



Opto Plus LED Corp.
0.20" SMD Type LED Display
OPS-Q2012W3 | OPS-Q2013W3

● **EDIT HISTORY**

Version A: Oct. 12, 2022

Preliminary Spec.

Confidential Document



www.opledtw.com

Opto Plus LED Corp. 0.20" SMD Type LED Display OPS-Q2012W3 | OPS-Q2013W3

● FEATURES

- 0.20 inch (5.08 mm) Digit Height.
- SMD type.
- Low current operation.
- RoHS Compliant, Pb Free.

● DESCRIPTION

The device are 0.20 inch (5.08 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-Q2012W3-GW	Common Anode Gray face White segment
OPS-Q2013W3-GW	Common Cathode Gray face White segment
OPS-Q2012W3-BW	Common Anode Black face White segment
OPS-Q2013W3-BW	Common Cathode Black face White segment

RoHS Compliance



Pb Free.



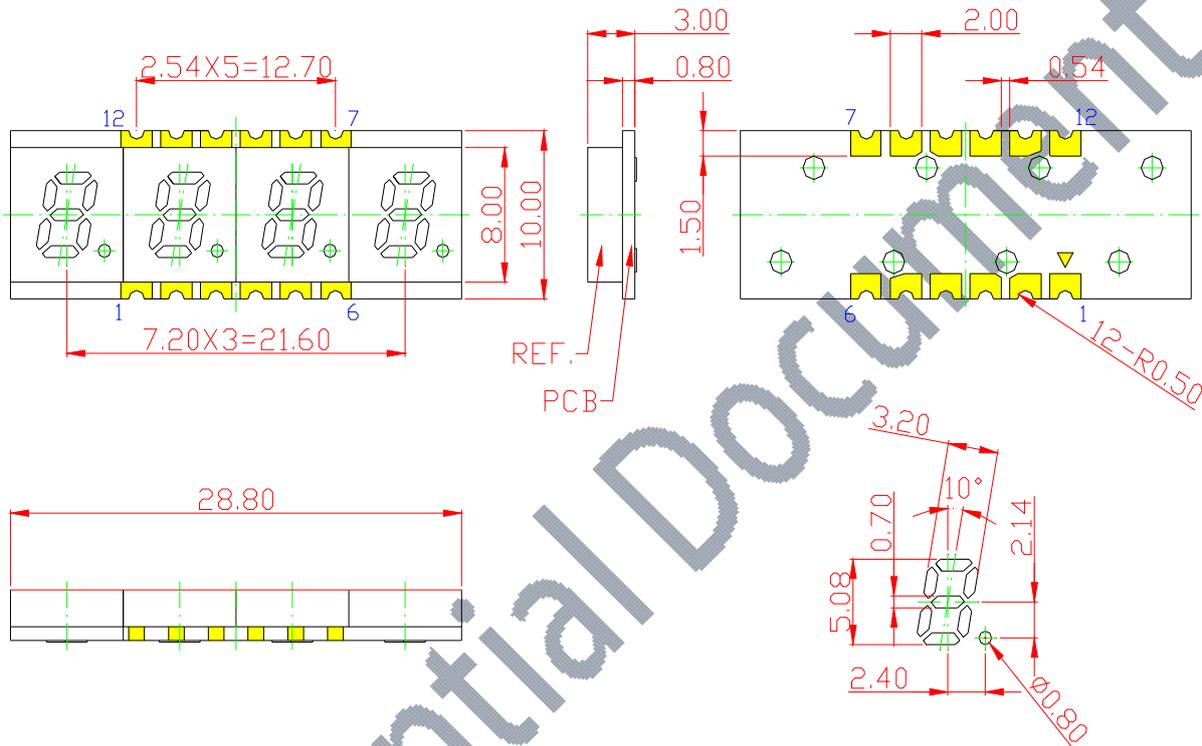


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● MECHANICAL DIMENSIONS



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

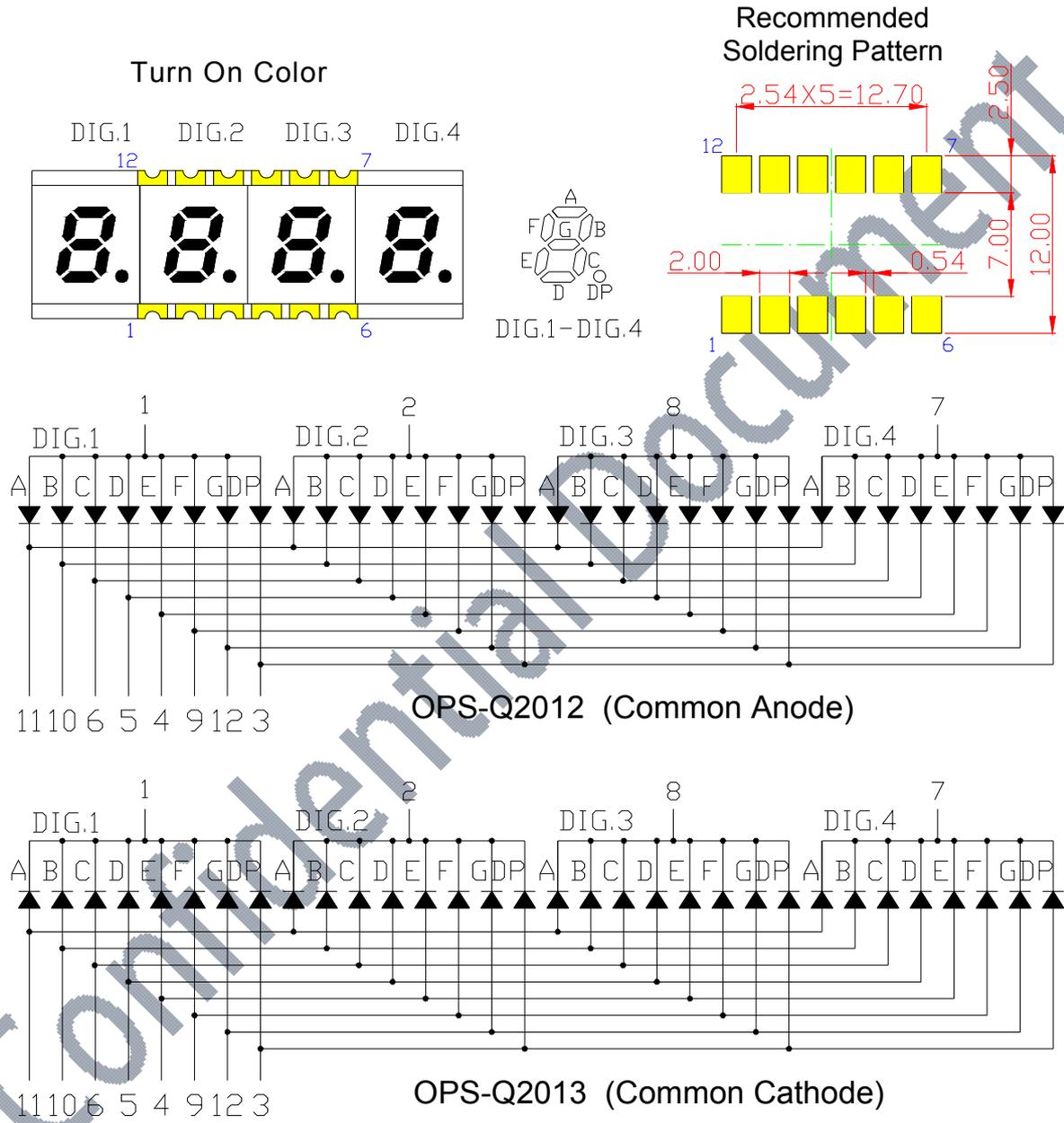


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● TYPICAL INTERNAL EQUIVALENT CIRCUIT



※EMITTED COLOR : SUPER BRIGHT WHITE



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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-Q2012W3-GW	Common Anode Gray face White segment
OPS-Q2013W3-GW	Common Cathode Gray face White segment
OPS-Q2012W3-BW	Common Anode Black face White segment
OPS-Q2013W3-BW	Common Cathode Black face White segment



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● **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		



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● **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

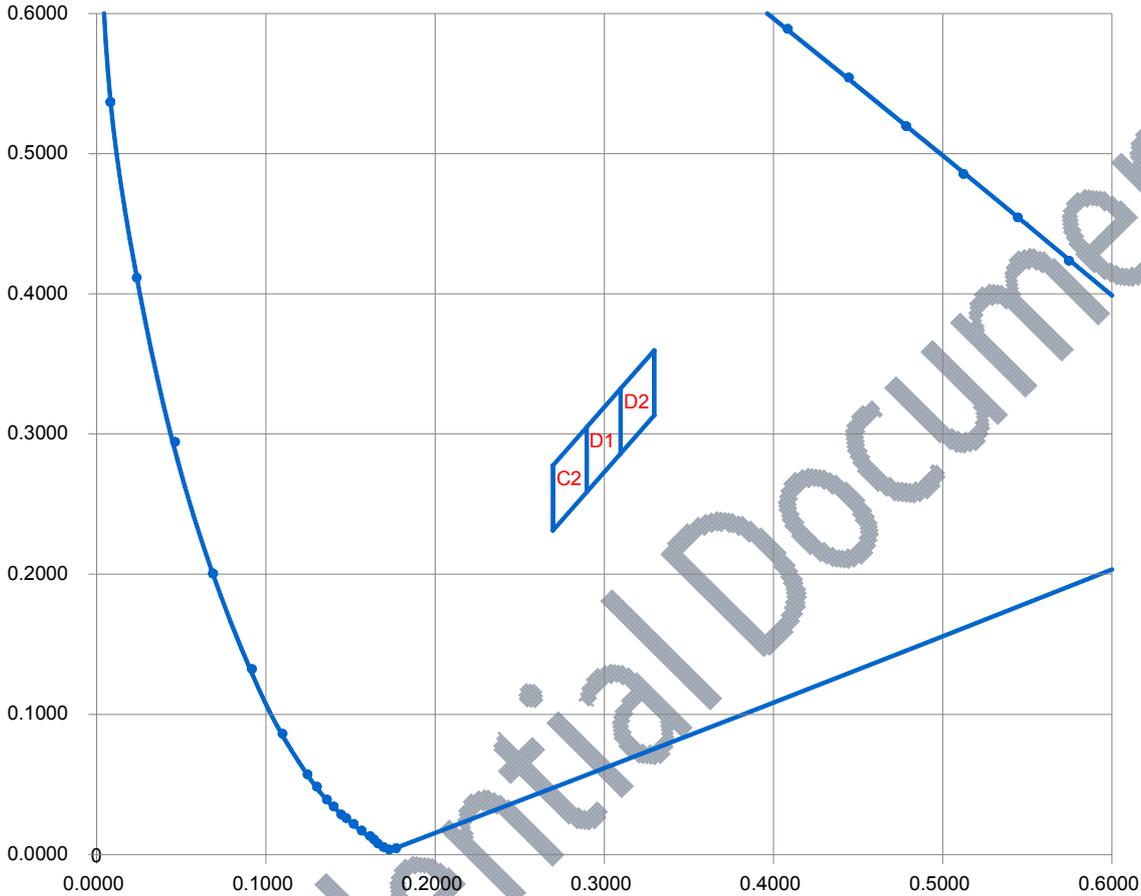
BIN CODE	H1	H2	H3	H4
SPEC. RANGE	2.8-2.9	2.9-3.0	3.0-3.1	3.1-3.2

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



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● **CHROMATICITY COORDINATE:**



● **AVAILABLE BIN / HUE TABLE**

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



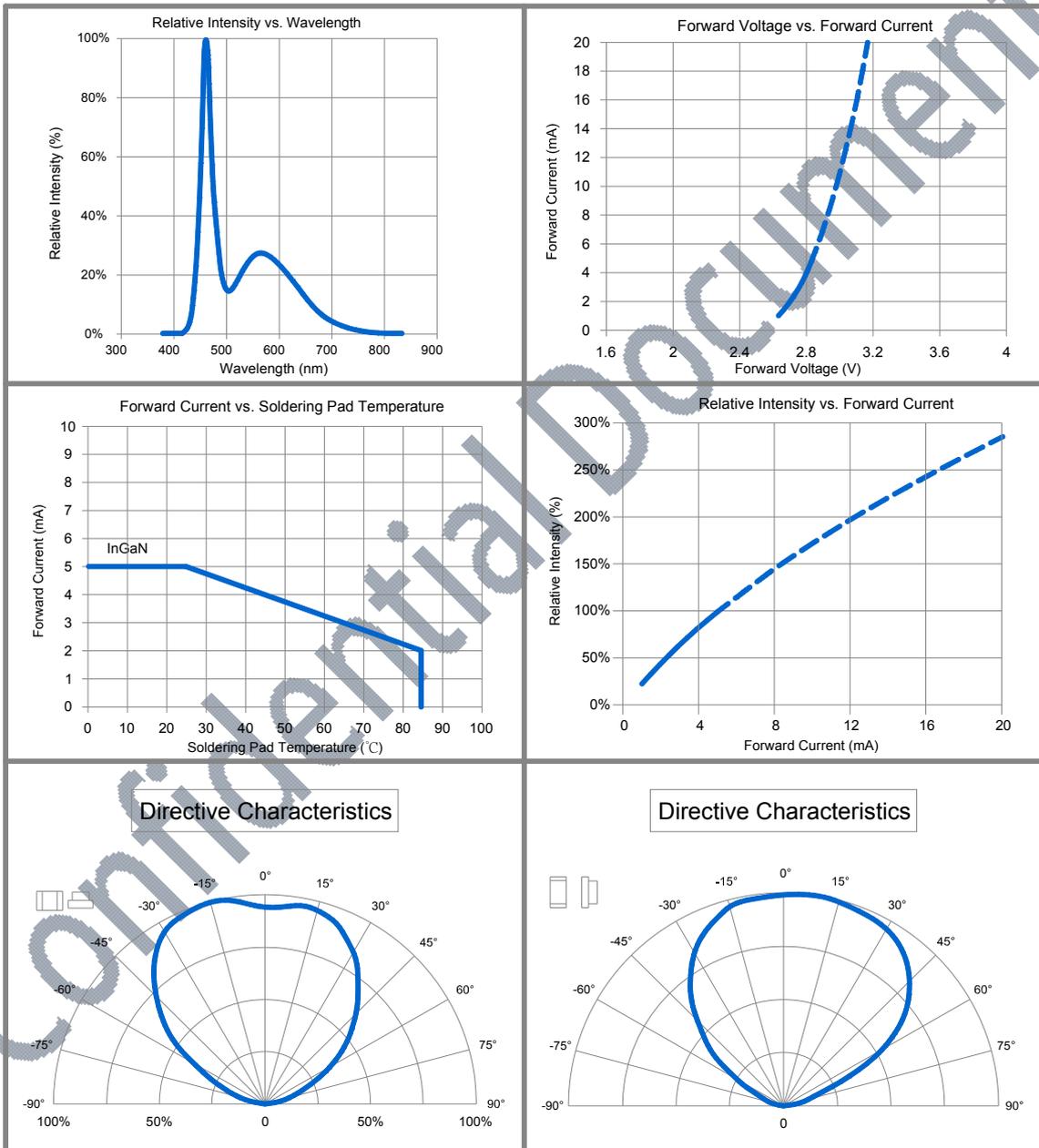
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● W3: SUPER BRIGHT WHITE (InGaN/GaN) CURVE

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





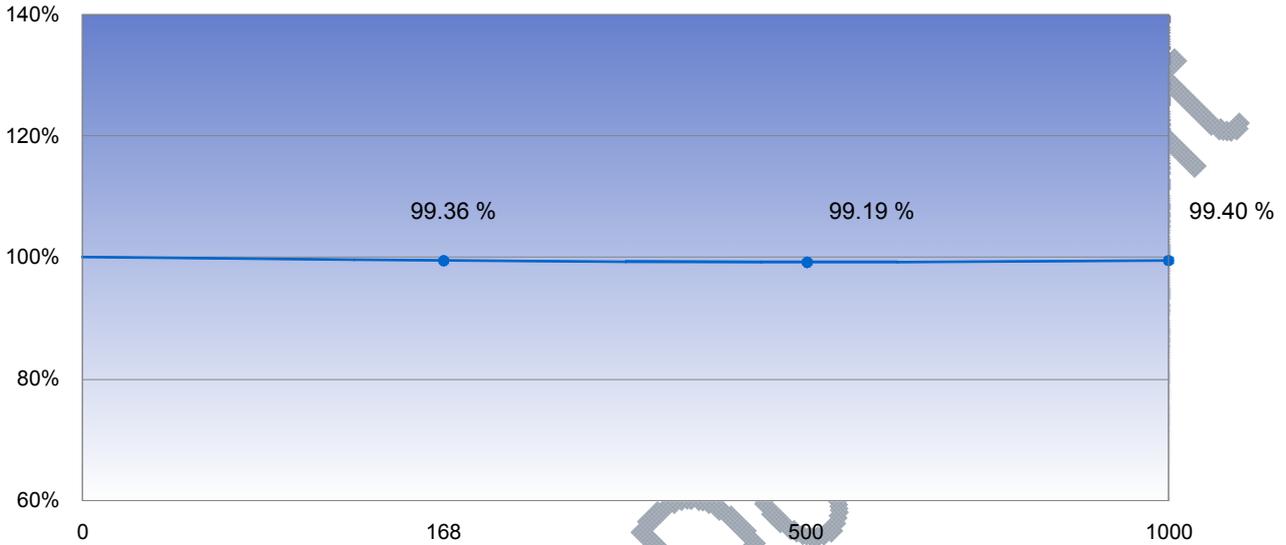
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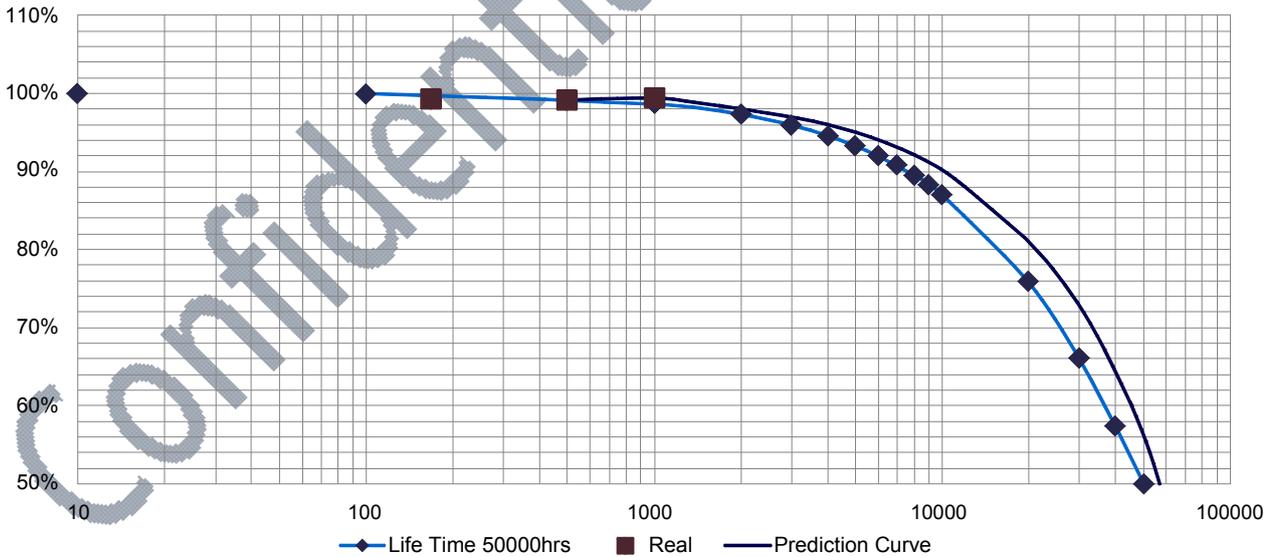
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● LIFE TIME

(25°C , 5mA)



LIFE Estimate





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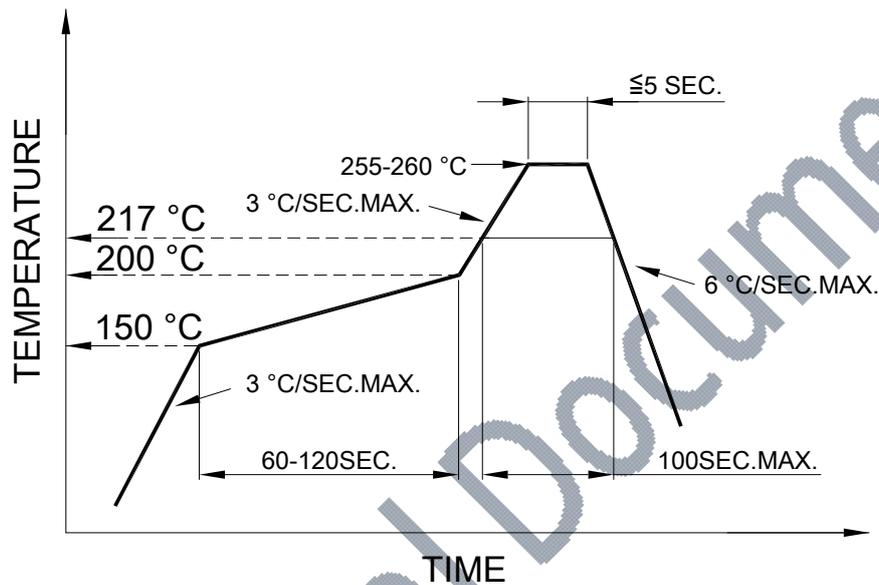
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● SMT REFLOW SOLDERING INSTRUCTIONS

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.

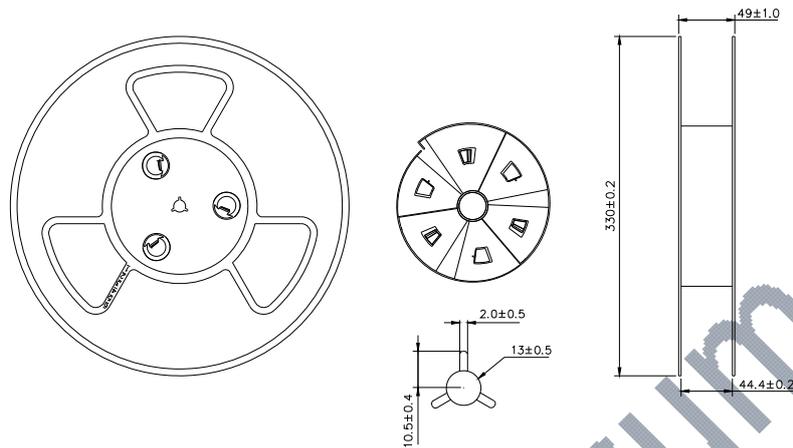


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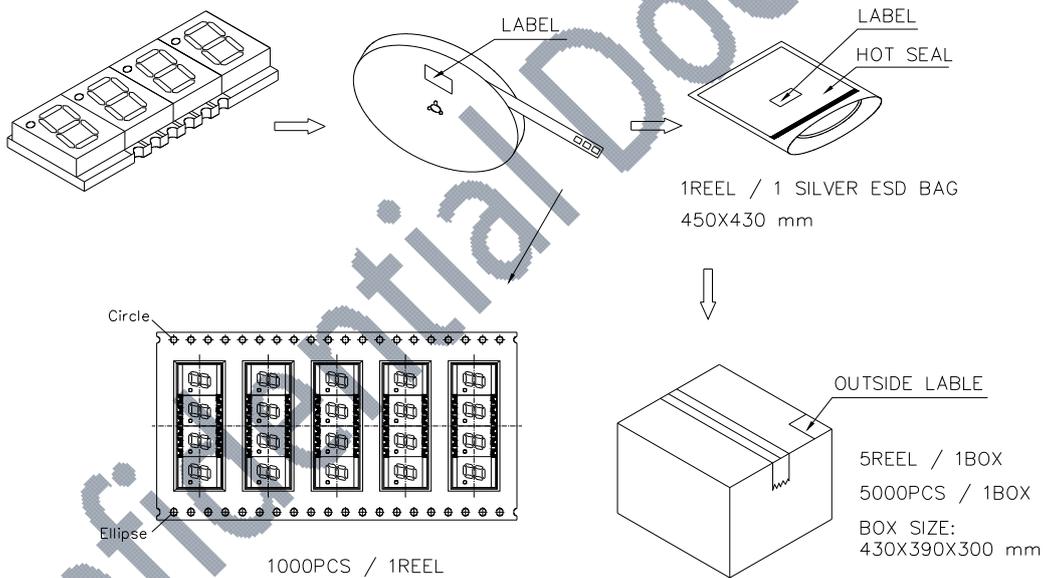
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● REEL DIMENSIONS



● 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)