



Opto Plus LED Corp.
0.40" SMD Type LED Display
OPS-AQ4022W3 | OPS-AQ4023W3

● **EDIT HISTORY**

Version A: Feb. 03, 2025

Preliminary Spec.

Confidential Document



Opto Plus LED Corp.

0.40" SMD Type LED Display

OPS-AQ4022W3 | OPS-AQ4023W3

● 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 alphanumeric displays.

The device is Opto Plus LED Corp standard LED Display.

This device utilizes Super Bright White SMD 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-AQ4022W3-GW	Common Anode Gray face White segment
OPS-AQ4023W3-GW	Common Cathode Gray face White segment
OPS-AQ4022W3-BW	Common Anode Black face White segment
OPS-AQ4023W3-BW	Common Cathode Black face White segment

RoHS Compliance



Pb Free.



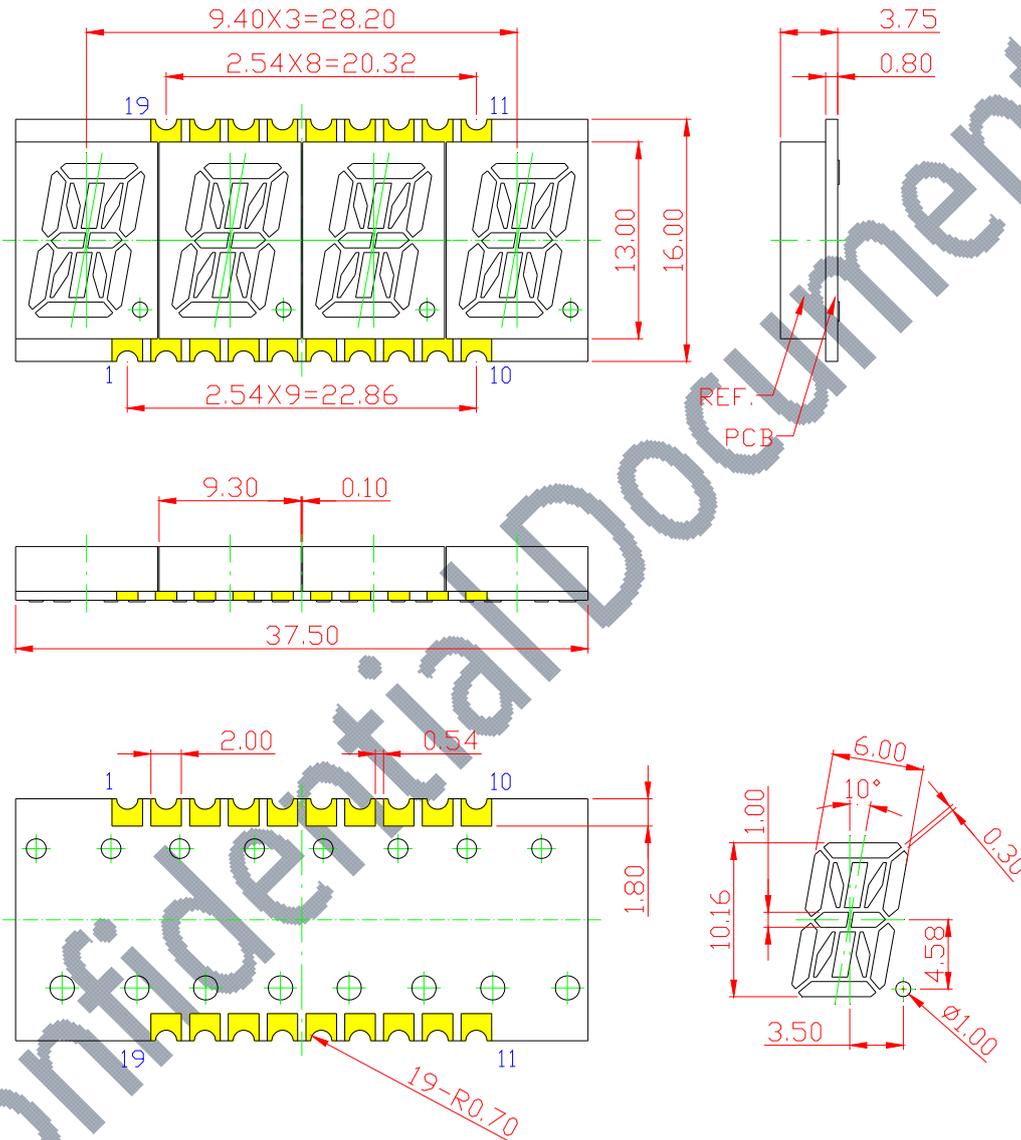


Opto Plus LED Corp.

0.40'' SMD Type LED Display

OPS-AQ4022W3 | OPS-AQ4023W3

● MECHANICAL DIMENSIONS



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



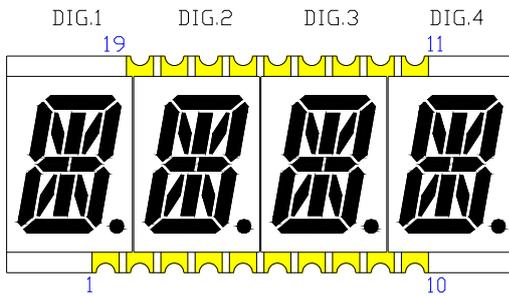
Opto Plus LED Corp.

0.40" SMD Type LED Display

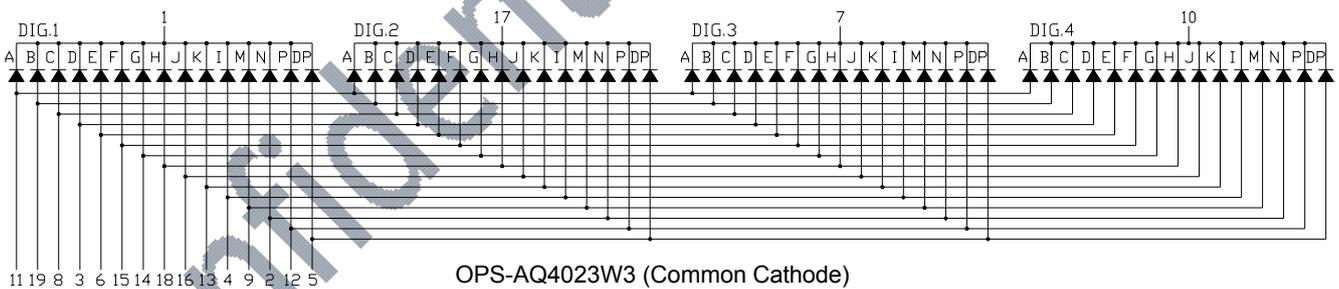
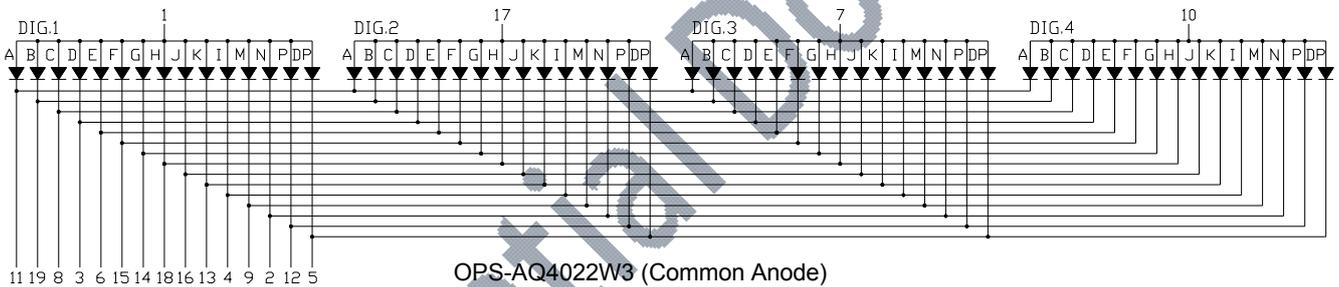
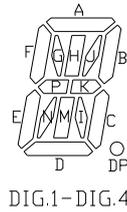
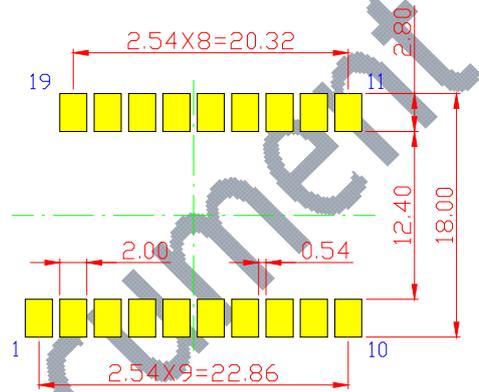
OPS-AQ4022W3 | OPS-AQ4023W3

● TYPICAL INTERNAL EQUIVALENT CIRCUIT

Turn On Color



Recommended Soldering Pattern



※EMITTED COLOR : SUPER BRIGHT WHITE



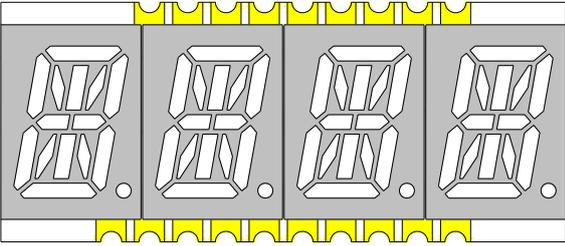
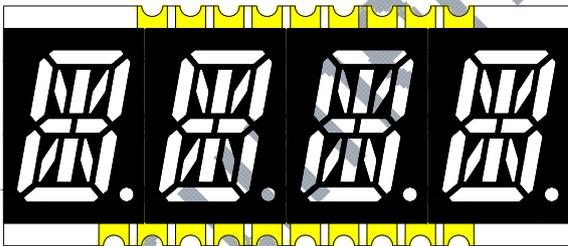
Opto Plus LED Corp.

0.40'' SMD Type LED Display

OPS-AQ4022W3 | OPS-AQ4023W3

● 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-AQ4022W3-GW	Common Anode Gray face White segment
OPS-AQ4023W3-GW	Common Cathode Gray face White segment
OPS-AQ4022W3-BW	Common Anode Black face White segment
OPS-AQ4023W3-BW	Common Cathode Black face White segment



Opto Plus LED Corp.
0.40'' SMD Type LED Display
OPS-AQ4022W3 | OPS-AQ4023W3

● **W3: SUPER BRIGHT WHITE (InGaN/GaN)**

ABSOLUTE MAXIMUM RATING AT Ta=25°C (Per SMD Chip)

Parameter	Symbol	Maximum Rating	Unit
Power dissipation	P_D	16	mW
Forward current	I_F	5	mA
Pulse forward current	I_{FP}	15	mA
Reverse voltage	V_R	5	V
Operating temperature	T_{OP}	-40 to + 85	°C
Storage temperature	T_{ST}	-40 to + 100	°C

ELECTRICAL - OPTICAL CHARACTERISTICS AT Ta=25°C (Per SMD Chip)

Characteristic	Symbol	Condition	Min.	Type	Max.	Unit
Forward Voltage	V_F	$I_F = 5\text{mA}$	-	2.8	3.2	V
Reverse Current	I_R	$V_R = 5\text{V}$	-	-	10	μA
Luminous Intensity	I_v	$I_F = 5\text{mA}$	71.5	150	226	mcd
Chromaticity Coordinate		X	-	0.3000		
		Y	-	0.2963		



Opto Plus LED Corp.
0.40" SMD Type LED Display
OPS-AQ4022W3 | OPS-AQ4023W3

● **WHITE: IV BIN (Unit : mcd) 5mA**

Super Bright White	1	2	3
	71.5 – 112.5	112.5 – 180.0	180.0 – 226.0
SMD BIN	Q	R	S1

Note: It maintains a tolerance of $\pm 10\%$ on Luminous Intensity

● **WHITE: COLOR BIN**

CIE	X	Y	X	Y	X	Y
	0.2700	0.2325	0.2900	0.2600	0.3100	0.2875
	0.2700	0.2775	0.2900	0.3050	0.3100	0.3325
	0.2900	0.3050	0.3100	0.3325	0.3300	0.3600
	0.2900	0.2600	0.3100	0.2875	0.3300	0.3150
SMD BIN	C2		D1		D2	

Note: It maintains a tolerance of $x,y \pm 0.007$

● **FORWARD VOLTAGE (VF) BIN:**

BIN CODE	G1	G2	G3	G4
SPEC. RANGE	2.4-2.5	2.5-2.6	2.6-2.7	2.7-2.8

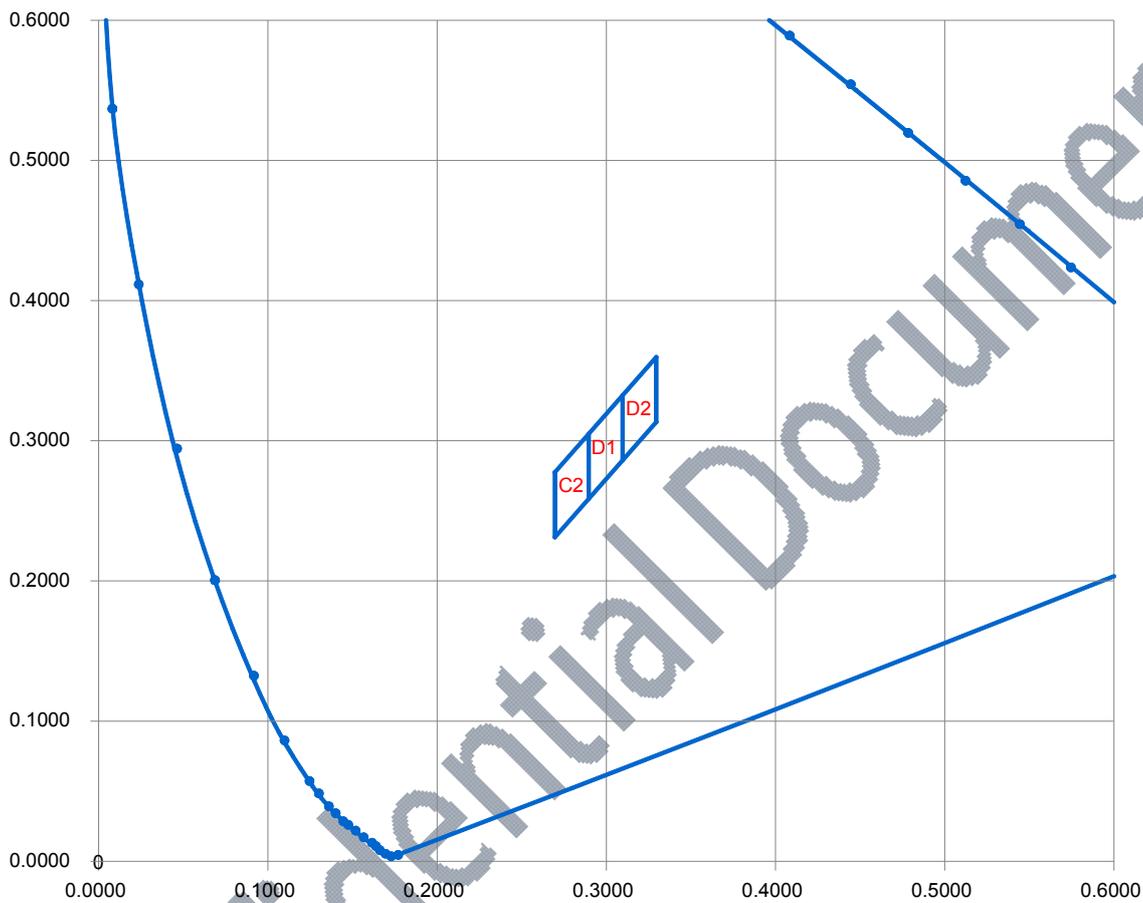
BIN CODE	H1	H2	H3	H4
SPEC. RANGE	2.8-2.9	2.9-3.0	3.0-3.1	3.1-3.2

Note: It maintains a tolerance of $\pm 0.05V$ on forward voltage measurements



Opto Plus LED Corp.
0.40" SMD Type LED Display
OPS-AQ4022W3 | OPS-AQ4023W3

● **CHROMATICITY COORDINATE:**



● **AVAILABLE BIN / HUE TABLE**

1C2	2C2	3C2
1D1	2D1	3D1
1D2	2D2	3D2



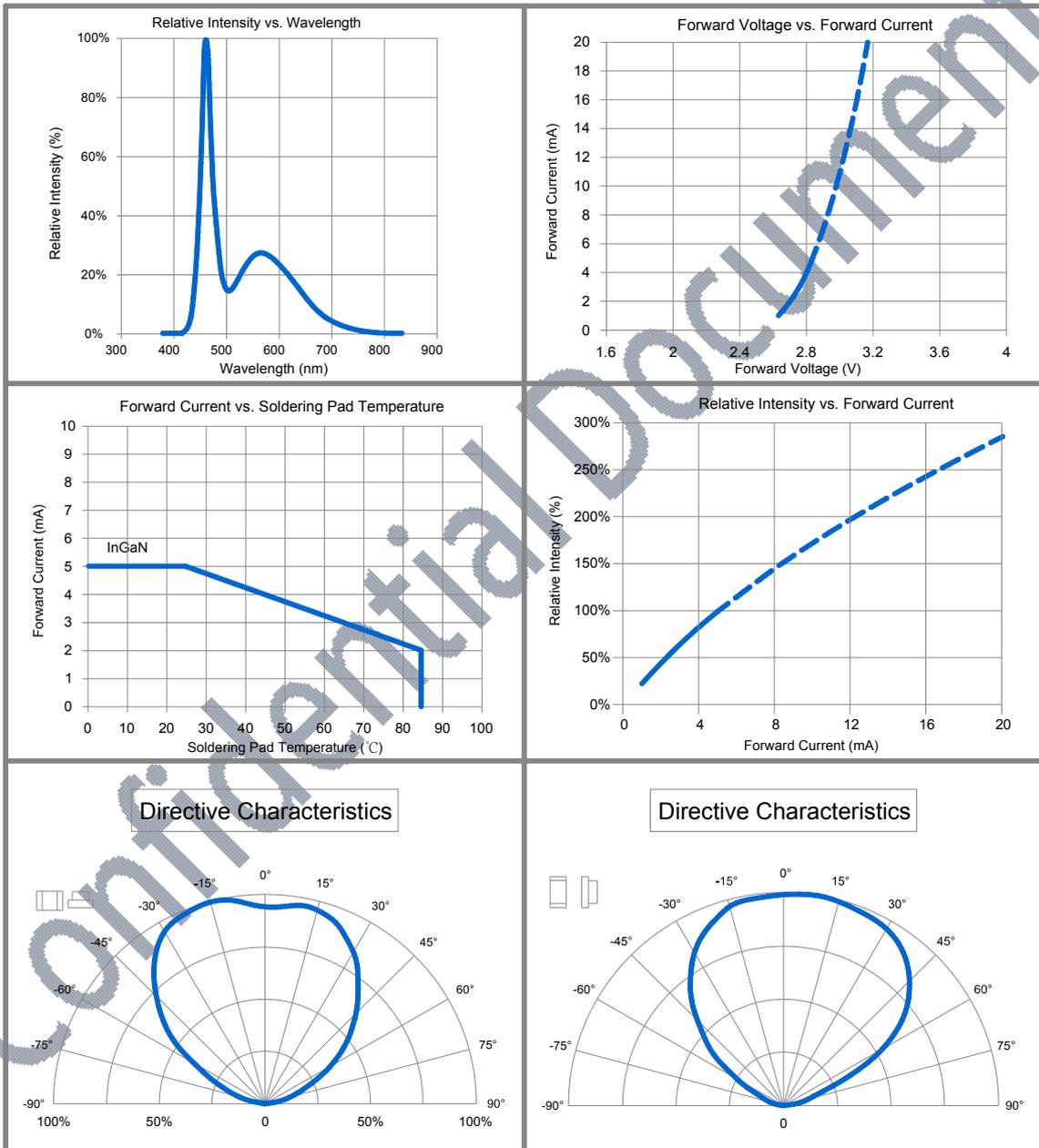
Opto Plus LED Corp.

0.40'' SMD Type LED Display

OPS-AQ4022W3 | OPS-AQ4023W3

● W3: SUPER BRIGHT WHITE (InGaN/GaN) CURVE

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





Opto Plus LED Corp.

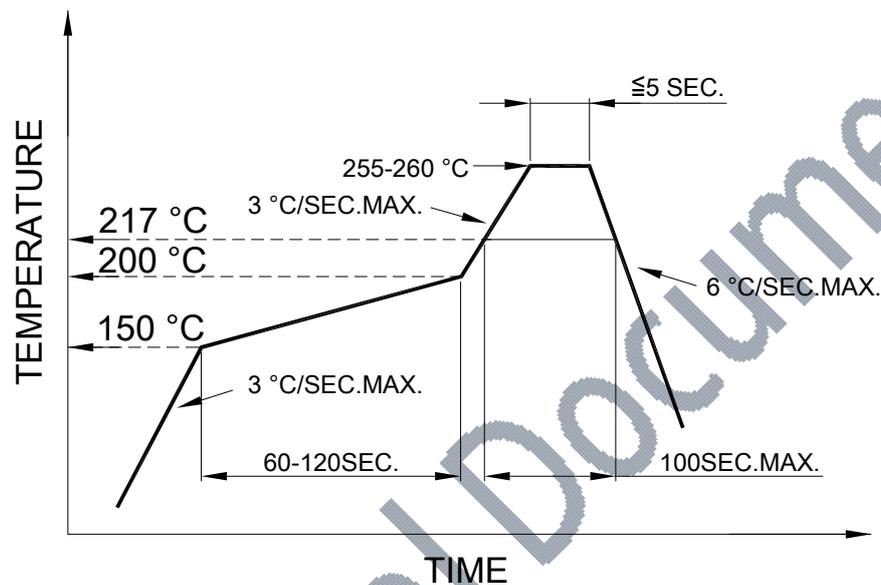
0.40" SMD Type LED Display

OPS-AQ4022W3 | OPS-AQ4023W3

● 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.

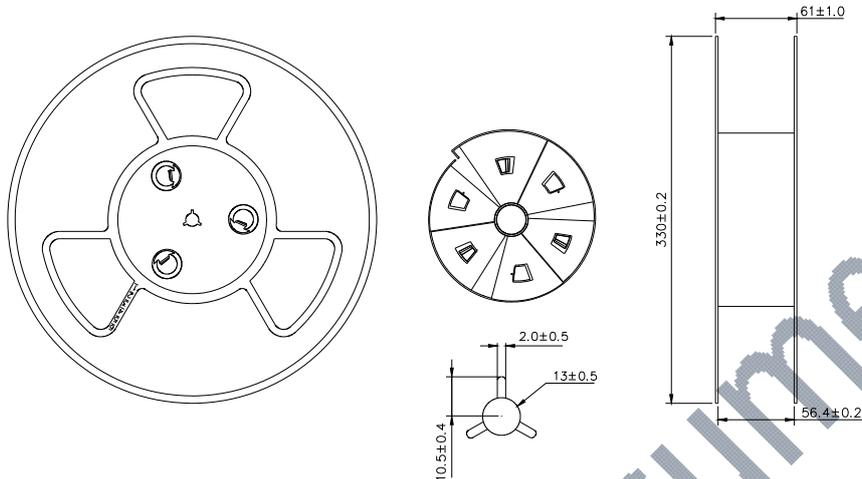


Opto Plus LED Corp.

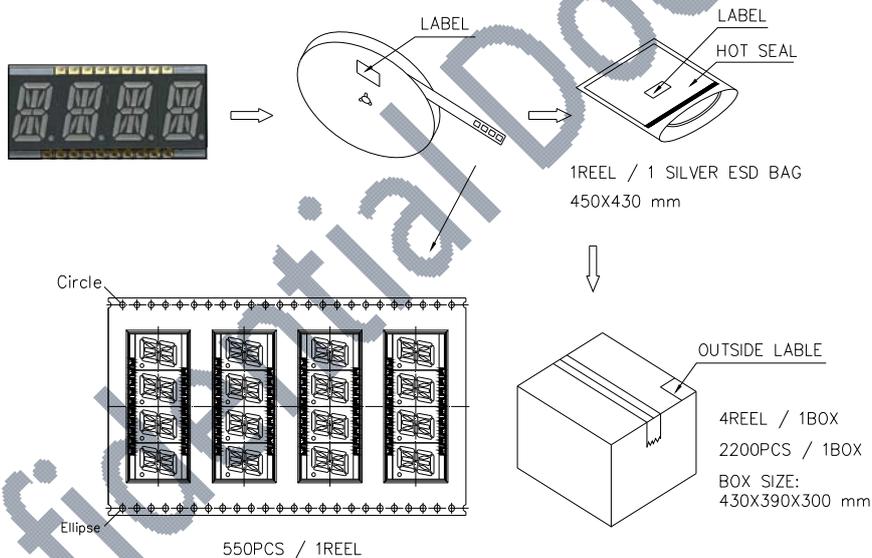
0.40'' SMD Type LED Display

OPS-AQ4022W3 | OPS-AQ4023W3

● 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	HUMDITY CONDITION	STORAGE TIME
5°C ~ 30°C	Below 60%RH	Within 4 weeks (MSL as level 2a)