

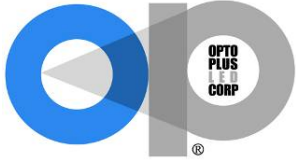
**Opto Plus LED Corp.**  
**0.4" SMD Type LED Display**  
**OPS-D4013W-BW**  
**OPS-D4014W-BW**

● **EDIT HISTORY**

Version A: Mar. 31, 2015

Preliminary Spec.

Manufacture	Examination	Approving



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**OPS-D4013W-BW**  
**OPS-D4014W-BW**

● **FEATURES**

- 0.40 inch (10.16 mm) Digit Height.
- Low current operation.
- SMD type.
- Black face, White segment.
- RoHS compliant, Pb Free.
- MSL Level: 2a in ESD bag package

● **DESCRIPTION**

The OPS-D4013W-BW and OPS-D4014W-BW are 0.40 inch (10.16 mm) height Dual digit 7-segment displays.

This device utilizes Super Bright White SMD LED chip which are made from InGaN On a transparent GaN substrate.

The display has Black face, White segment.

● **DEVICE**

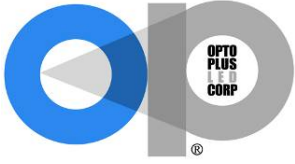
PART NO	DESCRIPTION
OPS-D4014W-BW	Common Anode
OPS-D4013W-BW	Common Cathode

**RoHS Compliance**



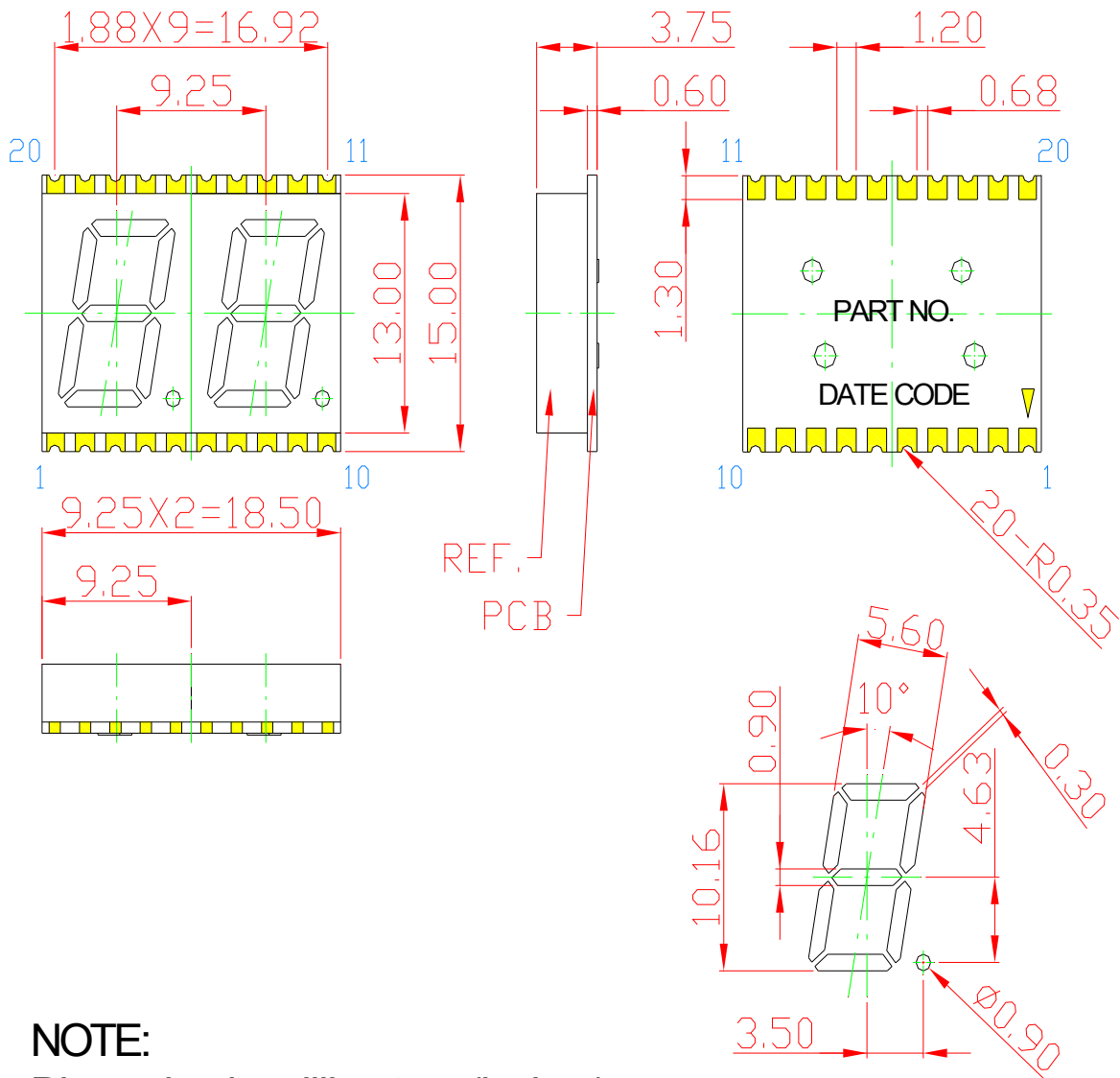
**Pb free.**



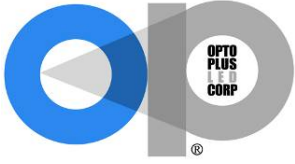


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● **MECHANICAL DIMENSIONS**



**NOTE:**  
 Dimension in millimeters (inches),  
 and tolerances are  $\pm 0.25\text{mm}$  (.01") specified.



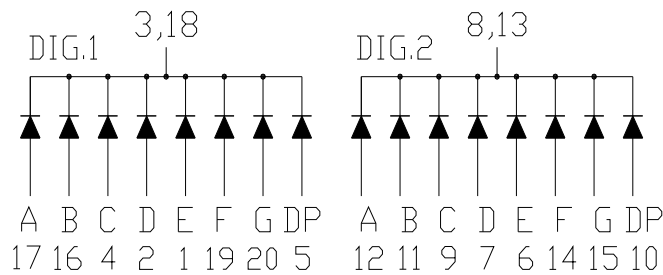
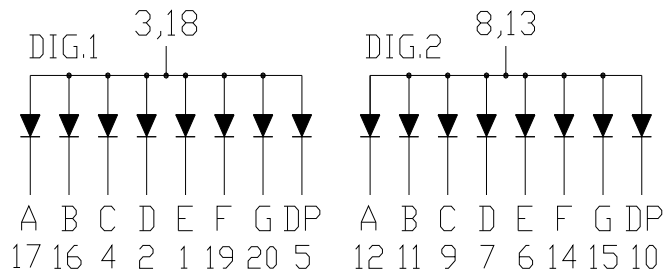
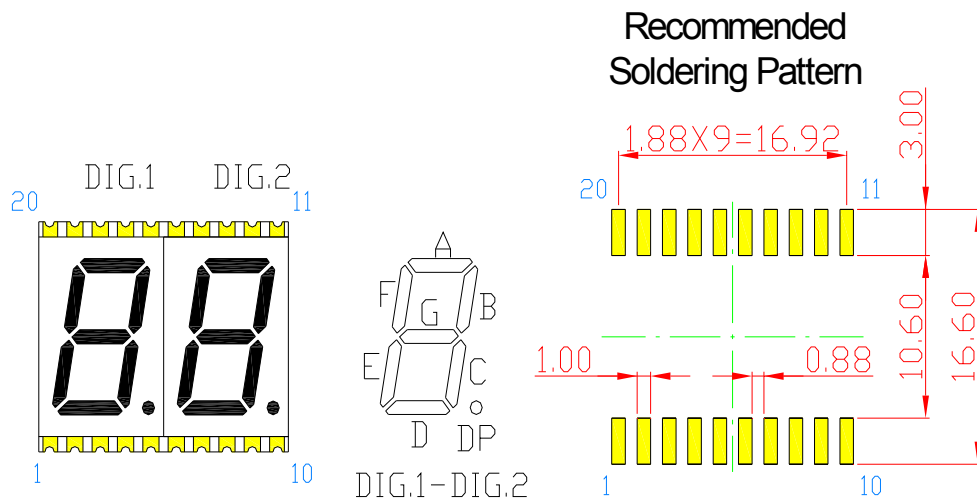
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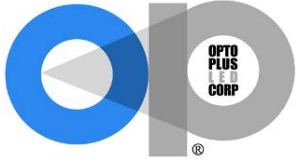
## 0.4" SMD Type LED Display

### OPS-D4013W-BW

### OPS-D4014W-BW

#### ● TYPICAL INTERNAL EQUIVALENT CIRCUIT





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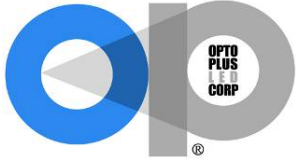
● **W: SUPER BRIGHT WHITE (InGaN/GaN)**

ABSOLUTE MAXIMUM RATING AT Ta=25°C

Parameter	Symbol	Maximum Rating	Unit
Power dissipation	$P_{AD}$	78	mW
Continuous forward current	$I_{AF}$	20	mA
Peak current (duty cycle 1/10, 1kHz)	$I_{PF}$	60	mA
Reverse voltage	$V_R$	5	V
Operating temperature	$T_{OPR}$	-40 to + 85	°C
Storage temperature	$T_{STG}$	-40 to + 100	°C

ELECTRICAL - OPTICAL CHARACTERISTICS AT Ta=25°C

Characteristic	Symbol	Condition	Min.	Type	Max.	Unit	
Forward Voltage	$V_F$	$I_F = 5mA$	-	2.9	3.5	V	
Reverse Current	$I_R$	$V_R = 5V$	-	-	10	$\mu A$	
Dominant Wavelength	$\lambda_D$	$I_F = 5mA$	X	-	0.29	-	nm
			Y	-	0.28	-	
Average Luminous Intensity	$I_V$	$I_F = 5mA$	15	-	80	mcd	
Spectrum Radiation Bandwidth	$\Delta\lambda$	$I_F = 5mA$	-	30	-	nm	



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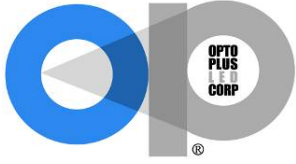
● **WHITE: BIN GRADE (Unit : mcd / I<sub>v</sub>=5mA)**

Super Bright White	2	3	4
	15.0 – 40.0	40.1 – 60.0	60.1 – 80.0

● **WHITE: HUE GRADE (λD : nm)**

CIE	AA2	BB1	BB2	CC2	DD1	DD2
X	0.30	0.31	0.32	0.30	0.31	0.32
	0.29	0.30	0.31	0.29	0.30	0.31
Y	0.28	0.29	0.30	0.29	0.30	0.31
	0.26	0.27	0.28	0.27	0.28	0.29

CIE	EE2	FF1	FF2	GG2	HH1	HH2
X	0.30	0.31	0.32	0.30	0.31	0.32
	0.29	0.30	0.31	0.29	0.30	0.31
Y	0.30	0.31	0.32	0.31	0.32	0.33
	0.28	0.29	0.30	0.29	0.30	0.31

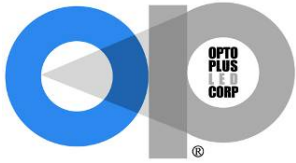


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● **AVAILABLE BIN / HUE TABLE**

2AA2	2BB1	2BB2	2CC2	2DD1	2DD2
3AA2	3BB1	3BB2	3CC2	3DD1	3DD2
4AA2	4BB1	4BB2	4CC2	4DD1	4DD2

2EE2	2FF1	2FF2	2GG2	2HH1	2HH2
3EE2	3FF1	3FF2	3GG2	3HH1	3HH2
4EE2	4FF1	4FF2	4GG2	4HH1	4HH2



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## 0.4" SMD Type LED Display

### OPS-D4013W-BW

### OPS-D4014W-BW

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

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

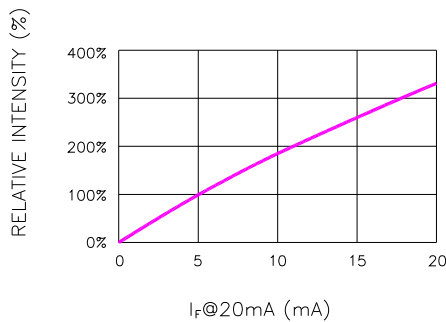


Fig.1 RELATIVE INTENSITY VS. FORWARD CURRENT

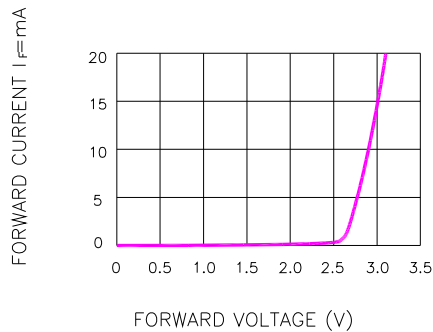


Fig.2 FORWARD CURRENT VS. FORWARD VOLTAGE

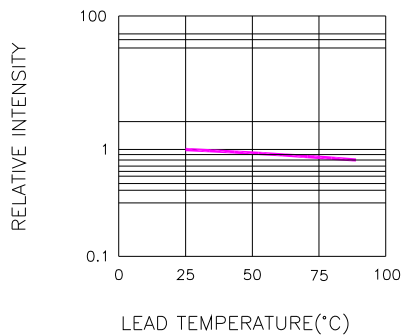


Fig.3 RELATIVE INTENSITY VS. LEAD TEMPERATURE  
(PULSED 20 mA; 300 $\mu$ s PULSE, 10ms PERIOD)

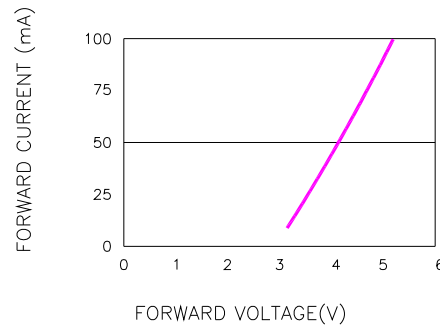


Fig.4 PEAK FORWARD VOLTAGE VS. FORWARD (100 $\mu$ s TEST PULSE, 1% DUTY CYCLE)

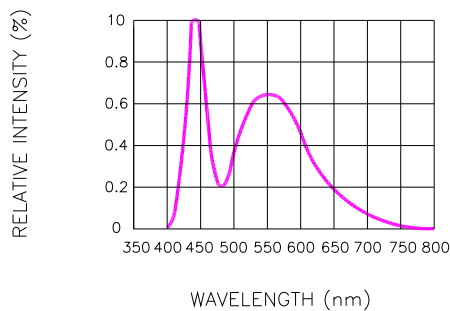


Fig.4 RELATIVE INTENSITY VS. WAVELENGTH

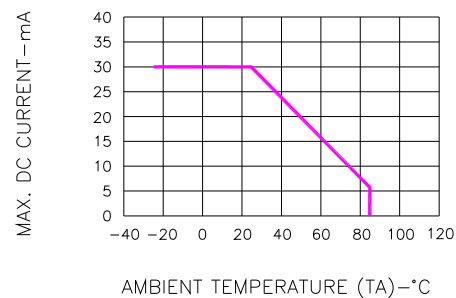
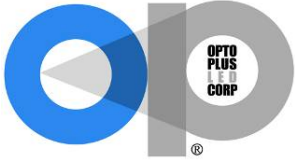


Fig.7 MAX. ALLOWABLE DC CURRENT VS. AMBIENT TEMPERATURE



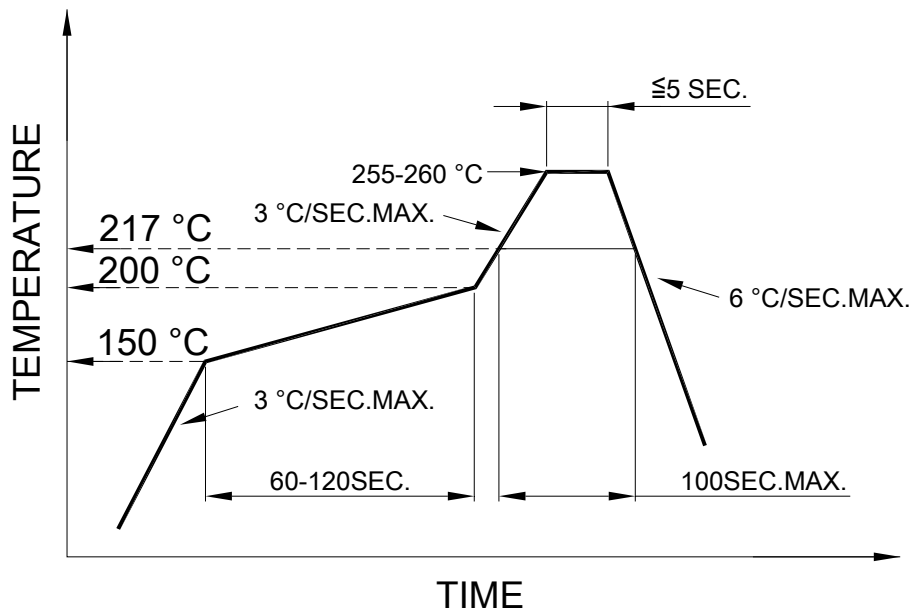


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● **SMT REFLOW SOLDERING INSTRUCTIONS**

SMT Soldering Profile

Pb free reflow soldering Profile

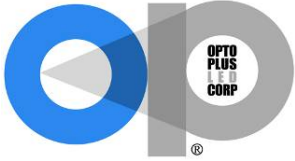


● **SOLDERING IRON**

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.



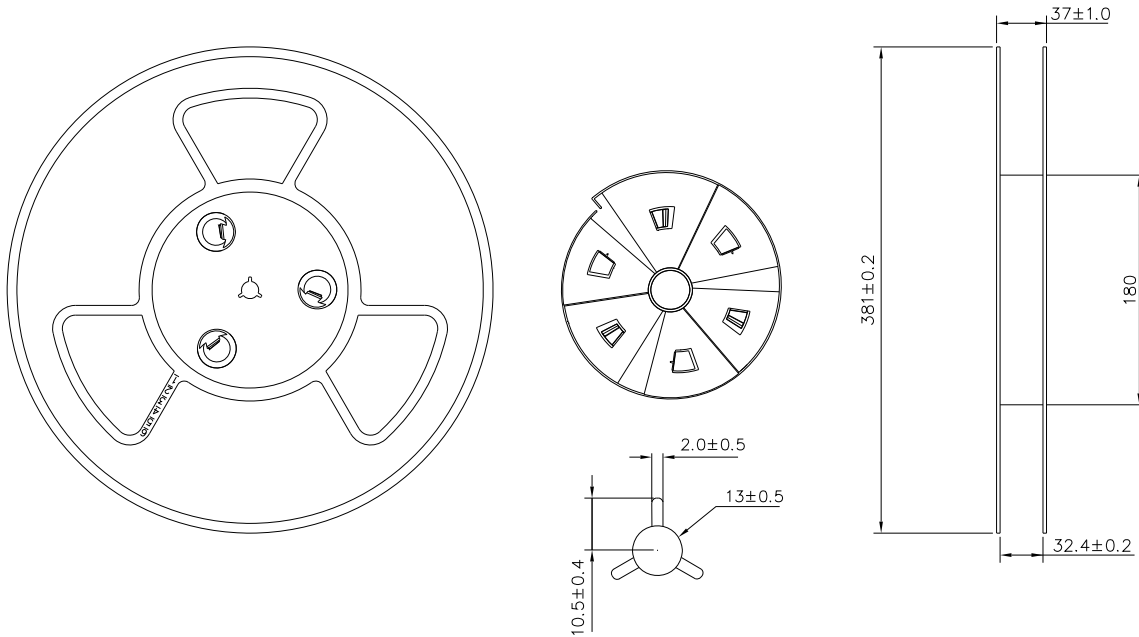
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## 0.4" SMD Type LED Display

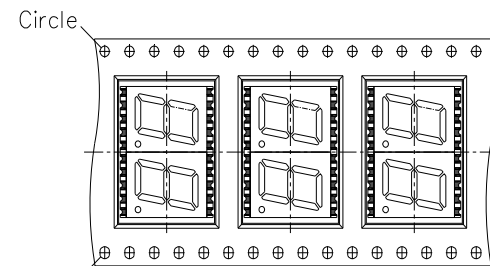
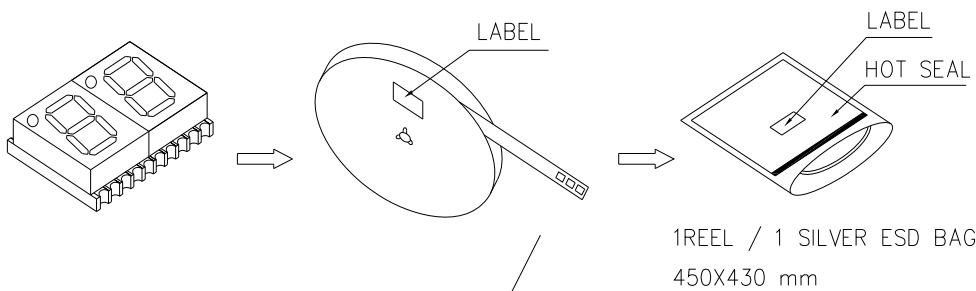
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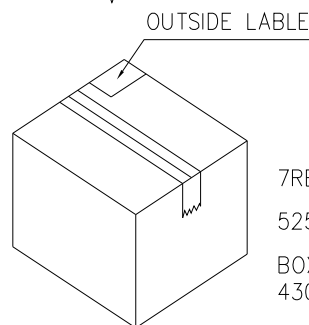
#### ● REEL DIMENSIONS



#### ● PACKING & LABEL SPECIFICATIONS



750PCS / 1 REEL



7 REEL / 1 BOX  
5250PCS / 1 BOX  
BOX SIZE:  
430X390X300 mm