

www.opledtw.com

Opto Plus LED Corp.
0.51" SMD Type LED Display
OPS-T5116SB | OPS-T5117SB

● **EDIT HISTORY**

Version A: May. 31, 2024

Preliminary Spec.

Confidential Document



www.opledtw.com

Opto Plus LED Corp.

0.51” SMD Type LED Display

OPS-T5116SB | OPS-T5117SB

● FEATURES

- 0.51 inch (13.00 mm) digit height.
- SMD type.
- Low current operation.
- RoHS Compliant, Pb Free.

● DESCRIPTION

The device are 0.51 inch (13.00 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-T5116SB-GW | Common Anode Gray face White segment |
| OPS-T5117SB-GW | Common Cathode Gray face White segment |
| OPS-T5116SB-BW | Common Anode Black face White segment |
| OPS-T5117SB-BW | Common Cathode Black face White segment |

RoHS Compliance



Pb Free.



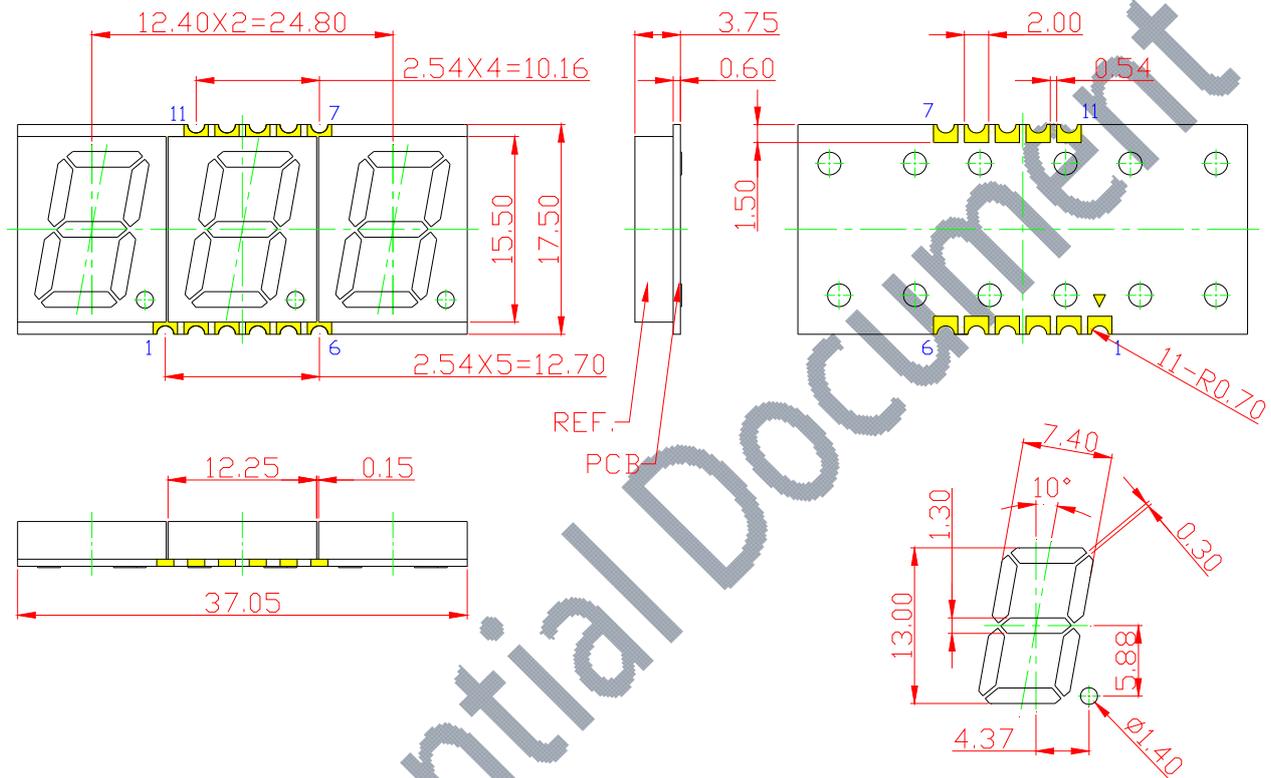


Opto Plus LED Corp.

0.51" SMD Type LED Display

OPS-T5116SB | OPS-T5117SB

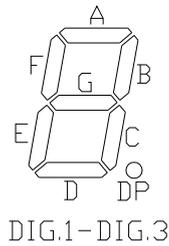
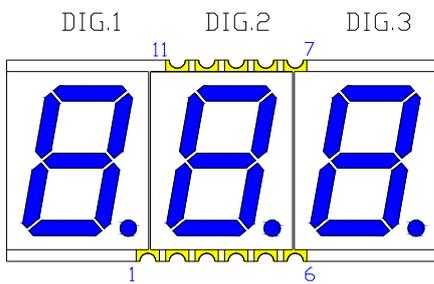
● MECHANICAL DIMENSIONS



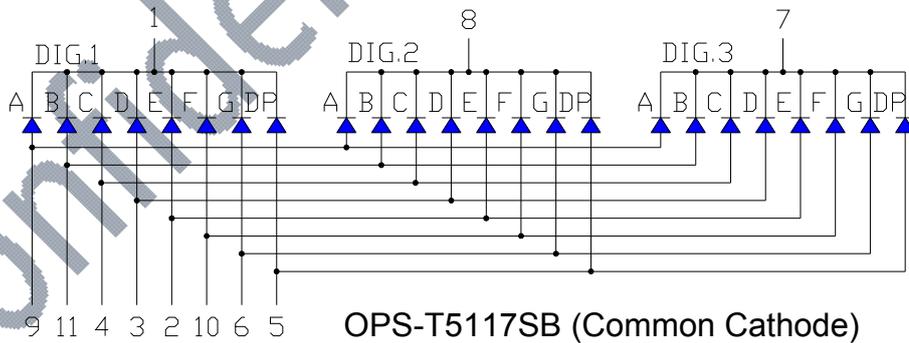
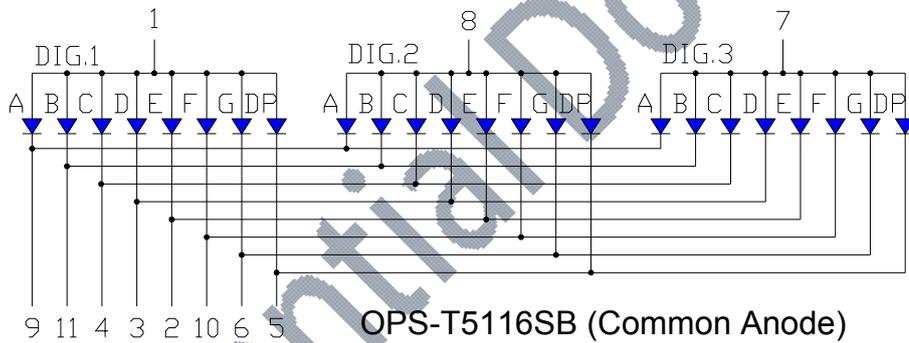
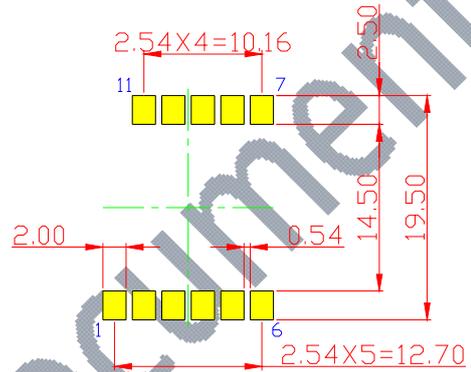
NOTES: All dimensions are in millimeters. Tolerances are ± 0.25 mm unless otherwise noted.

● TYPICAL INTERNAL EQUIVALENT CIRCUIT

Turn On Color



Recommended Soldering Pattern



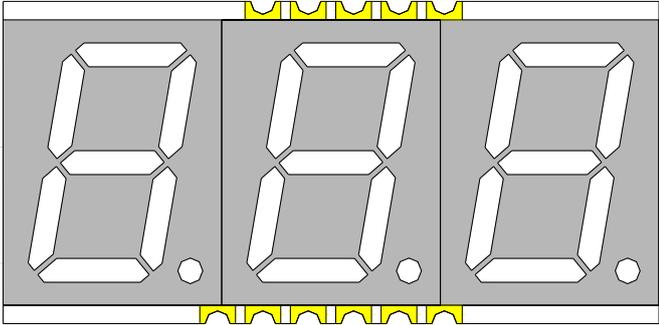
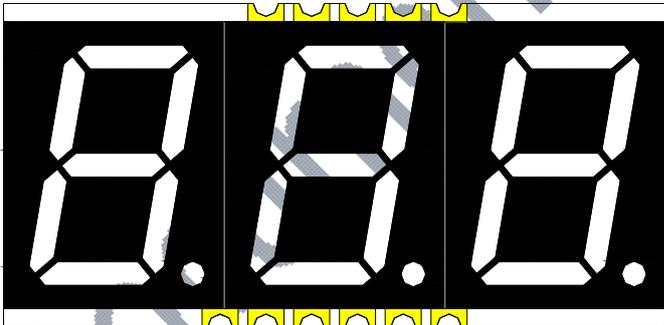
※EMITTED COLOR : SUPER BRIGHT BLUE



Opto Plus LED Corp. 0.51" SMD Type LED Display OPS-T5116SB | OPS-T5117SB

● 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 or contact 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-T5116SB-GW | Common Anode Gray face White segment |
| | OPS-T5117SB-GW | Common Cathode Gray face White segment |
| | OPS-T5116SB-BW | Common Anode Black face White segment |
| | OPS-T5117SB-BW | Common Cathode Black face White segment |



Opto Plus LED Corp.
0.51" SMD Type LED Display
OPS-T5116SB | OPS-T5117SB

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

ABSOLUTE MAXIMUM RATING AT Ta=25°C

| Parameter | Symbol | Maximum Rating | Unit |
|--------------------------------------|-----------|----------------|------|
| Power dissipation | P_{AD} | 90 | mW |
| Continuous forward current | I_{AF} | 30 | mA |
| Peak current (duty cycle 1/10, 1kHz) | I_{PF} | 60 | mA |
| Reverse voltage | V_R | 5 | V |
| Operating temperature | T_{OPR} | -40 to +105 | °C |
| Storage temperature | T_{STG} | -40 to +105 | °C |

ELECTRICAL - OPTICAL CHARACTERISTICS AT Ta=25°C

| Characteristic | Symbol | Condition | Min. | Type. | Max. | Unit |
|------------------------------|-----------------|---------------------|------|-------|------|---------------|
| Forward Voltage, (Per Dice) | V_F | $I_F = 20\text{mA}$ | - | 3.0 | 3.4 | V |
| Reverse Current, (Per Dice) | I_R | $V_R = 5\text{V}$ | - | - | 10 | μA |
| Dominant Wavelength | λ_D | $I_F = 20\text{mA}$ | 464 | - | 474 | nm |
| Luminous Intensity | I_V | $I_F = 20\text{mA}$ | 40 | - | 100 | mcd |
| Spectral Line Half-Bandwidth | $\Delta\lambda$ | $I_F = 20\text{mA}$ | - | 20 | - | nm |



Opto Plus LED Corp.
0.51” SMD Type LED Display
OPS-T5116SB | OPS-T5117SB

- SB: BIN GRADE (Unit : mcd) 20mA

| Super Bright Blue | M | N | O |
|-------------------|-------------|-------------|--------------|
| | 40.0 – 60.0 | 60.1 – 80.0 | 80.1 – 100.0 |

- SB: HUE GRADE (λ_D : nm)

| 1 | 2 | 3 |
|---------------|---------------|---------------|
| 464.0 - 467.0 | 467.1 - 470.0 | 470.1 - 474.0 |

- AVAILABLE BIN / HUE TABLE

| | | |
|----|----|----|
| M1 | N1 | O1 |
| M2 | N2 | O2 |
| M3 | N3 | O3 |



Opto Plus LED Corp.

0.51" SMD Type LED Display

OPS-T5116SB | OPS-T5117SB

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

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

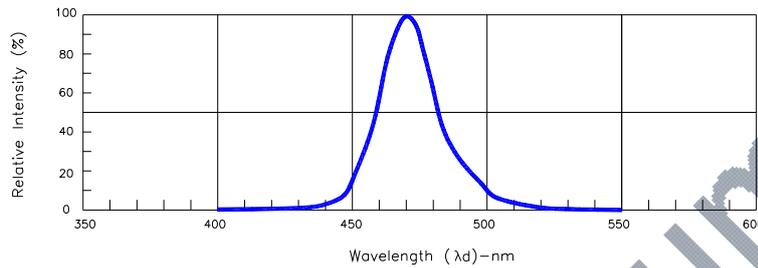


Fig.1-Relative Intensity VS. Wavelength

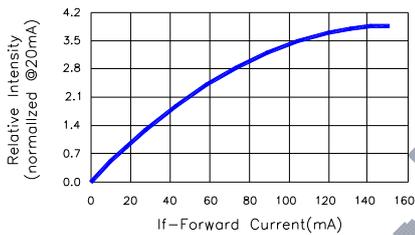


Fig.2-Relative Luminous Intensity vs. Forward Current

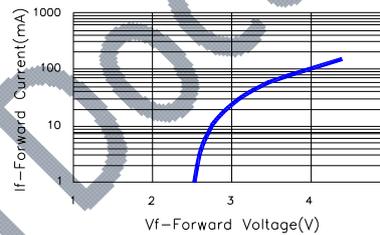


Fig.3-Forward Current vs. Forward Voltage

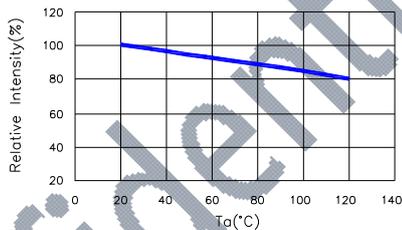


Fig.4-Relative Intensity(@20mA)VS. Ambient Temperature

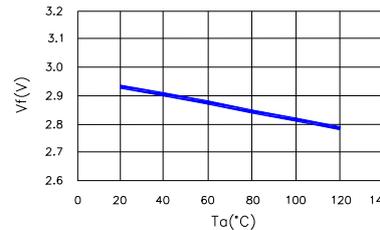


Fig.5-Forward Voltage(@20mA)VS. Ambient Temperature

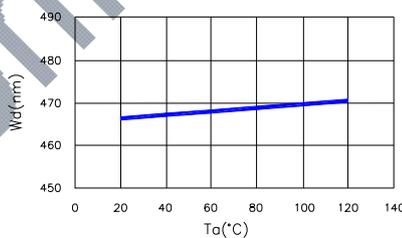


Fig.6-Dominant Wavelength(@20mA) VS. Ambient Temperature

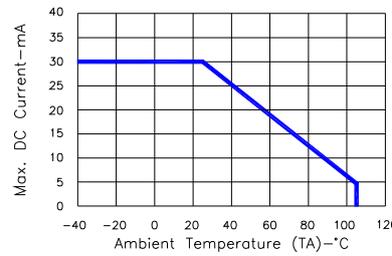


Fig.7-Max. Allowable DC Current VS. Ambient Temperature



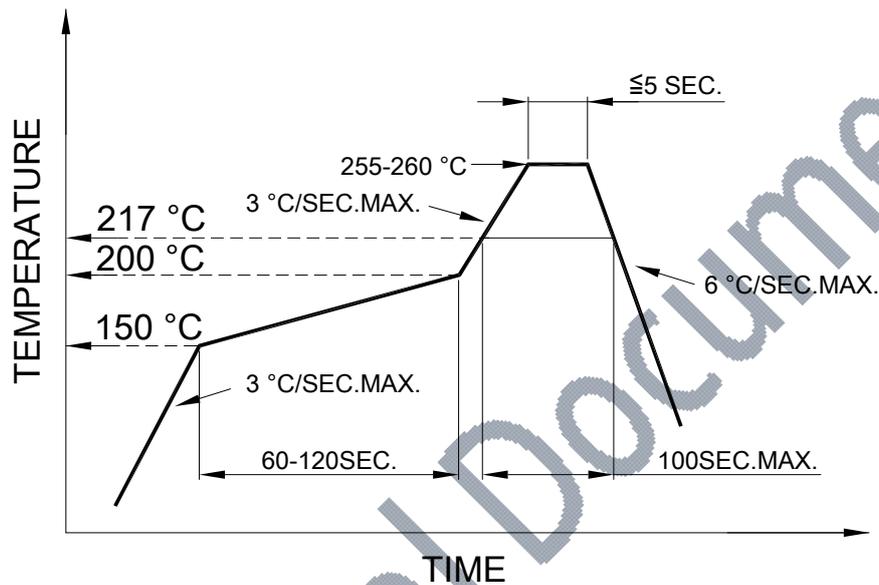
Opto Plus LED Corp.

0.51" SMD Type LED Display

OPS-T5116SB | OPS-T5117SB

● 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.

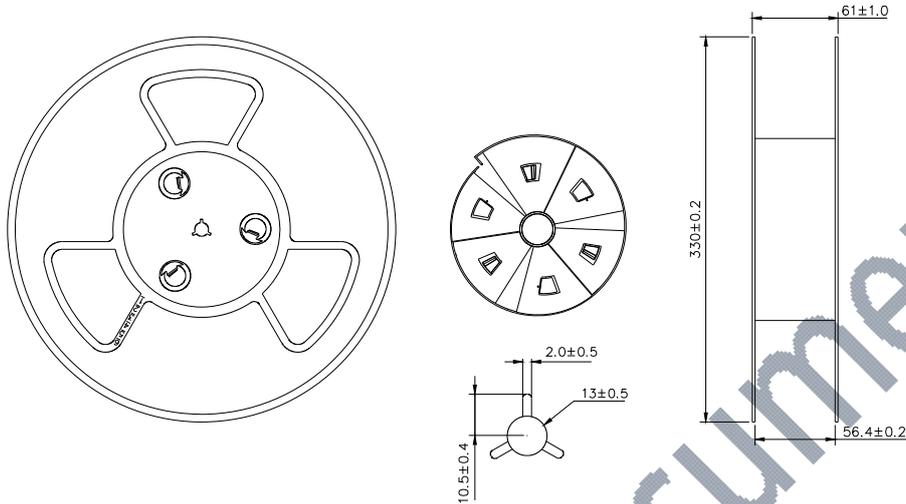
● SOLDERING IRON

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.

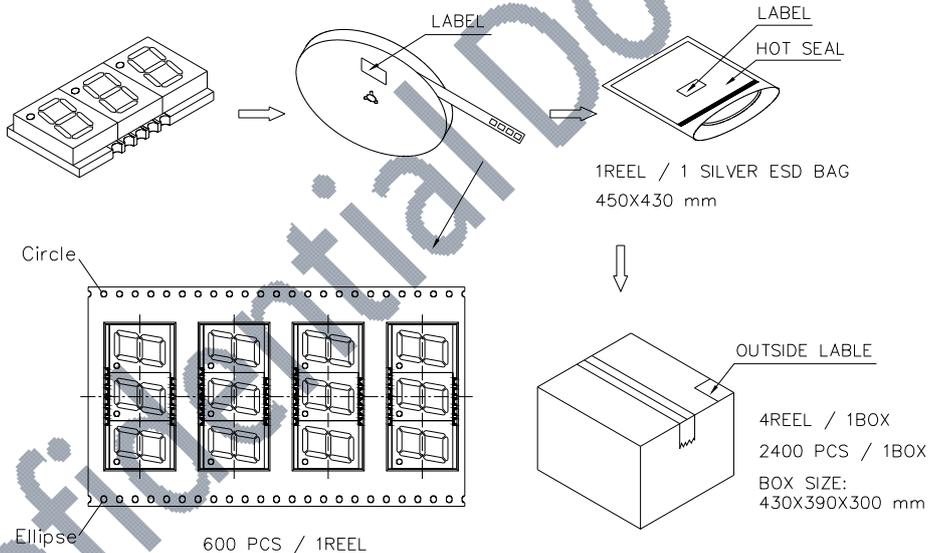
● REWORK

- Customer must finish rework within 3 sec. under 350°C.
- The head of soldering iron cannot touch copper foil.

● 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) |