



**American Opto Plus LED Corp.**  
**0.70" SMD Type LED Display**  
**SMA701SPG-ST-1.5 G/W**  
**SMC701SPG-ST-1.5 G/W**

● **EDIT HISTORY**

Version A: Jul. 24, 2015

Preliminary spec.

Version B: Aug. 17, 2015

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

Version C: Aug. 31, 2015

Add bin & hue data.



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● **FEATURES**

- 0.70 inch (17.78 mm) Digit Height.
- Low current operation.
- Super thin SMD type.
- Gray face, White segment.
- RoHS compliant, Pb Free.

● **DESCRIPTION**

The SMA701SPG-ST-1.5 G/W & SMC701SPG-ST-1.5 G/W

Are 0.70 inch (17.78 mm) height single digit 7-segment display.

This device utilizes Pure Green LED chip which are made from InGaN

On a transparent GaN, substrate.

The display has Gray face, White segment.

● **DEVICE**

PART NO	DESCRIPTION
SMA701SPG-ST-1.5 G/W	Common Anode
SMC701SPG-ST-1.5 G/W	Common Cathode

**RoHS Compliance**



**Pb free.**



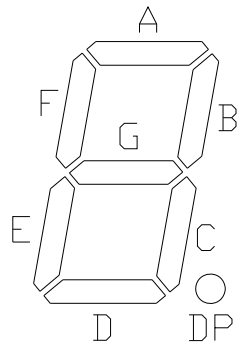
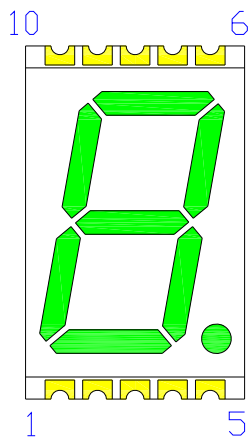




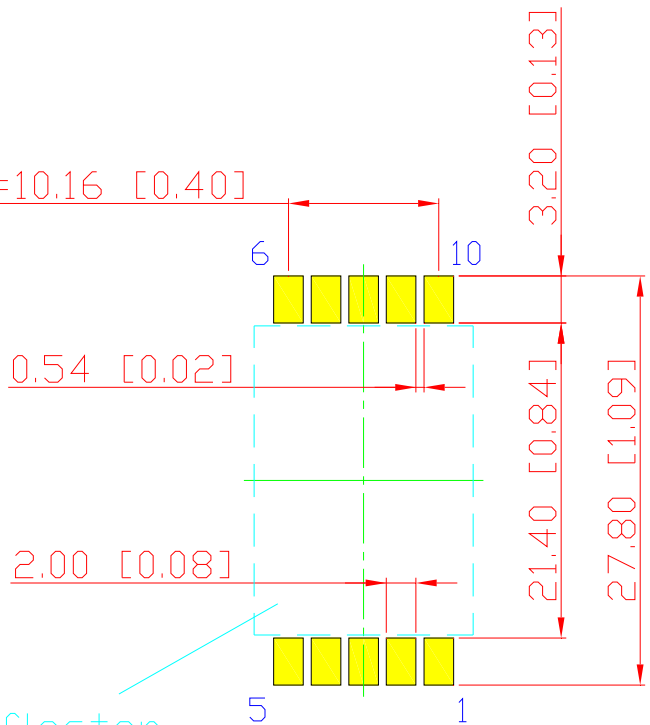
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● **TYPICAL INTERNAL EQUIVALENT CIRCUIT**

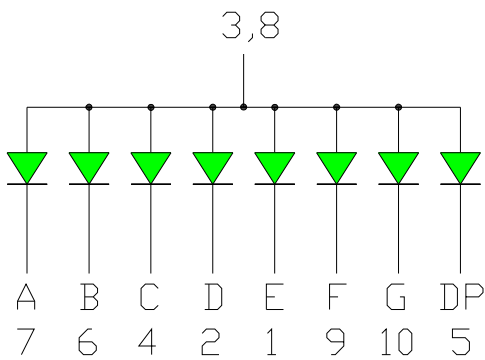
Recommended  
Reverse Mount  
Solder Pattern



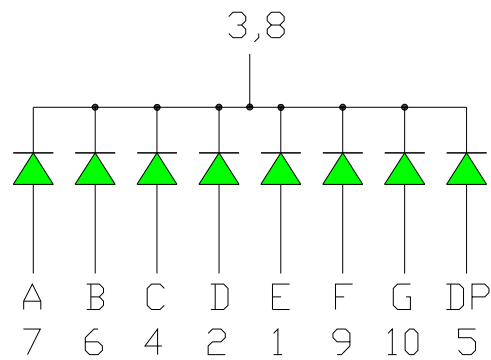
$2.54 \times 4 = 10.16$  [0.40]



Reflector  
(Mounting Hole)



SMA701SPG-ST-1.5 G/W  
(Common Anode)



SMC701SPG-ST-1.5 G/W  
(Common Cathode)



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● **SPG: PURE GREEN (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>	100	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	-	2.8	3.6	V
Reverse Current, (Per Dice)	I <sub>R</sub>	V <sub>R</sub> =8V	-	-	10	μA
Dominant Wavelength	λ <sub>D</sub>	I <sub>F</sub> =20mA	515	-	530	nm
Luminous Intensity	I <sub>V</sub>	I <sub>F</sub> =20mA	350	-	700	mcd
Spectral radiation bandwidth	Δλ	I <sub>F</sub> =20mA	-	30	-	nm



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● **SPG: BIN GRADE (Unit : mcd /  $I_F = 20\text{mA}$ )**

PURE GREEN	T	U	V
	350.0 – 470.0	470.1 – 590.0	590.1 – 700.0

● **SPG: HUE GRADE ( $\lambda_D$  : nm)**

1	2	3
515.0 – 520.0	520.1 – 525.0	525.1 – 530.0

● **AVAILABLE BIN / HUE TABLE**

T1	U1	V1
T2	U2	V2
T3	U3	V3



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## 0.70" SMD Type LED Display

### SMA701SPG-ST-1.5 G/W

### SMC701SPG-ST-1.5 G/W

#### ● SPG: PURE GREEN (InGaN/GaN) CURVE

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

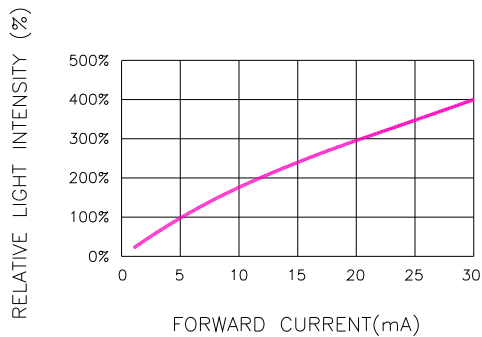


Fig.1 RELATIVE LIGHT INTENSITY VS. FORWARD CURRENT

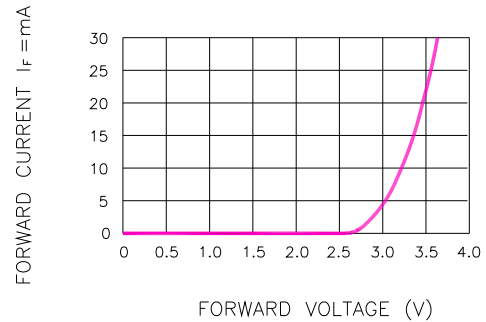


Fig.2 FORWARD CURRENT VS. FORWARD VOLTAGE

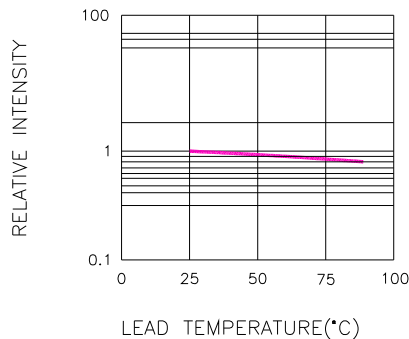


Fig.3 RELATIVE INTENSITY VS. LEAD TEMPERATURE  
(PULSED 20 mA; 300us PULSE, 10ms PERIOD)

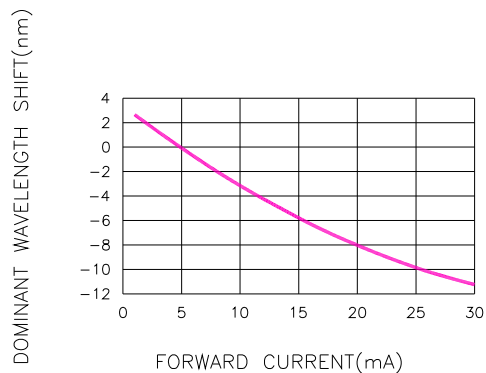


Fig.4 DOMINANT WAVELENGTH SHIFT VS. FORWARD CURRENT

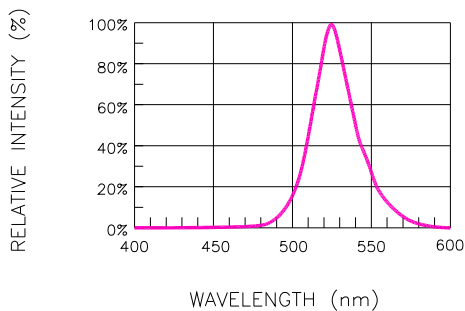


Fig.5 RELATIVE INTENSITY VS. WAVELENGTH

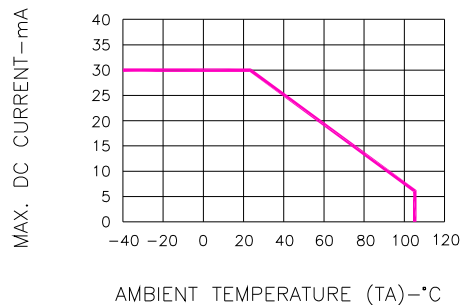


Fig.6 MAX. ALLOWABLE DC CURRENT VS. AMBIENT TEMPERATURE

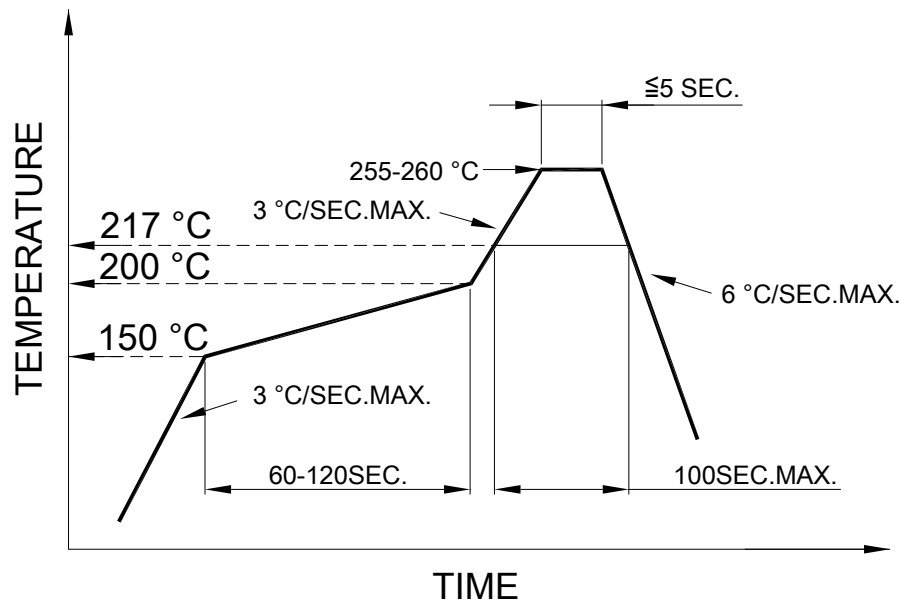


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● **SMT REFLOW SOLDERING INSTRUCTIONS**

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.