



**Opto Plus LED Corp.**  
**0.4" SMD Type LED Display**  
**OPS-AD4020SB-GW**  
**OPS-AD4021SB-GW**

● **EDIT HISTORY**

Version A: Nov. 05, 2015

Preliminary Spec.

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



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**0.4" SMD Type LED Display**  
**OPS-AD4020SB-GW**  
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● **FEATURES**

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

● **DESCRIPTION**

The OPS-AD4020SB-GW & OPS-AD4021SB-GW are 0.4 inch (10.16 mm) height dual alphanumeric display.

This device utilizes Super Bright Blue LED chip which are made from InGaN On a transparent GaN, substrate.

The display has Gray face, White segment.

● **DEVICE**

| PART NO         | DESCRIPTION    |
|-----------------|----------------|
| OPS-AD4020SB-GW | Common Anode   |
| OPS-AD4021SB-GW | Common Cathode |

**RoHS Compliance**



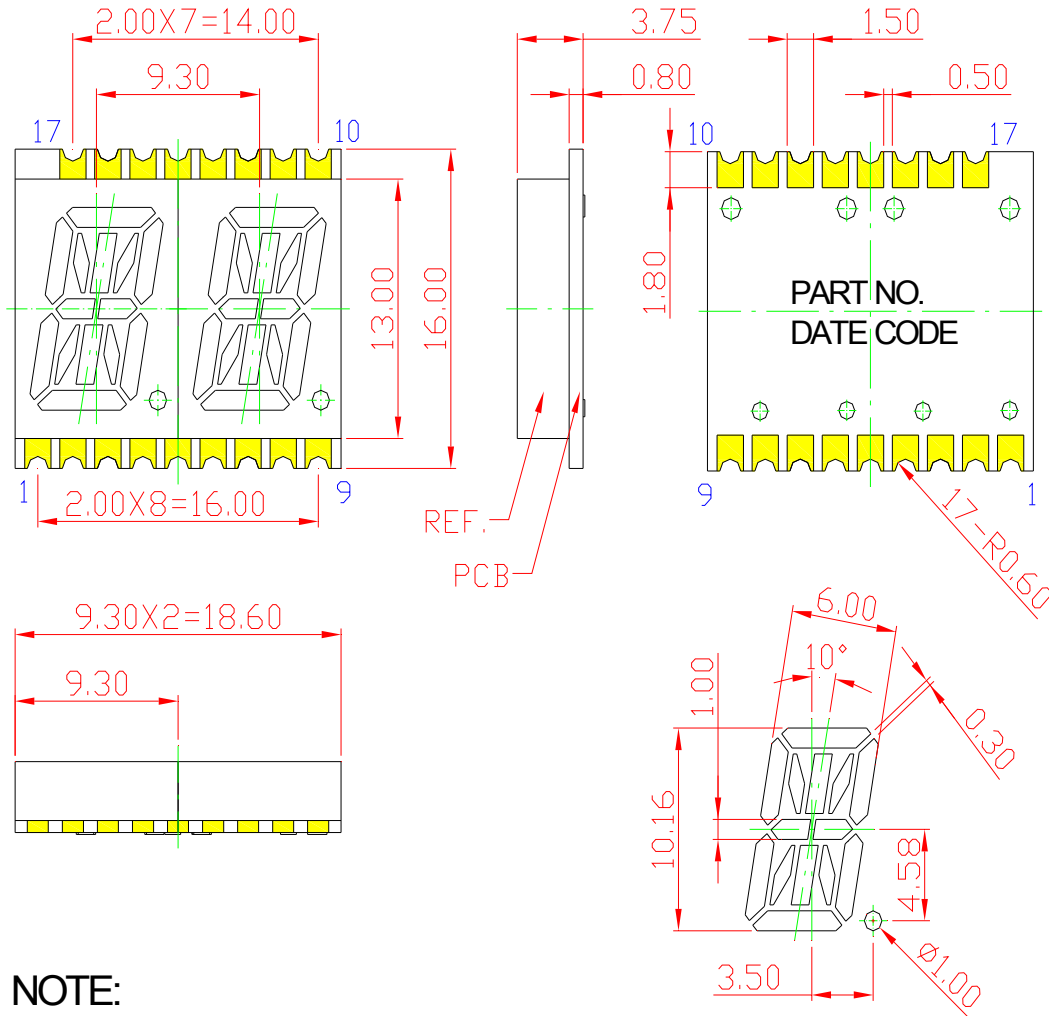
**Pb free.**





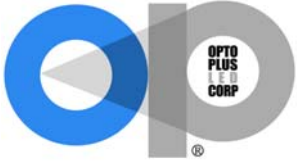
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● **MECHANICAL DIMENSIONS**



**NOTE:**

Dimension in millimeters (inches),  
 and tolerances are  $\pm 0.25\text{mm}$  (.01") specified.



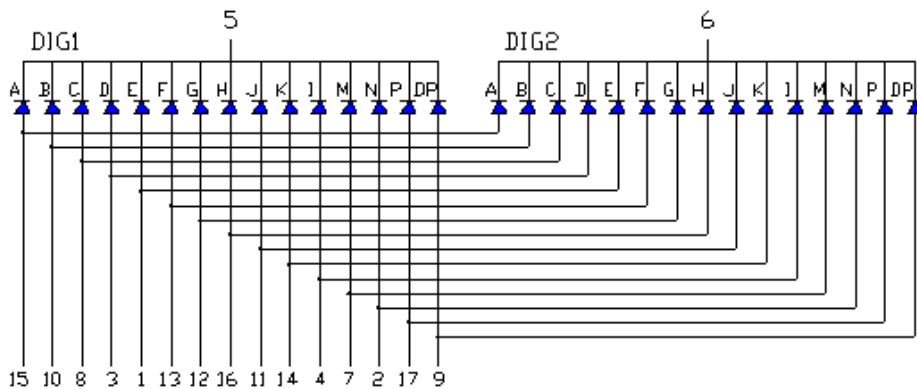
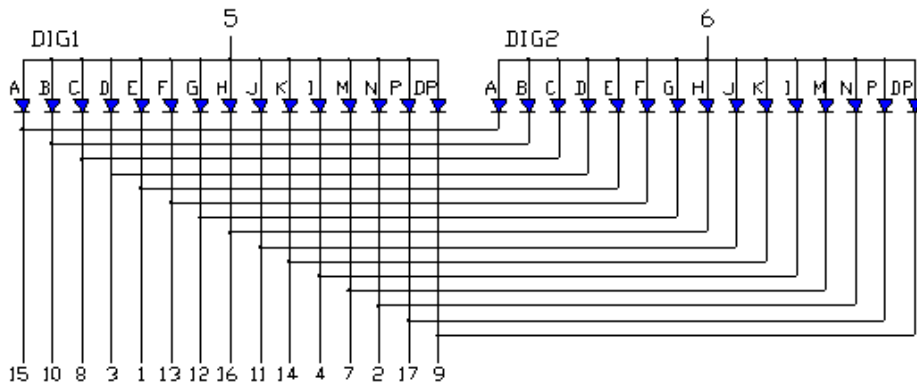
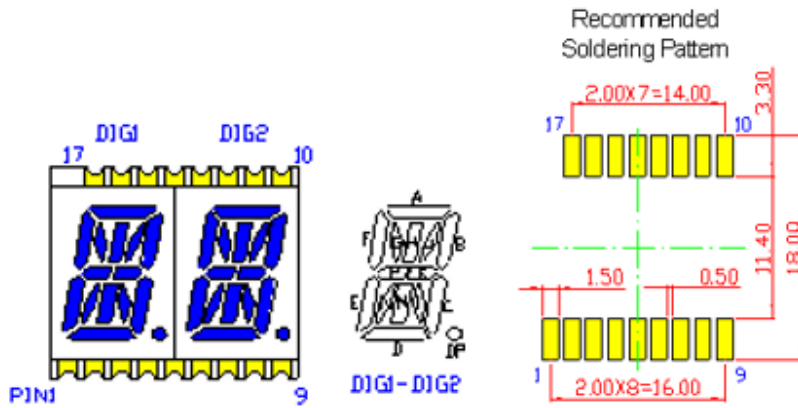
# Opto Plus LED Corp.

## 0.4" SMD Type LED Display

### OPS-AD4020SB-GW

### OPS-AD4021SB-GW

#### ● TYPICAL INTERNAL EQUIVALENT CIRCUIT





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● **SB: SUPER BRIGHT BLUE (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>  | 43             | 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 | -    | 3.1   | 4.0  | V    |
| Reverse Current, (Per Dice)  | I <sub>R</sub> | V <sub>R</sub> =8V   | -    | -     | 10   | µA   |
| Peak Wavelength              | λ <sub>P</sub> | I <sub>F</sub> =20mA | 464  | -     | 474  | nm   |
| Dominant Wavelength          | λ <sub>D</sub> | I <sub>F</sub> =20mA | -    | 30    | -    | nm   |
| Luminous Intensity           | I <sub>V</sub> | I <sub>F</sub> =20mA | -    | 30    | -    | mcd  |
| Spectral radiation bandwidth | Δλ             | I <sub>F</sub> =20mA | -    | 3.1   | 4.0  | nm   |



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## 0.4" SMD Type LED Display

### OPS-AD4020SB-GW

### OPS-AD4021SB-GW

#### ● SB: SUPER BRIGHT BLUE (InGaN/GaN) CURVE

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

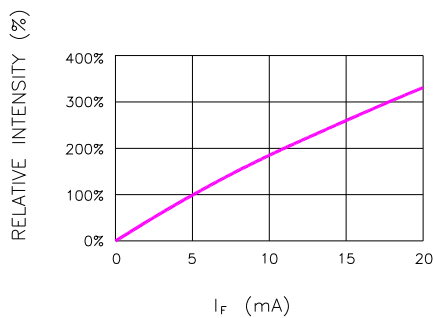


Fig.1 RELATIVE INTENSITY VS. FORWARD CURRENT

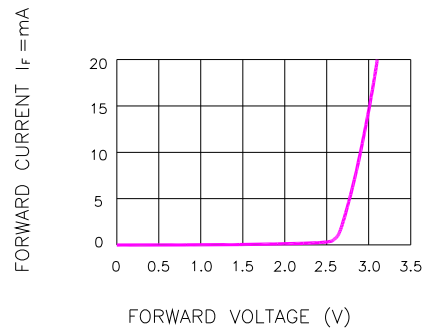


Fig.2 FORWARD CURRENT VS. FORWARD VOLTAGE

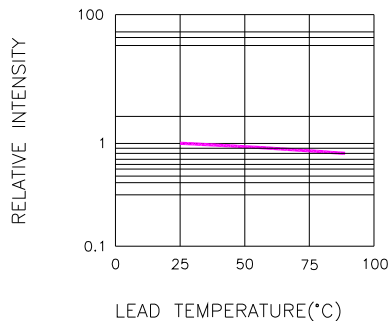


Fig.3 RELATIVE INTENSITY VS. LEAD TEMPERATURE  
(PULSED 20 mA; 300us PULSE, 10ms PERIOD)

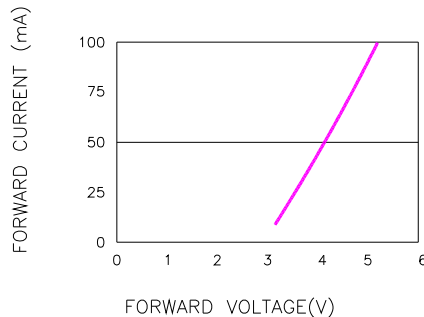


Fig.4 PEAK FORWARD VOLTAGE VS. FORWARD (100us TEST PULSE, 1% DUTY CYCLE)

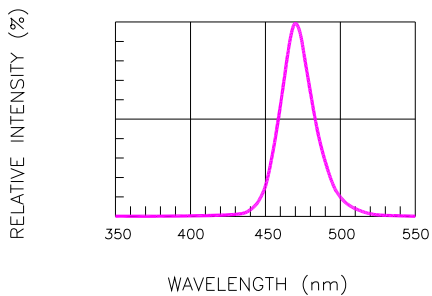


Fig.5 RELATIVE INTENSITY VS. WAVELENGTH

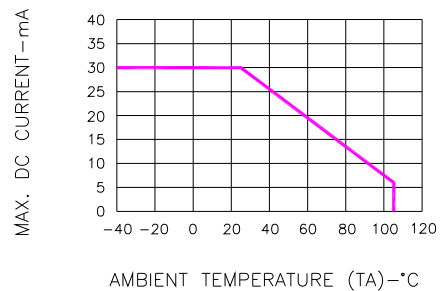


Fig.6 MAX. ALLOWABLE DC CURRENT VS. AMBIENT TEMPERATURE

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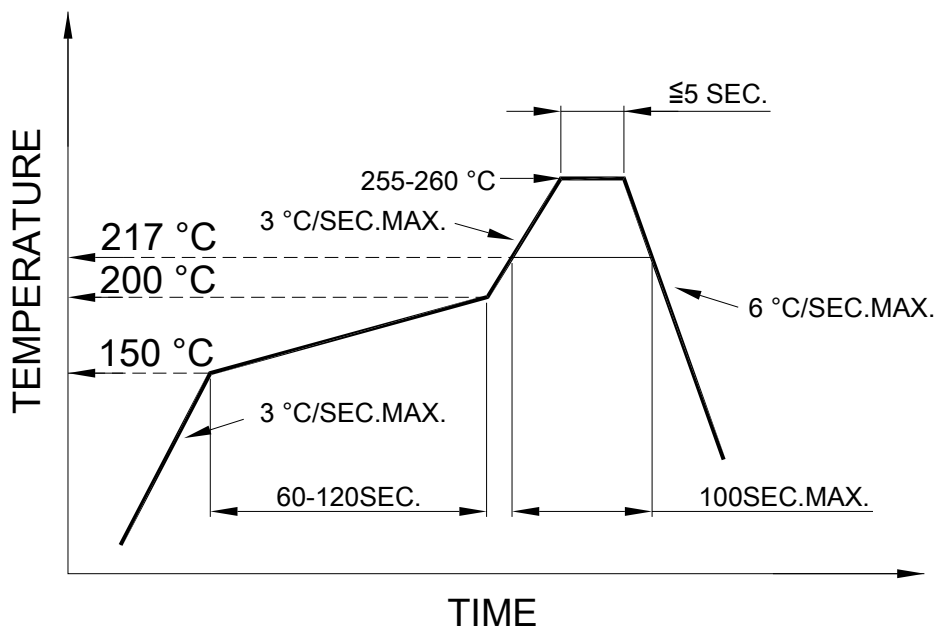


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● **SMT REFLOW SOLDERING INSTRUCTIONS**

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.