



LIGITEK ELECTRONICS CO.,LTD.
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LED SMD



PRELIMINARY

This is just a preliminary design
to let you evaluate the concept

LG-C2020FJRGB-T12Y-DT

DATA SHEET

DOC. NO : QW0905-LG-C2020FJRGB-T12Y-DT

REV. : A

DATE : 10 - Sep. - 2024

Features:

1. Meet RoHS.
- 2.Full Color SMD Chip LED With IC Control.
- 3.Top view Package in 8.0mm carrier tape on 7" diameter reel.
- 4.Each RGB chip is 8 bit control, total of 16M color can be displayed.

Descriptions:

The LG-C2020 SMD has wide viewing angle and optimized light coupling by inter reflector, The low current requirement makes this device ideal for portable equipment or any other application where power is at a premium.

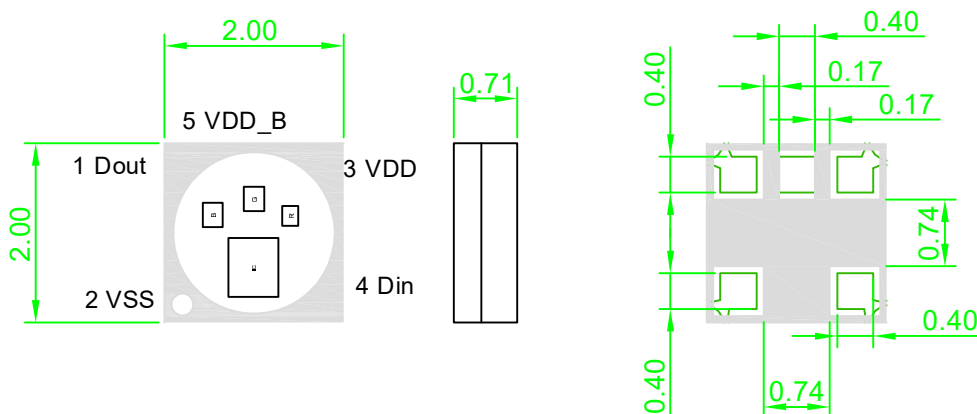
Applications:

1. Consumer product, Home appliances, Telecommunication, light bar.
2. Toy lights, Christmas lights, Decorative lights.

Device Selection Guide:

PART NO	MATERIAL	COLOR	
		Emitted	Lens
LG-C2020FJRGB-T12Y-DT	AlGaInP	Red	White Diffused
	InGaN	Blue	
	InGaN	Green	

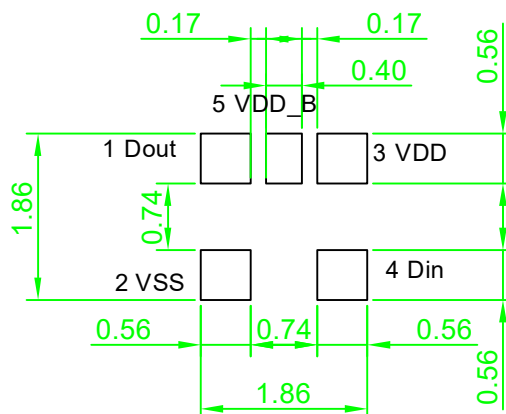
Package Dimensions



NO.	Symbol	Function Description
1	DOUT	Control date signal output
2	VSS	Ground
3	VDD	DC power input
4	DIN	Control date signal input
5	VDD_B	B Chip Anode

Note : 1.All dimension are in millimeter tolerance is $\pm 0.2\text{mm}$ unless otherwise noted.
2.Specifications are subject to change without notice.

Recommended Soldering Pad Dimensions



Note : The tolerances unless mentioned is $\pm 0.1\text{mm}$, Angle $\pm 0.5^\circ$. Unit=mm.

Absolute Maximum Ratings

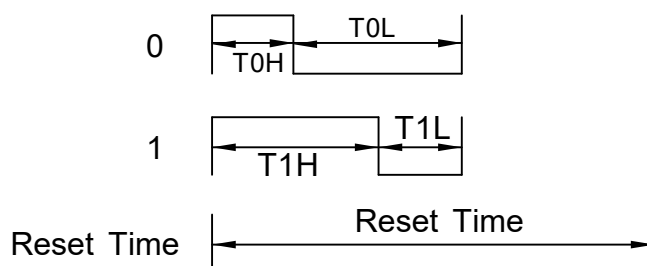
(Ta=25°C, VDD=5V, VSS=0)

Parameter	Symbol	Ratings	UNIT
Supply Voltage	VDD	3.3 ~ +6.5	V
LED Output Current	I _{OUT}	25	mA
Operating Temperature	T _{opr}	-40~ +85	°C
Storage Temperature	T _{stg}	-40 ~ +100	°C

Typical Electrical & Optical Characteristics (Ta=25°C)

Items	Symbol	Min.	Typ.	Max.	UNIT	CONDITION
Supply Voltage	VDD	3.3	5	5.5	V	
Each R/G/B Current	IOL		12		mA	VDD=5V
Input High Voltage	VIH	2.7		VDD	V	DI,
Input Low Voltage	VIL	0		1.0	V	DI,
Output High Voltage	VOH	3.8				IOH=4mA VDD=5V
Output Low Voltage	VOL			0.6	V	IOL=4mA VDD=5V
Operation Current	IDD			2	mA	B、G、R no load
Pull Down Resistance	R _{PD}		500K		Ω	Din, Dout(VDD=5V)

Timing Wave Form



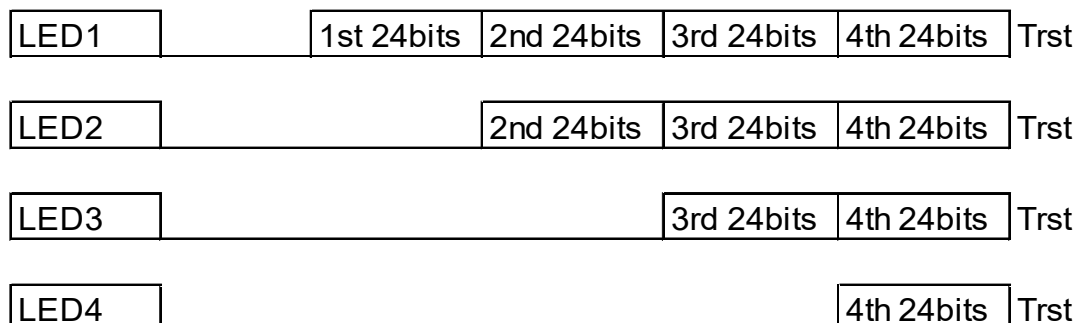
High Speed mode

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

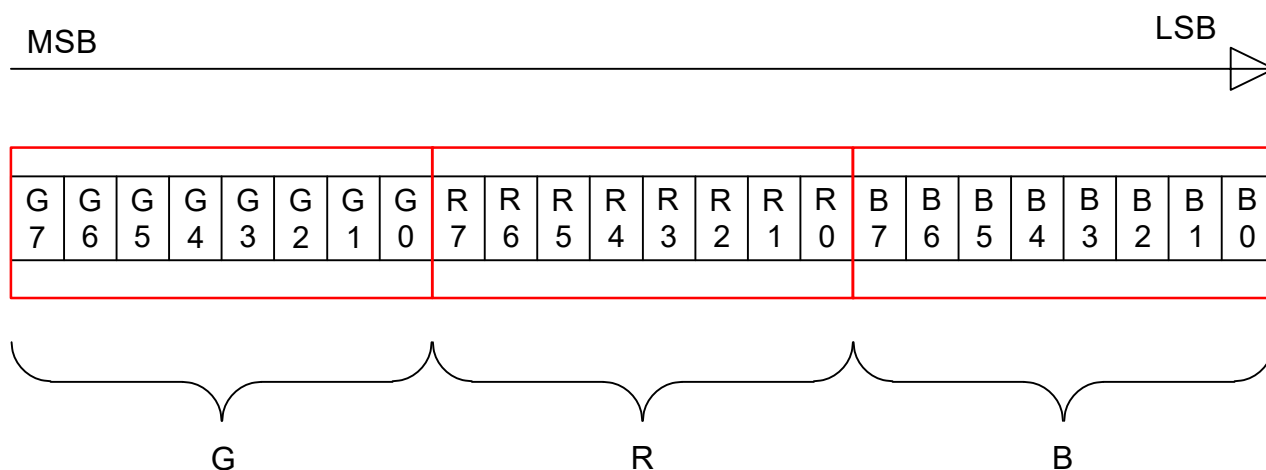
Control Commands for multiple strips connected parallely

LG-C2020FJRGB-T12Y-DT supports the scenarios of controlling multiple strips with parallel connection (up to 15 strips). With appropriate commands, each of the strips can be identified and assigned a unique strip dynamic ID (by set dynamic ID command). After the commands is completed, MCU host can individually control and send the display data to each strip with the help of "Clean ID" 、"Check ID" 、"specify ID" commands.

Data Communication



Single Data in 24bit 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/10kHz/20kHz)

Electrical Optical Characteristics at Ta=25°C

Items	Symbol		Min.	Typ.	Max.	UNIT	CONDITION
Luminous Intensity	Iv	R	----	230	----	mcd	VDD = 5.0 V
		G	----	500	----		
		B	----	70	----		
Dominant Wavelength	λD	R	----	622	----	nm	
		G	----	524	----		
		B	----	468	----		
Viewing Angle	2θ 1/2		120			deg	

- 1.The luminous intensity data did not including $\pm 15\%$ testing tolerance.
- 2.The dominant wavelength data did not including $\pm 1\text{nm}$ testing tolerance

Typical Electro-Optical Characteristics Curve

Fig.1 R CHIP

Relative Intensity vs. Wavelength

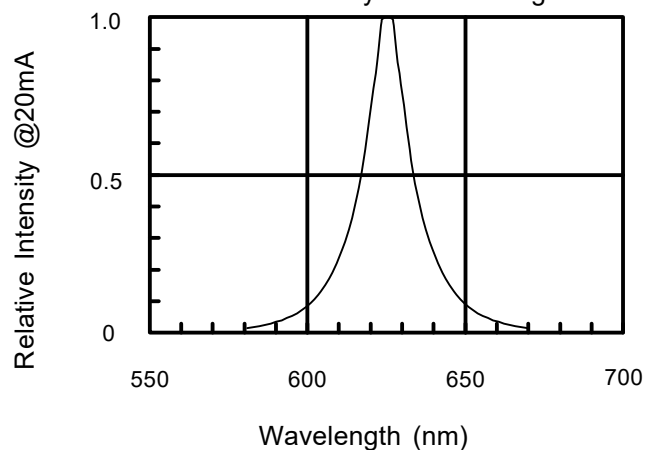


Fig.2 G CHIP

Relative Intensity vs. Wavelength

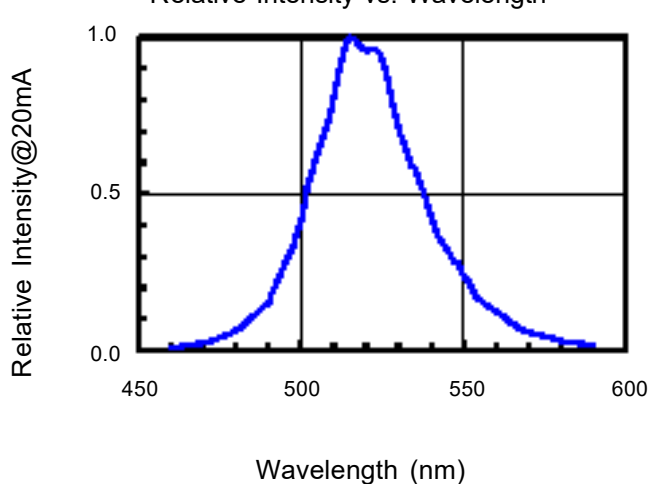
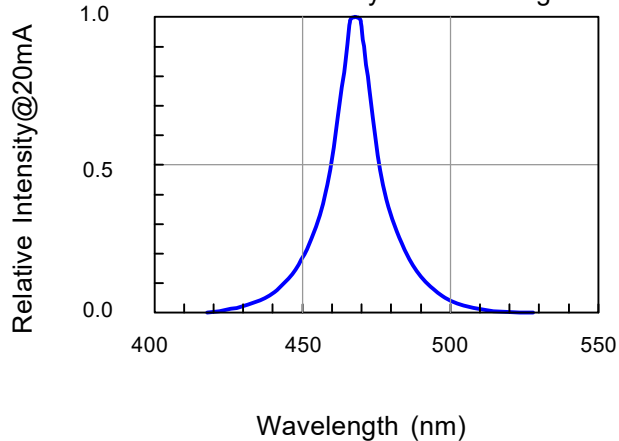


Fig.3 B CHIP

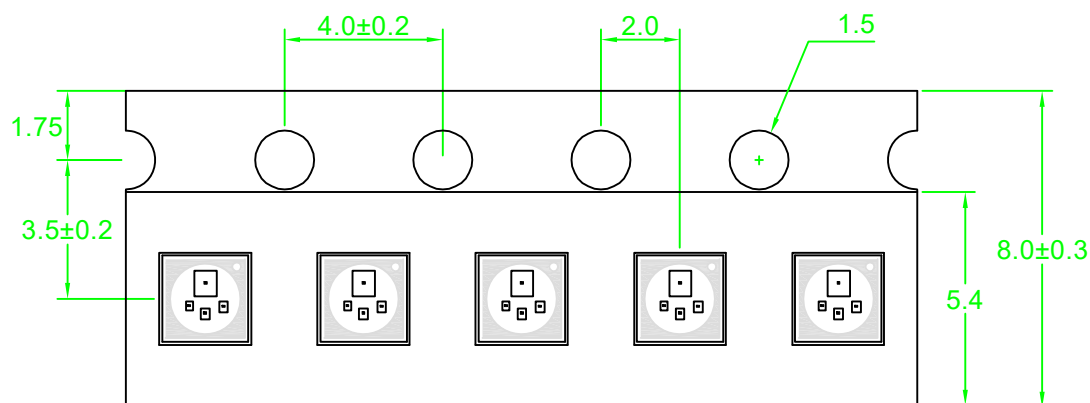
Relative Intensity vs. Wavelength



PART NO. LG-C2020FJRGB-T12Y-DT

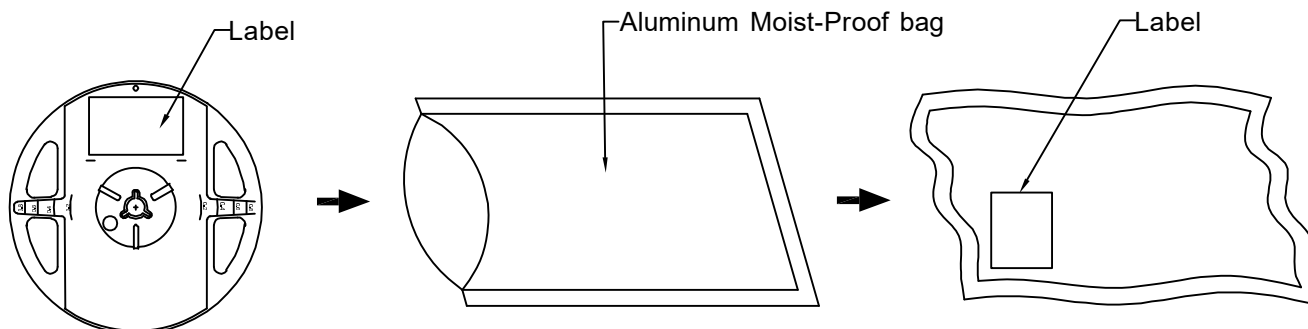
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Carrier Type Dimensions



Note : The tolerances unless mentioned is ± 0.1 mm, Angle ± 0.5 . Unit=mm.

• Packing Specifications



Part No.	Description	Quantity/Reel
LG-C2020FJRGB-T12Y-DT	8.0mm tape, 7" reel	3000 PCS

PART NO. LG-C2020FJRGB-T12Y-DT

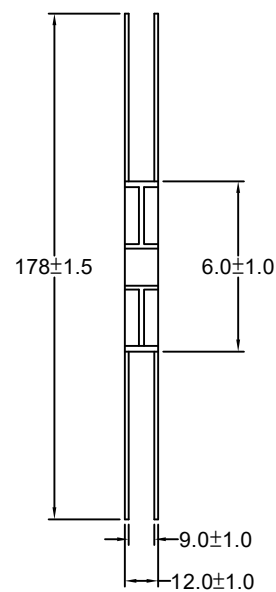
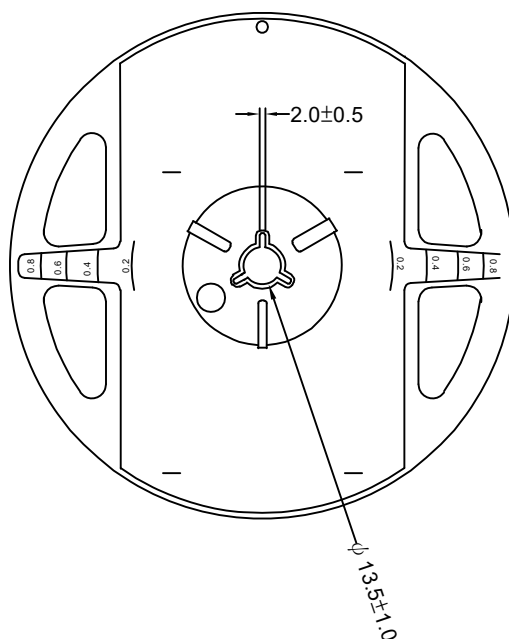
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Label Explanation

	LIGITEK ELECTRONICS CO., LTD.
PART :	LG-C2020FJRGB-T12Y-DT
LOT :	GS11730168
QTY(PCS):	3000
BIN/HUE :	1

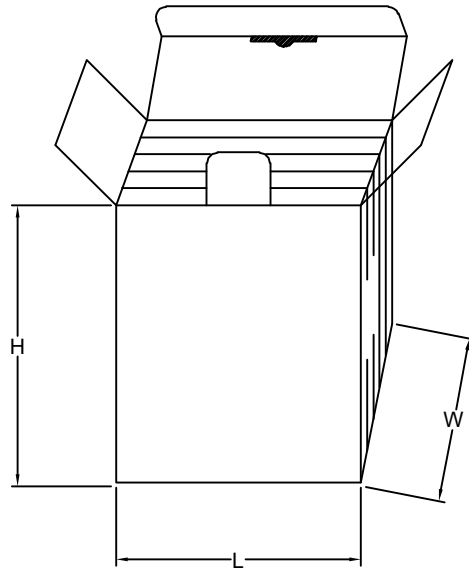
BIN : Luminous Intensity

Reel Dimensions

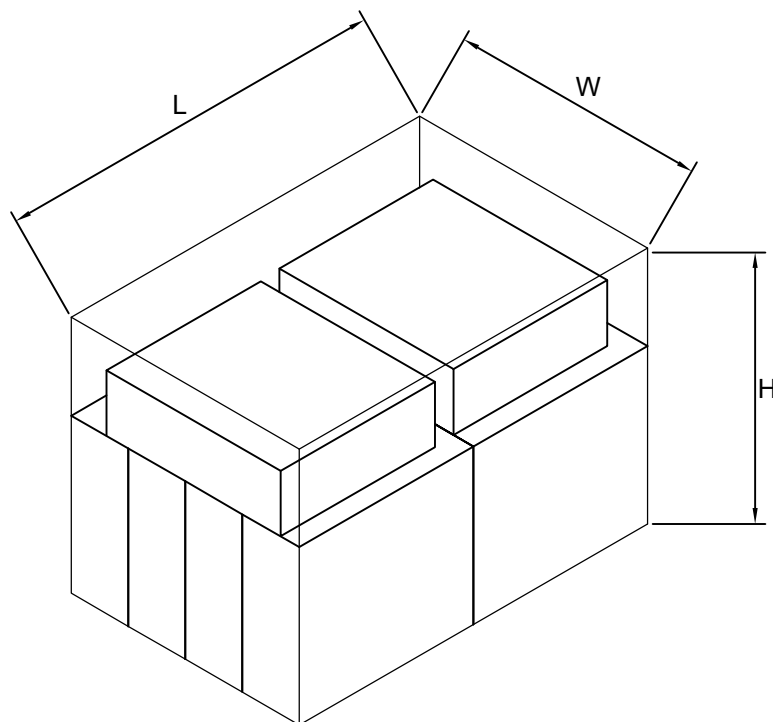


Box Explanation

1. 5 BAG / INNER BOX
2. INNER BOX SIZE : L X W X H 23cm X 8.5cm x 26cm

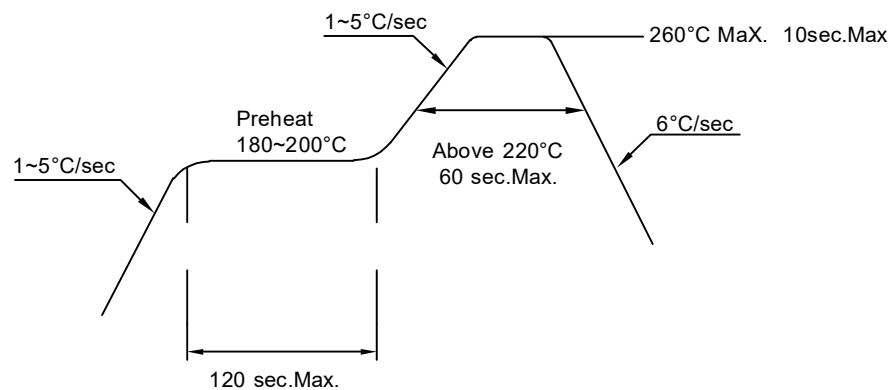


3. 10 INNER BOXES / CARTON
4. CARTON SIZE : L X W X H 58cm X 34cm x 35cm



Recommended Soldering Conditions**1. Hand Solder**

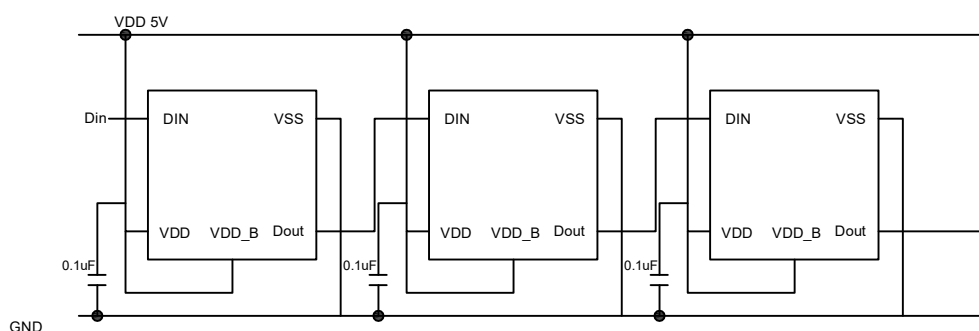
Basic spec is $\leq 280^{\circ}\text{C}$ 3 sec one time only.

2. PB-Free Reflow Solder**Note:**

- 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.

Precautions For Use:**Storage time:**

1. Calculated shelf life before opening is 12 months at $< 30^{\circ}\text{C}$ 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 $\leq 30^{\circ}\text{C}$ / 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 $23\pm 5^{\circ}\text{C}$
 - b) 2.a) or 2.b) doesn't meet
4. If baking is required, devices should be baked for >24 hours at $60\pm 5^{\circ}\text{C}$ / 5% RH. Performing baking only once, and using the baked devices within 8 hours.

Recommended route**Cleaning:**

Use alcohol-based cleaning solvents such as 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-electrosatic glove is recommended when handing these LED. All devices, equipment and machinery must be properly grounded.