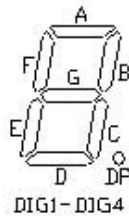
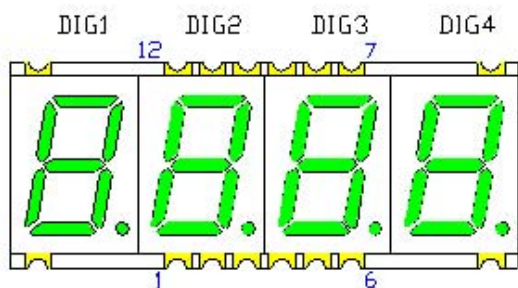


**NOTE:**  
 Dimension in millimeters (inches),  
 and tolerances are  $\pm 0.25$ mm (.01") specified.

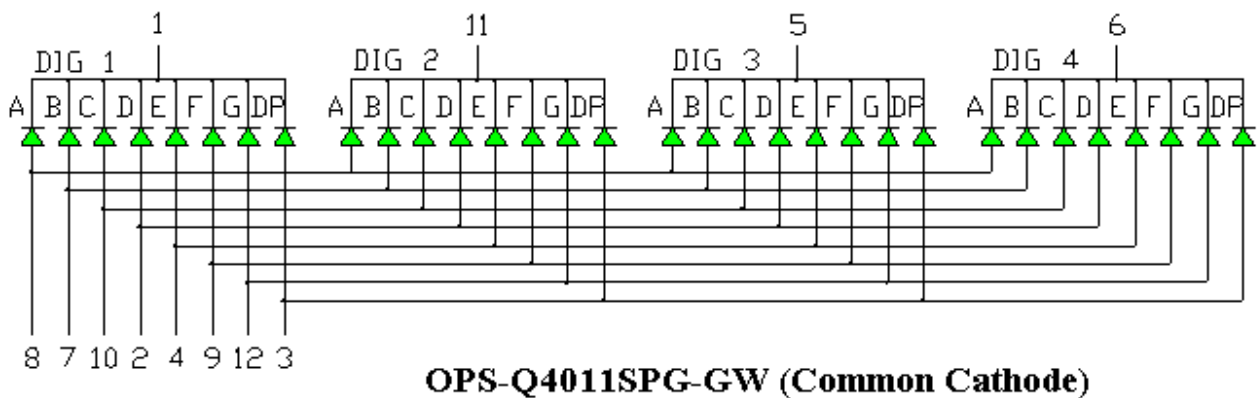
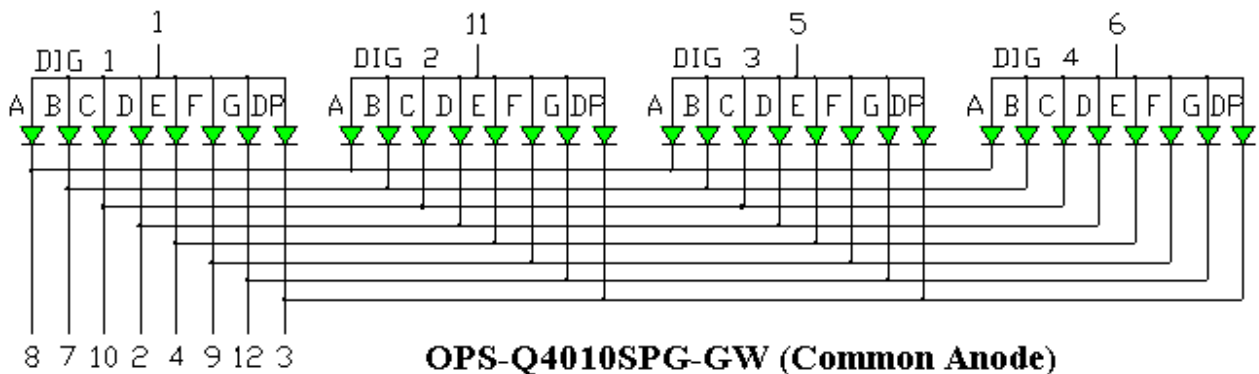
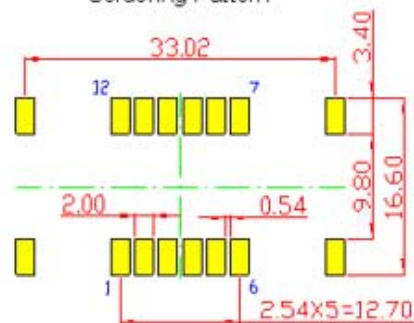


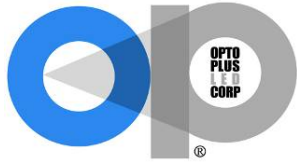
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● **TYPICAL INTERNAL EQUIVALENT CIRCUIT**



Recommended Soldering Pattern





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● **SPG: PURE GREEN (InGaN/GaN)**

ABSOLUTE MAXIMUM RATING AT Ta=25°C

| Parameter                            | Symbol           | Maximum Rating | Unit    |
|--------------------------------------|------------------|----------------|---------|
| Power dissipation                    | P <sub>AD</sub>  | 120            | mW      |
| Derating liner from 25°C             | -                | 0.3            | mA / °C |
| Continuous forward current           | I <sub>AF</sub>  | 30             | mA      |
| Peak current (duty cycle 1/10, 1kHz) | I <sub>PF</sub>  | 100            | mA      |
| Reverse voltage                      | V <sub>R</sub>   | 5              | V       |
| Operating temperature                | T <sub>OPR</sub> | -40 to +105    | °C      |
| Storage temperature                  | T <sub>STG</sub> | -40 to +105    | °C      |

ELECTRICAL - OPTICAL CHARACTERISTICS AT Ta=25°C

| Characteristic               | Symbol         | Condition             | Min. | Type. | Max. | Unit |
|------------------------------|----------------|-----------------------|------|-------|------|------|
| Forward Voltage, (Per Dice)  | V <sub>F</sub> | I <sub>F</sub> = 20mA | -    | 2.8   | 3.8  | V    |
| Reverse Current, (Per Dice)  | I <sub>R</sub> | V <sub>R</sub> = 8V   | -    | -     | 10   | μA   |
| Dominant Wavelength          | λ <sub>D</sub> | I <sub>F</sub> = 20mA | 515  | -     | 530  | nm   |
| Luminous Intensity           | I <sub>v</sub> | I <sub>F</sub> = 20mA | 70   | -     | 300  | mcd  |
| Spectral radiation bandwidth | Δλ             | I <sub>F</sub> = 20mA | -    | 30    | -    | nm   |



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● **SPG: BIN GRADE (Unit : mcd ) 20mA**

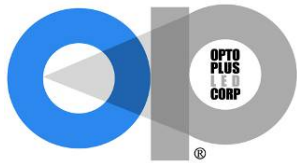
| PURE GREEN | Q            | R             | S             |
|------------|--------------|---------------|---------------|
|            | 70.0 – 140.0 | 140.1 – 220.0 | 220.1 – 300.0 |

● **SPG: HUE GRADE ( $\lambda_D$  : nm)**

| 1             | 2             | 3             |
|---------------|---------------|---------------|
| 515.0 – 520.0 | 520.1 – 525.0 | 525.1 – 530.0 |

● **AVAILABLE BIN / HUE TABLE**

|    |    |    |
|----|----|----|
| Q1 | R1 | S1 |
| Q2 | R2 | S2 |
| Q3 | R3 | S3 |



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## 0.39" SMD Type LED Display

### OPS-Q4010SPG-GW

### OPS-Q4011SPG-GW

#### ● SPG: PURE GREEN (InGaN/GaN) CURVE

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

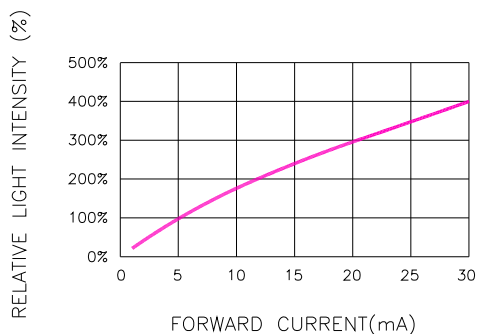


Fig.1 RELATIVE LIGHT INTENSITY VS. FORWARD CURRENT

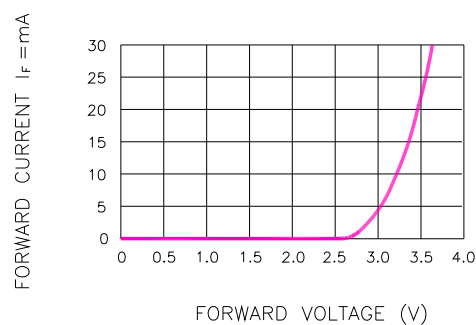


Fig.2 FORWARD CURRENT VS. FORWARD VOLTAGE

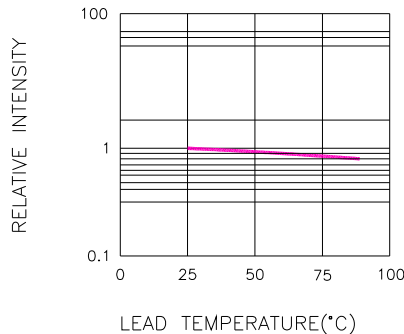


Fig.3 RELATIVE INTENSITY VS. LEAD TEMPERATURE  
(PULSED 20 mA; 300us PULSE, 10ms PERIOD)

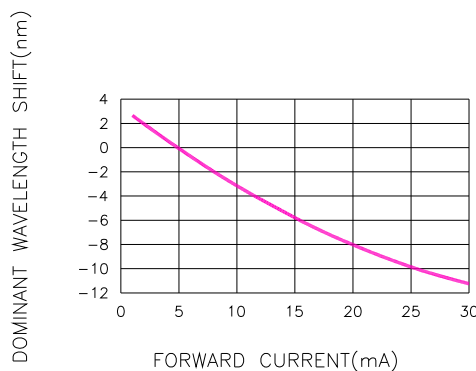


Fig.4 DOMINANT WAVELENGTH SHIFT VS. FORWARD CURRENT

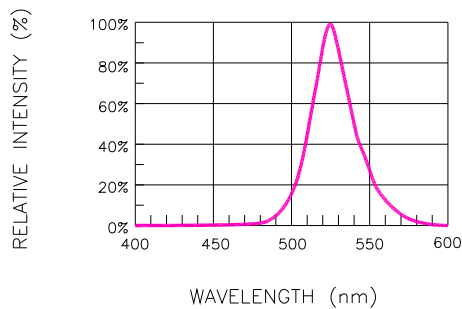


Fig.5 RELATIVE INTENSITY VS. WAVELENGTH

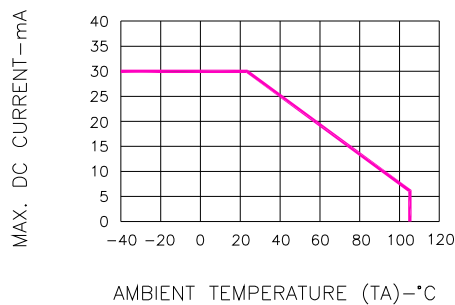


Fig.6 MAX. ALLOWABLE DC CURRENT VS. AMBIENT TEMPERATURE

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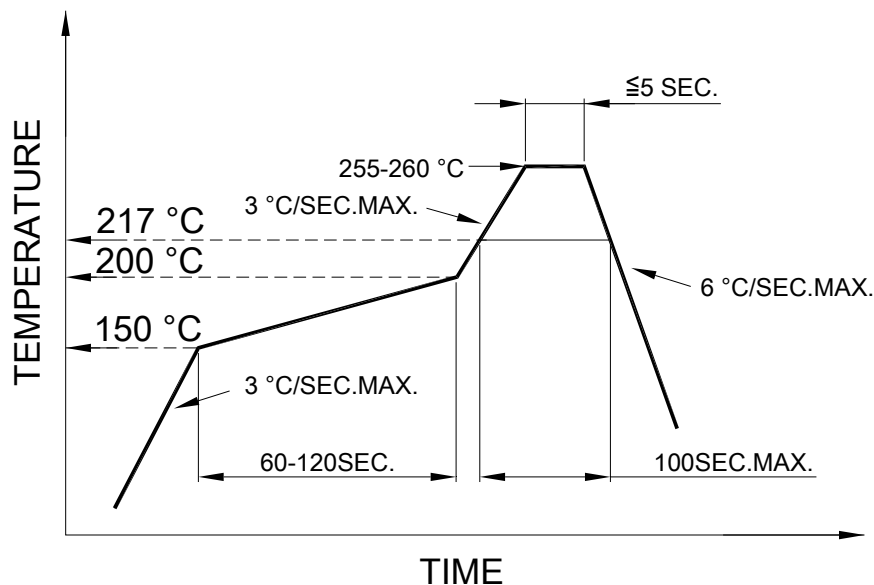


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● **RECOMMEND SOLDERING PROFILE**

SMT Soldering Profile

Pb free reflow soldering Profile



- We recommend the reflow temperature 245°C (+/- 5°C).  
The maximum soldering temperature should be limited to 260°C.
- Number of reflow process shall be 2 times or less.

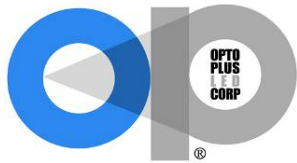
● **SOLDERING IRON**

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 3 sec. under 350°C.
- The head of soldering iron cannot touch copper foil.





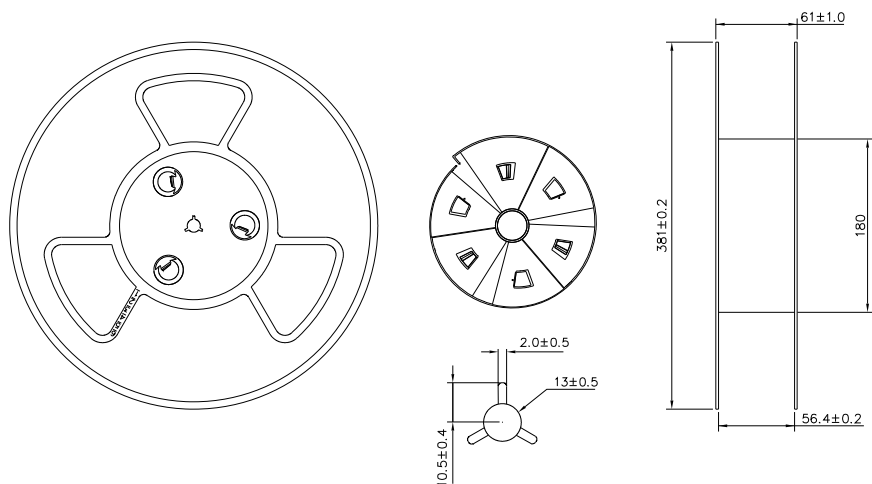
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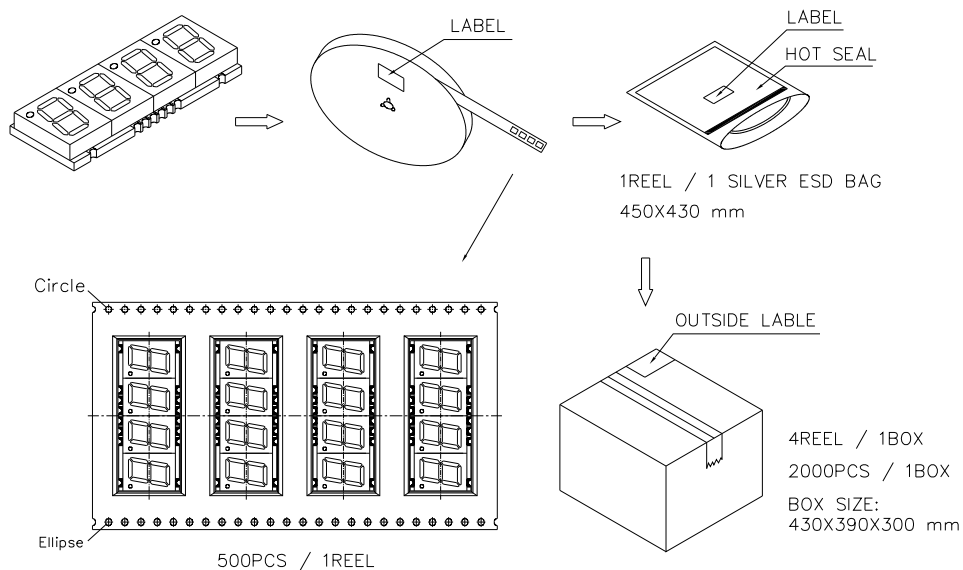
### OPS-Q4010SPG-GW

### OPS-Q4011SPG-GW

#### ● REEL DIMENSIONS



#### ● PACKING & LABEL SPECIFICATIONS



#### ● STORAGE CONDITION

In factory original sealed bag package

| TEMPERATURE CONDITION | HUMIDITY CONDITION |
|-----------------------|--------------------|
| 5°C ~ 30°C            | Below 60%RH        |

After opened and not in factory original sealed bag package

| TEMPERATURE CONDITION | HUMIDITY CONDITION | STORAGE TIME                     |
|-----------------------|--------------------|----------------------------------|
| 5°C ~ 30°C            | Below 60%RH        | Within 4 weeks (MSL as level 2a) |

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