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LED SMD



PRELIMINARY

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

LG-5050FRGB-T12

DATA SHEET

DOC. NO : QW0905-LG-5050FRGB-T12

REV. : A

DATE : 23 - Jan. - 2019

Features:

1. Meet RoHS.
- 2.Full Color SMD Chip LED With IC Control.
- 3.Top view Package in 12.0mm carrier tape on 7" diameter reel.
- 4.Each RGB chip is 8 bit control, total of 16M color can be displayed.

Descriptions:

The LG-5050 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.

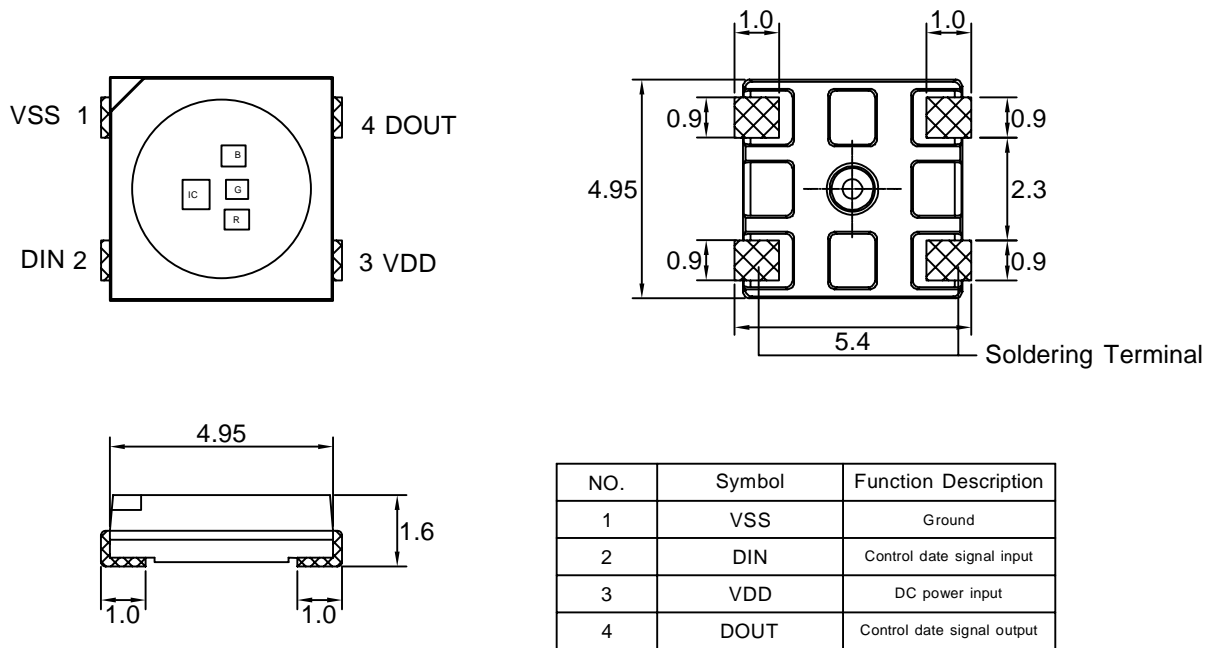
Applications:

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

Device Selection Guide:

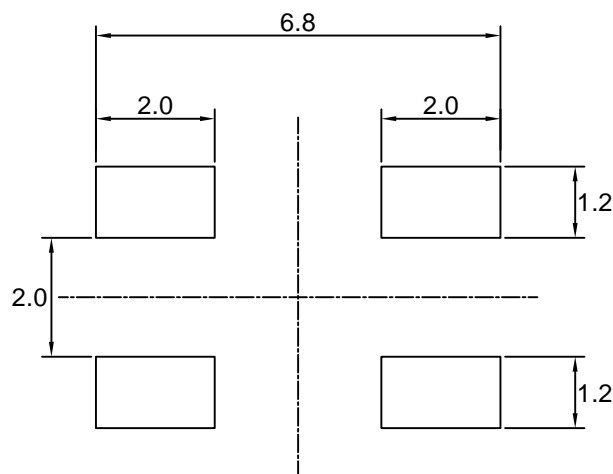
PART NO	MATERIAL	COLOR	
		Emitted	Lens
LG-5050FRGB-T12	AlGaInP	Red	Water Clear
	InGaN	Blue	
	InGaN	Green	

Package Dimensions



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 ± 0.5 . Unit=mm.

Absolute Maximum Ratings

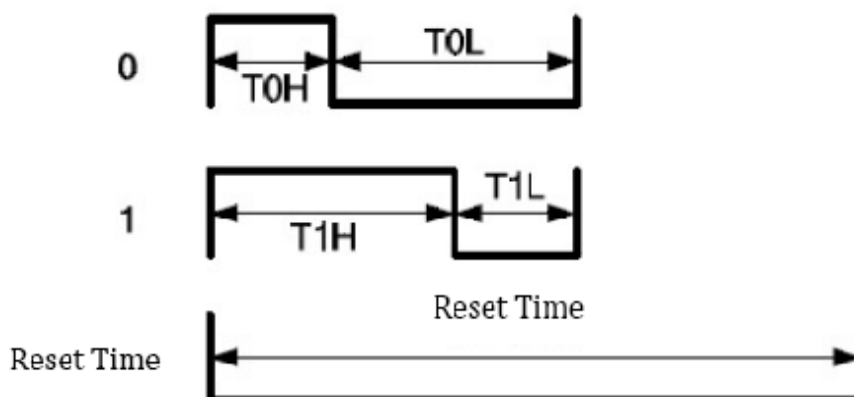
(Ta=25°C, VDD=5V, VSS=0)

Parameter	Symbol	Ratings	UNIT
Supply Voltage	VDD	-0 ~ +6.0	V
LED Output Current	I _{OUT}	20	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	4.5				DO,@VDD=5V
Output Low Voltage	VOL			0.4 VDD	V	DO,@VDD=5V

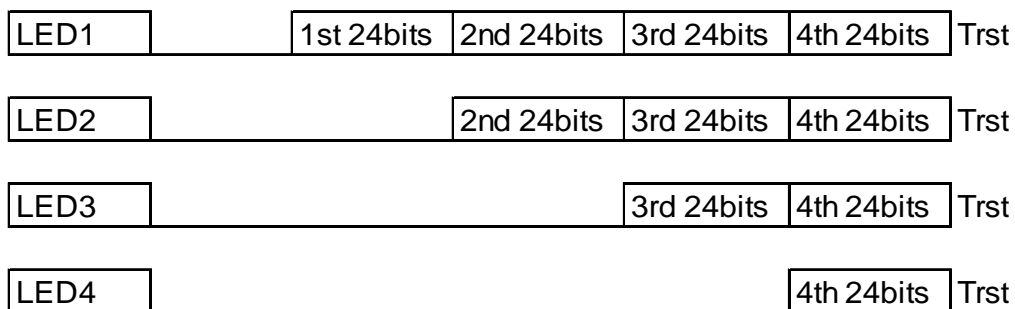
Timing Wave Form



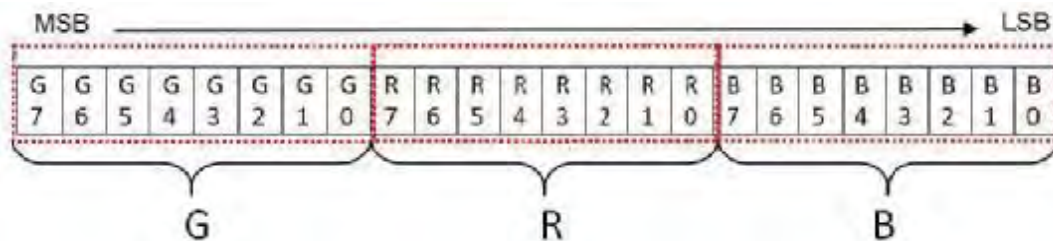
High Speed mode

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

Data Communication



Single Data in 24bit for RGB

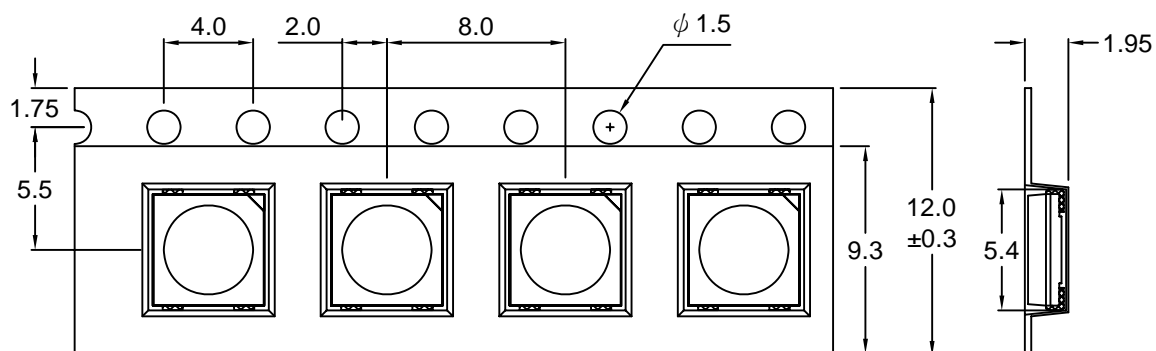


Electrical Optical Characteristics at Ta=25°C

Items	Symbol	Min.	Typ.	Max.	UNIT	CONDITION
Luminous Intensity	R	----	500	----	mcd	VDD = 5.0 V
	G	----	650	----		
	B	----	190	----		
Dominant Wavelength	R	----	622	----	nm	
	G	----	525	----		
	B	----	470	----		
Viewing Angle	2θ 1/2	120		deg		

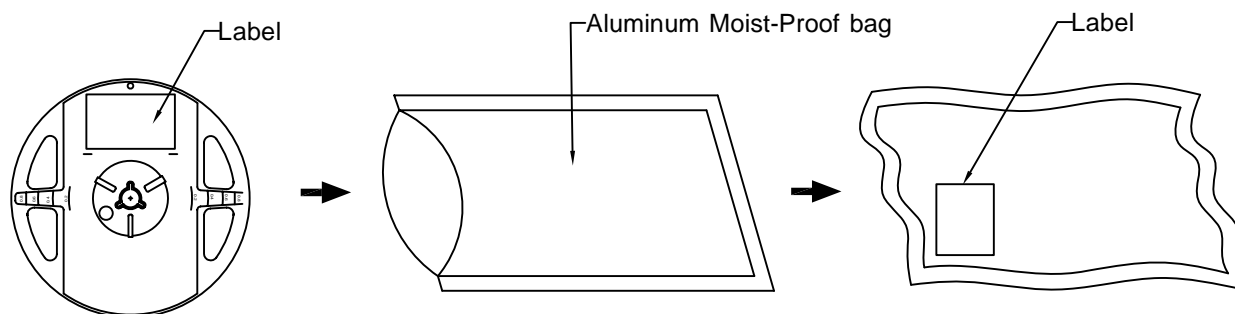
- 1.The luminous intensity data did not including ±15% testing tolerance.
- 2.The dominant wavelength data did not including ±1nm testing tolerance

Carrier Type Dimensions








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

Packing Specifications



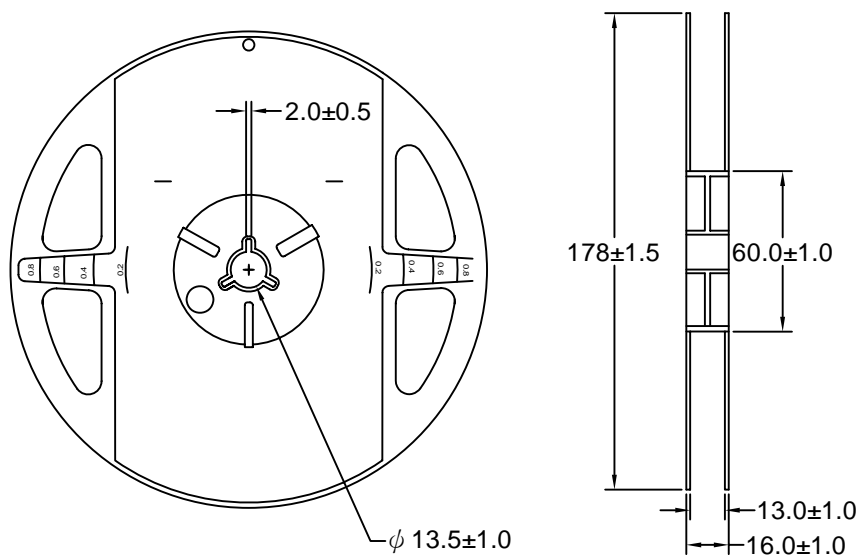
Part No.	Description	Quantity/Reel
LG-5050FRGB-T12	12.0mm tape,7"reel	1000 PCS

Label Explanation

 LIGITEK ELECTRONICS CO., LTD.	
PART :	 LG-5050FRGB-T12
LOT :	 GS11730168
QTY(PCS):	 1000
BIN/HUE :	 XXXXX

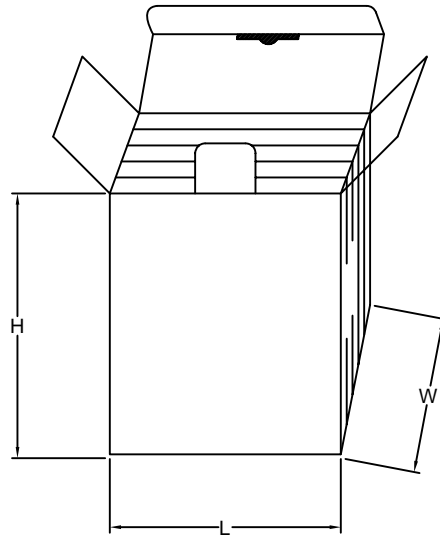
BIN : Luminous Intensity

Reel Dimensions

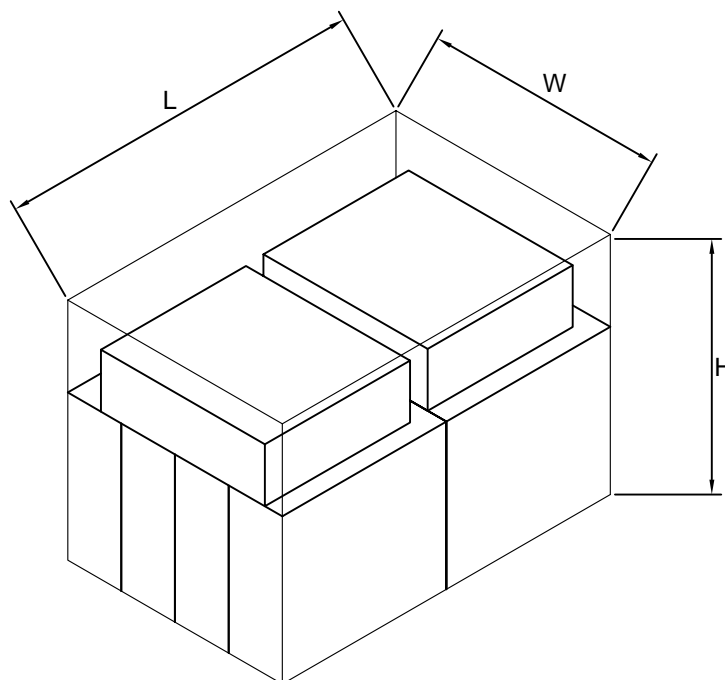


Box Explanation

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

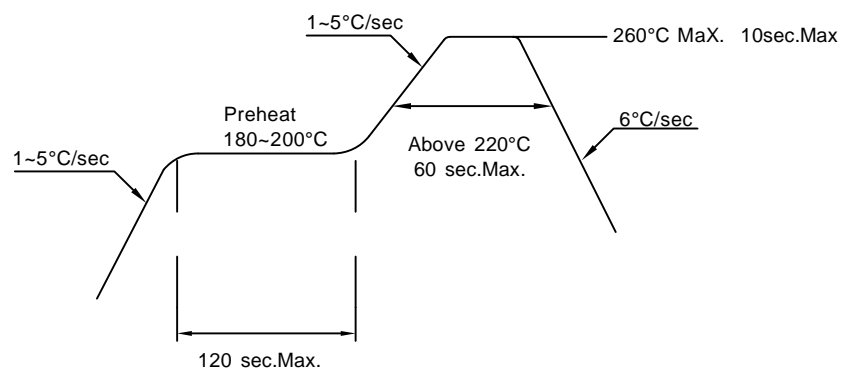


3. 10 INNER BOXES / CARTON
4. CARTON SIZE : L X W X H 58cm X 34cm x 35cm



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 24 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 >72 hours at $60\pm 5^{\circ}\text{C} / 5\%$ RH. Performing baking only once, and using the baked devices within 72 hours.

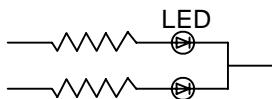
MSL : 3

Drive Method:

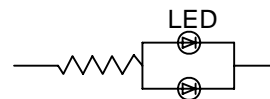
LED is a current operated device, and therefore, requires some kind of current limiting incorporated into the driver circuit. This current limiting typically takes the form of a current limiting resistor placed in series with the LED.

Consider worst case voltage variations than could occur across the current limiting resistor. The forward current should not be allowed to change by more than 40% of its desired value.

Circuit model A



Circuit model B



(A) Recommended circuit.

(B) The difference of brightness between LED could be found due to the VF-IF characteristics of LED.

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-electrostatic glove is recommended when handling these LED. All devices, equipment and machinery must be properly grounded.