



**American Opto Plus LED Corp.**  
**0.51" SMD Type LED Display**  
**SMA512W G/W**  
**SMC512W G/W**

● **FEATURES**

- 0.51 inch (13.0 mm) Digit Height..
- SMD type.
- Low current operation.
- Gray face, White segment.
- RoHS compliant, Pb Free.

● **DESCRIPTION**

The SMA512W GW & SMC512W GW are 0.51 inch (13.0mm) height  
Double 7-segment displays.

This device utilizes Super Bright White LED chip which are made from InGaN  
On a transparent GaN, substrate.

The display has Gray face, White segment.

● **DEVICE**

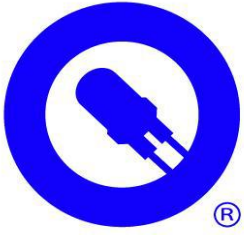
| PART NO     | DESCRIPTION    |
|-------------|----------------|
| SMA512W G/W | Common Anode   |
| SMC512W G/W | Common Cathode |

**RoHS Compliance**



**Pb free.**





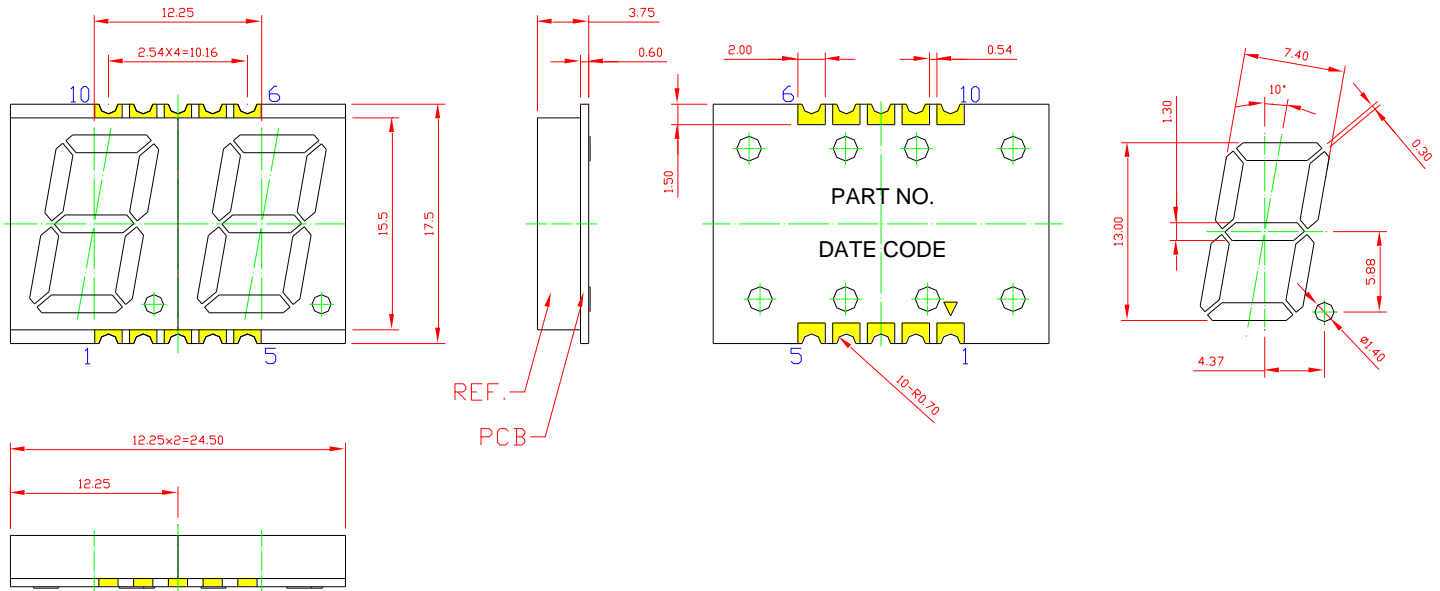
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## 0.51" SMD Type LED Display

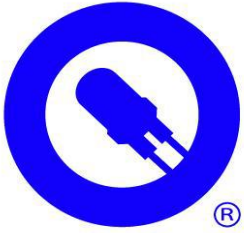
### SMA512W G/W

### SMC512W G/W

### ● MECHANICAL DIMENSIONS



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



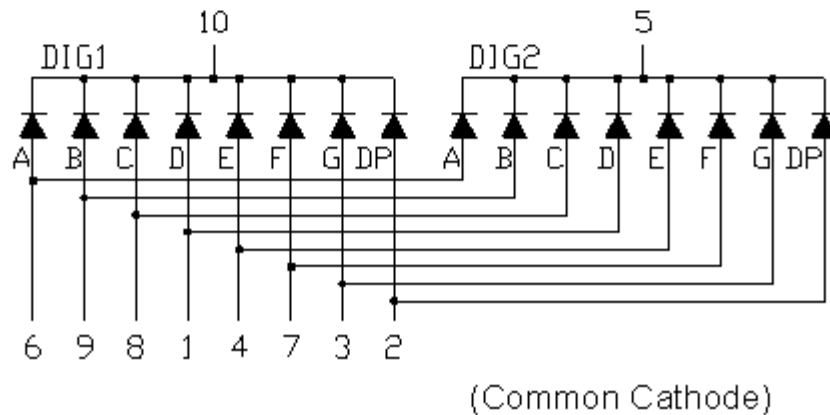
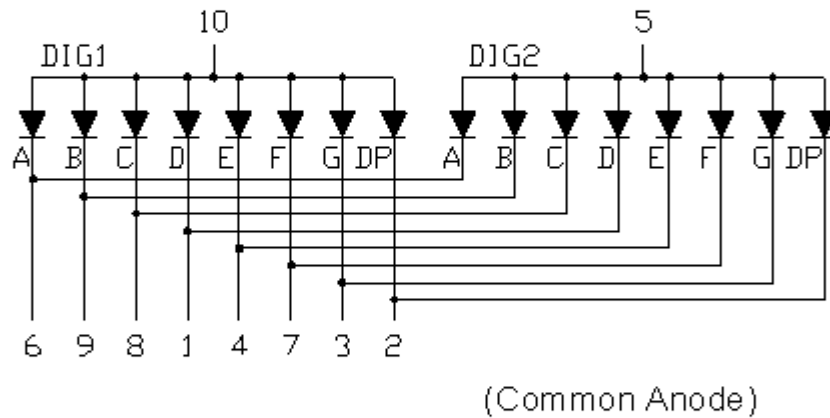
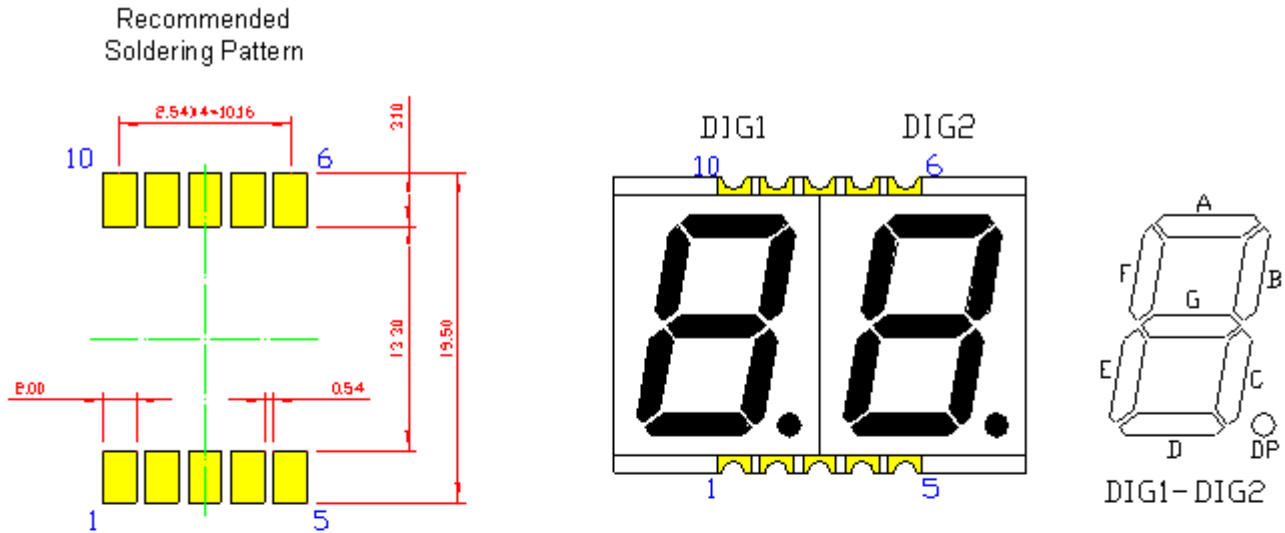
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### SMA512W G/W

### SMC512W G/W

#### ● TYPICAL INTERNAL EQUIVALENT CIRCUIT





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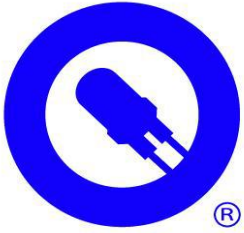
● **SUPER BRIGHT WHITE (InGaN/GaN)**

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

| Parameter                                | Symbol    | Maximum Rating | Unit                    |
|--|-----------|----------------|-------------------------|
| Power dissipation                        | $P_{AD}$  | 120            | mW                      |
| Derating liner from $25^{\circ}\text{C}$ | -         | 0.3            | mA / $^{\circ}\text{C}$ |
| Continuous forward current               | $I_{AF}$  | 30             | mA                      |
| Peak current (duty cycle 1/10, 1kHz)     | $I_{PF}$  | 100            | mA                      |
| Reverse voltage                          | $V_R$     | 5              | V                       |
| Operating temperature                    | $T_{OPR}$ | -40 to +105    | $^{\circ}\text{C}$      |
| Storage temperature                      | $T_{STG}$ | -40 to +105    | $^{\circ}\text{C}$      |

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

| Characteristic               | Symbol          | Condition        | Min. | Type. | Max. | Unit          |
|------------------------------|-----------------|------------------|------|-------|------|---------------|
| Forward voltage              | $V_F$           | $I_F=5\text{mA}$ | -    | 3.2   | 4.0  | V             |
| Reverse current              | $I_R$           | $V_R=8\text{V}$  | -    | -     | 10   | $\mu\text{A}$ |
| Chromaticity coordinate      | X               | $I_F=5\text{mA}$ | -    | 0.29  | -    | -             |
|                              | Y               | $I_F=5\text{mA}$ | -    | 0.29  | -    | -             |
| Luminous intensity           | $I_v$           | $I_F=5\text{mA}$ | -    | 30    | -    | mcd           |
| Spectral radiation bandwidth | $\Delta\lambda$ | $I_F=5\text{mA}$ | -    | 30    | -    | nm            |



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#### ● SUPER BRIGHT WHITE (InGaN/GaN) CURVE

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

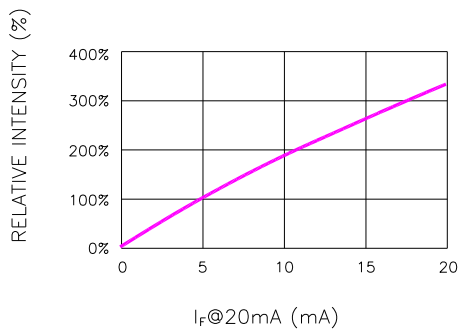


Fig.1 RELATIVE INTENSITY VS. FORWARD CURRENT

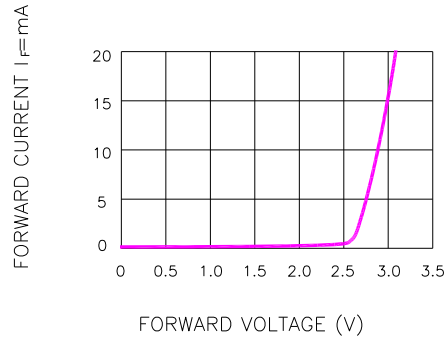


Fig.2 FORWARD CURRENT VS. FORWARD VOLTAGE

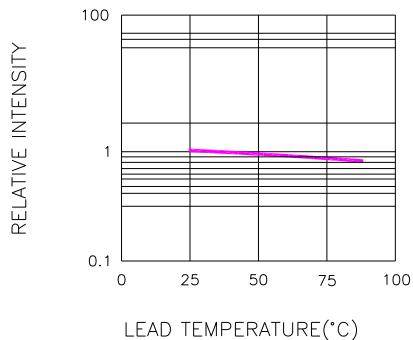


Fig.3 RELATIVE INTENSITY VS. LEAD TEMPERATURE  
(PULSED 20 mA; 300us PULSE, 10ms PERIOD)

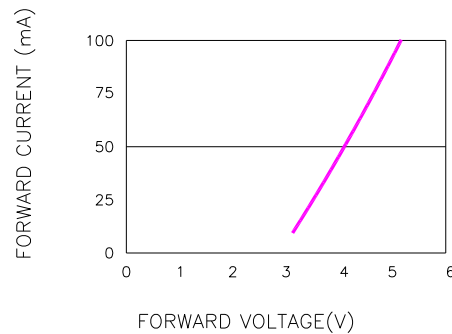


Fig.4 PEAK FORWARD VOLTAGE VS. FORWARD (100us TEST PULSE, 1% DUTY CYCLE)

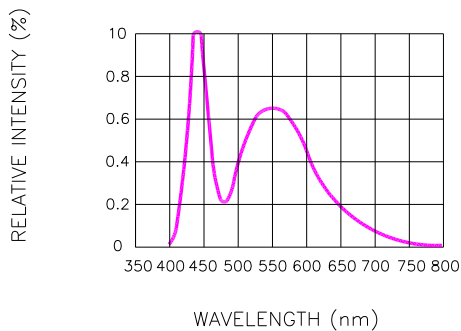


Fig.4 RELATIVE INTENSITY VS. WAVELENGTH

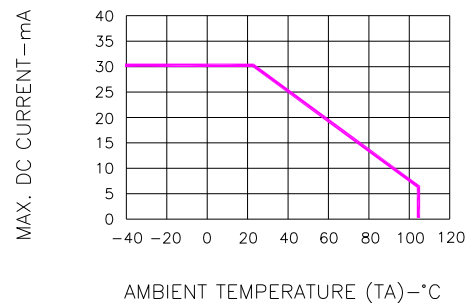


Fig.7 MAX. ALLOWABLE DC CURRENT VS. AMBIENT TEMPERATURE

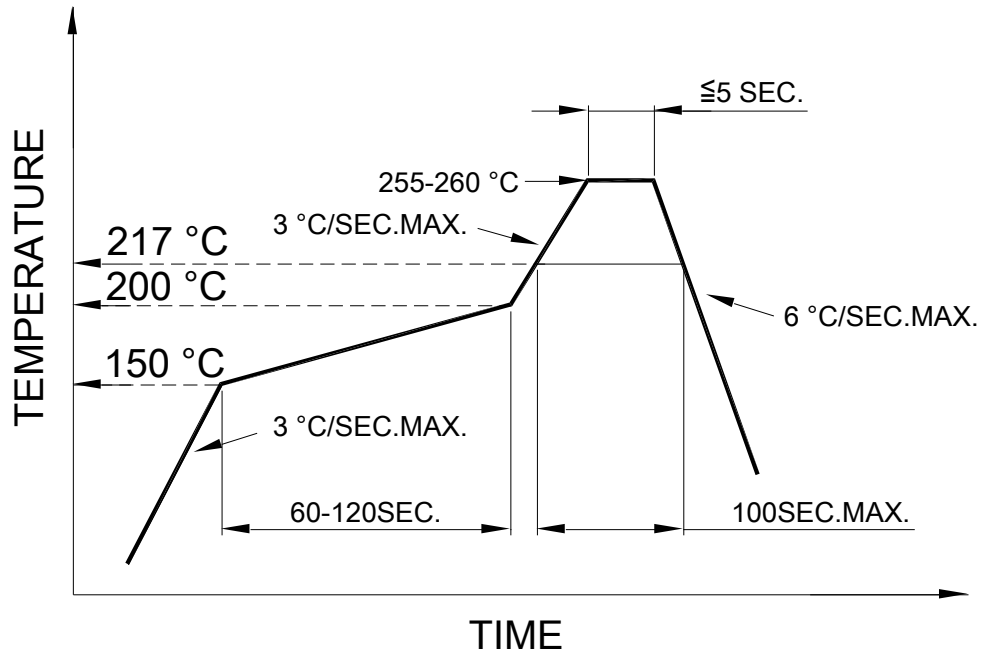


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● **RECOMMEND SOLDERING PROFILE**

SMT Soldering Profile

Pb free reflow soldering Profile



● **SOLDERING IRON**

Basic specification :  $\leq 4$  seconds 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  $\leq 3$  sec under 350°C.