

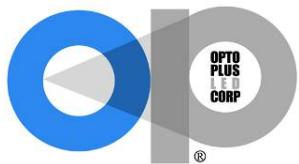
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Opto Plus LED Corp.
0.40" SMD Type LED Display
OPS-Q4012W | OPS-Q4013W

● **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 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

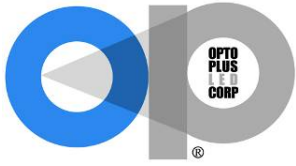
PART NO.		DESCRIPTION
	OPS-Q4012W-GW	Common Anode Gray face White segment
	OPS-Q4013W-GW	Common Cathode Gray face White segment
	OPS-Q4012W-BW	Common Anode Black face White segment
	OPS-Q4013W-BW	Common Cathode Black face White segment

RoHS Compliance



Pb Free.

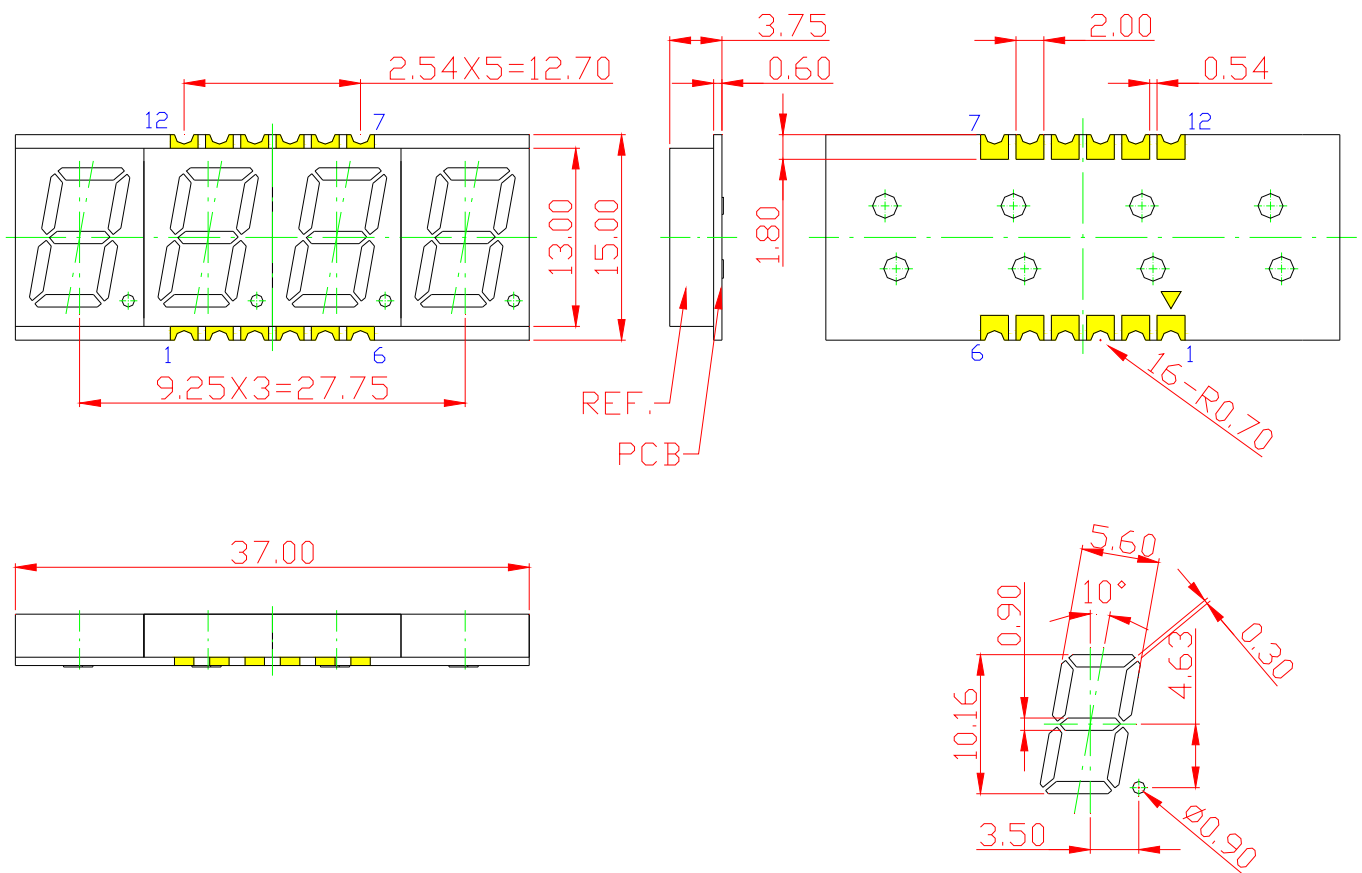




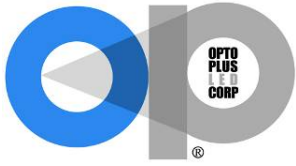
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● MECHANICAL DIMENSIONS



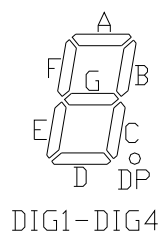
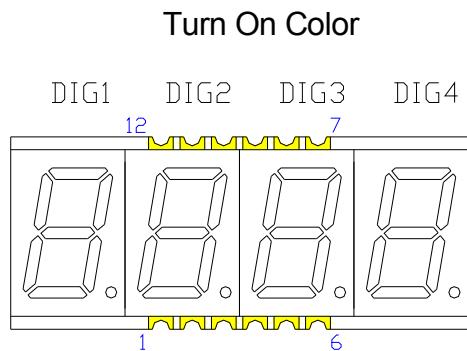
NOTES: All dimensions are in millimeters. Tolerances are ± 0.25 mm unless otherwise noted.



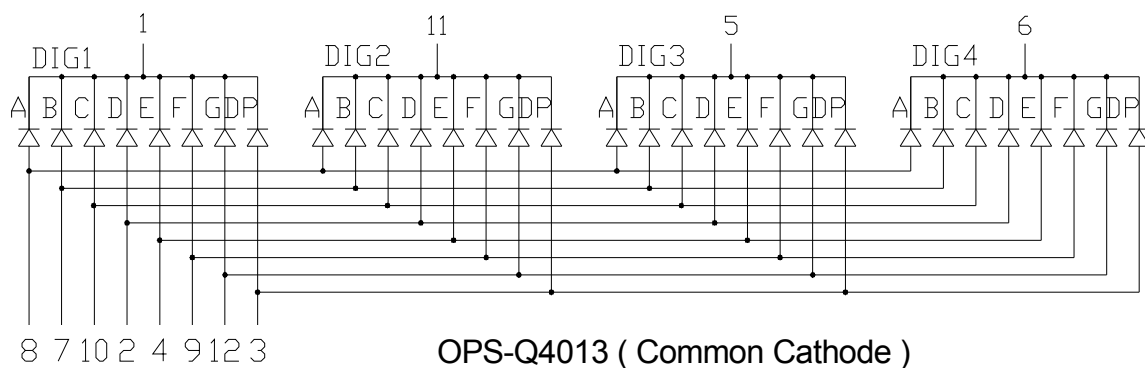
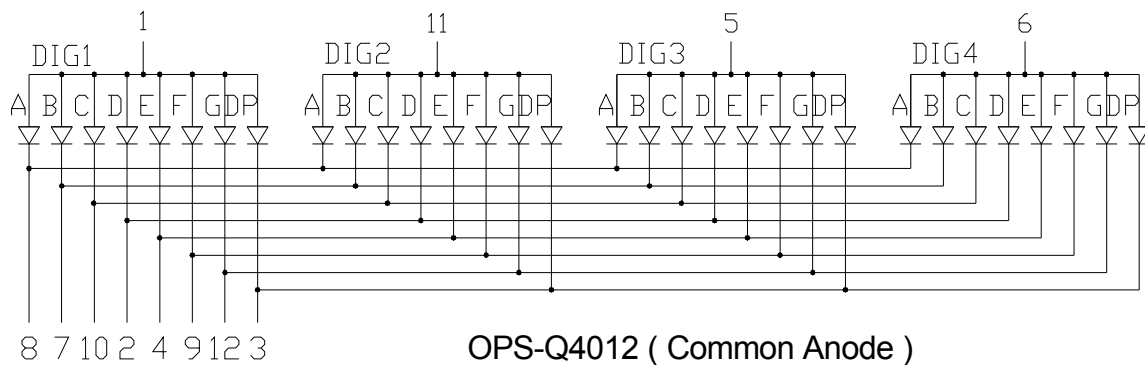
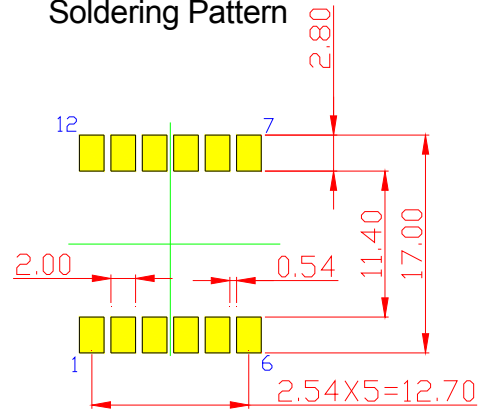
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● TYPICAL INTERNAL EQUIVALENT CIRCUIT



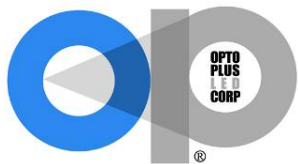
Recommended
Soldering Pattern



※EMITTED COLOR : SUPER BRIGHT WHITE

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Disclaimer:
Subject to change without notice



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0.40" SMD Type LED Display

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● PRODUCT APPEARANCE

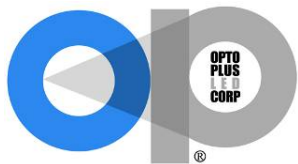
The most common reflector color and segment color are show in below diagram.

-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 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-Q4012W-GW	Common Anode Gray face White segment
OPS-Q4013W-GW	Common Cathode Gray face White segment
OPS-Q4012W-BW	Common Anode Black face White segment
OPS-Q4013W-BW	Common Cathode Black face White segment



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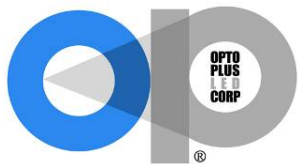
● W: SUPER BRIGHT WHITE (InGaN/GaN)

ABSOLUTE MAXIMUM RATING AT Ta=25°

Parameter	Symbol	Maximum Rating	Unit
Power Dissipation	P _D	33	mW
Forward Current	I _F	10	mA
Pulse Forward Current	I _{FP}	60	mA
Operating temperature	T _{OP}	-40 to + 85	°C
Storage temperature	T _{ST}	-40 to + 100	°C

ELECTRICAL - OPTICAL CHARACTERISTICS AT Ta=25°C

Characteristic	Symbol	Condition	Min.	Type	Max.	Unit
Forward Voltage (Per Chip)	V _F	I _F =5mA	-	2.9	3.2	V
Reverse Current (Per Chip)	I _R	V _R =5V	-	-	10	μA
Chromaticity Coordinate	λ _D	X	-	0.285	-	
		Y	-	0.275	-	
Luminous Intensity (Per Chip)	I _V	I _F =5mA	112.5	200	285	mcd
Viewing Angle (Per Chip)	2Θ1/2	X	-	120	-	deg
		Y		135		



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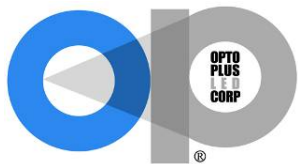
● **LUMINOUS INTENSITY (IV) BIN:**

Super Bright White	1	2	3
Reference BIN (Chip)	(R11) 112.5-126.0	(R12) 126.0-140.0	(R21) 140.0-160.0

Super Bright White	4	5	6
Reference BIN (Chip)	(R22) 160.0-180.0	(S11) 180.0-202.0	(S12) 202.0-226.0

Super Bright White	7	8
Reference BIN (Chip)	(S21) 226.0-255.5	(S22) 255.5-285.0

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



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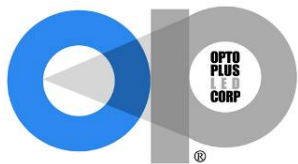
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● COLOR BIN:

Color	AA2		BB1		BB2	
TW	0.2700	0.2400	0.2800	0.2500	0.2900	0.2600
	0.2700	0.2500	0.2800	0.2600	0.2900	0.2700
	0.2800	0.2600	0.2900	0.2700	0.3000	0.2800
	0.2800	0.2500	0.2900	0.2600	0.3000	0.2700
	CC2		DD1		DD2	
	0.2700	0.2500	0.2800	0.2600	0.2900	0.2700
	0.2700	0.2600	0.2800	0.2700	0.2900	0.2800
	0.2800	0.2700	0.2900	0.2800	0.3000	0.2900
	0.2800	0.2600	0.2900	0.2700	0.3000	0.2800
	EE2		FF1		FF2	
	0.2700	0.2600	0.2800	0.2700	0.2900	0.2800
	0.2700	0.2700	0.2800	0.2800	0.2900	0.2900
	0.2800	0.2800	0.2900	0.2900	0.3000	0.3000
	0.2800	0.2700	0.2900	0.2800	0.3000	0.2900
	GG2		HH1		HH2	
	0.2700	0.2700	0.2800	0.2800	0.2900	0.2900
	0.2700	0.2800	0.2800	0.2900	0.2900	0.3000
	0.2800	0.2900	0.2900	0.3000	0.3000	0.3100
	0.2800	0.2800	0.2900	0.2900	0.3000	0.3000

Note: It maintains a tolerance of X,Y ± 0.007 .

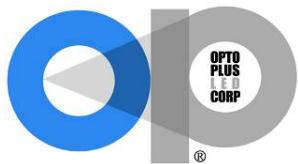


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● AVAILABLE BIN / HUE TABLE

1AA2	1BB1	1BB2	1CC2	1DD1	1DD2
1EE2	1FF1	1FF2	1GG2	1HH1	1HH2
2AA2	2BB1	2BB2	2CC2	2DD1	2DD2
2EE2	2FF1	2FF2	2GG2	2HH1	2HH2
3AA2	3BB1	3BB2	3CC2	3DD1	3DD2
3EE2	3FF1	3FF2	3GG2	3HH1	3HH2
4AA2	4BB1	4BB2	4CC2	4DD1	4DD2
4EE2	4FF1	4FF2	4GG2	4HH1	4HH2
5AA2	5BB1	5BB2	5CC2	5DD1	5DD2
5EE2	5FF1	5FF2	5GG2	5HH1	5HH2
6AA2	6BB1	6BB2	6CC2	6DD1	6DD2
6EE2	6FF1	6FF2	6GG2	6HH1	6HH2
7AA2	7BB1	7BB2	7CC2	7DD1	7DD2
7EE2	7FF1	7FF2	7GG2	7HH1	7HH2
8AA2	8BB1	8BB2	8CC2	8DD1	8DD2
8EE2	8FF1	8FF2	8GG2	8HH1	8HH2



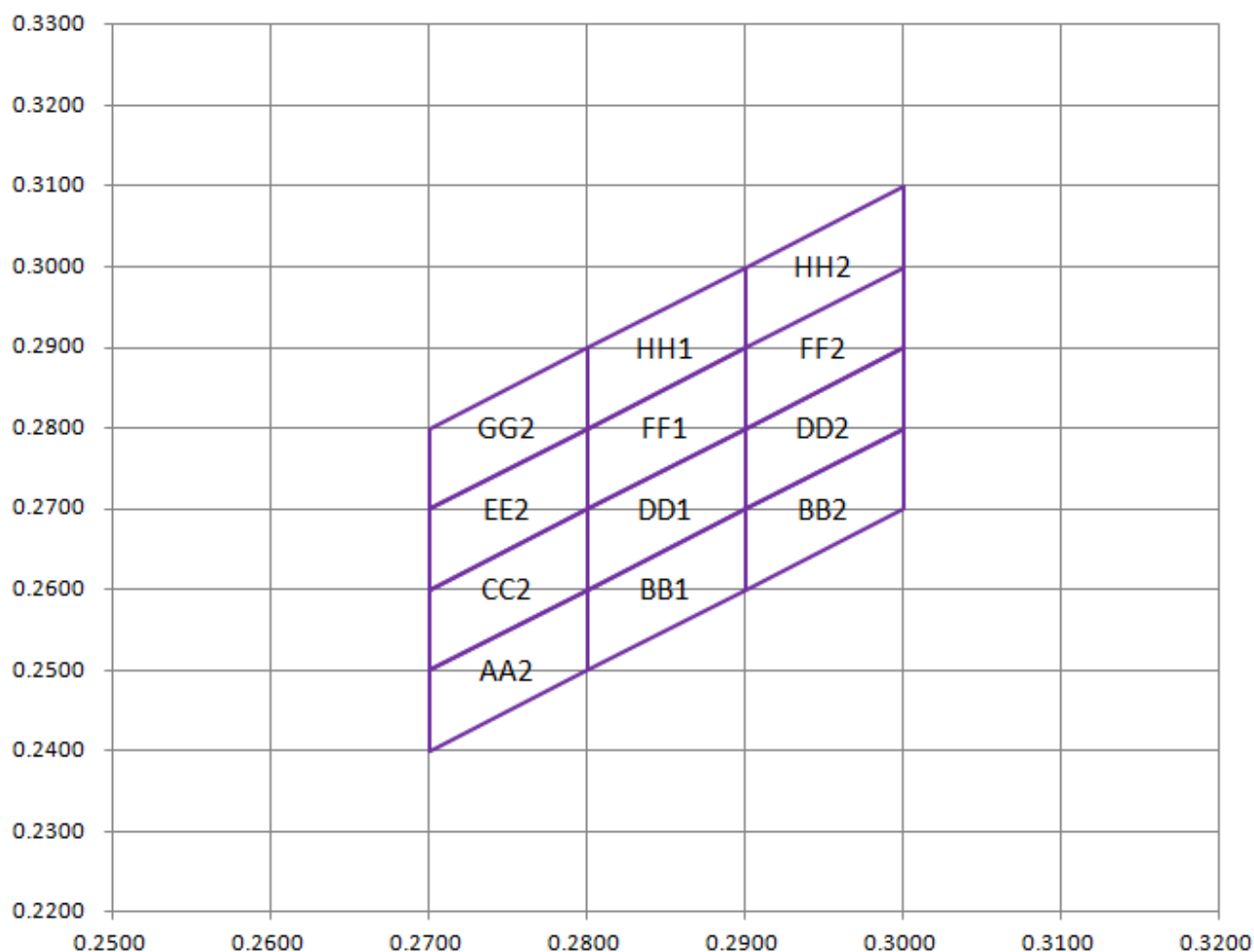
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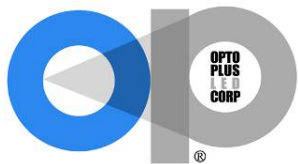
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● CHROMATICITY COORDINATE:



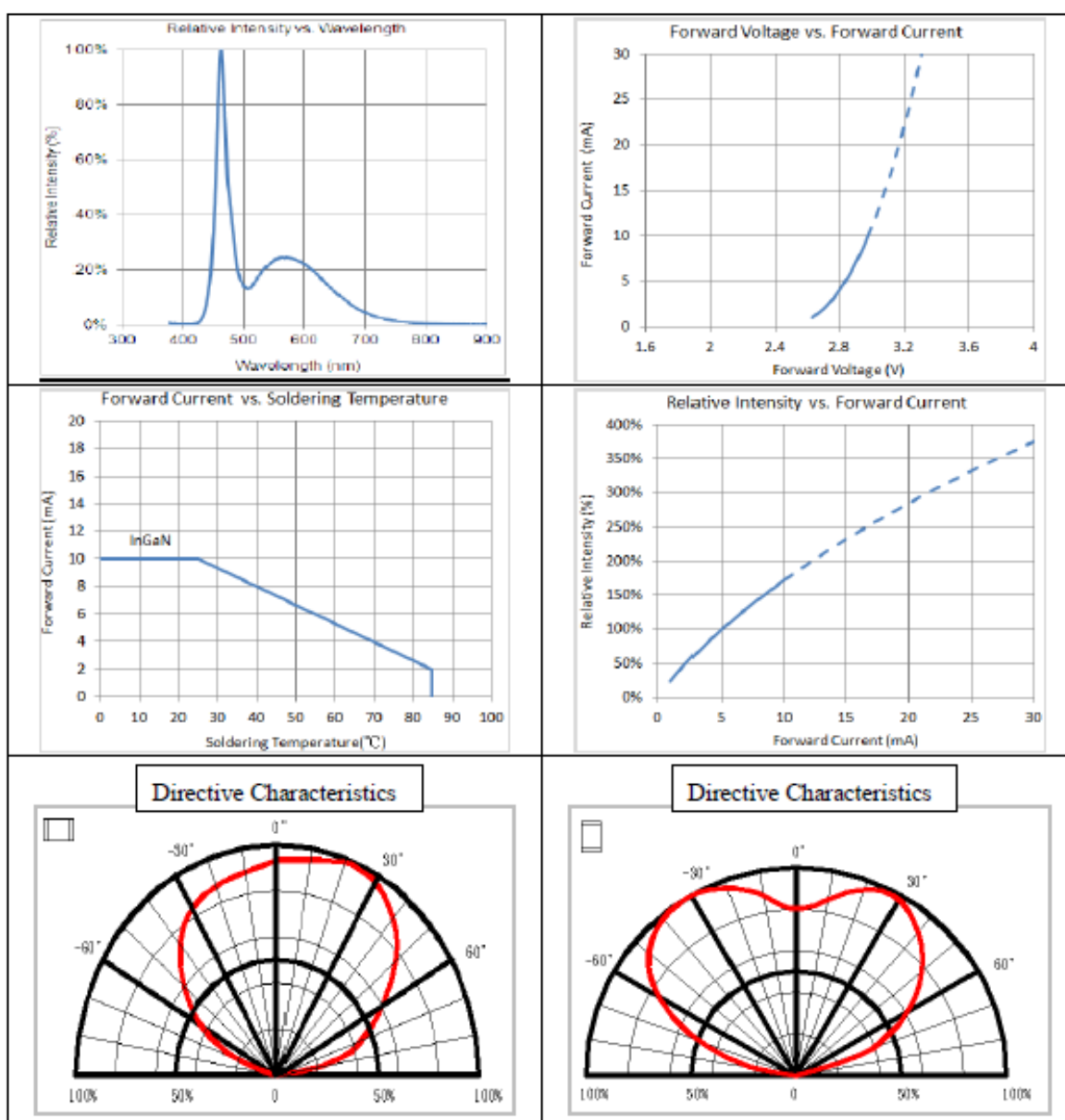


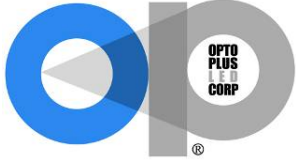
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● W: SUPER BRIGHT WHITE (InGaN/GaN) CURVE

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





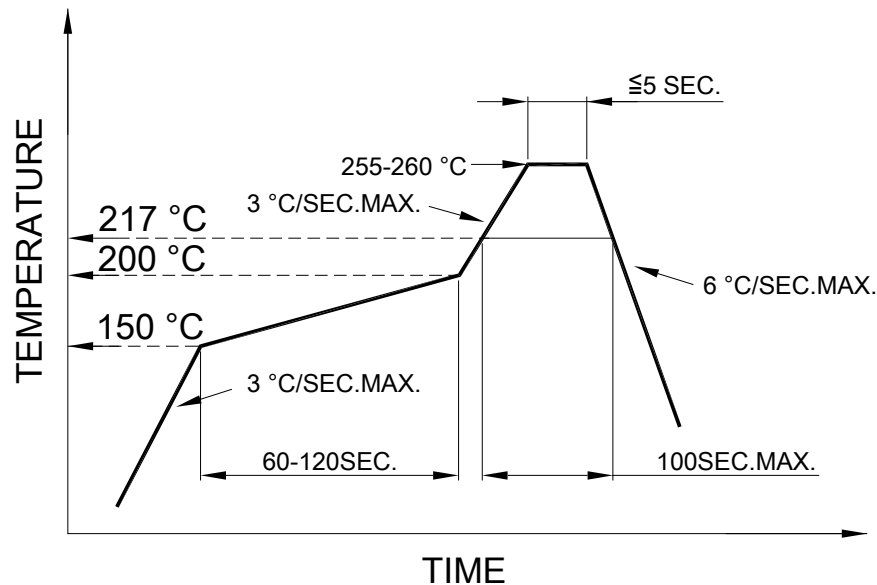
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● SMT REFLOW SOLDERING INSTRUCTIONS

SMT Soldering Profile

Pb free reflow soldering Profile



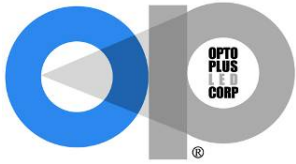
- We recommend the reflow temperature 245°C (+/- 5°C).
The maximum soldering temperature should be limited to 260°C.
- Number of reflow process shall be 2 times or less.

● 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

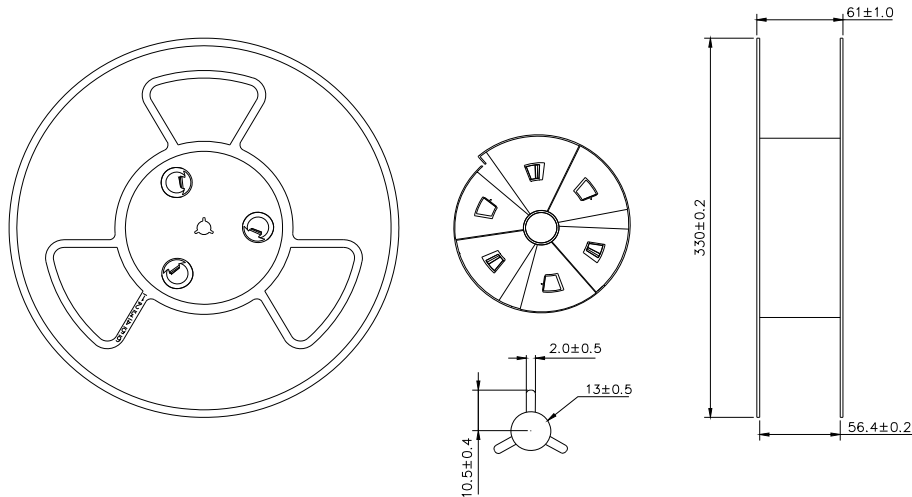
- Customer must finish rework within 3 sec. under 350°C.
- The head of soldering iron cannot touch copper foil.



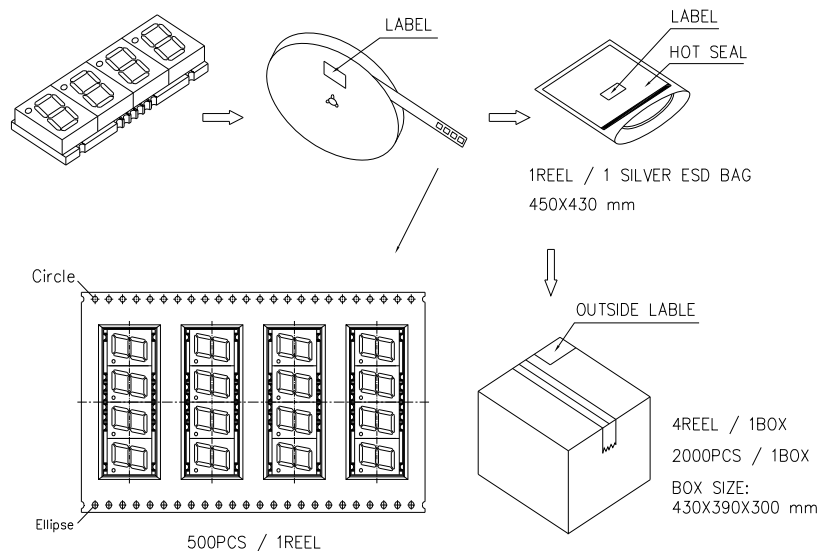
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● REEL DIMENSIONS



● PACKING & LABEL SPECIFICATIONS



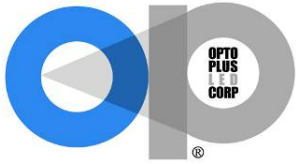
● STORAGE CONDITION

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)

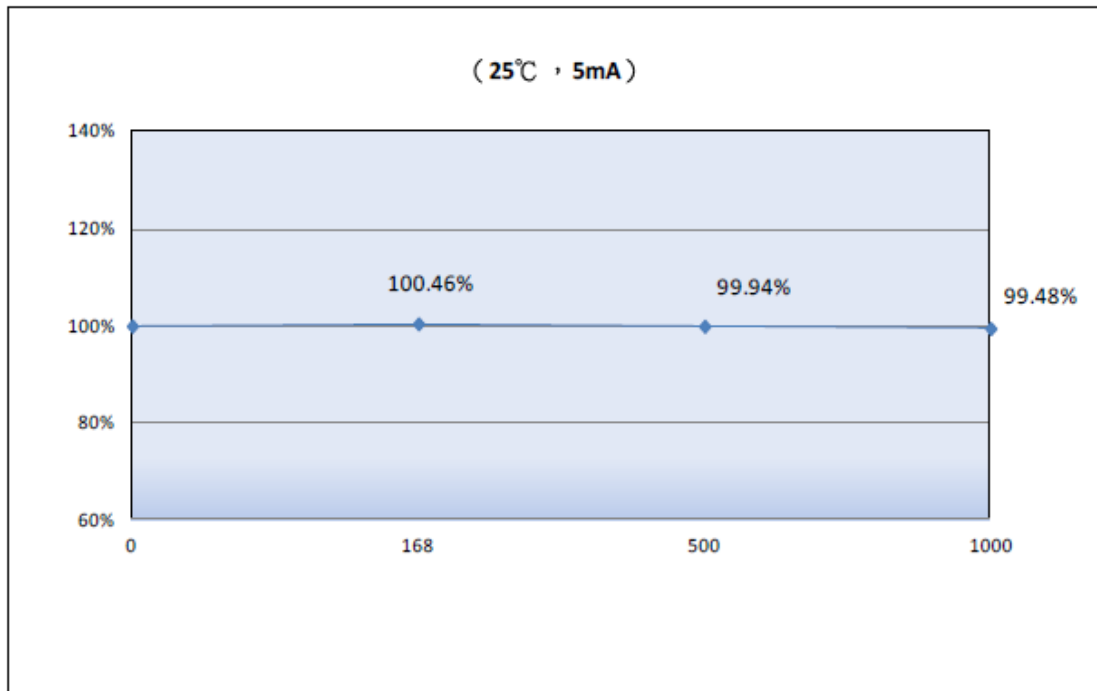


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Life Time

25°C 5mA



LIFE Estimate

