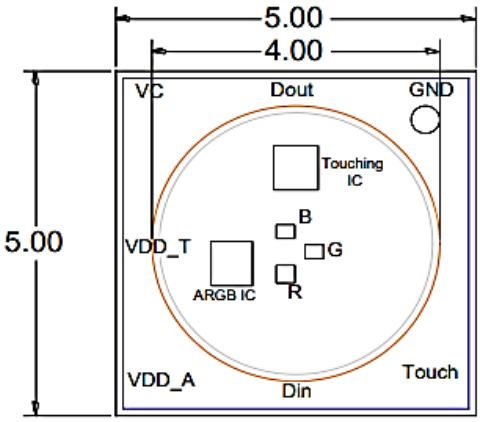
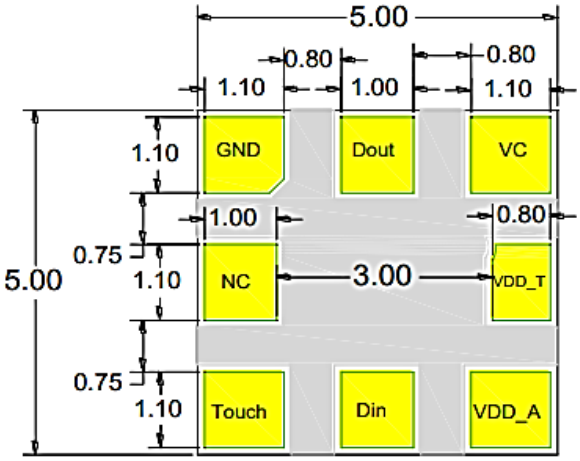
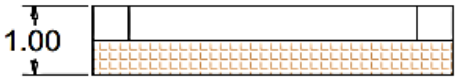
American Opto Plus LED Corp.
L381L-LEPGB-CTI
5.0 x 5.0 x 1.0mm Addressable RGB Capacitive Touch SMD LED

PACKAGE DIMENSION







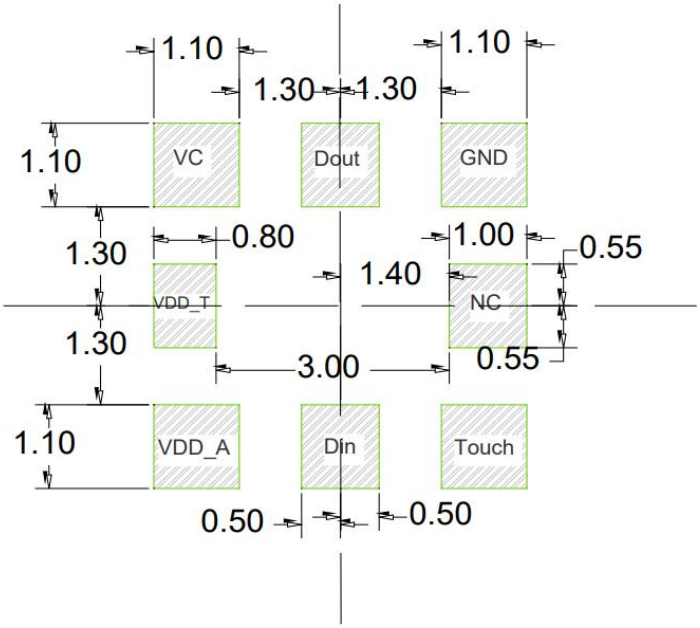
NO.	Symbol	Function Description
1	Touch	Touch sensing signal output
2	GND	Ground
3	VDD_A	Driver IC DC power input
4	VDD_T	Touch IC DC power input
5	VC	Capacitor sampling pin
6	Din	Control date signal input
7	Dout	Control date signal output
8	NC	No polarity

Notes:

1. All dimension are in millimeter tolerance is ±0.2mm unless otherwise noted.
2. Specifications are subject to change without notice.

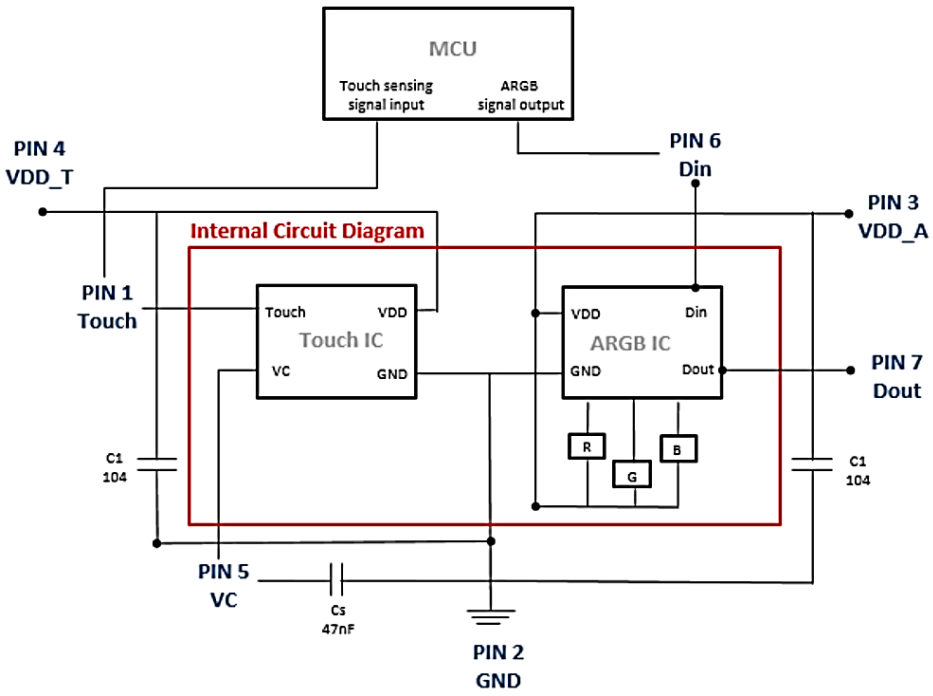
Material	Color	
	Emitted	Lens
AlGaInP	Red	White Diffused
InGaN	Pure Green	
InGaN	Blue	

RECOMMENDED SOLDERING PAD DIMENSIONS



Note: The tolerance unless mentioned is ±0.2mm, unit=mm.

APPLICATION CIRCUIT



Application Note:

1. Initial Pin 1(Touch) output is 0(Low level) as power on. When touching sensor detect a touch, Pin 1(Touch) switch to 1(High level). When the touching sensing is removed. It will switch Pin 1(Touch) from 1(High level) to 0(Low level).
2. When Pin5 (VC) is Adding the Cs(47nF) to VSS, the sensitivity is most sensitive. When reduce the values of Cs .It will reduce sensitivity in the useful range. (1nF≦Cs≦47nF).
3. The material of panel covering on the PCB cannot include the metal or the electric element. The paints on the surfaces are the same. The cover's thickness design rule is under 2mm.
4. The power supply must be stable. If the supply voltage drift or shift quickly, maybe causing sensitivity anomalies or false detections.
5. The sensitivity adjustment capacitors (Cs) must use smaller temperature coefficient and more stable capacitors. Such are X7R, NPO for example. So for touch application, recommend to use NPO capacitor, for reducing that the temperature varies to affect sensitivity.

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ABSOLUTE MAXIMUM RATING (Ta=25°C)

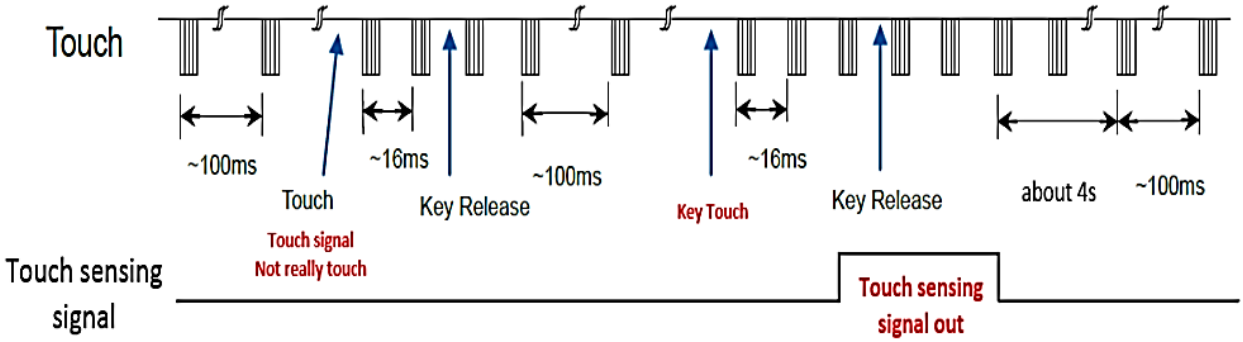
Parameter	Symbol	Rating	Unit
Operating Temperature Range	Topr	-25~+85	°C
Storage Temperature Range	Tstg	-30~+100	°C
Supply Voltage	VDD	3.3~5.5	V

ELECTRICAL / OPTICAL CHARACTERISTICS (Ta=25°C)

	Parameter	Symbol		Condition	Min.	Typ.	Max.	Unit
Touch Sensing IC	Supply Voltage	VDD		--	3.3	5	5.5	V
	Standby Current	IOPL		VDD=5V,no load	--	10.5	--	uA
	High Level Input Voltage	VIH		VDD	2/3	--	--	VDD
	Low Level Input Voltage	VIL		VDD	--	0.1	1/3	VDD
	Output Response Time	TR		VDD=5V	--	48	--	ms
ARGB	Supply Voltage	VDD		--	3.3	5	5.5	V
	R/G/B Current	IOL		VDD=5V	--	12	1	mA
	Input High Voltage	VIH		--	2.7	--	VDD	V
	Input Low Voltage	VIL		--	0	--	1	V
	R/G/B Off Leakage Current	Ioff		PWM=0(off) @R/G/B=5V	--	--	1	uA
LED	Luminous Intensity	Iv	R	VDD=5V	--	320	--	mcd
			G		--	700	--	
			B		--	150	--	
	Dominant Wavelength		R	VDD=5V	--	622	--	nm
			G		--	525	--	
			B		--	468	--	
	Viewing Angle	2θ1/2		VDD=5V	--	120	--	deg

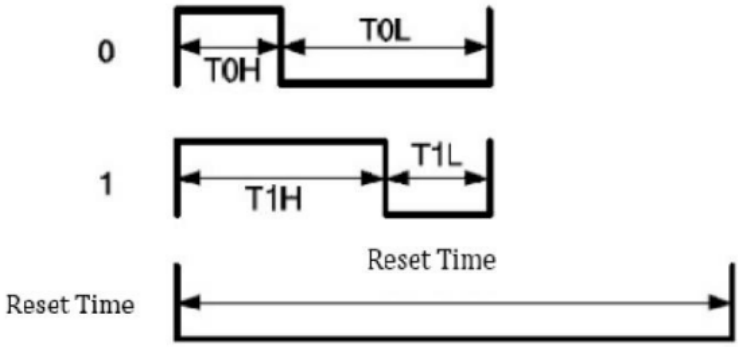
Version 1.1 Date: 01/16/2024
American Opto Plus LED Corp. 1206 E. Lexington Ave. , Pomona CA 91766 Tel: 909-465-0080 Fax: 909-465-0130 www.aopled.com

Touch sensing Time chart Description



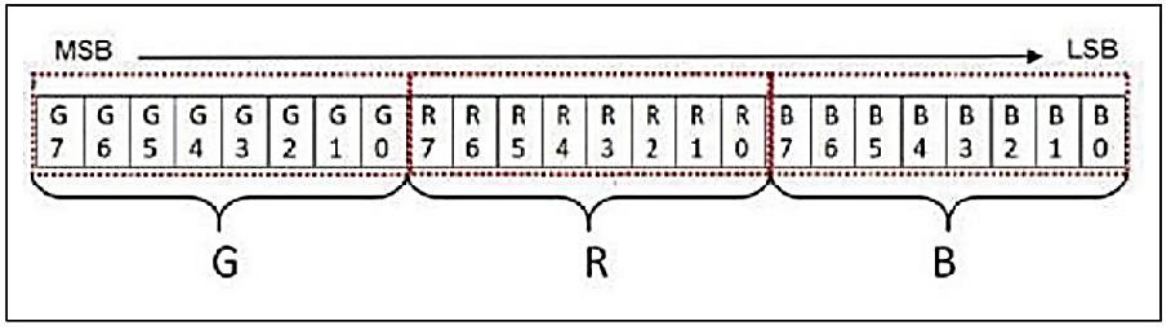
LED FUNCTIONAL DESCRIPTION

Timing Wave Form



Item	Description	min	Typical	Allowance	unit
T0H	0 code, High-level time		0.3	±0.15	us
T0L	0 code, Low-level time		0.9	±0.15	us
T1H	1 code, High-level time		0.9	±0.15	us
T1L	1 code, Low-level time		0.3	±0.15	us
Trst	Reset code,Low-level time	250			us

Single data in 24 bit for RGB



ADVANCE FUNCTION MODE

This product has a Advance Function mode that supports the MCU to start with a specific command setting.
Advance Function Mode includes the following function。

1. Feedback the cascaded number of LEDs and maximum sink current of R/G/B channel
2. Current Gain control:32 level(5bits) to adjust maximum sink current of R/G/B channel
3. Programmable PWM refresh rate (1.25kHz/2.5kHz/5kHz/10kHz)

TYPICAL ELECTRO-OPTICAL CHARACTERISTICS CURVE

Fig.1 R CHIP
Relative Intensity vs. Wavelength

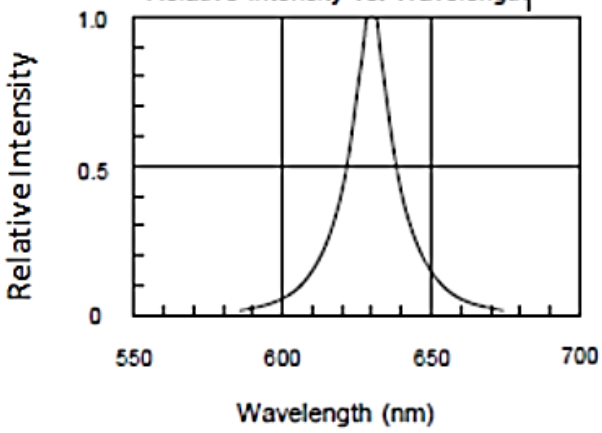


Fig.2 G CHIP
Relative Intensity vs. Wavelength

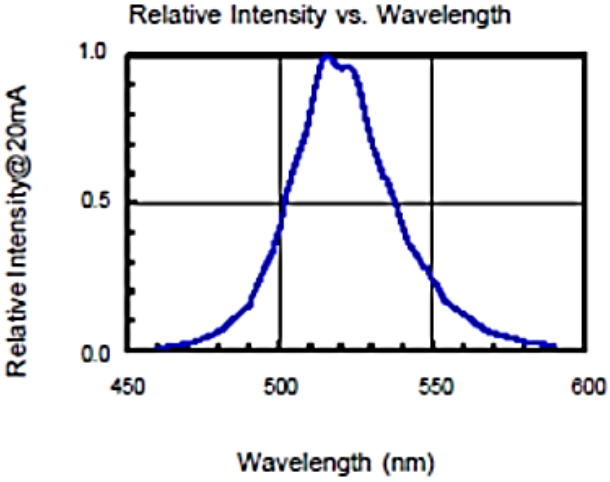


Fig.3 B CHIP
Relative Intensity vs. Wavelength

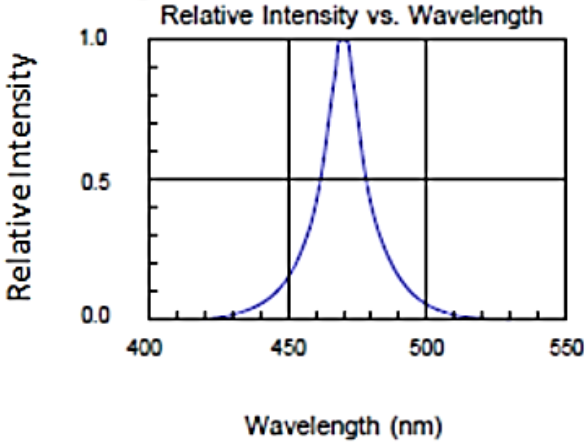
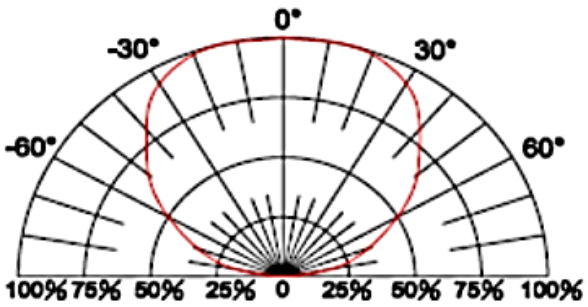
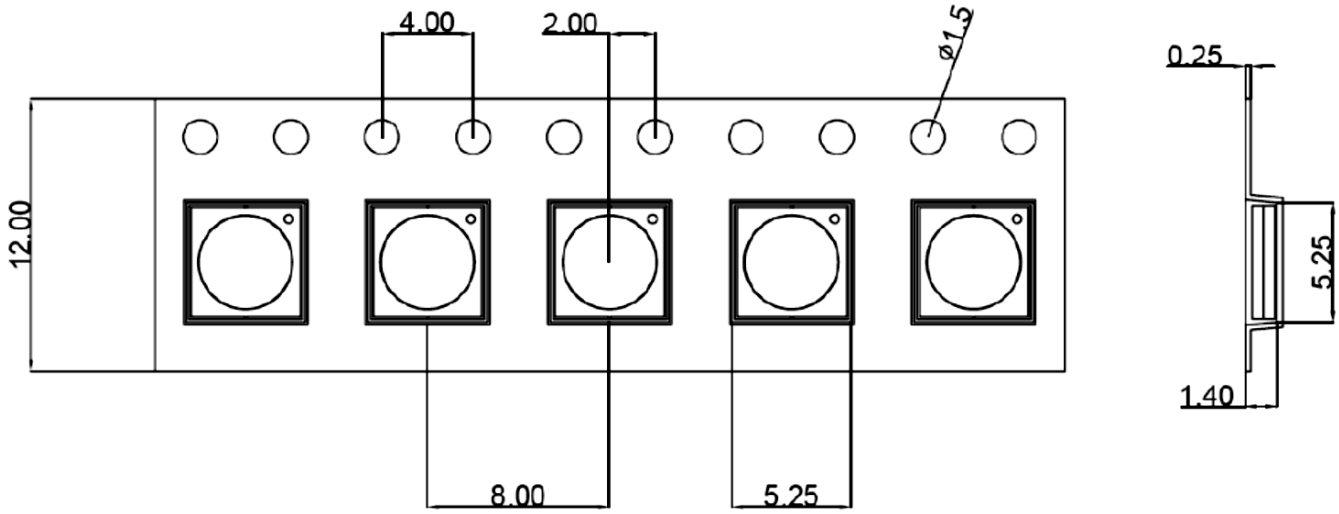


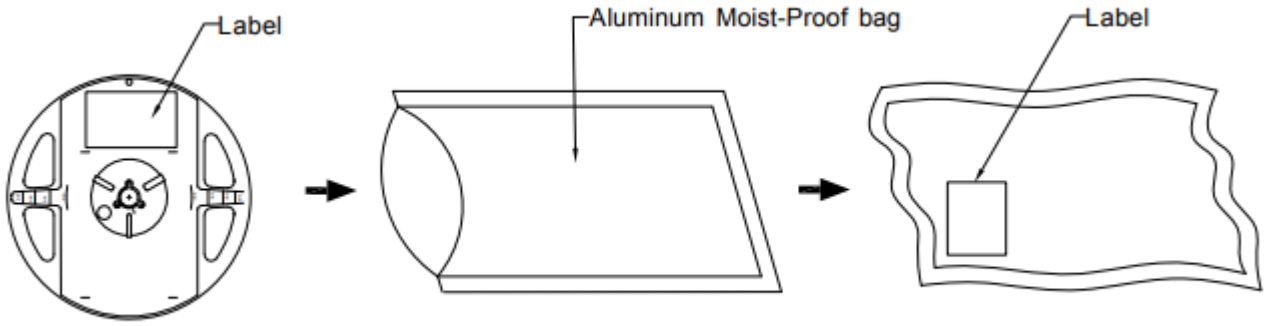
Fig.4 Directive Radiation



CARRIER TEPE DIMENSIONS



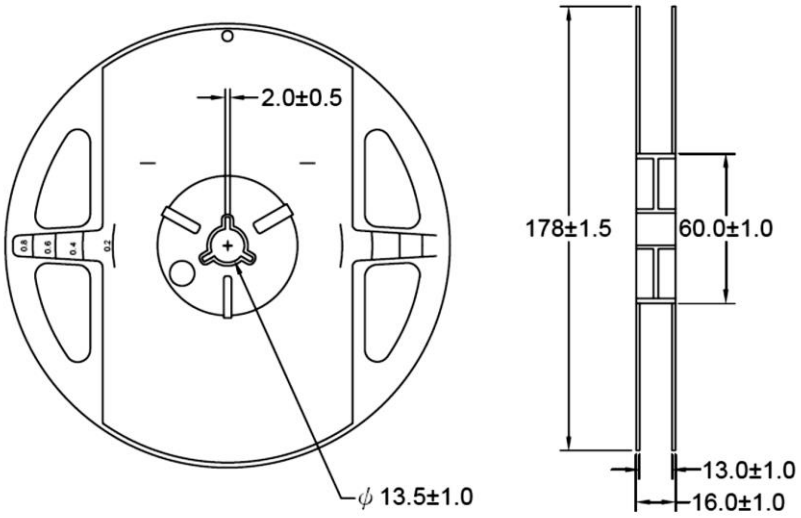
PACKING SPECIFICATIONS



NOTES:

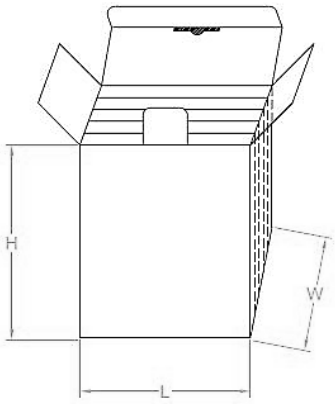
1. 12.0 mm tape, 7” reel
2. 1000 devices (Quantity/reel)

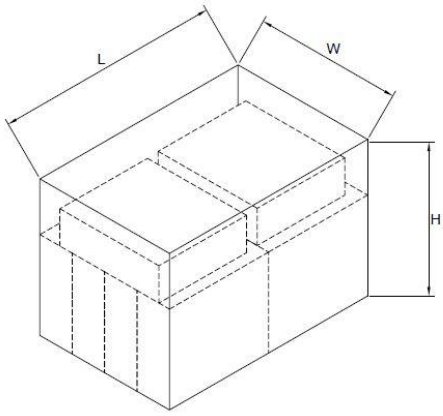
REEL DIMENSIONS



BOX EXPLANATION

1. 4 bag / inner box
2. Inner box size: L x W x H
   23cm x 8.5cm x 26cm





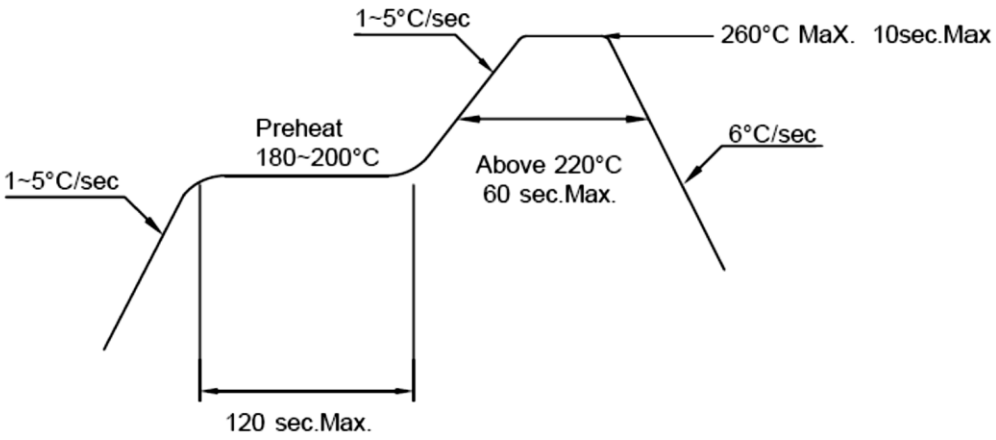
3. 10 Inner box / carton
4. Carton size: L x W x H
   58cm x 34cm x 35cm

RECOMMENDED SOLDERING

1. Hand solder

   Basic spec is ≦280°C 3sec one time only.

2. PB-Free reflow solder.



NOTES:

1. Reflow soldering should not be done more than two times.
2. When soldering, do not put stress on the LEDs during heating.
3. After soldering, do not warp the circuit board.

PRECAUTION FOR USE

Storage time

1. Calculated shelf life before opening is 12 months at < 30°C and < 90% relative humidity (RH).
2. After bag is opened, devices which will be subjected to reflow soldering or other high temperature processes must be
   a) Assembled within 168 hours in an environment of ≦30°C / 60% RH, Or
   b) Stored at ambient of 10% RH or less.

3. Devices are required baking before assembly if:
   a) Humidity indicator Card reads >10% (for level 2a -5a) or >60% (for level 2) at ambient temperature 23±5°C
   b) 2.a) or 2.b) doesn't meet.

4. If baking is required, devices should be baked for >72 hours at 60+5°C/5%. Performing baking only once, and using the baked devices within 72 hours

Cleaning

Use alcohol based cleaning solvents such isopropyl alcohol to clean the LED.

ESD (Electrostatic Discharge)

Static Electricity or power surge will damage the LED. Use of a conductive wrist band or anti-electrostatic glove is recommended when handing these LED. All devices, equipment and machinery must be properly grounded.