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**Opto Plus LED Corp.**  
**0.40" SMD Type LED Display**  
**OPS-AQ4020SE | OPS-AQ4020SE**

● **EDIT HISTORY**

Version A: Jan. 08, 2021

Preliminary Spec.



# Opto Plus LED Corp.

## 0.40" SMD Type LED Display

### OPS-AQ4020SE | OPS-AQ4020SE

#### ● FEATURES

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

#### ● DESCRIPTION

The device are 0.4 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 Red 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-AQ4020SE-GW	Common Anode   Gray face   White segment
OPS-AQ4021SE-GW	Common Cathode   Gray face   White segment
OPS-AQ4020SE-BW	Common Anode   Black face   White segment
OPS-AQ4021SE-BW	Common Cathode   Black face   White segment

#### RoHS Compliance



#### Pb Free.



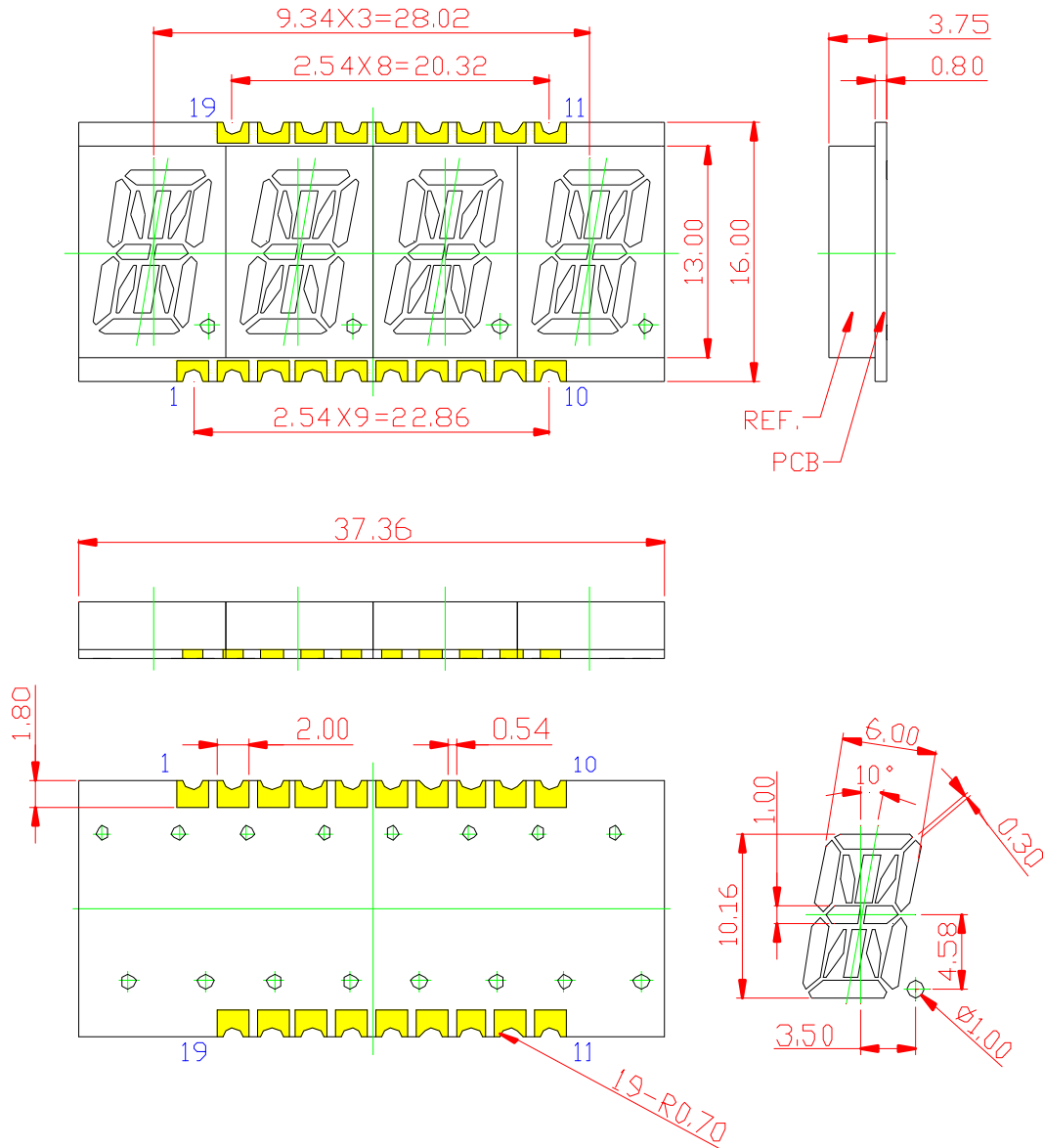


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## 0.40" SMD Type LED Display

### OPS-AQ4020SE | OPS-AQ4020SE

#### ● MECHANICAL DIMENSIONS



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



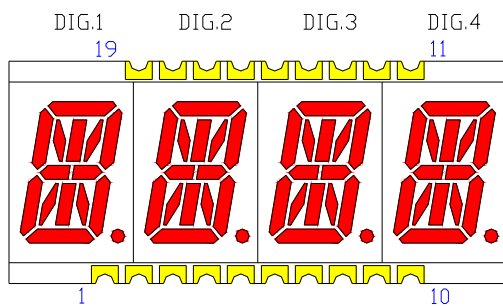
# Opto Plus LED Corp.

## 0.40'' SMD Type LED Display

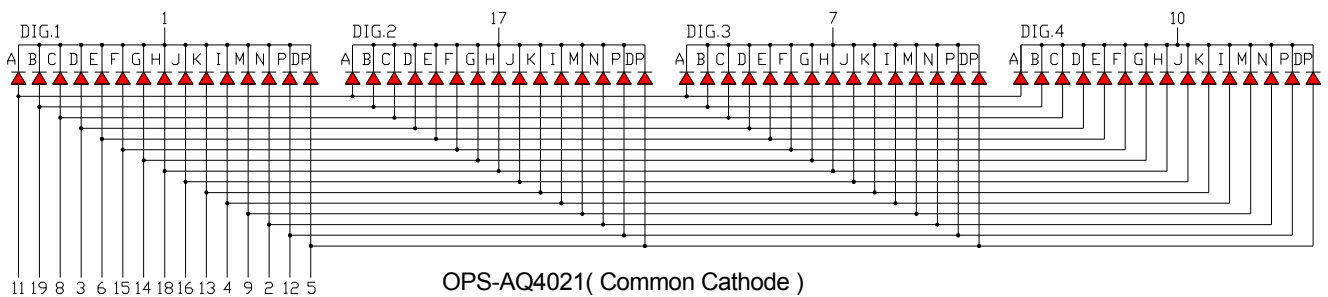
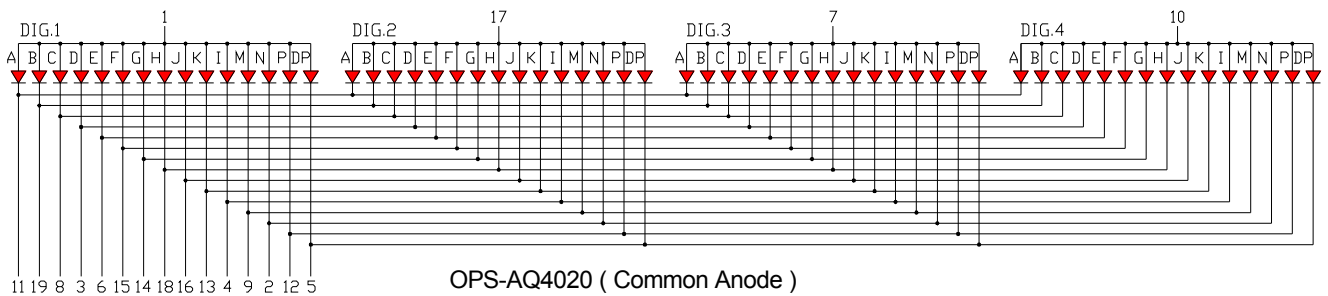
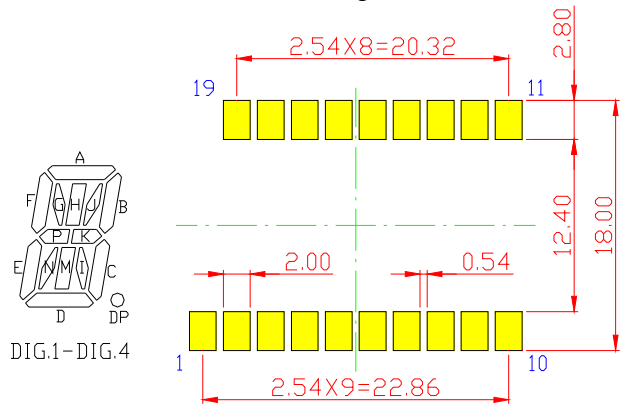
### OPS-AQ4020SE | OPS-AQ4020SE

#### ● TYPICAL INTERNAL EQUIVALENT CIRCUIT

Turn On Color



Recommended Soldering Pattern



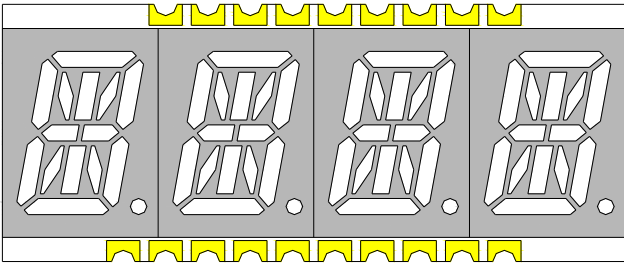
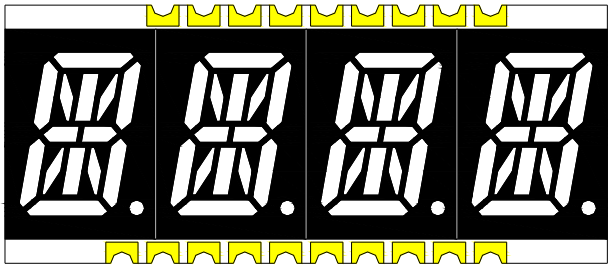
※EMITTED COLOR : SUPER BRIGHT RED



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● **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](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-AQ4020SE-GW	Common Anode   Gray face   White segment
OPS-AQ4021SE-GW	Common Cathode   Gray face   White segment
OPS-AQ4020SE-BW	Common Anode   Black face   White segment
OPS-AQ4021SE-BW	Common Cathode   Black face   White segment



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● **SE: SUPER BRIGHT RED (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)	$V_F$	$I_F = 20\text{mA}$	-	2.1	2.4	V
Reverse Current, (Per Dice)	$I_R$	$V_R = 5\text{V}$	-	-	10	$\mu\text{A}$
Peak Wavelength	$\lambda_P$	$I_F = 20\text{mA}$	-	632	-	nm
Dominant Wavelength	$\lambda_D$	$I_F = 20\text{mA}$	619	-	629	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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● **SE: BIN GRADE (Unit : mcd) 20mA**

Super Bright Red	M	N	O
	15.0 – 30.0	30.1 - 45.0	45.1 - 60.0

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

1	2	3
619.0 – 622.0	622.1 – 626.0	626.1 – 629.0

● **AVAILABLE BIN / HUE TABLE**

M1	M2	M3
N1	N2	N3
O1	O2	O3



# Opto Plus LED Corp.

## 0.40" SMD Type LED Display

### OPS-AQ4020SE | OPS-AQ4020SE

#### ● SE: SUPER BRIGHT RED (AlGaInP/GaAs) CURVE

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

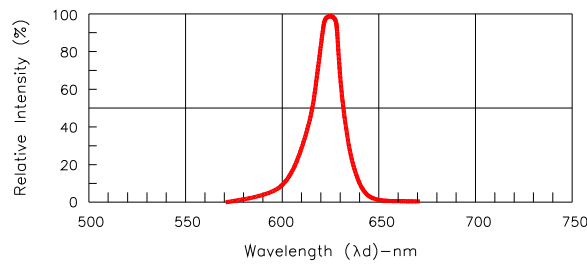


Fig.1-Relative Intensity VS. Wavelength

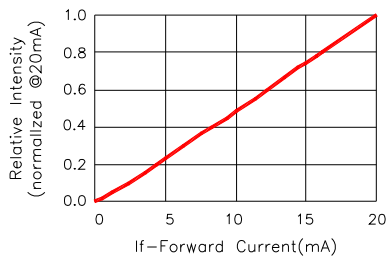


Fig.2-Relative Luminous Intensity vs. Forward Current

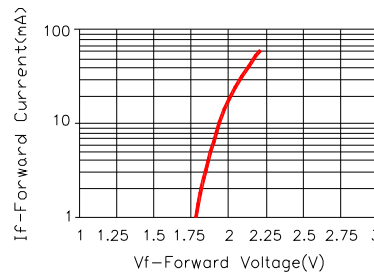


Fig.3-Forward Current vs. Forward Voltage

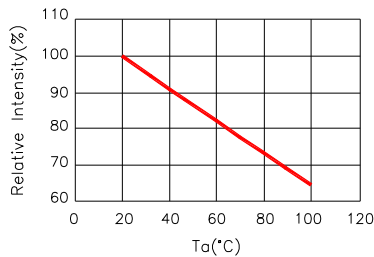


Fig.4-Relative Intensity(@20mA) vs. Ambient Temperature

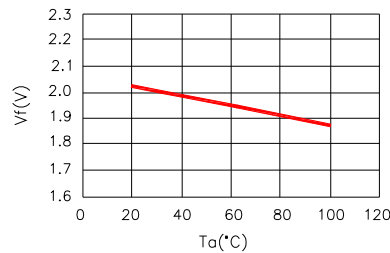


Fig.5-Forward Voltage(@20mA) vs. Ambient Temperature

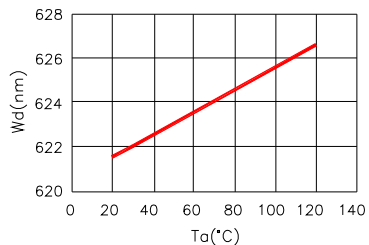


Fig.6-Dominant Wavelength(@20mA) VS. Ambient Temperature

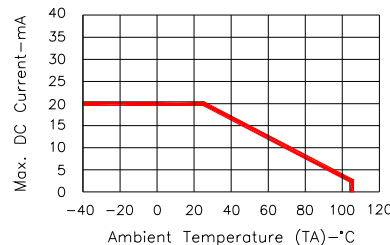


Fig.7-Max. Allowable DC Current VS. Ambient Temperature





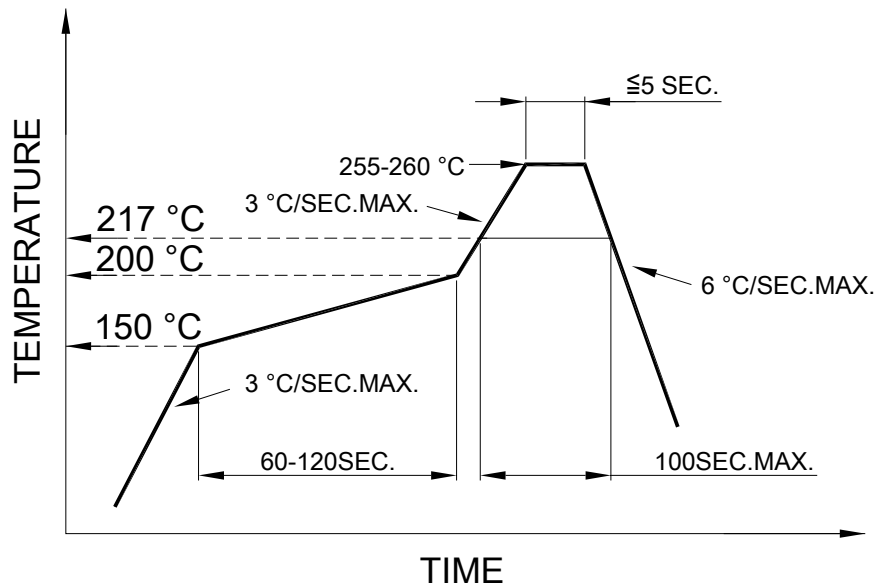
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#### ● SMT REFLOW SOLDERING INSTRUCTIONS

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.