



Opto Plus LED Corp.
0.20" SMD Type LED Display
OPS-D2010SB | OPS-D2011SB

● **EDIT HISTORY**

Version A: Nov. 10, 2020

Preliminary Spec.

Version B: Aug. 29, 2023

Modify IV data, bin grade & available bin table.

Confidential Document



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Opto Plus LED Corp. 0.20" SMD Type LED Display OPS-D2010SB | OPS-D2011SB

● FEATURES

- 0.20 inch (5.08 mm) Digit Height.
- SMD type.
- Low current operation.
- RoHS Compliant, Pb Free.

● DESCRIPTION

The device are 0.20 inch (5.08 mm) height dual digit 7-segment displays.

The device is Opto Plus LED Corp standard LED Display.

This device utilizes Super Bright Blue 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 |
|----------------|---|
| OPS-D2010SB-GW | Common Anode Gray face White segment |
| OPS-D2011SB-GW | Common Cathode Gray face White segment |
| OPS-D2010SB-BW | Common Anode Black face White segment |
| OPS-D2011SB-BW | Common Cathode Black face White segment |

RoHS Compliance



Pb Free.



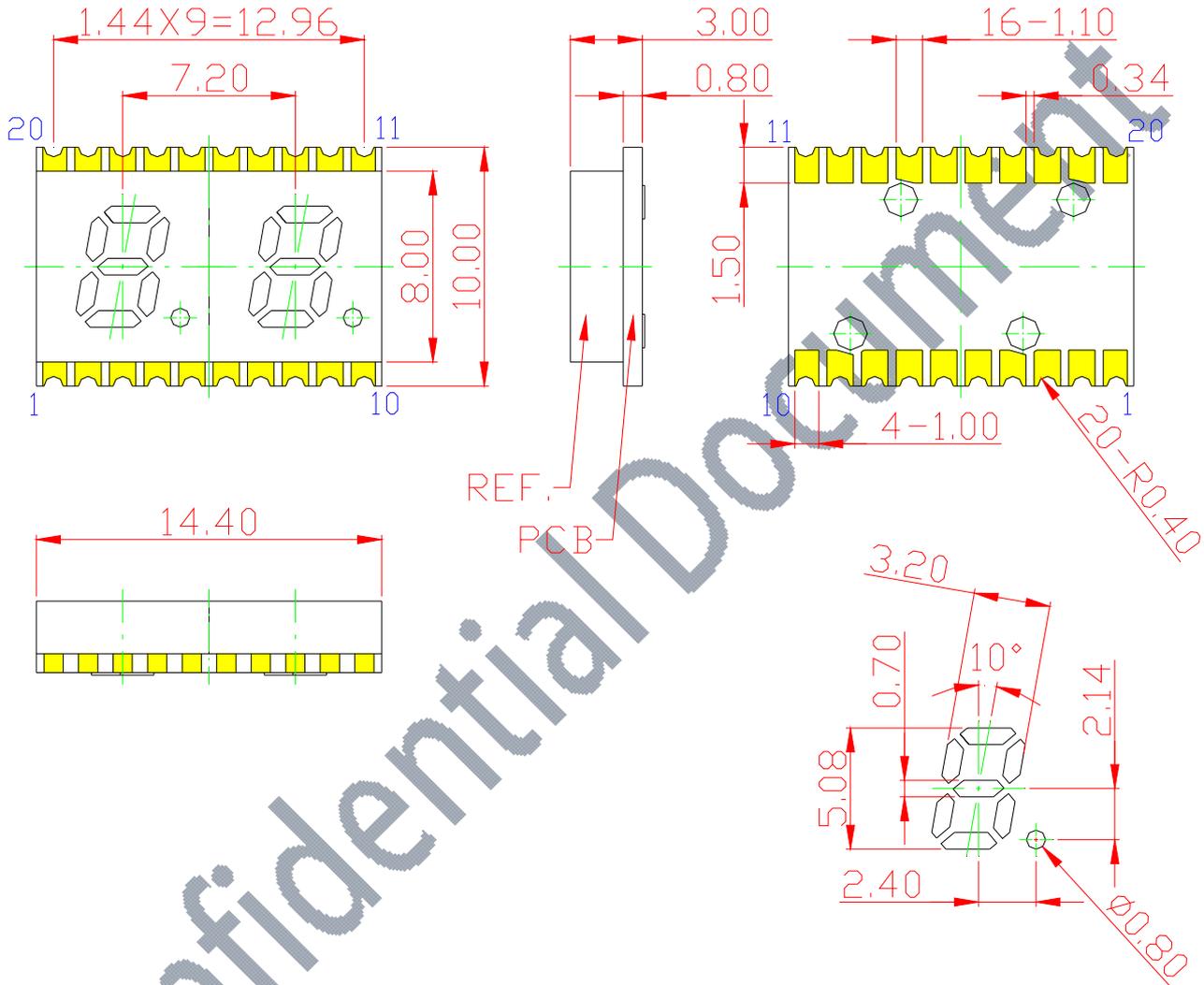


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● MECHANICAL DIMENSIONS



NOTES: All dimensions are in millimeters. Tolerances are ± 0.25 mm unless otherwise noted.

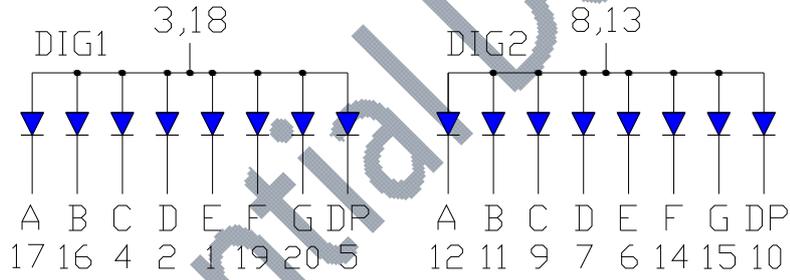
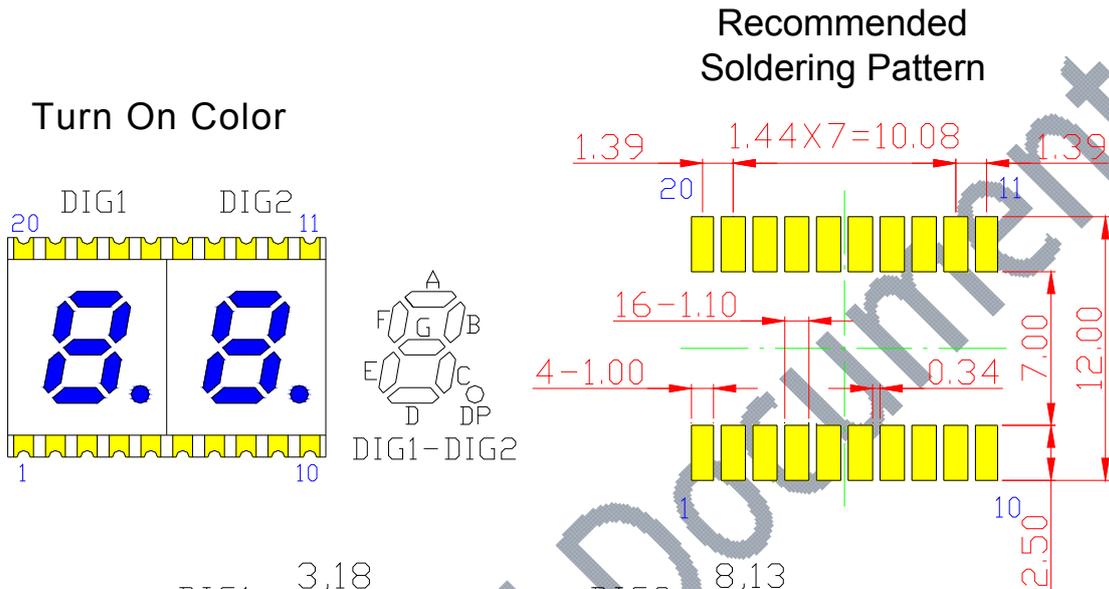


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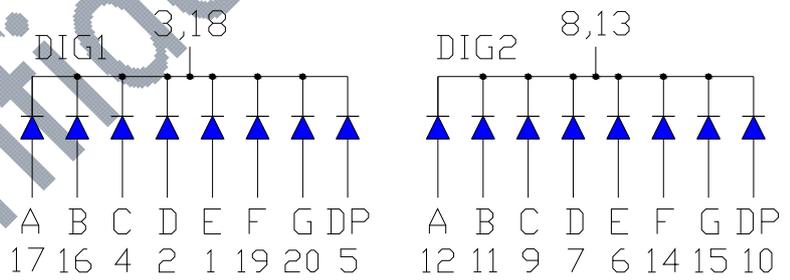
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● TYPICAL INTERNAL EQUIVALENT CIRCUIT



OPS-D2010 (Common Anode)



OPS-D2011 (Common Cathode)

※EMITTED COLOR : SUPER BRIGHT BLUE



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● PRODUCT APPEARANCE

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

| -GW | -BW |
|---|--|
| | |
| ※ REFLECTOR COLOR: Gray ※ SEGMENT COLOR: White | ※ REFLECTOR COLOR: Black ※ 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 or contact sales@opledtw.com for more **Standard Product Customization** information.

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

| PART NO. | DESCRIPTION |
|----------------|---|
| OPS-D2010SB-GW | Common Anode Gray face White segment |
| OPS-D2011SB-GW | Common Cathode Gray face White segment |
| OPS-D2010SB-BW | Common Anode Black face White segment |
| OPS-D2011SB-BW | Common Cathode Black face White segment |



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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_{AD} | 90 | mW |
| Continuous forward current | I_{AF} | 30 | mA |
| Peak current (duty cycle 1/10, 1kHz) | I_{PF} | 60 | mA |
| Reverse voltage | V_R | 5 | V |
| Operating temperature | T_{OPR} | -40 to +105 | °C |
| Storage temperature | T_{STG} | -40 to +105 | °C |

ELECTRICAL - OPTICAL CHARACTERISTICS AT Ta=25°C

| Characteristic | Symbol | Condition | Min. | Type. | Max. | Unit |
|------------------------------|-----------------|---------------------|------|-------|------|---------------|
| Forward Voltage, (Per Dice) | V_F | $I_F = 20\text{mA}$ | - | 3.0 | 3.4 | V |
| Reverse Current, (Per Dice) | I_R | $V_R = 5\text{V}$ | - | - | 10 | μA |
| Dominant Wavelength | λ_D | $I_F = 20\text{mA}$ | 464 | - | 474 | nm |
| Luminous Intensity | I_v | $I_F = 20\text{mA}$ | 10 | 25 | 40 | mcd |
| Spectral Line Half-Bandwidth | $\Delta\lambda$ | $I_F = 20\text{mA}$ | - | 20 | - | nm |



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● **SB: BIN GRADE (Unit : mcd) 20mA**

| | | | |
|--------------------------|-------------|-------------|-------------|
| Super Bright Blue | J | K | L |
| | 10.0 - 20.0 | 20.1 - 30.0 | 30.1 - 40.0 |

● **SB: HUE GRADE (λD : nm)**

| | | |
|---------------|---------------|---------------|
| 1 | 2 | 3 |
| 464.0 - 467.0 | 467.1 - 470.0 | 470.1 - 474.0 |

● **AVAILABLE BIN / HUE TABLE**

| | | |
|----|----|----|
| J1 | J2 | J3 |
| K1 | K2 | K3 |
| L1 | L2 | L3 |



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

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

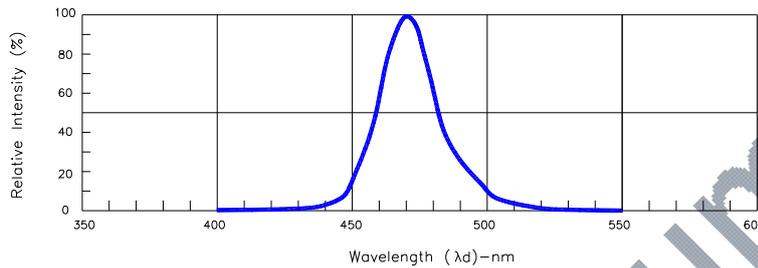


Fig.1-Relative Intensity VS. Wavelength

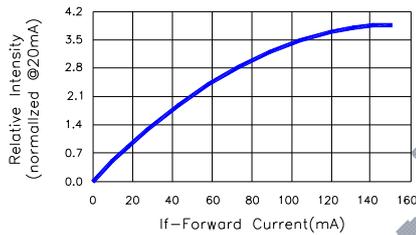


Fig.2-Relative Luminous Intensity vs. Forward Current

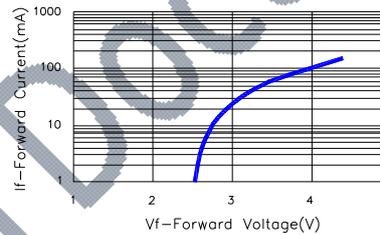


Fig.3-Forward Current vs. Forward Voltage

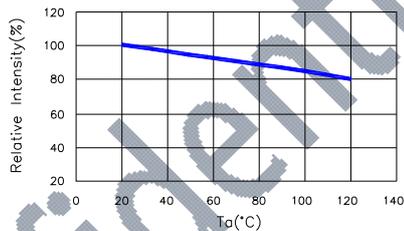


Fig.4-Relative Intensity (@20mA) VS. Ambient Temperature

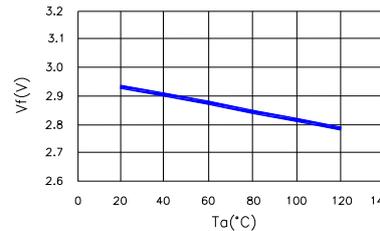


Fig.5-Forward Voltage (@20mA) VS. Ambient Temperature

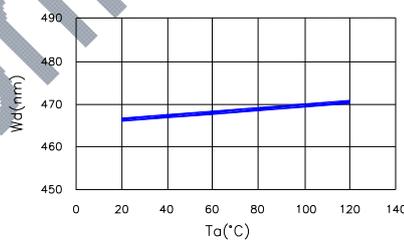


Fig.6-Dominant Wavelength (@20mA) VS. Ambient Temperature

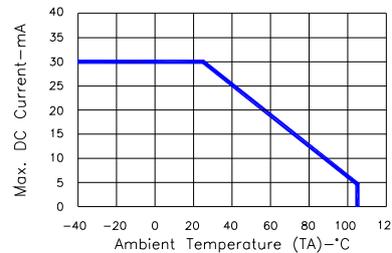


Fig.7-Max. Allowable DC Current VS. Ambient Temperature



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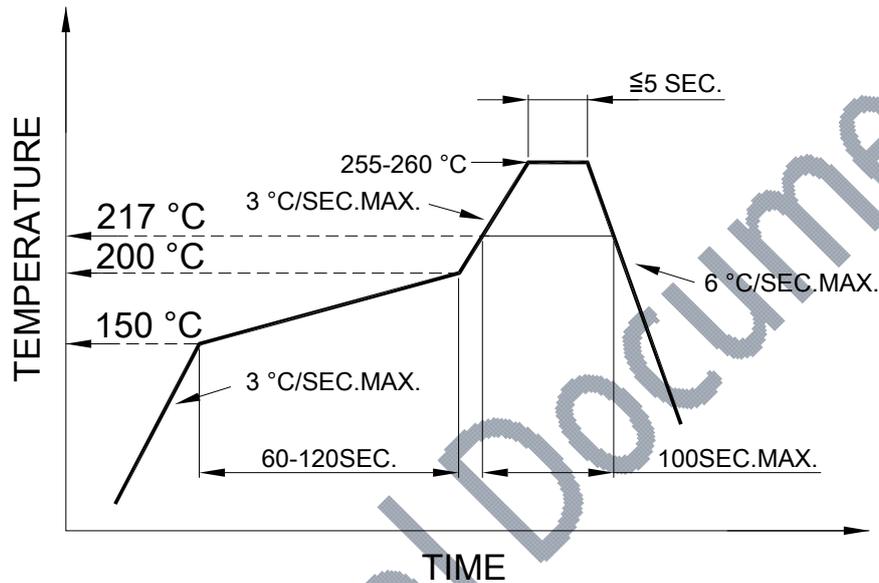
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● SMT REFLOW SOLDERING INSTRUCTIONS

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 ≤ 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.



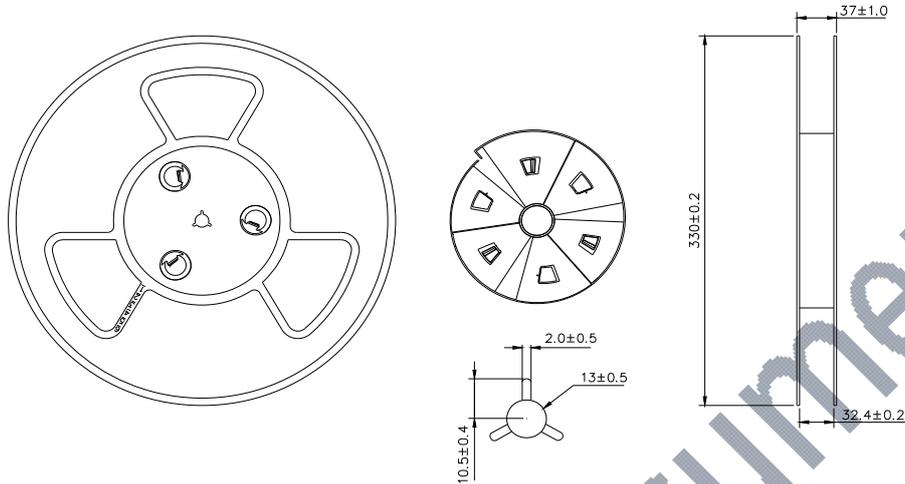
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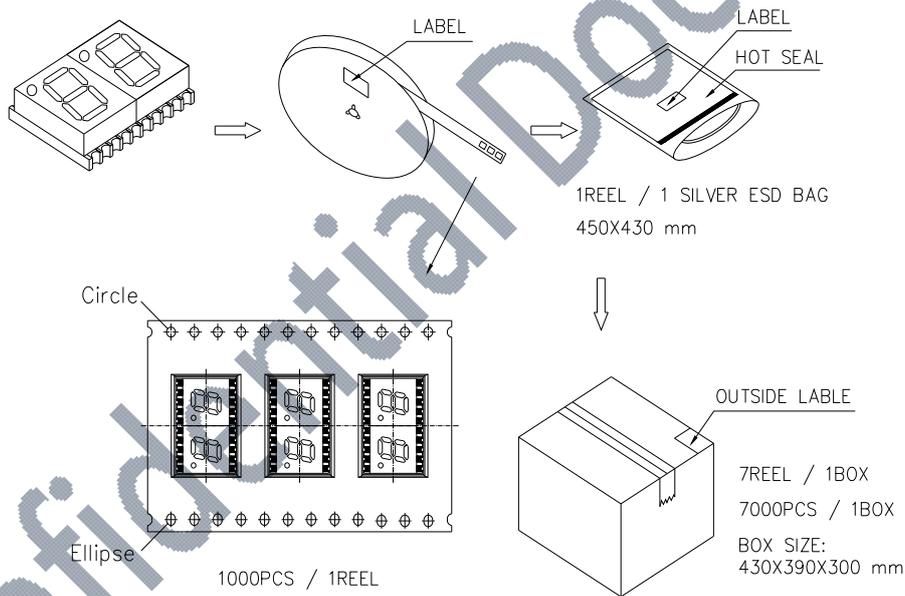
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● REEL DIMENSIONS



● 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) |