



**Opto Plus LED Corp.**  
**0.40" SMD Type LED Display**  
**OPS-Q4012SB | OPS-Q4013SB**

● **EDIT HISTORY**

Version A: Nov. 24, 2020

Preliminary Spec.



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# Opto Plus LED Corp.

## 0.40" SMD Type LED Display

### OPS-Q4012SB | OPS-Q4013SB

#### ● FEATURES

- 0.40 inch (10.16 mm) digit height.
- SMD type.
- Low current operation.
- RoHS Compliant, Pb Free.

#### ● DESCRIPTION

The device are 0.40 inch (10.16 mm) height quadruple 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-Q4012SB-GW	Common Anode   Gray face   White segment
OPS-Q4013SB-GW	Common Cathode   Gray face   White segment
OPS-Q4012SB-BW	Common Anode   Black face   White segment
OPS-Q4013SB-BW	Common Cathode   Black face   White segment

#### RoHS Compliance



#### Pb Free.





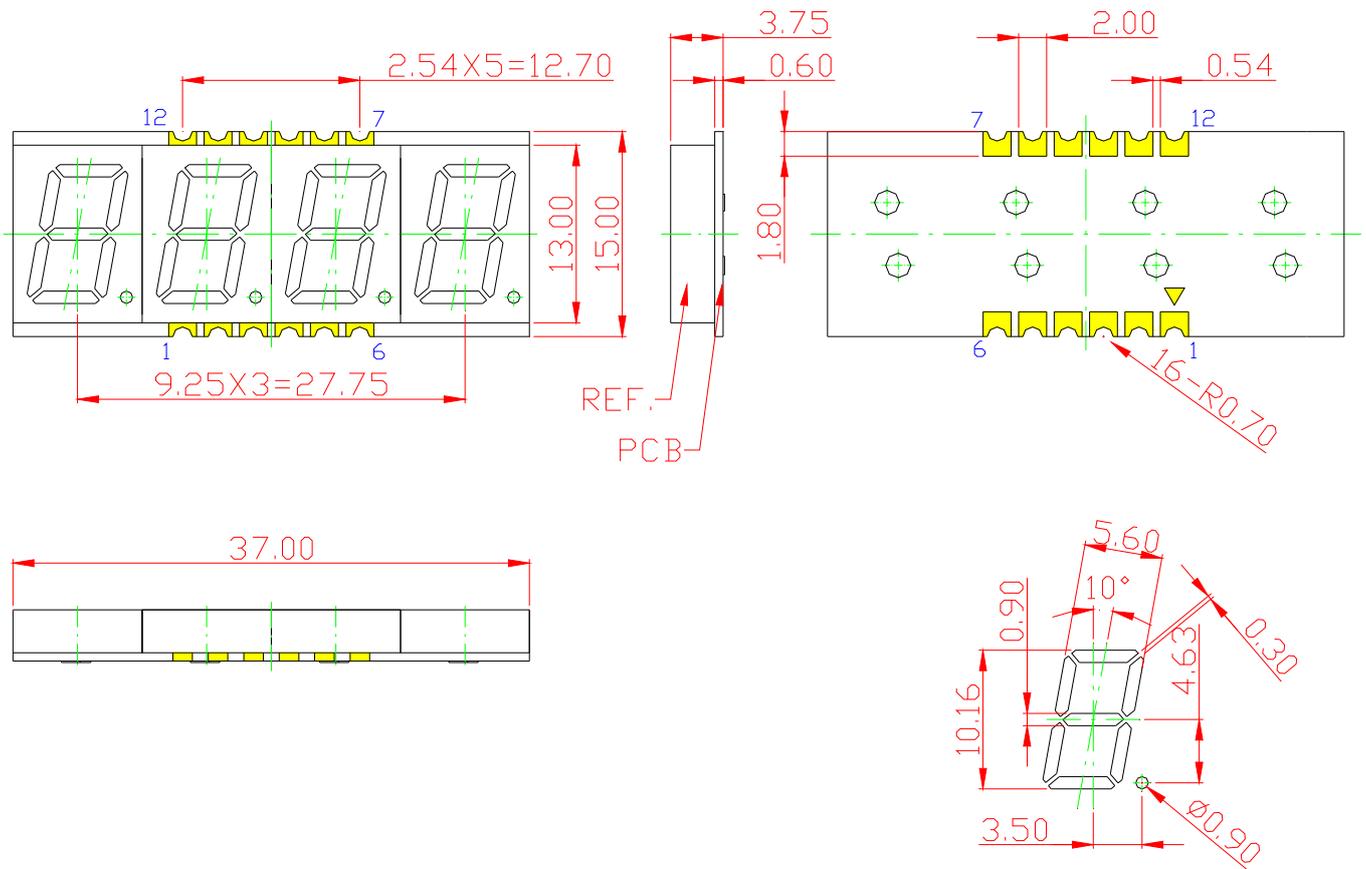
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## 0.40" SMD Type LED Display

### OPS-Q4012SB | OPS-Q4013SB

#### ● MECHANICAL DIMENSIONS



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

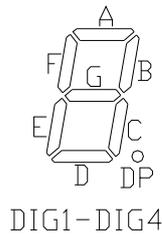
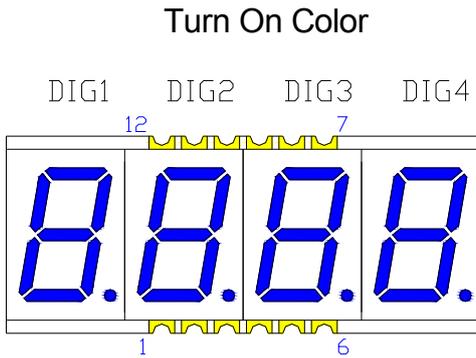


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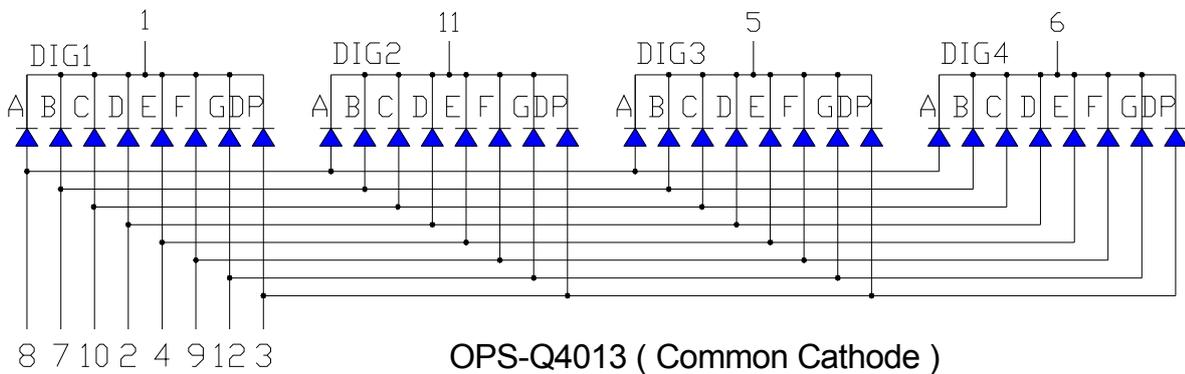
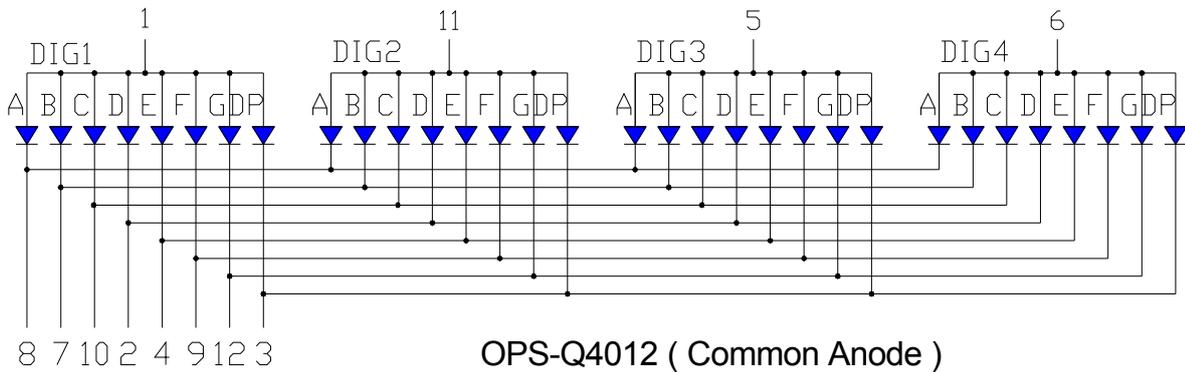
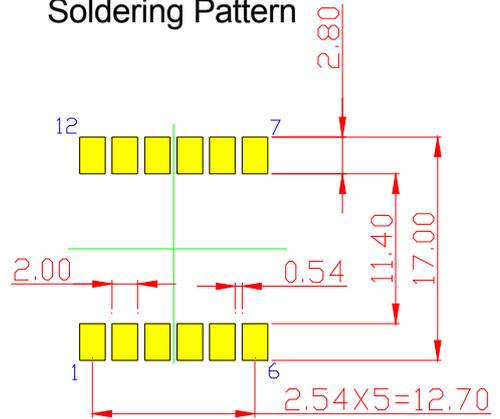
## 0.40" SMD Type LED Display

### OPS-Q4012SB | OPS-Q4013SB

#### ● TYPICAL INTERNAL EQUIVALENT CIRCUIT



#### Recommended Soldering Pattern



※EMITTED COLOR : SUPER BRIGHT BLUE



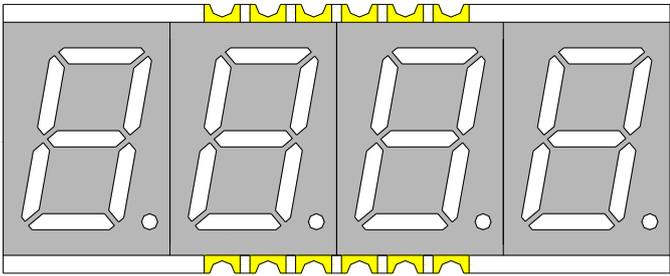
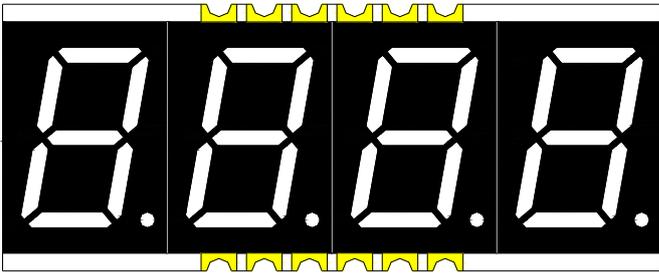
# Opto Plus LED Corp.

## 0.40'' SMD Type LED Display

### OPS-Q4012SB | OPS-Q4013SB

#### ● PRODUCT APPEARANCE

The most common reflector color and segment color are show in below diagram.

-GW	-BW
	
<ul style="list-style-type: none"> <li>※ REFLECTOR COLOR: Gray</li> <li>※ SEGMENT COLOR: White</li> </ul>	<ul style="list-style-type: none"> <li>※ REFLECTOR COLOR: Black</li> <li>※ SEGMENT COLOR: White</li> </ul>

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-Q4012SB-GW	Common Anode   Gray face   White segment
OPS-Q4013SB-GW	Common Cathode   Gray face   White segment
OPS-Q4012SB-BW	Common Anode   Black face   White segment
OPS-Q4013SB-BW	Common Cathode   Black face   White segment



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## 0.40'' SMD Type LED Display

### OPS-Q4012SB | OPS-Q4013SB

#### ● 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)	$V_F$	$I_F = 20mA$	-	3.0	3.4	V
Reverse Current, (Per Dice)	$I_R$	$V_R = 5V$	-	-	10	$\mu A$
Dominant Wavelength	$\lambda_D$	$I_F = 20mA$	466	-	474	nm
Luminous Intensity	$I_V$	$I_F = 20mA$	30	52.5	75	mcd
Spectral Line Half-Bandwidth	$\Delta\lambda$	$I_F = 20mA$	-	20	-	nm



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● **SB: BIN GRADE (Unit : mcd) 20mA**

	<b>L</b>	<b>M</b>	<b>N</b>
<b>Super Bright Blue</b>	30.0 – 45.0	45.1 – 60.0	60.1 – 75.0

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

	<b>1</b>	<b>2</b>
<b>Super Bright Blue</b>	466.0 - 470.0	470.1 - 474.0

● **AVAILABLE BIN / HUE TABLE**

L1	L2
M1	M2
N1	N2



# Opto Plus LED Corp.

## 0.40'' SMD Type LED Display

### OPS-Q4012SB | OPS-Q4013SB

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

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

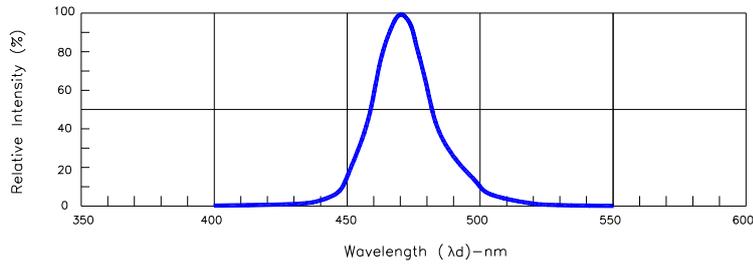


Fig.1-Relative Intensity VS. Wavelength

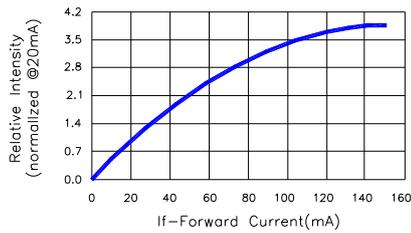


Fig.2-Relative Luminous Intensity vs. Forward Current

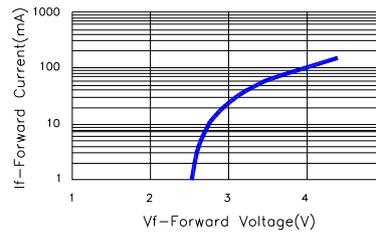


Fig.3-Forward Current vs. Forward Voltage

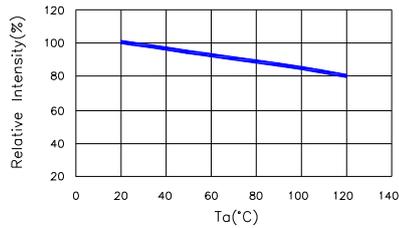


Fig.4-Relative Intensity(@20mA) VS. Ambient Temperature

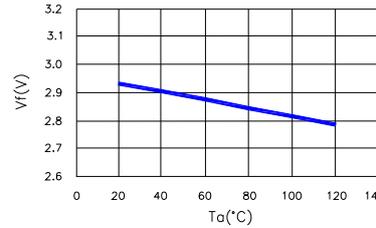


Fig.5-Forward Voltage(@20mA) VS. Ambient Temperature

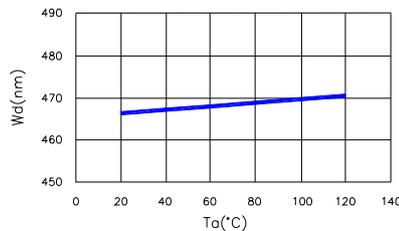


Fig.6-Dominant Wavelength(@20mA) VS. Ambient Temperature

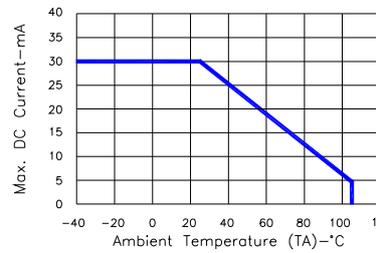


Fig.7-Max. Allowable DC Current VS. Ambient Temperature



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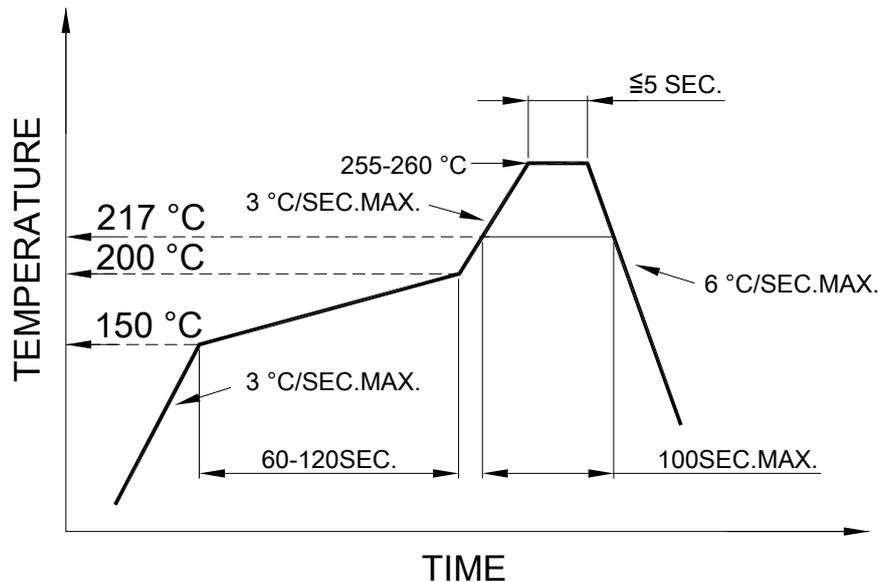
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#### ● SMT REFLOW SOLDERING INSTRUCTIONS

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.



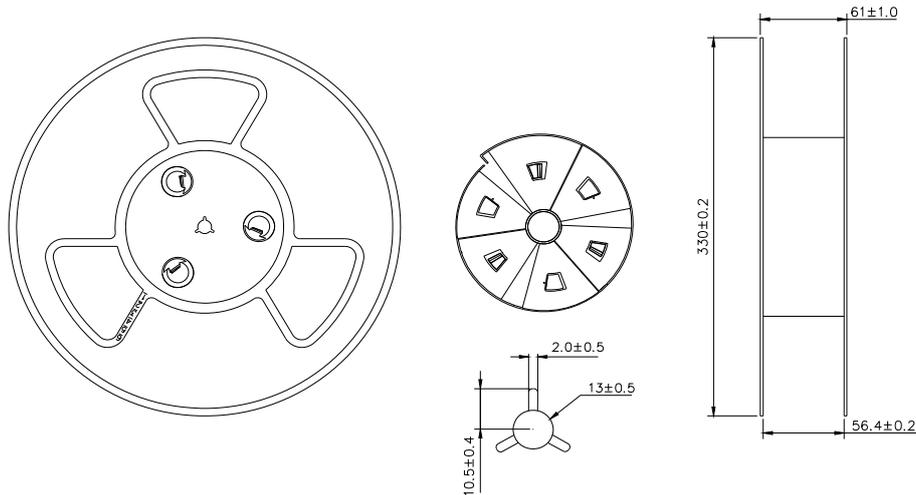
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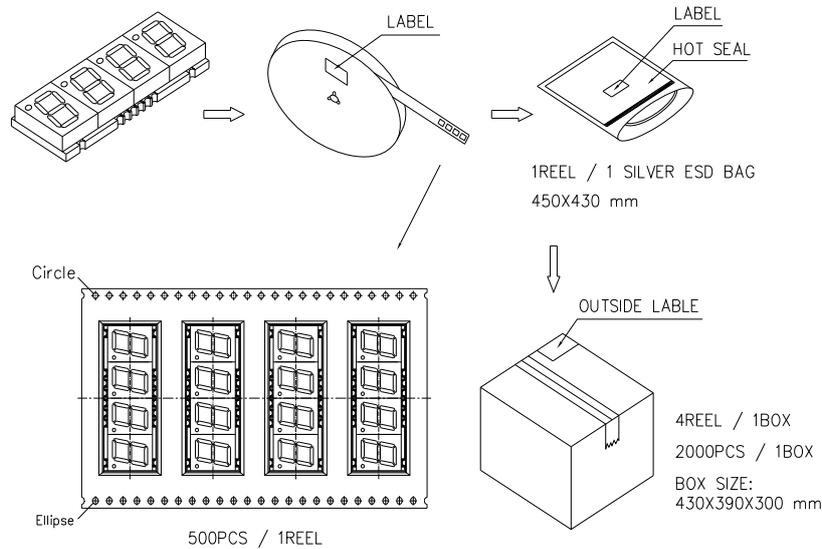
## 0.40" SMD Type LED Display

### OPS-Q4012SB | OPS-Q4013SB

#### ● 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)