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Opto Plus LED Corp.
0.40" SMD Type LED Display
OPS-Q4012SA | OPS-Q4013SA

● **EDIT HISTORY**

Version A: Nov. 24, 2020

Preliminary Spec.



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● 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 Amber LED chip which are made from AlGaInP
On a transparent GaAs, substrate.

The device has face and segment option, please refer to **PRODUCT APPEARANCE**.

● DEVICE

PART NO.	DESCRIPTION
OPS-Q4012SA-GW	Common Anode Gray face White segment
OPS-Q4013SA-GW	Common Cathode Gray face White segment
OPS-Q4012SA-BW	Common Anode Black face White segment
OPS-Q4013SA-BW	Common Cathode Black face White segment

RoHS Compliance



Pb Free.



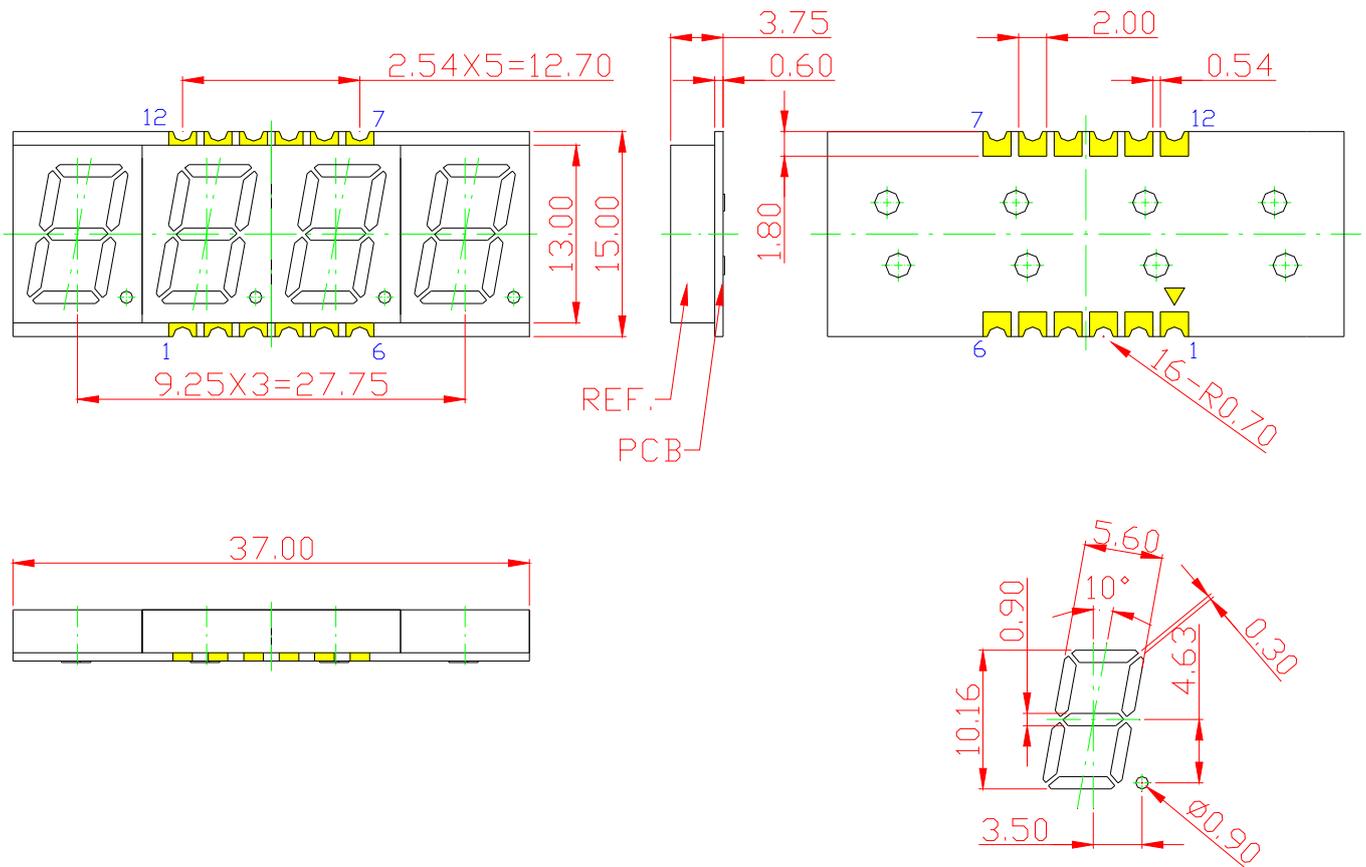


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● MECHANICAL DIMENSIONS



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

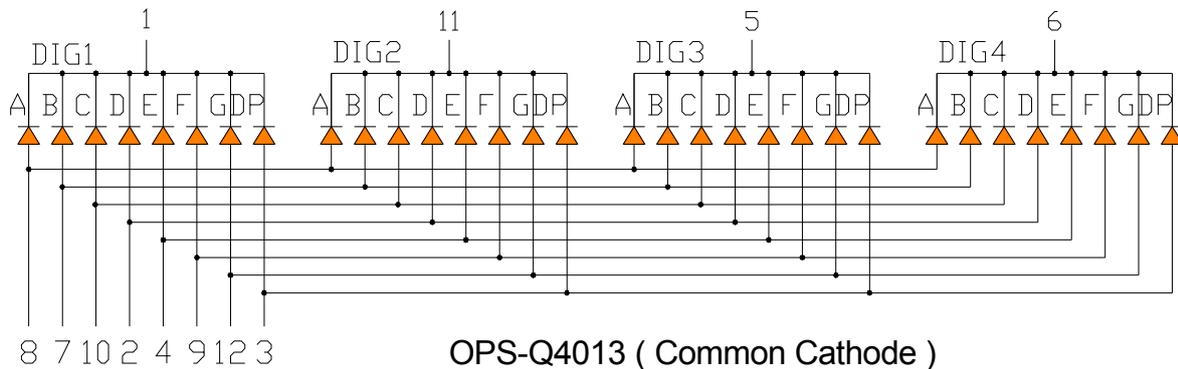
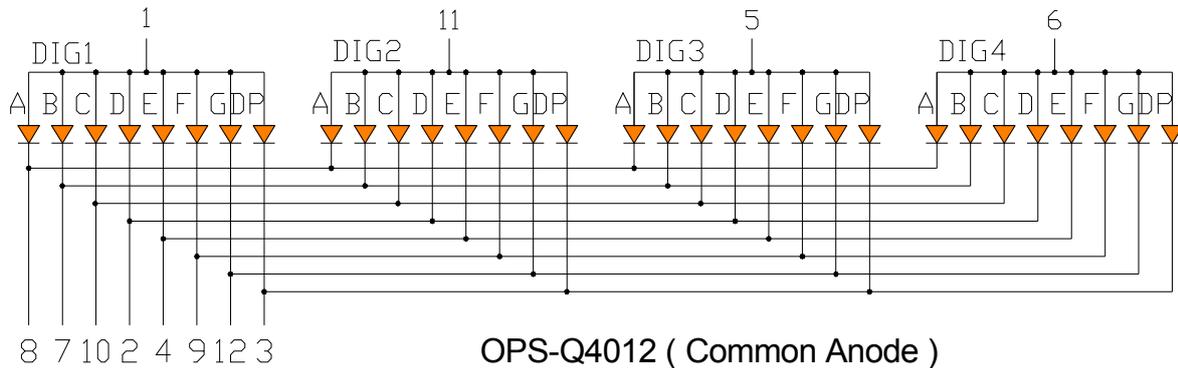
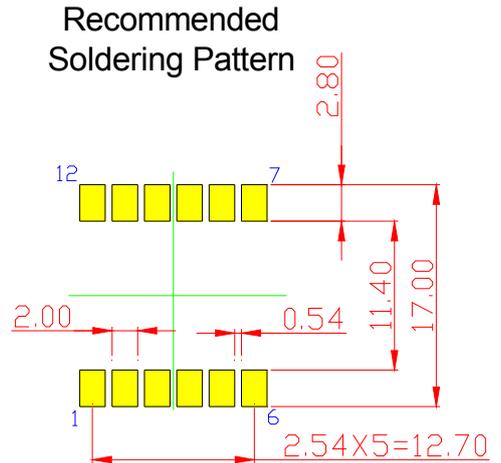
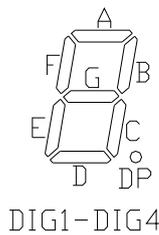
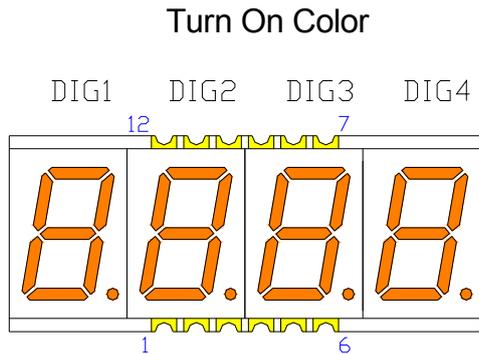


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● TYPICAL INTERNAL EQUIVALENT CIRCUIT



※EMITTED COLOR : SUPER BRIGHT AMBER



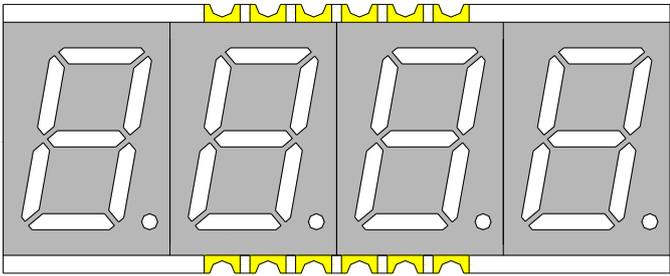
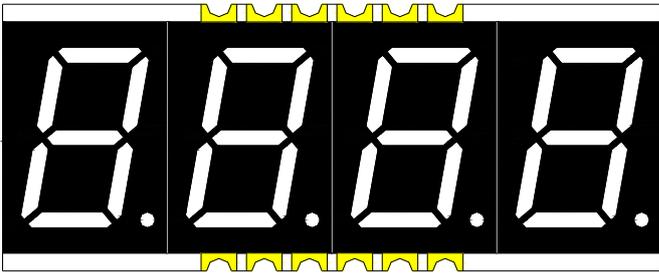
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● PRODUCT APPEARANCE

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

-GW	-BW
	
<ul style="list-style-type: none"> ※ REFLECTOR COLOR: Gray ※ SEGMENT COLOR: White 	<ul style="list-style-type: none"> ※ 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-Q4012SA-GW	Common Anode Gray face White segment
OPS-Q4013SA-GW	Common Cathode Gray face White segment
OPS-Q4012SA-BW	Common Anode Black face White segment
OPS-Q4013SA-BW	Common Cathode Black face White segment



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● **SA: SUPER BRIGHT AMBER (AlGaInP/GaAs)**

ABSOLUTE MAXIMUM RATING AT Ta=25°C

Parameter	Symbol	Maximum Rating	Unit
Power dissipation	P_{AD}	48	mW
Continuous forward current	I_{AF}	20	mA
Peak current (duty cycle 1/10, 1kHz)	I_{PF}	40	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	$I_F = 20\text{mA}$	-	2.0	2.4	V
Reverse Current, (Per Dice)	I_R	$V_R = 5\text{V}$	-	-	10	μA
Peak Wavelength	λ_P	$I_F = 20\text{mA}$	-	612	-	nm
Dominant Wavelength	λ_D	$I_F = 20\text{mA}$	601	-	613	nm
Luminous Intensity	I_v	$I_F = 20\text{mA}$	15	37.5	60	mcd
Spectral Line Half-Bandwidth	$\Delta\lambda$	$I_F = 20\text{mA}$	-	20	-	nm



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● SA: BIN GRADE (Unit : mcd) 20mA

	K	L	M
Super Bright Amber	15.0 -30.0	30.1 – 45.0	45.1 - 60.0

● SA: HUE GRADE (λ_D : nm)

1	2	3
601.0 – 605.0	605.1 – 610.0	610.1 – 613.0

● AVAILABLE BIN / HUE TABLE

K1	K2	K3
L1	L2	L3
M1	M2	M3



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● SA: SUPER BRIGHT AMBER (AlGaInP/GaAs) CURVE

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

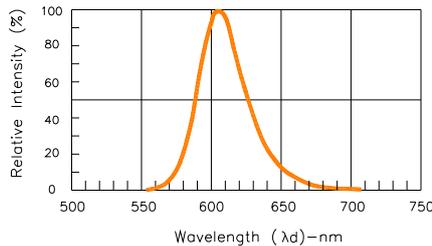


Fig.1-Relative Intensity VS. Wavelength

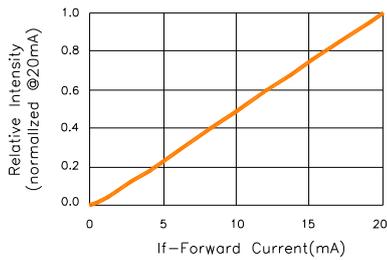


Fig.2-Relative Luminous Intensity vs. Forward Current

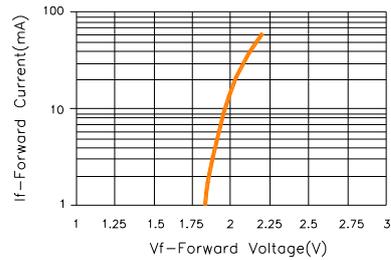


Fig.3-Forward Current vs. Forward Voltage

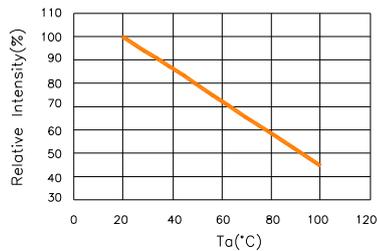


Fig.4-Relative Intensity(@20mA)VS. Ambient Temperature

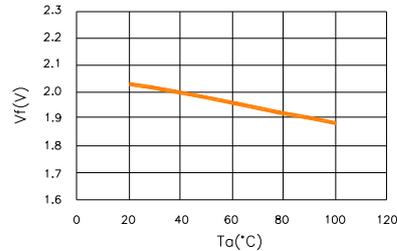


Fig.5-Forward Voltage(@20mA)VS. Ambient Temperature

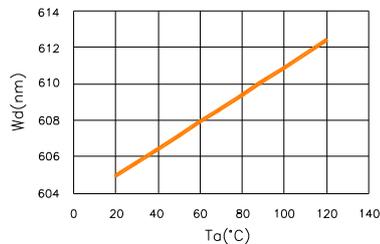


Fig.6-Dominant Wavelength(@20mA) VS. Ambient Temperature

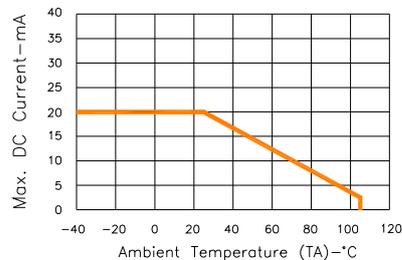


Fig.7-Max. Allowable DC Current VS. Ambient Temperature



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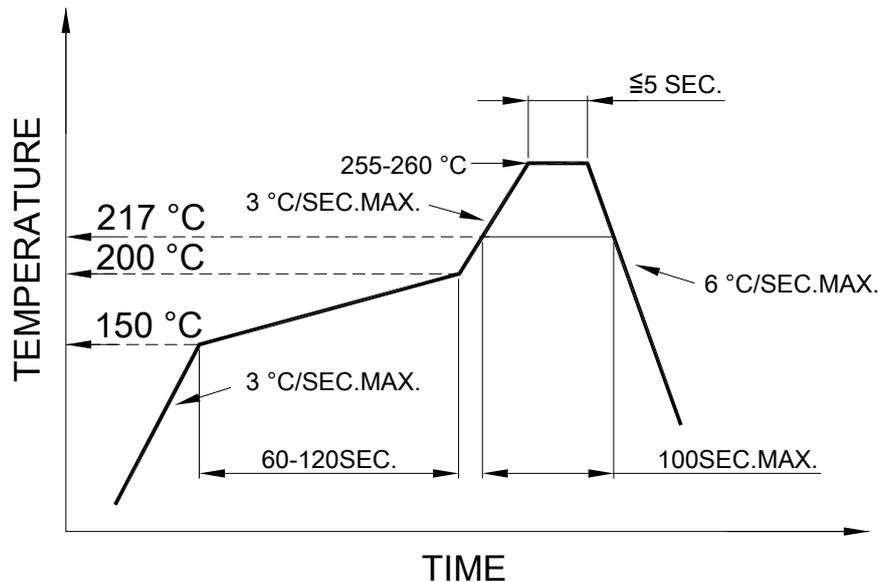
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● SMT REFLOW SOLDERING INSTRUCTIONS

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.



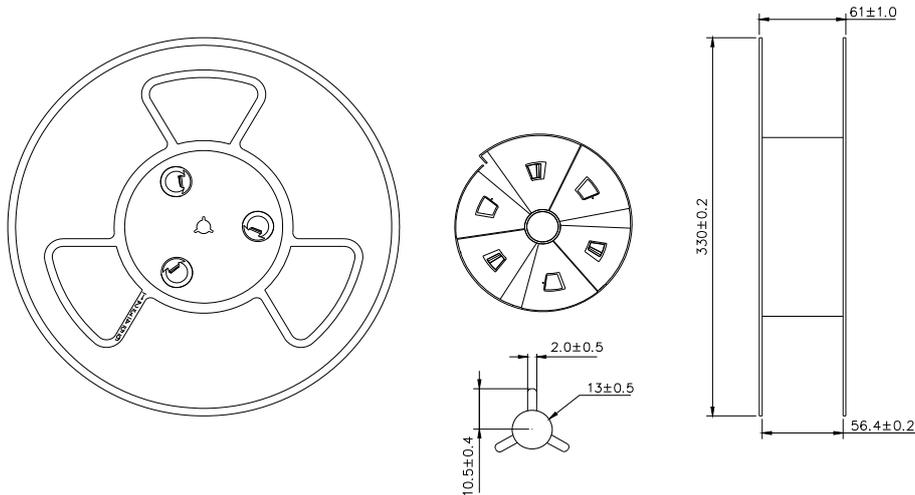
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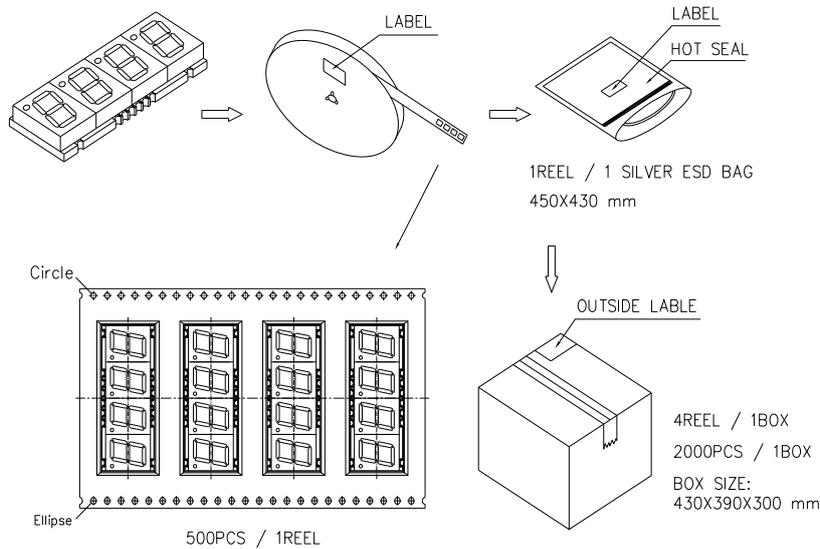
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● REEL DIMENSIONS



● 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)