

Opto Plus LED Corp. Touch Button with IC Built in OPD-V1616W-BW(H)

● EDIT HISTORY

Version A: Sep. 21, 2018

Preliminary Spec.

Version B: Oct. 28, 2018

Modify Typical Internal Equivalent Circuit.



Opto Plus LED Corp. Touch Button with IC Built in OPD-V1616W-BW(H)

● FEATURES

- Excellent character appearance.
- Case mold type.
- White face.
- RoHS compliant, Pb Free.

● DESCRIPTION

The OPD-V1616W-BW(H) is a 16.0 mm x 16.0 mm Capacitor touch switch LED button. This device utilizes Super Bright White SMD type LED chip which are made from InGaN on a transparent GaN substrate.

The display has White face.

The display is attached with overlay

● DEVICE

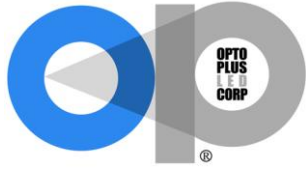
PART NO	DESCRIPTION
Super Bright White	
OPD-V1616W-BW(H)	Capacitor touch switch LED button

RoHS Compliance



Pb free.





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● INTERNAL FEATURES

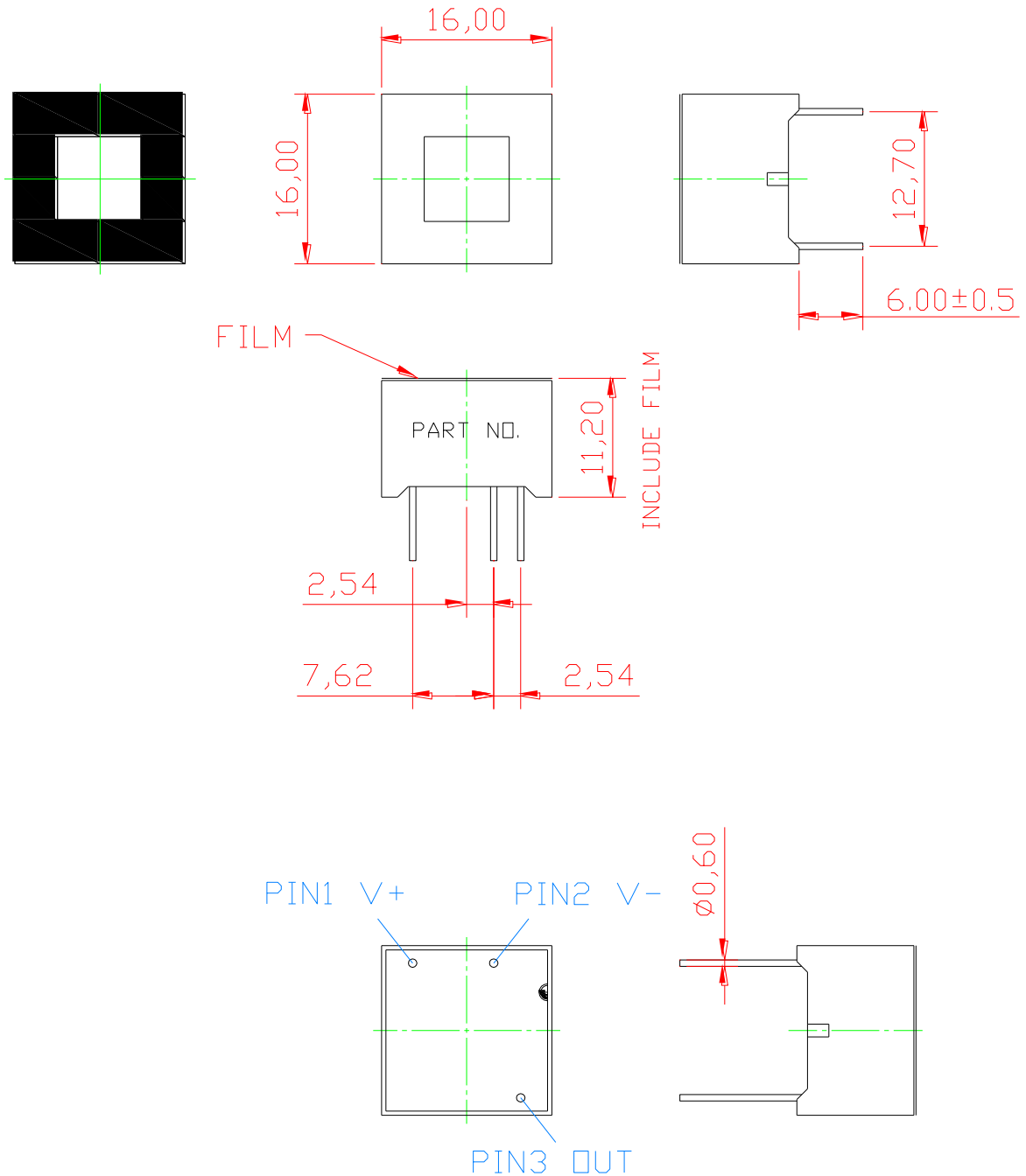
1. Capacitor touch switch LED button.
2. Output mode: GPIO
3. Capacitor touch switch cascade.
4. Touch distance 1mm – 5mm (sensitivity adjustable.)
5. Anti-water function.
6. Anti-Electro-Magnetic Interference (EMI)
7. Anti-Mobile Electro-Magnetic Interference.
8. Anti-5W Walky-Talky over 2CM.
9. Operating Voltage Range: 3.0V – 5.5V.
10. Low voltage reset function.
11. Operating Current Range: 100mA – 300mA.
12. Power Dissipation: 500mW
13. Power down and wake-up functions to reduce power consumption.
14. Operating temperature: -40°C to +85°C
15. Timer Module and many other features further enhance devices functionality and flexibility.
These touch key devices will find excellent use in a huge range of modern Touch Key product applications such as instrumentation, household appliances, electronically controlled tools to name but a few.

Note: These are stress ratings only. Stresses exceeding the range specified under "Absolute Maximum Ratings" may cause substantial damage to the device. Functional operation of the devices at other conditions beyond those listed in the specification is not implied and prolonged exposure to extreme conditions may affect device reliability.



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● MECHANICAL DIMENSIONS

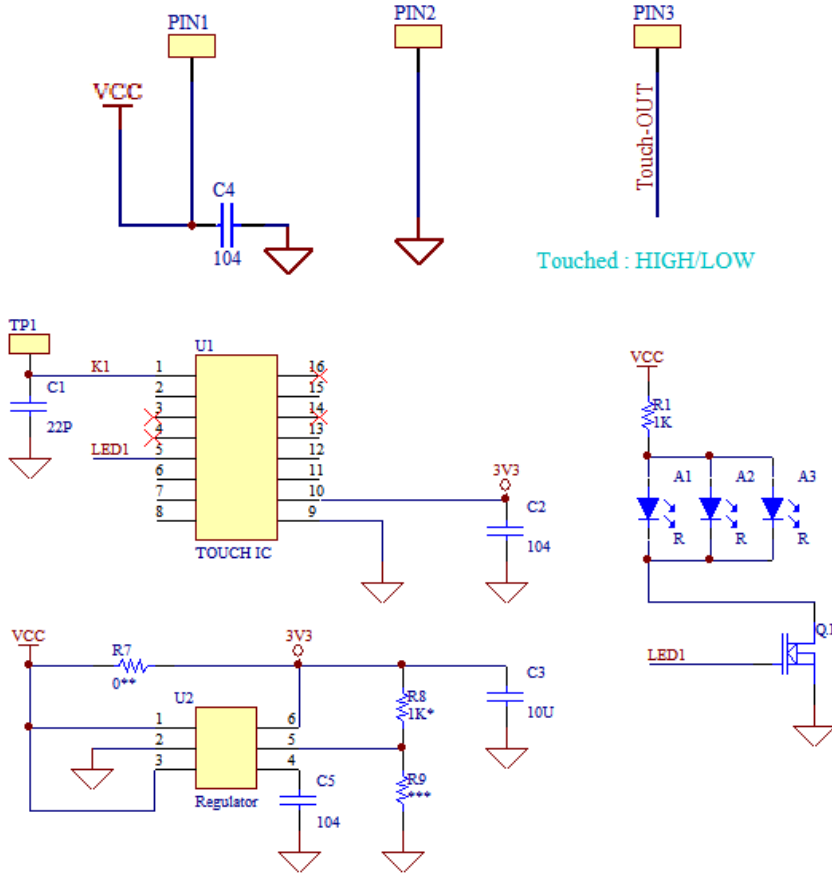


NOTES: All dimensions are in millimeters. Tolerances are ± 0.25 mm unless otherwise noted.

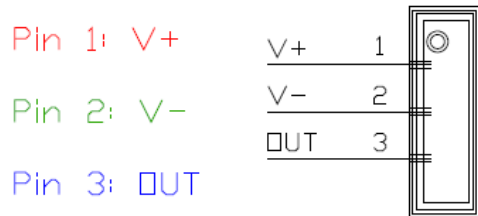
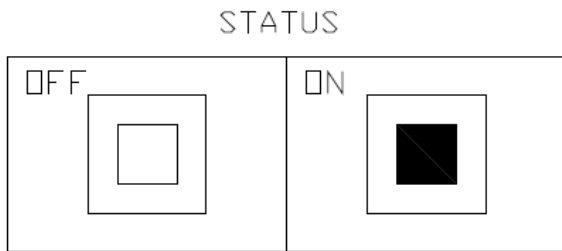


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● TYPICAL INTERNAL EQUIVALENT CIRCUIT



● RECOMMEND CIRCUIT FOR MULTI-TOUCH IC DESIGN





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● Internal IC Electrical Characteristics(D.C.)

For data in the following tables, note that factors such as oscillator type, operating voltage, operating frequency, pin load conditions, temperature and program instruction type, etc., can all exert an influence on the measured values.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating Voltage Characteristics Ta=-40°C~85°C						
V _{DD}	Operating Voltage – HIRC		2.2	-	5.5	V
	Operating Voltage – LIRC		2.2	-	5.5	V
Standby Current Characteristics Ta=25°C						
I _{STB}	SLEEP Mode	WDT on @V _{DD} = 3V	1.5	-	3.6	μA
	SLEEP Mode	WDT on @V _{DD} = 5V	3	5	6	μA
	IDLE0 Mode – LIRC	f _{SUB} on @V _{DD} = 3V	3	5	6	μA
	IDLE0 Mode – LIRC	f _{SUB} on @V _{DD} = 5V	5	10	12	μA
	IDLE1 Mode – HIRC	f _{SUB} on ,f _{SYS} = 8MHz @V _{DD} = 3V	360	500	600	μA
	IDLE1 Mode – HIRC	f _{SUB} on ,f _{SYS} = 8MHz @V _{DD} = 5V	600	800	960	μA
Operating Current Characteristics Ta=25°C						
I _{DD}	SLOW Mode – LIRC	f _{SYS} = 32KHz @V _{DD} = 3V	-	10	20	μA
	SLOW Mode – LIRC	f _{SYS} = 32KHz @V _{DD} = 5V	-	30	50	μA
	FAST Mode – HIRC	f _{SYS} = 8MHz @V _{DD} = 3V	-	0.8	1.2	mA
	FAST Mode – HIRC	f _{SYS} = 8MHz @V _{DD} = 5V	-	1.6	2.4	mA



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● W: SUPER BRIGHT WHITE (InGaN/GaN)

ABSOLUTE MAXIMUM RATING AT Ta=25°C

Parameter	Symbol	Super Bright White	Unit
Power dissipation per SMD	P _{AD}	78	mW
Continuous forward current per SMD	I _{AF}	20	mA
Peak current per dice (duty cycle 1/10, 1kHz)	I _{PF}	60	mA
Reverse voltage per SMD	V _R	5	V
Operating temperature	T _{OPR}	-25 to +85	°C
Storage temperature	T _{STG}	-25 to +85	°C

ELECTRICAL - OPTICAL CHARACTERISTICS AT Ta=25°C

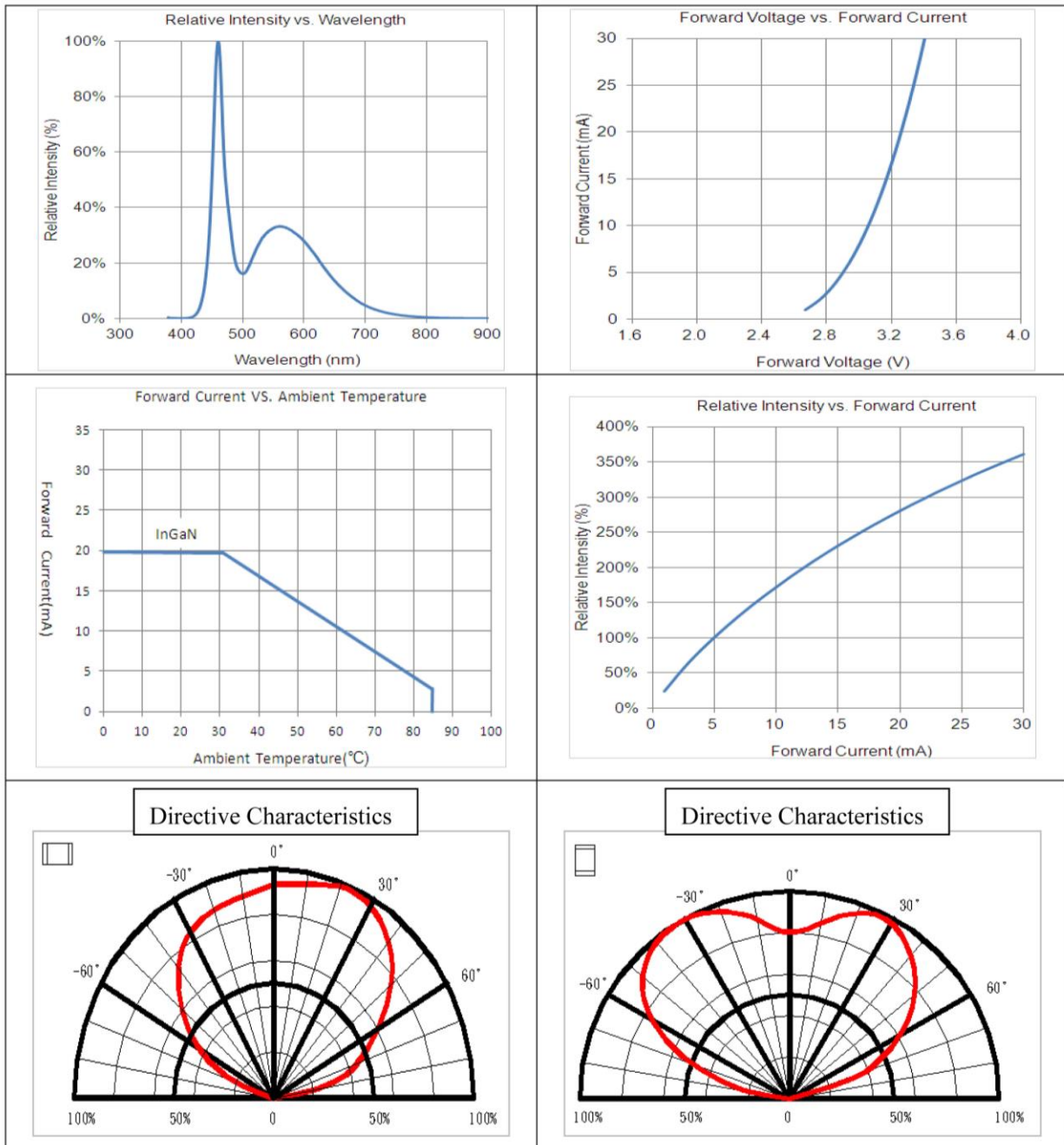
Characteristic	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage per SMD	V _F	I _F =5mA	-	2.8	3.4	V
Reverse Current	I _R	V _R =5V	-	-	10	μA
Peak Wavelength per SMD	λ _P	I _F =5mA	X	0.26	-	nm
			Y	0.25	-	
Average Luminous Intensity	I _V	I _F =5mA	-	45	-	mcd
Spectrum Radiation Bandwidth	Δλ	I _F =5mA	-	30	-	nm



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● W: Super bright white (InGaN/GaN) CURVE

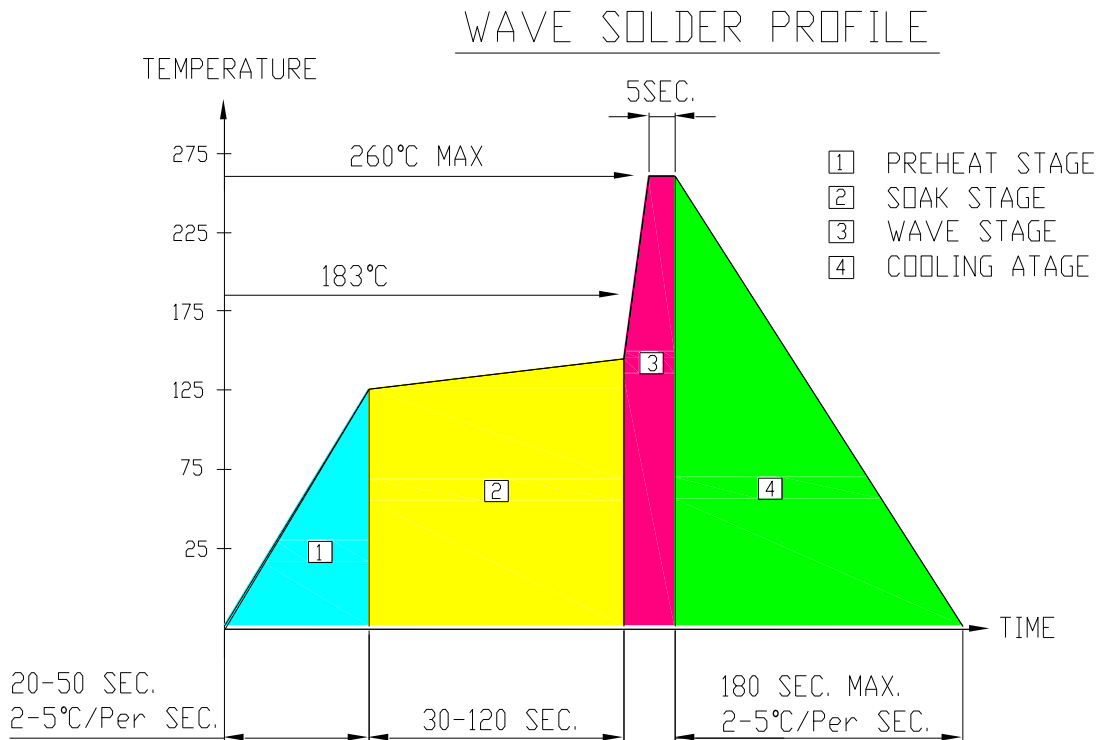
Typical Electro-optical Characteristic Curves
(25 °C Free Air Temperature Unless Otherwise Specified)





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● RECOMMEND SOLDERING PROFILE



● Note:

- Recommend pre-heat temperature of 105°C or less (as measured with a thermocouple attached to the LED pins) prior to immersion in the solder wave with a maximum solder bath temperature of 260°C
- Peak wave soldering temperature between 245°C ~ 225°C for 3 sec (5 sec max)
- No more than one wave soldering pass

● 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

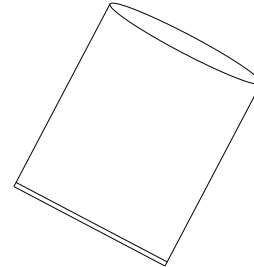
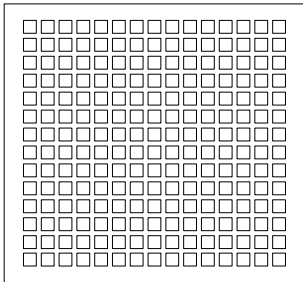
Customer must finish rework within ≤ 3 sec under 350°C.
The head of soldering iron cannot touch copper foil.



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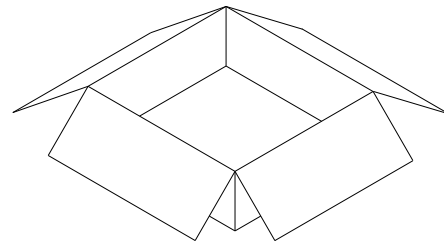
● PACKAGE DIMENSIONS

210 PCS (14 X 15) / 1 ANTISTATIC E. PE. FOAM SHEET



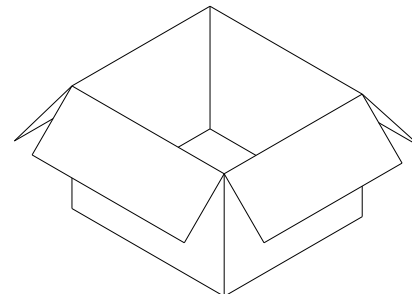
ESD BAG SIZE : 650 x 550 mm

4 ANTISTATIC E. PE. FOAM SHEET & 1 CARDBOARD / 1 PINK ESD BAG
840 PCS / 1 Inner Carton



INNER BOX SIZE : 394 x 370 x 138 mm

1680 PCS / 2 Inner Carton / 1 Outer Carton



OUTER BOX SIZE : 430 x 390 x 300 mm

● Note:

LED DISPLAY STANDARD STORAGED CONDITION

Product in the original packaging material state is the recommended storage conditions.

TERATURE CONDITION	HUMIDITY CONDITION
5°C ~ 30°C	Below 60%RH

If the storage conditions do not meet specification standards, the component pins may become oxidized requiring re-plating and re-sorting before use. Suggest customers consume LEDs as soon as possible, and avoid long-term storage of large inventories.