



**Opto Plus LED Corp.**  
**0.20" SMD Type LED Display**  
**OPS-D2010SA | OPS-D2011SA**

● **EDIT HISTORY**

Version A: Nov. 09, 2020

Preliminary Spec.

Version B: Aug. 29, 2023

Modify bin grade & available bin table.

Confidential Document



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# Opto Plus LED Corp.

## 0.20" SMD Type LED Display

### OPS-D2010SA | OPS-D2011SA

#### ● 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 Amber LED chip which are made from AlGaInP On a transparent GaAs, substrate.

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

#### ● DEVICE

PART NO.	DESCRIPTION
OPS-D2010SA-GW	Common Anode   Gray face   White segment
OPS-D2011SA-GW	Common Cathode   Gray face   White segment
OPS-D2010SA-BW	Common Anode   Black face   White segment
OPS-D2011SA-BW	Common Cathode   Black face   White segment

**RoHS Compliance**



**Pb Free.**



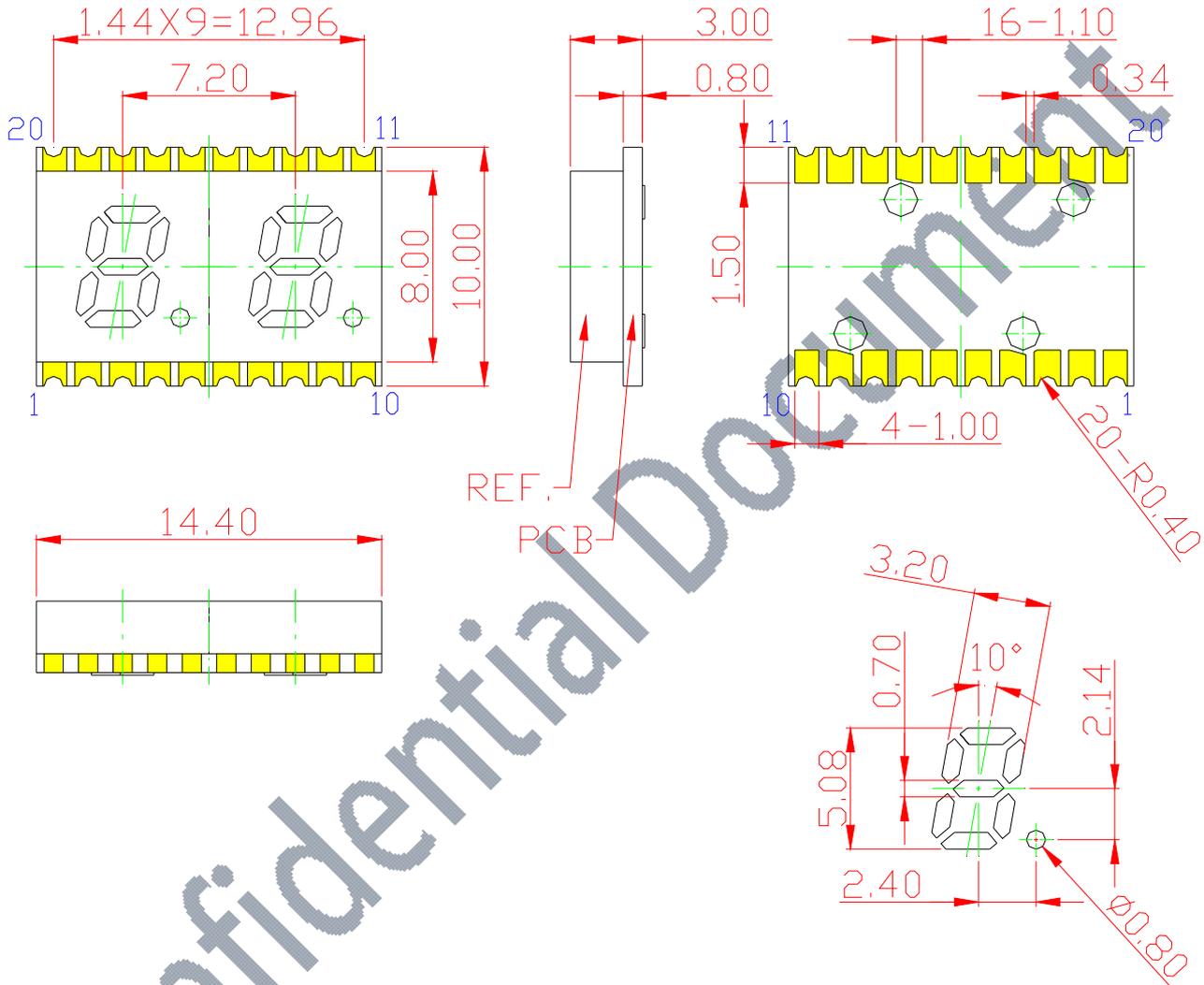


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### OPS-D2010SA | OPS-D2011SA

#### ● MECHANICAL DIMENSIONS



NOTES: All dimensions are in millimeters. Tolerances are  $\pm 0.25$  mm unless otherwise noted.

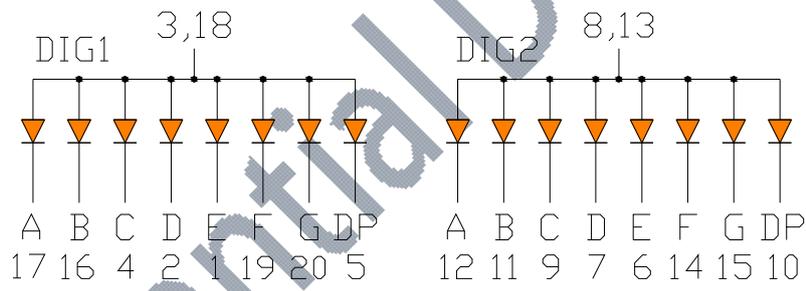
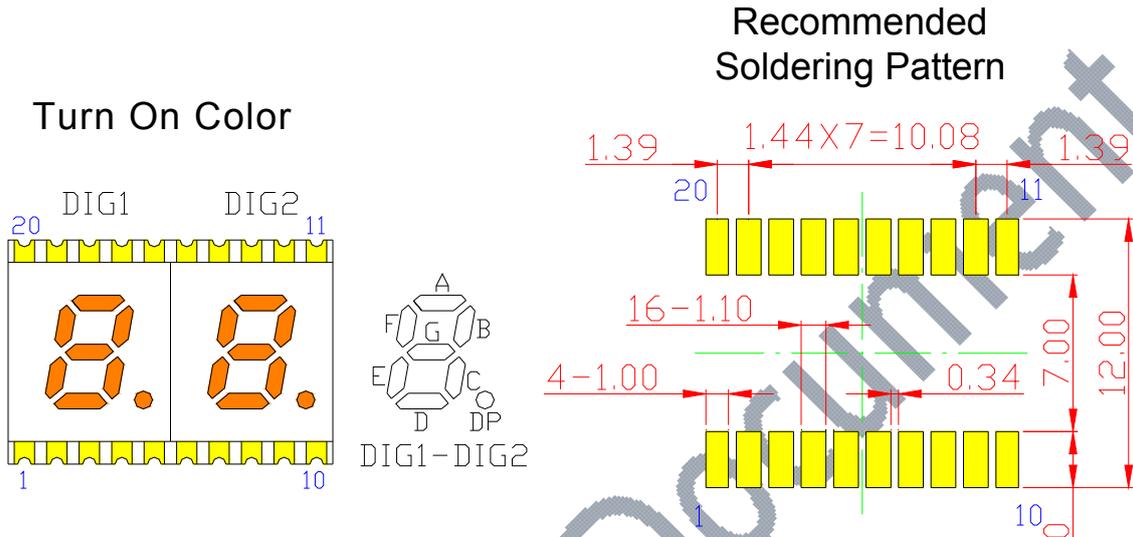


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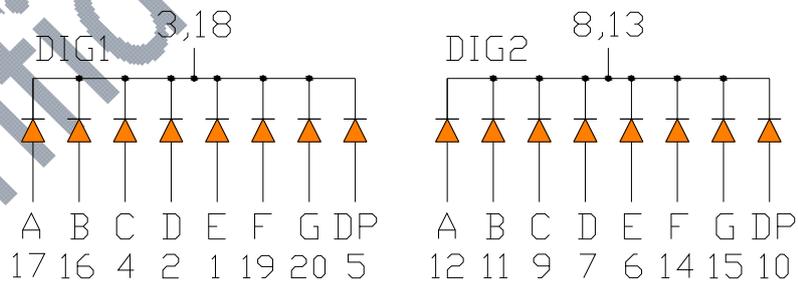
## 0.20" SMD Type LED Display

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#### ● TYPICAL INTERNAL EQUIVALENT CIRCUIT



OPS-D2010 (Common Anode)



OPS-D2011 (Common Cathode)

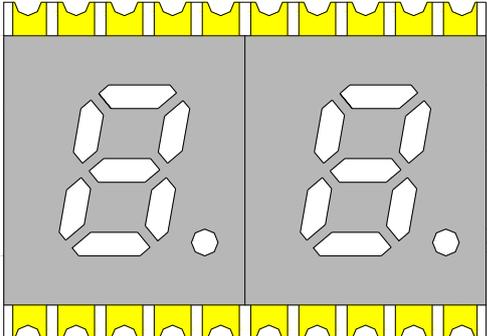
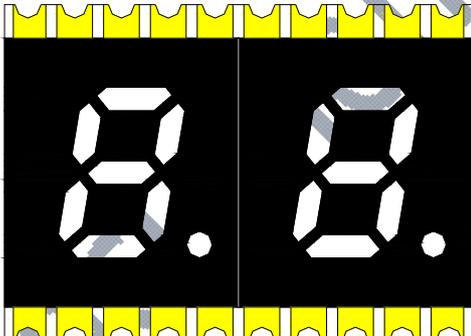
※EMITTED COLOR : SUPER BRIGHT AMBER



## Opto Plus LED Corp. 0.20'' SMD Type LED Display OPS-D2010SA | OPS-D2011SA

### ● 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](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
OPS-D2010SA-GW	Common Anode   Gray face   White segment
OPS-D2011SA-GW	Common Cathode   Gray face   White segment
OPS-D2010SA-BW	Common Anode   Black face   White segment
OPS-D2011SA-BW	Common Cathode   Black face   White segment



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● **SA: SUPER BRIGHT AMBER (AlGaInP/GaAs)**

ABSOLUTE MAXIMUM RATING AT Ta=25°C

Parameter	Symbol	Maximum Rating	Unit
Power dissipation	P <sub>AD</sub>	48	mW
Continuous forward current	I <sub>AF</sub>	20	mA
Peak current (duty cycle 1/10, 1kHz)	I <sub>PF</sub>	40	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	-	2.0	2.4	V
Reverse Current, (Per Dice)	I <sub>R</sub>	V <sub>R</sub> = 5V	-	-	10	μA
Peak Wavelength	λ <sub>P</sub>	I <sub>F</sub> = 20mA	-	612	-	nm
Dominant Wavelength	λ <sub>D</sub>	I <sub>F</sub> = 20mA	601	-	613	nm
Luminous Intensity	I <sub>V</sub>	I <sub>F</sub> = 20mA	10	25	40	mcd
Spectral Line Half-Bandwidth	Δλ	I <sub>F</sub> = 20mA	-	20	-	nm



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● SA: BIN GRADE (Unit : mcd) 20mA

<b>Super Bright Amber</b>	<b>J</b>	<b>K</b>	<b>L</b>
	10.0 – 20.0	20.1 – 30.0	30.1 - 40.0

● SA: HUE GRADE ( $\lambda_D$  : nm)

<b>1</b>	<b>2</b>	<b>3</b>
601.0 – 604.0	604.1 – 607.0	607.1 – 613.0

● AVAILABLE BIN / HUE TABLE

J1	J2	J3
K1	K2	K3
L1	L2	L3



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#### ● SA: SUPER BRIGHT AMBER (AlGaInP/GaAs) CURVE

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

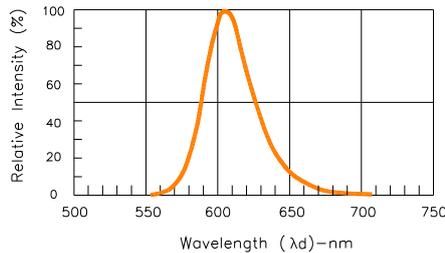


Fig.1-Relative Intensity VS. Wavelength

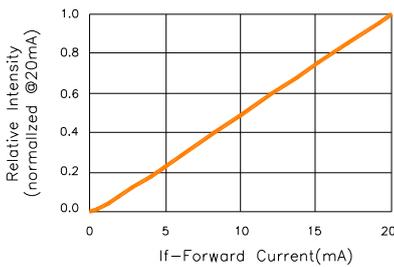


Fig.2-Relative Luminous Intensity vs. Forward Current

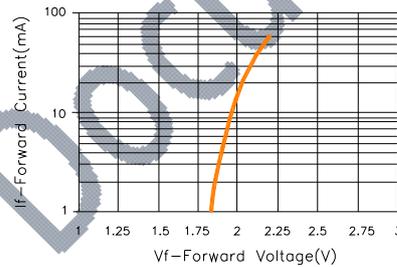


Fig.3-Forward Current vs. Forward Voltage

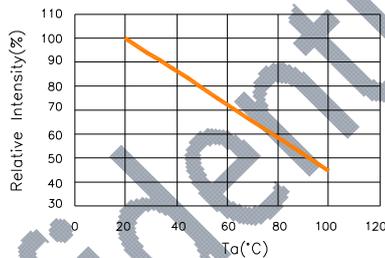


Fig.4-Relative Intensity(@20mA) VS. Ambient Temperature

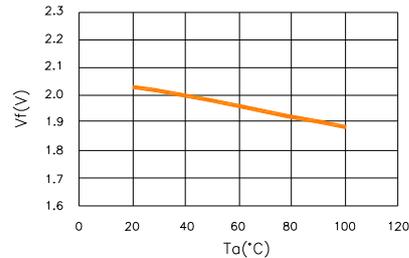


Fig.5-Forward Voltage(@20mA) VS. Ambient Temperature

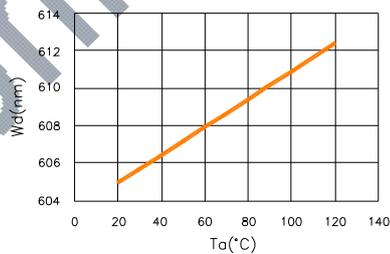


Fig.6-Dominant Wavelength(@20mA) VS. Ambient Temperature

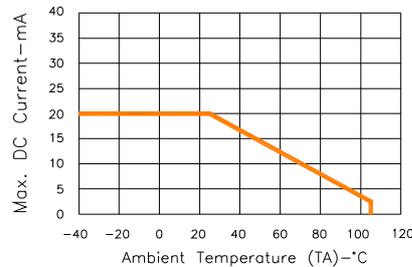


Fig.7-Max. Allowable DC Current VS. Ambient Temperature



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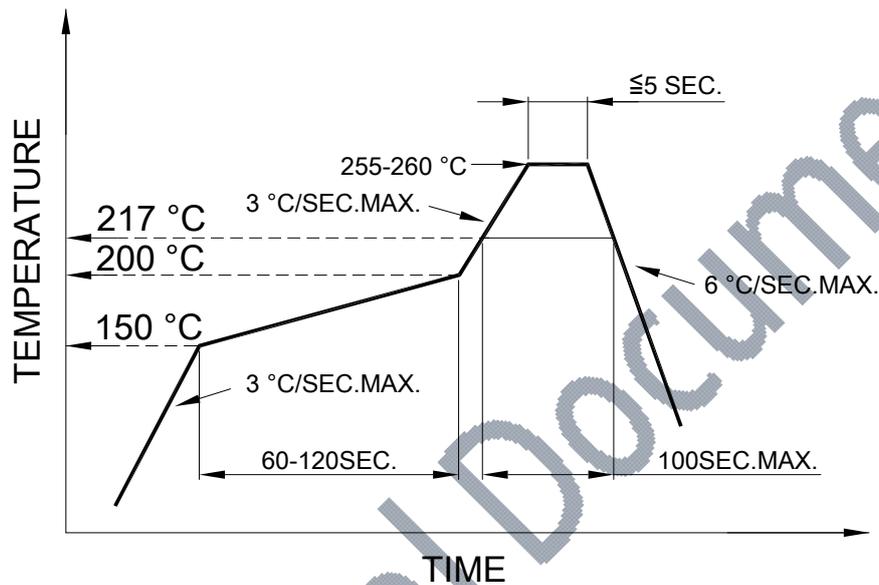
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#### ● SMT REFLOW SOLDERING INSTRUCTIONS

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  $\leq 4$  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.

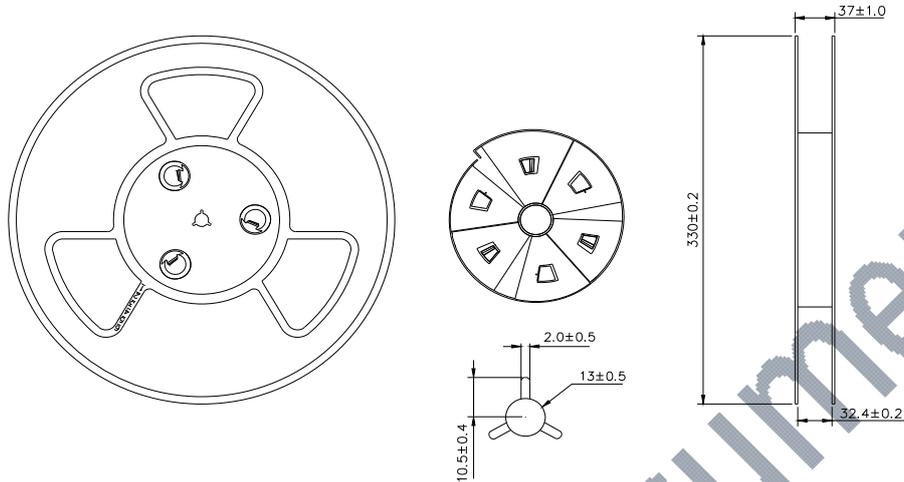


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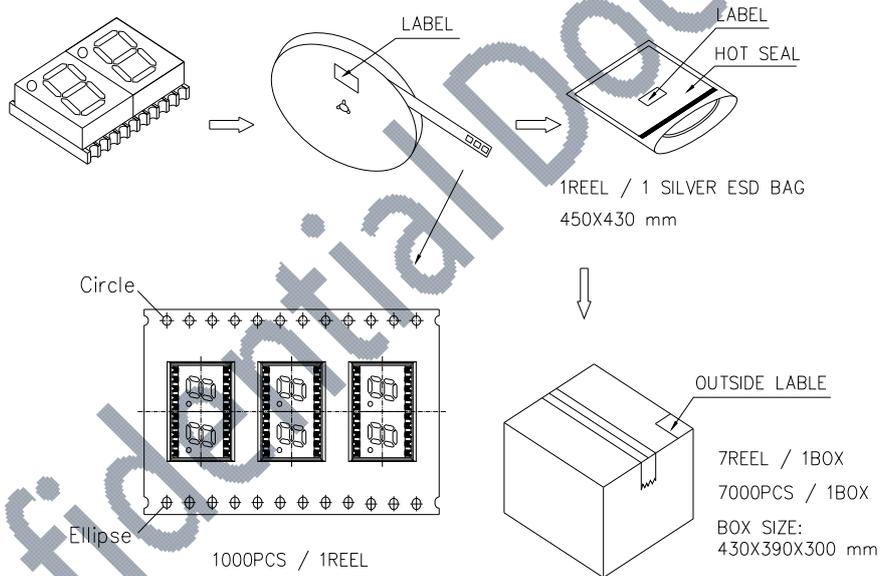
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#### ● REEL DIMENSIONS



#### ● 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)