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**Opto Plus LED Corp.**  
**0.20" SMD Type LED Display**  
**OPS-T2040SB-STT(R)-1.5-G(B)W**  
**OPS-T2041SB-STT(R)-1.5-G(B)W**

● **EDIT HISTORY**

Version A: Mar. 24, 2025

Preliminary Spec.

Confidential Document



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● **FEATURES**

- 0.20 inch (5.08 mm) Digit Height.
- Low current operation.
- Excellent character appearance.
- Super thin SMD type.
- RoHS compliant, Pb Free.

● **DESCRIPTION**

The device are 0.20 inch (5.08 mm) height triple 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-T2040SB-STT-1.5-GW	Common Anode   Gray face   White segment   Top mount
OPS-T2041SB-STT-1.5-GW	Common Cathode   Gray face   White segment   Top mount
OPS-T2040SB-STT-1.5-BW	Common Anode   Black face   White segment   Top mount
OPS-T2041SB-STT-1.5-BW	Common Cathode   Black face   White segment   Top mount
OPS-T2040SB-STR-1.5-GW	Common Anode   Gray face   White segment   Reverse mount
OPS-T2041SB-STR-1.5-GW	Common Cathode   Gray face   White segment   Reverse mount
OPS-T2040SB-STR-1.5-BW	Common Anode   Black face   White segment   Reverse mount
OPS-T2041SB-STR-1.5-BW	Common Cathode   Black face   White segment   Reverse mount

**RoHS Compliance**



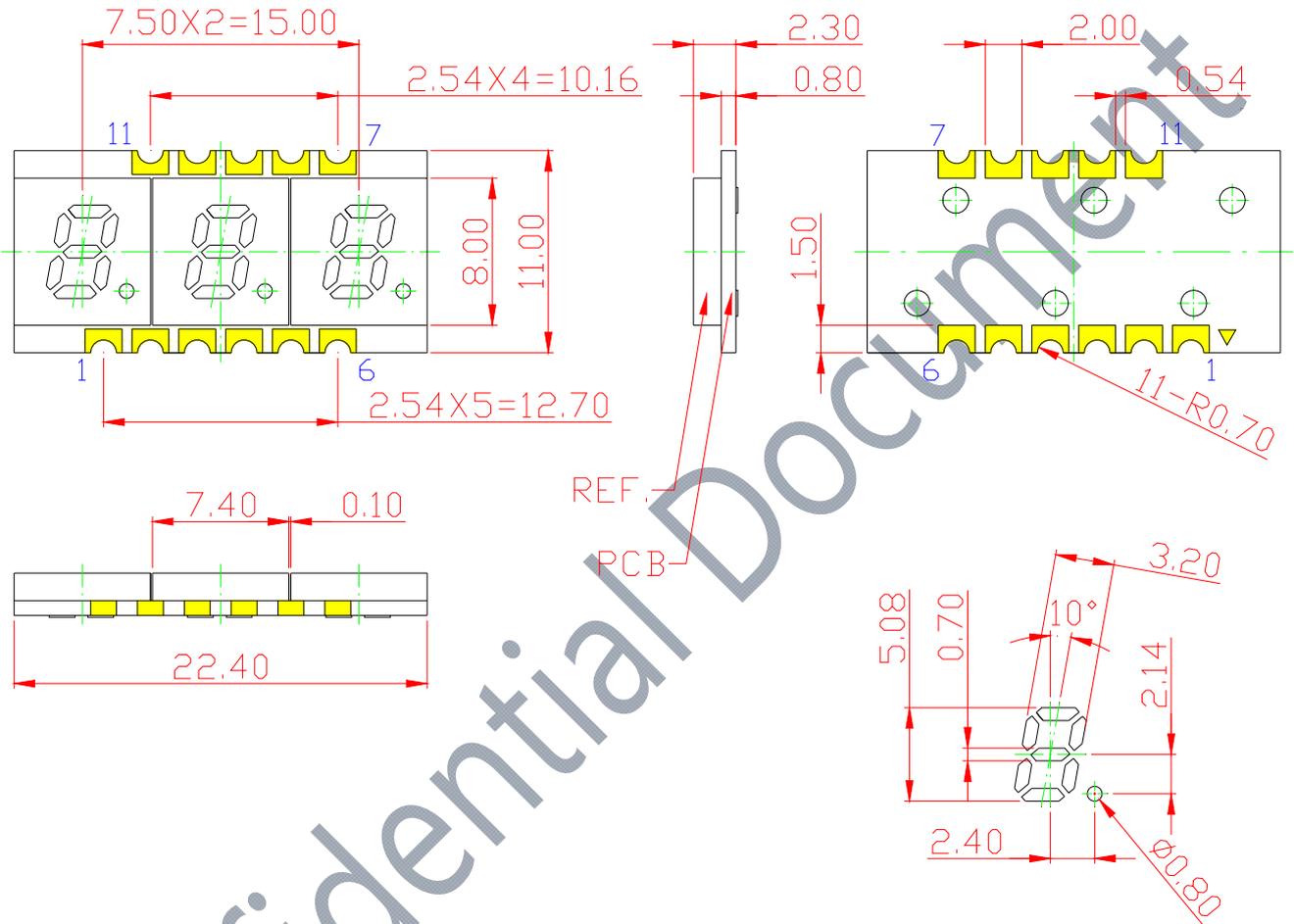
**Pb Free.**





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● **MECHANICAL DIMENSIONS**



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



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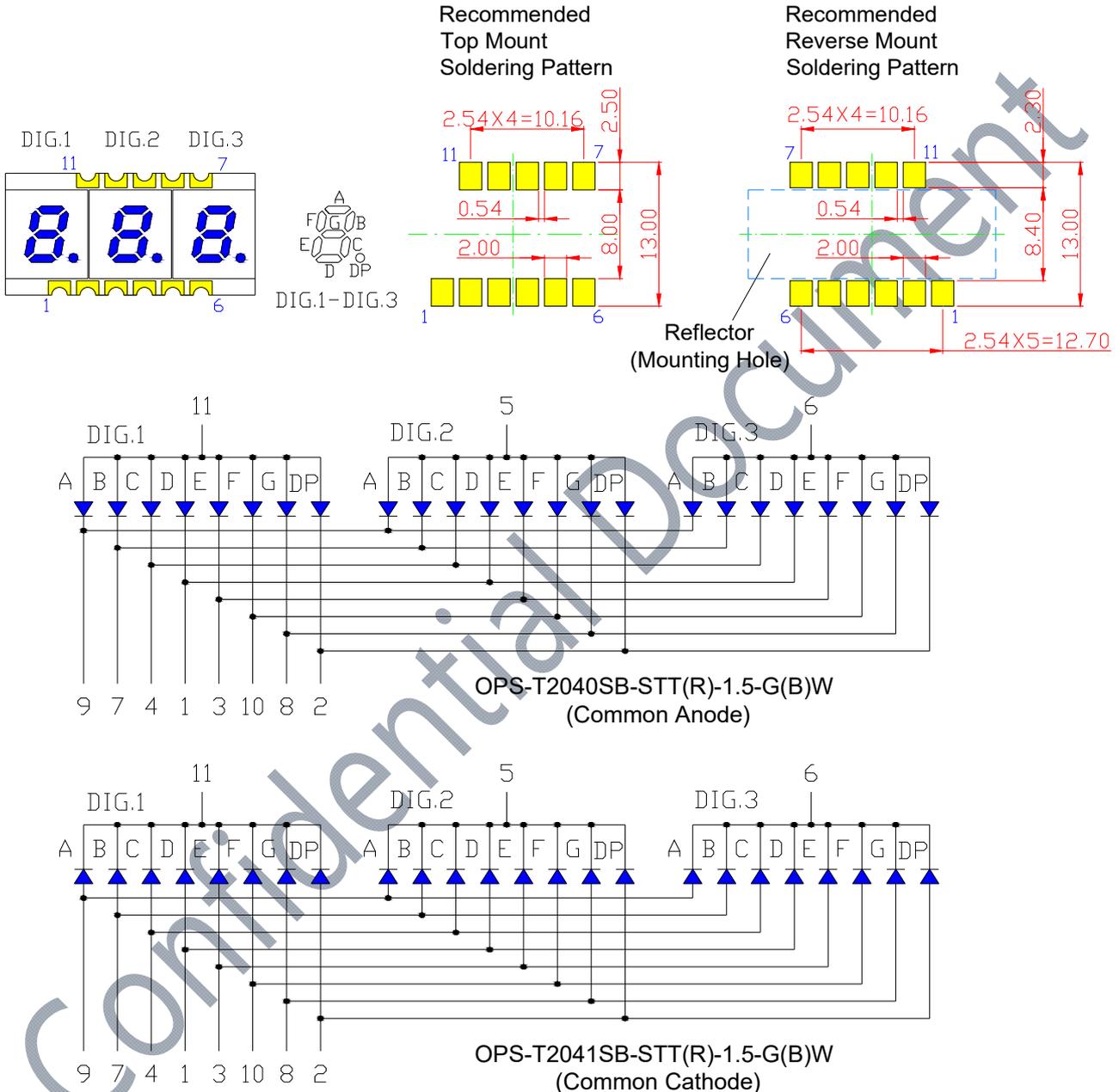
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## 0.20" SMD Type LED Display

### OPS-T2040SB-STT(R)-1.5-G(B)W

### OPS-T2041SB-STT(R)-1.5-G(B)W

#### ● TYPICAL INTERNAL EQUIVALENT CIRCUIT



※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](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-T2040SB-STT-1.5-GW	Common Anode   Gray face   White segment   Top mount
OPS-T2041SB-STT-1.5-GW	Common Cathode   Gray face   White segment   Top mount
OPS-T2040SB-STT-1.5-BW	Common Anode   Black face   White segment   Top mount
OPS-T2041SB-STT-1.5-BW	Common Cathode   Black face   White segment   Top mount
OPS-T2040SB-STR-1.5-GW	Common Anode   Gray face   White segment   Reverse mount
OPS-T2041SB-STR-1.5-GW	Common Cathode   Gray face   White segment   Reverse mount
OPS-T2040SB-STR-1.5-BW	Common Anode   Black face   White segment   Reverse mount
OPS-T2041SB-STR-1.5-BW	Common Cathode   Black face   White segment   Reverse mount



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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>	90	mW
Continuous forward current	I <sub>AF</sub>	30	mA
Peak current (duty cycle 1/10, 1kHz)	I <sub>PF</sub>	60	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	-	3.0	3.4	V
Reverse Current, (Per Dice)	I <sub>R</sub>	V <sub>R</sub> = 5V	-	-	10	μA
Dominant Wavelength	λ <sub>D</sub>	I <sub>F</sub> = 20mA	464	-	474	nm
Luminous Intensity	I <sub>v</sub>	I <sub>F</sub> = 20mA	10	-	40	mcd
Spectral Line Half-Bandwidth	Δλ	I <sub>F</sub> = 20mA	-	20	-	nm



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● **SB: BIN GRADE (Unit : mcd) 20mA**

Super Bright Blue	<b>H</b>	<b>I</b>	<b>J</b>
	10.0 - 20.0	20.1 - 30.0	30.1 - 40.0

● **SB: HUE GRADE (λD : nm)**

<b>1</b>	<b>2</b>	<b>3</b>
464.0 - 467.0	467.1 - 470.0	470.1 - 474.0

● **AVAILABLE BIN / HUE TABLE**

H1	H2	H3
I1	I2	I3
J1	J2	J3



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### OPS-T2041SB-STT(R)-1.5-G(B)W

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

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

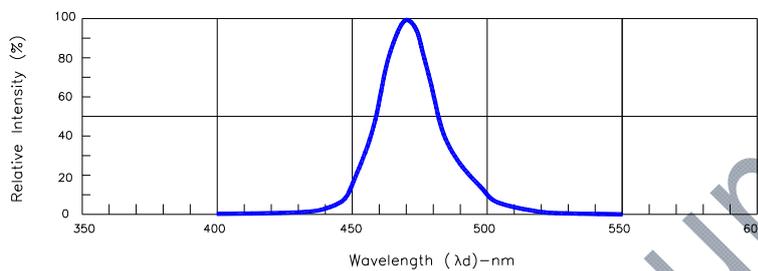


Fig.1-Relative Intensity VS. Wavelength

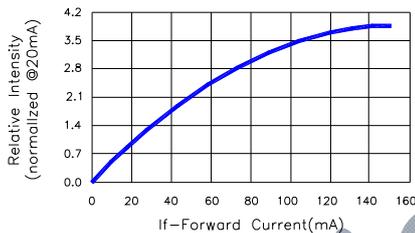


Fig.2-Relative Luminous Intensity vs. Forward Current

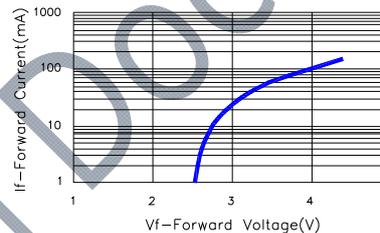


Fig.3-Forward Current vs. Forward Voltage

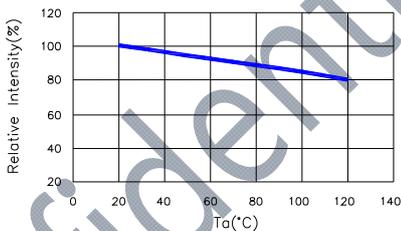


Fig.4-Relative Intensity(@20mA)VS. Ambient Temperature

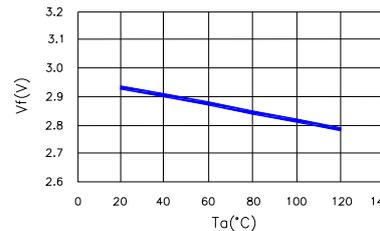


Fig.5-Forward Voltage(@20mA)VS. Ambient Temperature

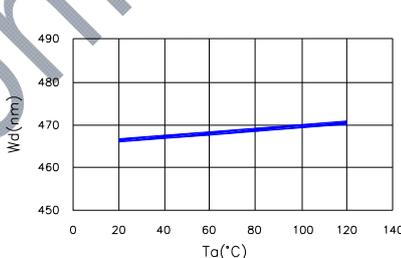


Fig.6-Dominant Wavelength(@20mA)  
VS. Ambient Temperature

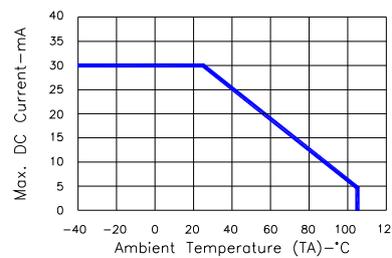


Fig.7-Max. Allowable DC Current  
VS. Ambient Temperature

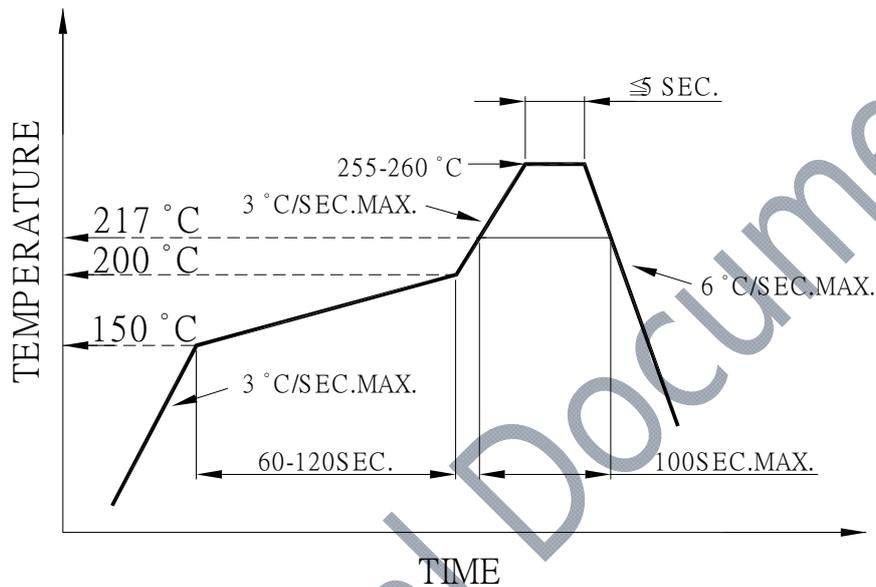


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● **SMT REFLOW SOLDERING INSTRUCTIONS**

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.



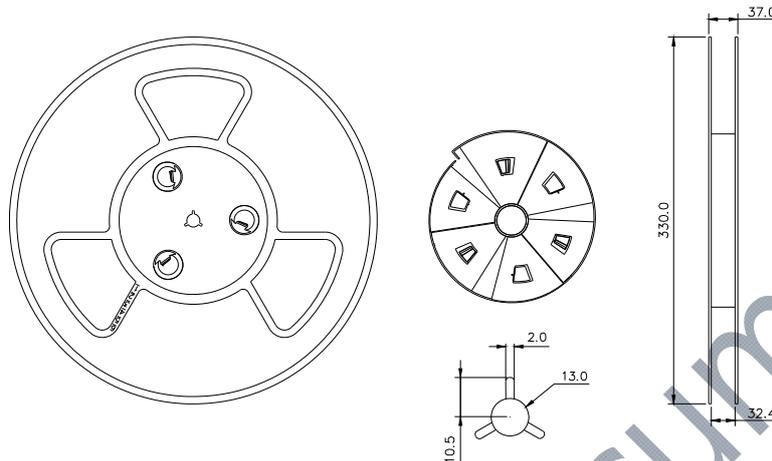
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### ● REEL DIMENSIONS



### ● PACKING & LABEL SPECIFICATIONS

OPS-T2040(1)XX-STT-1.5-BW Top Mount	OPS-T2040(1)XX-STR-1.5-BW Reverse Mount	OPS-T2040(1)XX-STT-1.5-BW OPS-T2040(1)XX-STR-1.5-BW
<p>Circle</p> <p>Ellipse</p> <p>1300PCS / 1REEL</p>	<p>Circle</p> <p>Ellipse</p> <p>1300PCS / 1REEL</p>	<p>LABEL HOT SEAL</p> <p>1REEL / 1 SILVER ESD BAG 450X430 mm</p> <p>OUTSIDE LABEL</p> <p>7REEL / 1BOX 9100PCS / 1BOX BOX SIZE: 430X390X300 mm</p>

### ● 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)