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American Opto Plus LED Corp.
0.56" SMD Type LED Display
SMA561B-ST-1.5 G/W
SMC561B-ST-1.5 G/W

● **EDIT HISTORY**

Version A: Jul. 15, 2015

Preliminary spec.

Version B: Jul. 22, 2015

1. Modify mechanical dimensions.
2. Modify typical internal equivalent circuit.

Version C: Oct. 07, 2016

Add package spec.

Version D: Aug. 29, 2017

Modify package spec.

Version E: Apr. 25, 2019

1. Modify absolute maximum rating.
2. Modify electrical-optical characteristics.
3. Modify bin grade data.
4. Modify mechanical dimensions.
5. Modify curve graph.
6. Modify packing & label specifications.



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● FEATURES

- 0.56 inch (14.22 mm) Digit Height.
- Low current operation.
- Super thin SMD type.
- Gray face, White segment.
- RoHS compliant, Pb Free.

● DESCRIPTION

The SMA561B-ST-1.5 G/W & SMC561B-ST-1.5 G/W

Are 0.56 inch (14.22mm) height single digit 7-segment 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
SMA561B-ST-1.5 G/W	Common Anode
SMC561B-ST-1.5 G/W	Common Cathode

RoHS Compliance



Pb free.





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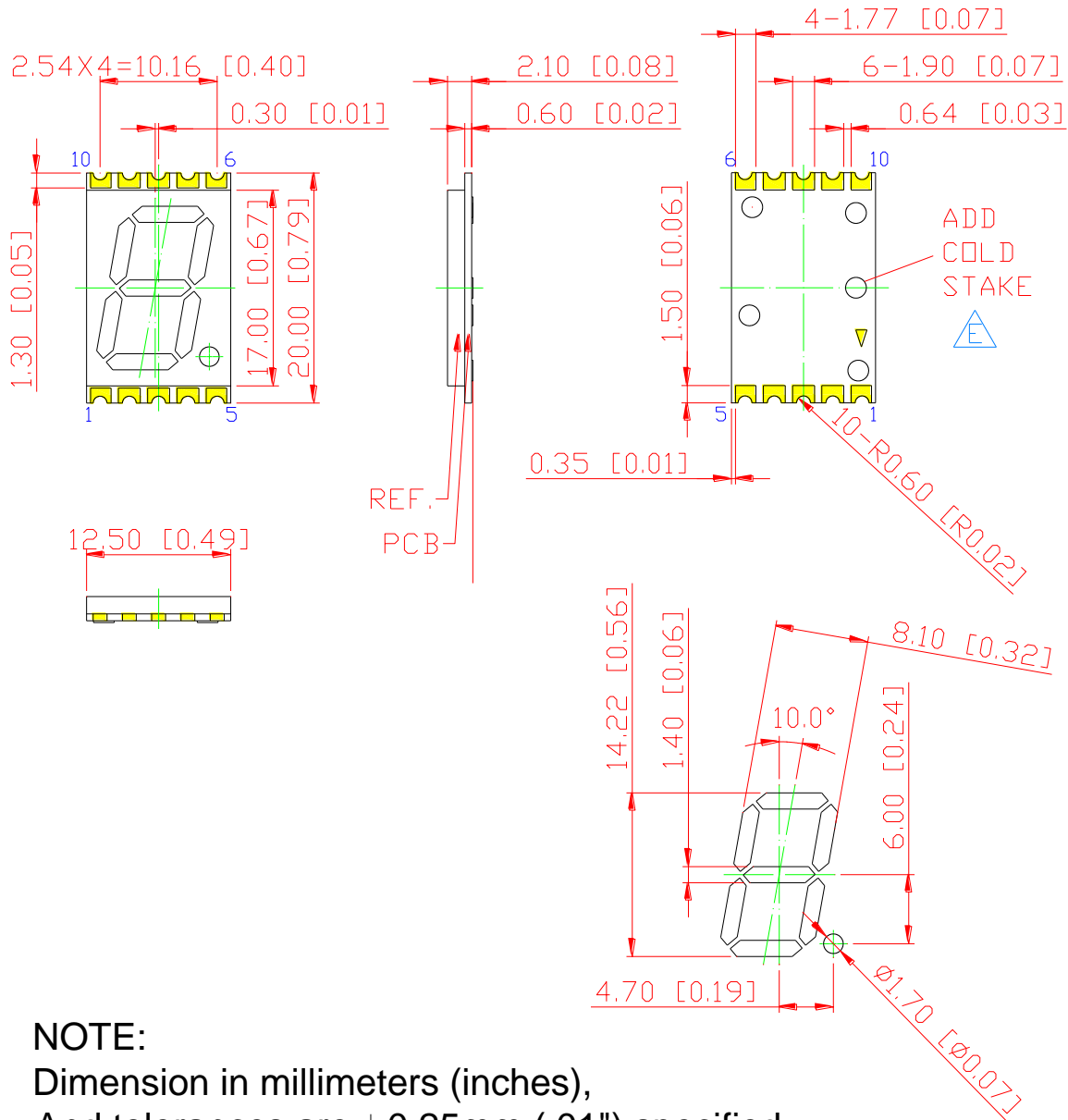
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● MECHANICAL DIMENSIONS



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



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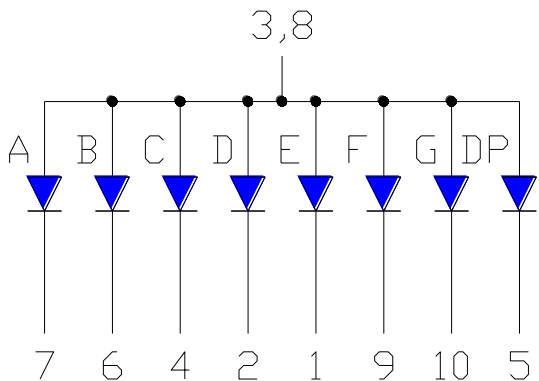
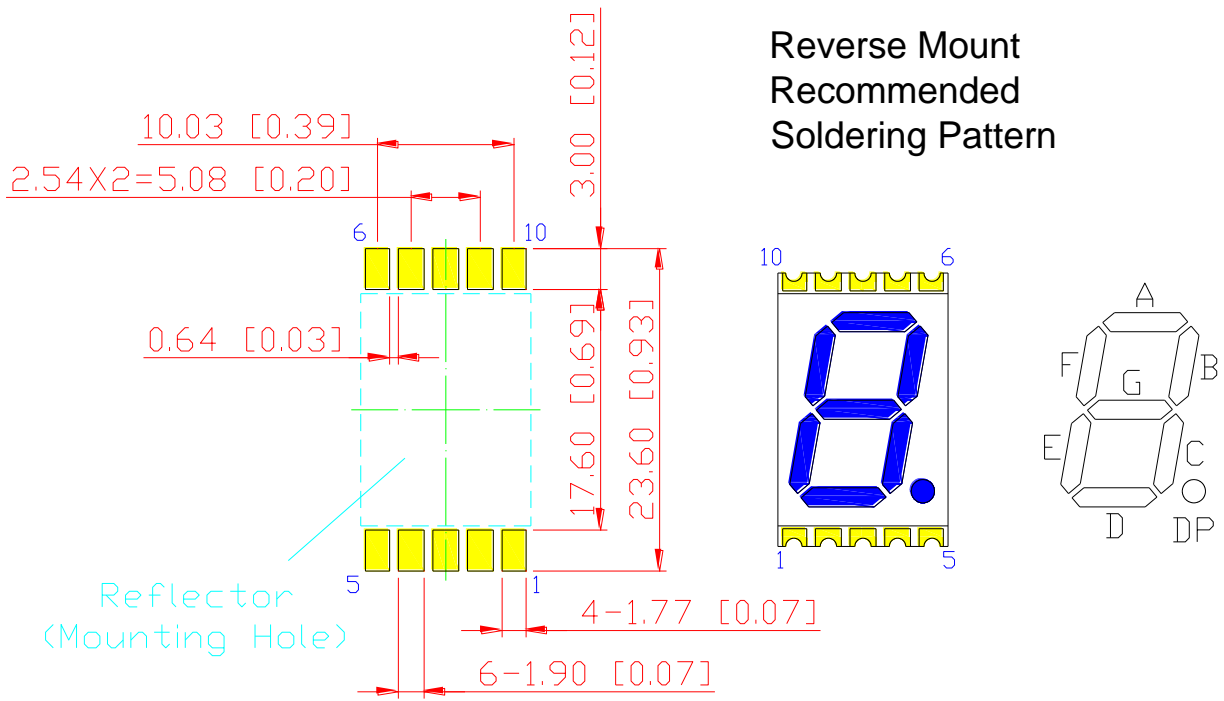
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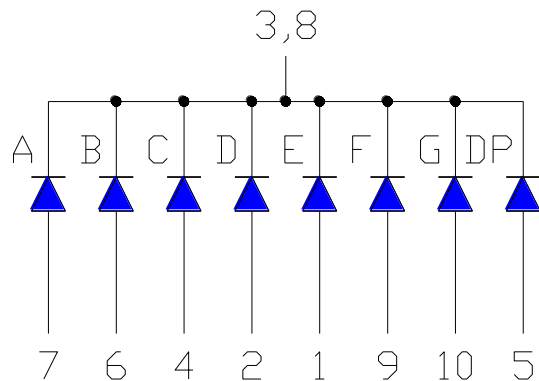
SMA561B-ST-1.5 G/W

SMC561B-ST-1.5 G/W

● TYPICAL INTERNAL EQUIVALENT CIRCUIT



SMA561B-ST-1.5 G/W
(Common Anode)



SMC561B-ST-1.5 G/W
(Common Cathode)



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● **B: SUPER BRIGHT BLUE (InGaN/GaN)**

ABSOLUTE MAXIMUM RATING AT $T_a=25^{\circ}\text{C}$

Parameter	Symbol	Maximum Rating	Unit
Power dissipation	P_{AD}	66	mW
Continuous forward current	I_{AF}	20	mA
Peak current (duty cycle 1/10, 1kHz)	I_{PF}	60	mA
Reverse voltage	V_R	5	V
Operating temperature	T_{OPR}	-40 to +85	$^{\circ}\text{C}$
Storage temperature	T_{STG}	-40 to +85	$^{\circ}\text{C}$

ELECTRICAL - OPTICAL CHARACTERISTICS AT $T_a=25^{\circ}\text{C}$

Characteristic	Symbol	Condition	Min.	Type.	Max.	Unit
Forward Voltage, (Per Dice)	V_F	$I_F=5\text{mA}$	-	3.0	3.3	V
Reverse Current, (Per Dice)	I_R	$V_R=5\text{V}$	-	-	10	μA
Dominant Wavelength	λ_D	$I_F=5\text{mA}$	460	-	470	nm
Luminous Intensity	I_V	$I_F=5\text{mA}$	10	-	40	mcd
Spectral Line Half-Bandwidth	$\Delta\lambda$	$I_F=5\text{mA}$	-	20	-	nm



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● **B: BIN GRADE (Unit : mcd) 5mA**

Super Bright Blue	G	H	I
	10.0 – 20.0	20.1 – 30.0	30.1 – 40.0

● **B: HUE GRADE (λ_D : nm)**

Super Bright Blue	1	2	3
	460.0 - 463.0	463.1 – 467.0	467.1 – 470.0

● **AVAILABLE BIN / HUE TABLE**

G1	G2	G3
H1	H2	H3
I1	I2	I3



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

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

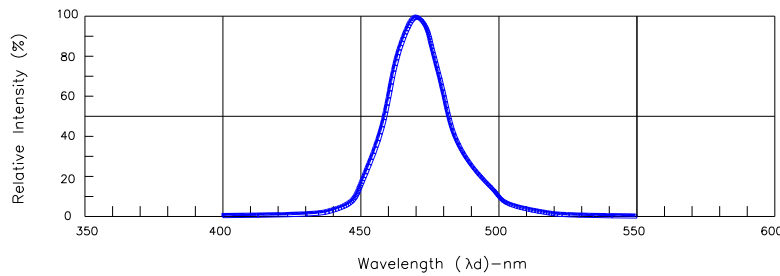


Fig.1-Relative Intensity VS. Wavelength

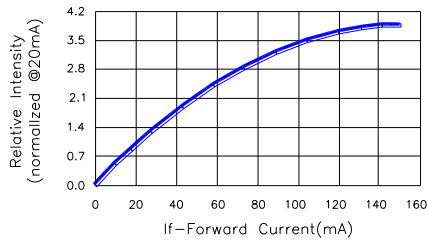


Fig.2-Relative Luminous Intensity vs. Forward Current

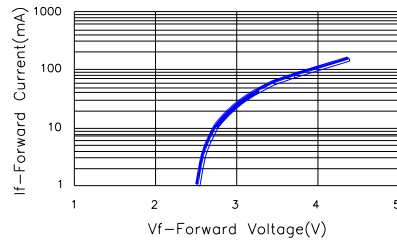


Fig.3-Forward Current vs. Forward Voltage

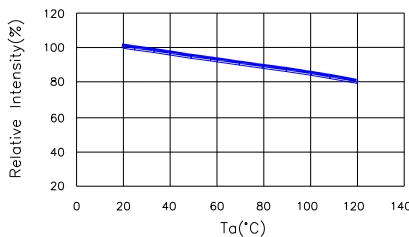


Fig.4-Relative Intensity(@20mA)VS. Ambient Temperature

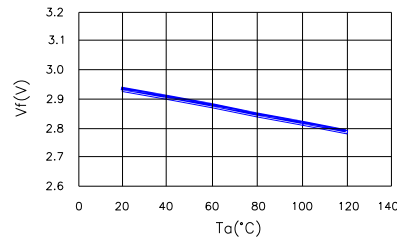


Fig.5-Forward Voltage(@20mA)VS. Ambient Temperature

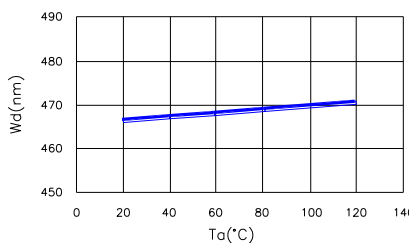


Fig.6-Dominant Wavelength(@20mA)
VS. Ambient Temperature

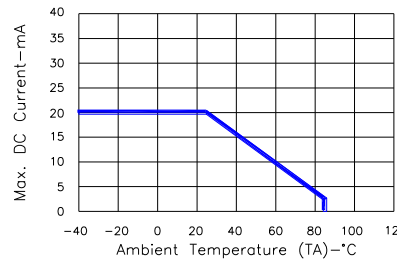


Fig.7-Max. Allowable DC Current
VS. Ambient Temperature



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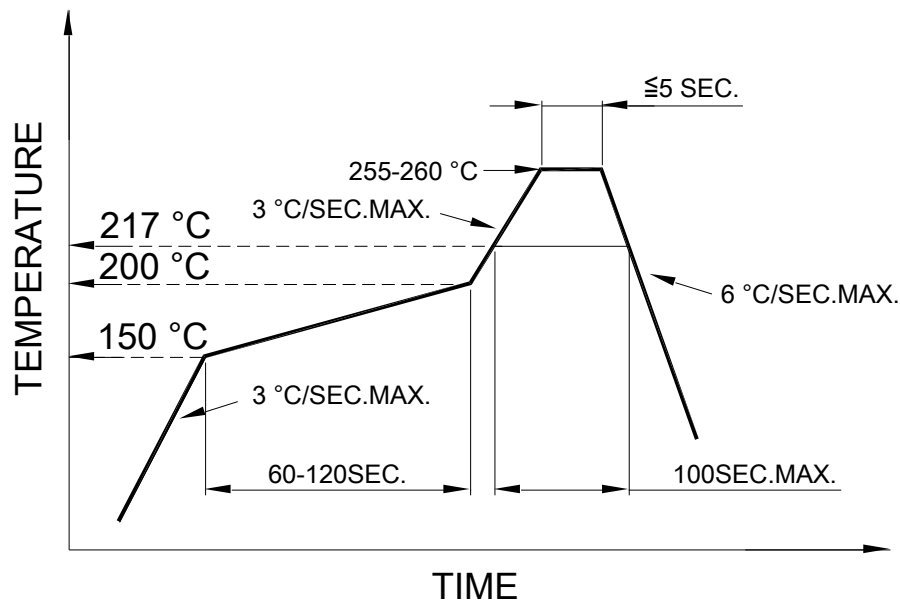
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● SMT REFLOW SOLDERING INSTRUCTIONS

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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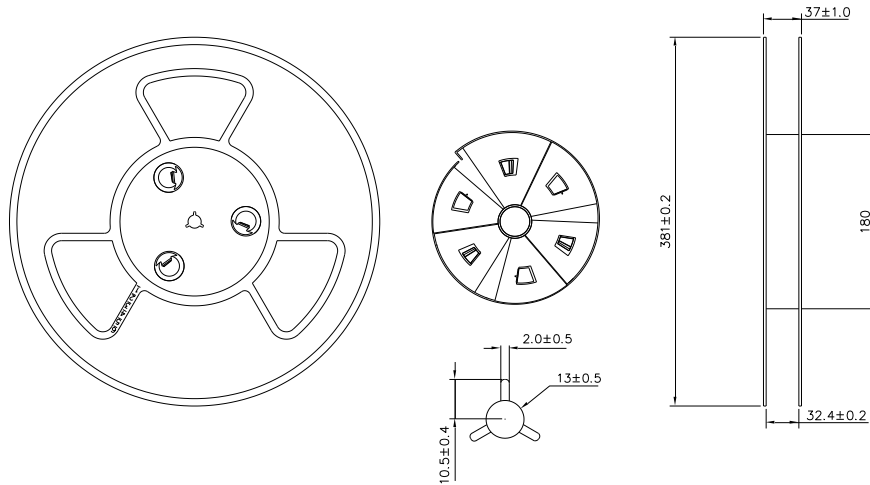
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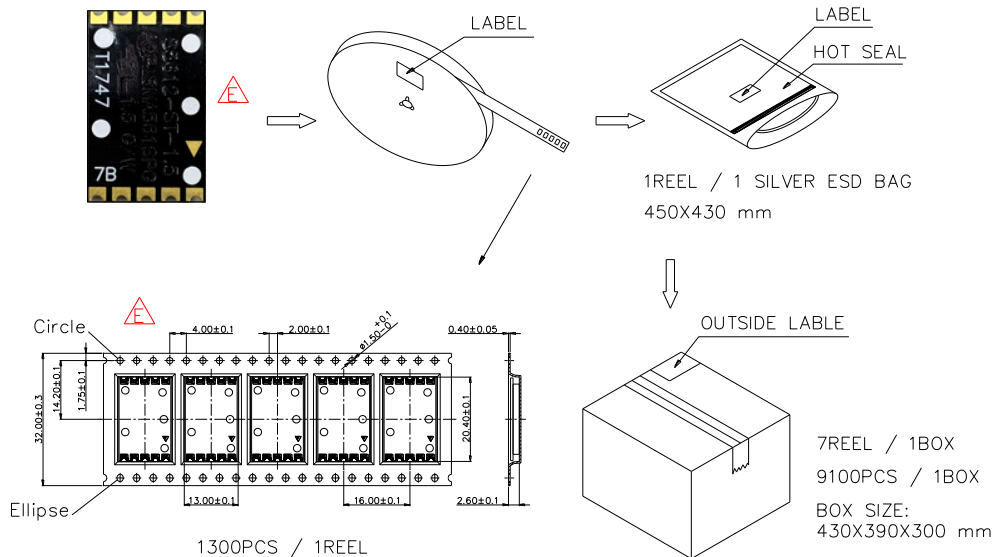
SMA561B-ST-1.5 G/W

SMC561B-ST-1.5 G/W

● REEL DIMENSIONS



● PACKING & LABEL SPECIFICATIONS



The leader and trailer length of actual tape with no component in it are 400 mm each.

● STORAGED 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)