

LIGHT EMITTING DIODE SPECIFICATION

DESCRIPTION:	IE-5050RGB-HB-L-CE
REVISION:	V2.2
ISSUE DATE:	2023 8 9

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Features:

- Long operating life
- Low voltage DC operated
- RoHS Compliant
- Anti ultraviolet Package

**Application:**

- Outdoor Brightening Lighting
- Application of car lights, traffic lights, wooden wall screens and pixel screens
- motormeter

Part Number	Dice Material	Emitted Color	Lens Color
IE-5050RGB-HB-L-CE	AlGaInP InGaN InGaN	Red Green Blue	Water Clear

Electro Optical Characteristics($T_a=25^{\circ}\text{C}$, @20mA)

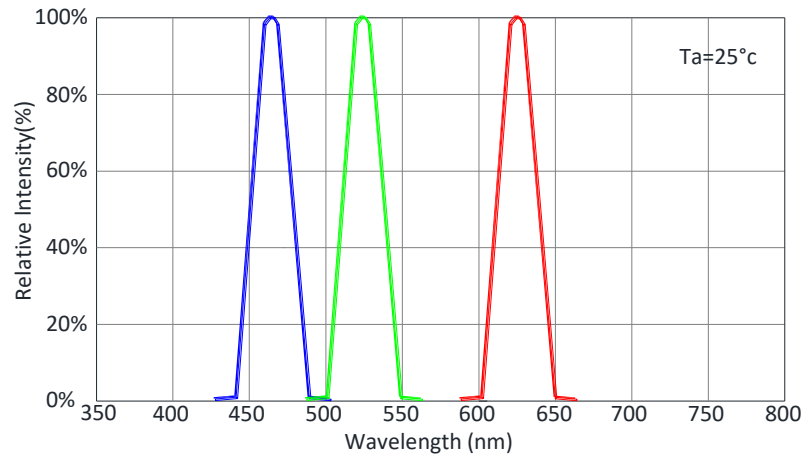
Parameter	Color	Symbol	Min.	Typ.	Max.	Unit
Luminous Intensity		IV	2000		3000	mcd
			4000		6000	
			1000		1500	
Radiation Bandwidth		$\Delta\lambda$		20		nm
				35		
				25		
Forward Voltage		VF	1.90	2.00	2.40	v
			2.90	3.00	3.40	
			2.90	3.00	3.40	
Dominant Wavelength		λ_d	620	620	630	nm
			520	520	530	
			460	465	475	
Viewing Angle		2 θ 1/2		30	45	deg
Reverse Current		IR			10	uA

Absolute Maximum Ratings($T_a=25^{\circ}\text{C}$)

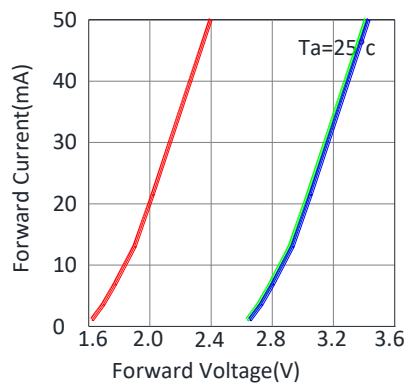
Parameter	Symbol	Max.	Unit
Peak Forward Current(1/10 Duty Cycle, 0.1ms Pulse Width)	IFP	60*3	mA
Forward Current	IF	50*3	mA
Reverse Voltage	VR	5*3	v
Electrostatic Discharge	ESD	2000*3	v
Operating Temperature Range	Topr	40to+90	$^{\circ}\text{C}$
Storage Temperature Range	Tstg	40to+90	$^{\circ}\text{C}$
Reflow Soldering	Tsld	260 $^{\circ}\text{C}$ for 10secs	

Optical & Electrical Characteristics

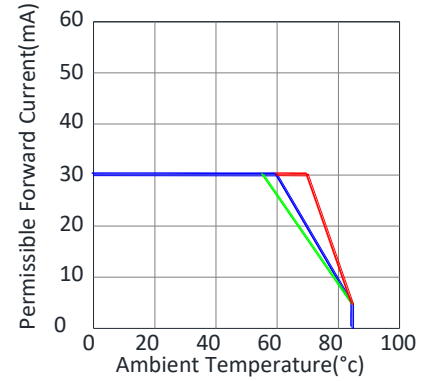
Relative Intensity vs.Wavelength



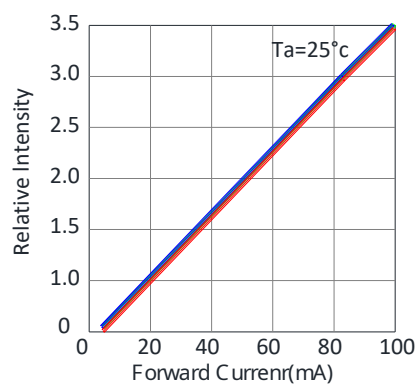
Forward Current vs.Forward Voltage



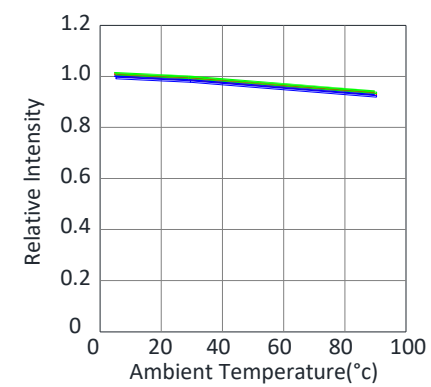
Forward Current vs.Ambient Temperature



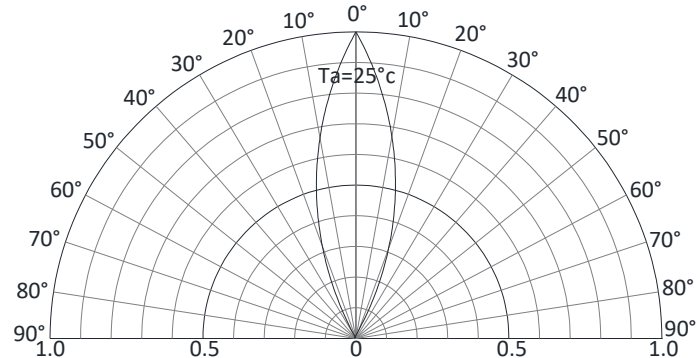
Relative Intensity vs.Forward Current



Relative Intensity vs.Ambient Temperature



Radiation Pattern



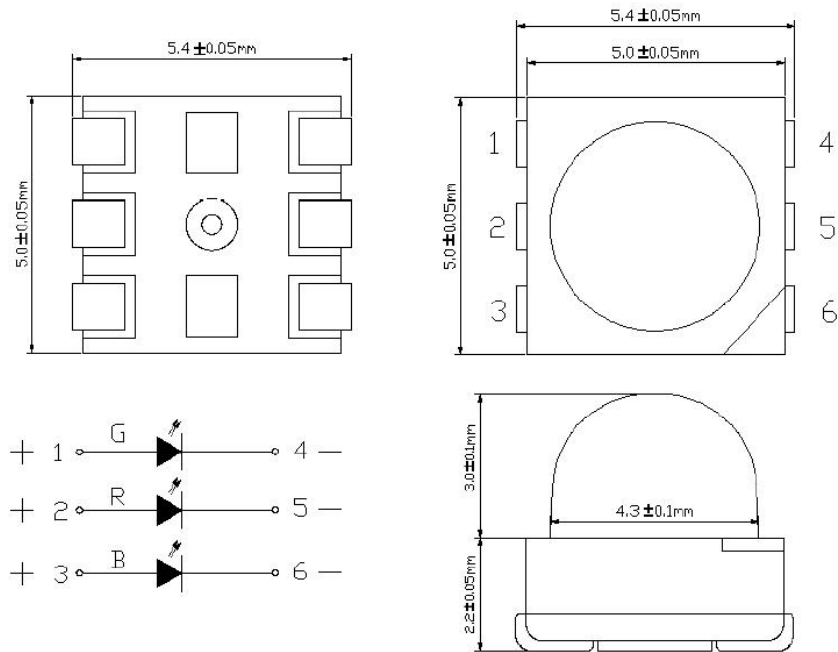
Reliability Test Items And Conditions

Test Items	Reference	Test Conditions	Time	Quantity	Criterion
Thermal Shock	MIL STD 202G	40°C (30min) 100°C (30min)	100 Cycles	22	0/22
Temperature And Humidity Cyclic	JEITA ED 4701 200 203	10°C~65°C; 0%~90%RH	10cycles	22	0/22
High Temperature Storage	JEITA ED 4071 200 201	Ta=100°C	1000H	22	0/22
Low Temperature Storage	JEITA ED 4071 200 202	Ta= 40°C	1000H	22	0/22
High Temperature High Humidity Storage	JEITA ED 4071 100 103	Ta=60°C; RH=90%	1000H	22	0/22
High Temperature Life Test	JESD22 A108D	Ta=80°C	1000H	22	0/22
Life Test	JESD22 A108D	Ta=25°C IF=20mA	1000H	22	0/22
Resistance to Sodering Heat	GB/T 4937, II , 2.2&2.3	Tsol*=(240±5) °C10secs	2 times	22	0/22

Criteria For Judging Damage

Test Items	Symbol	Test Conditions	Criteria For Judging Damage
Forward Voltage	V _F	I _F =I _{FT}	Initial Data±10%
Recease Current	I _R	V _R =5V	I _R ≤10uA
Luminous Intensity	I _V	I _F =I _{FT}	Average I _V degradation≤30% ; Single LED I _V degradation≤50%
Resistance to Soldering Heat			Material without internal cracks,no material between stripped,no deaded light

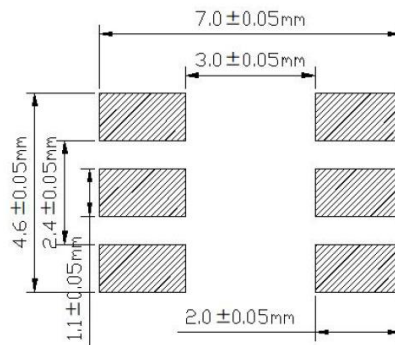
Product size (Unit:mm)



NOTES :

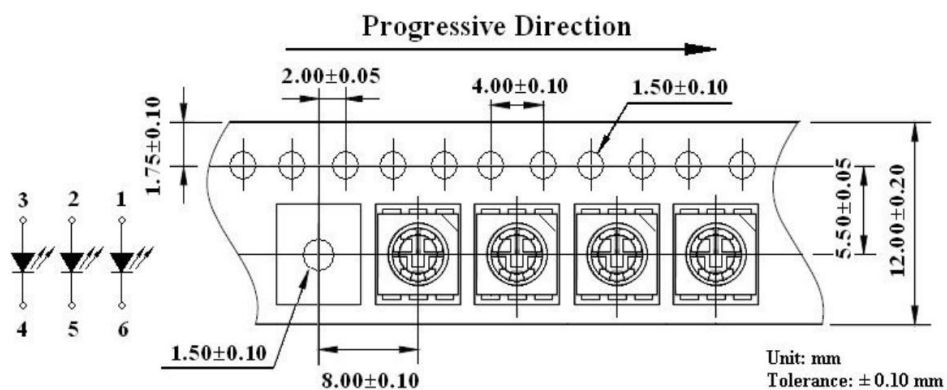
1. All dimensions are in millimeters (inches) 2. Tolerances are ± 0.2 mm (0.008 inch) unless otherwise noted

Recommended Soldering Pad Design (Unit:mm)

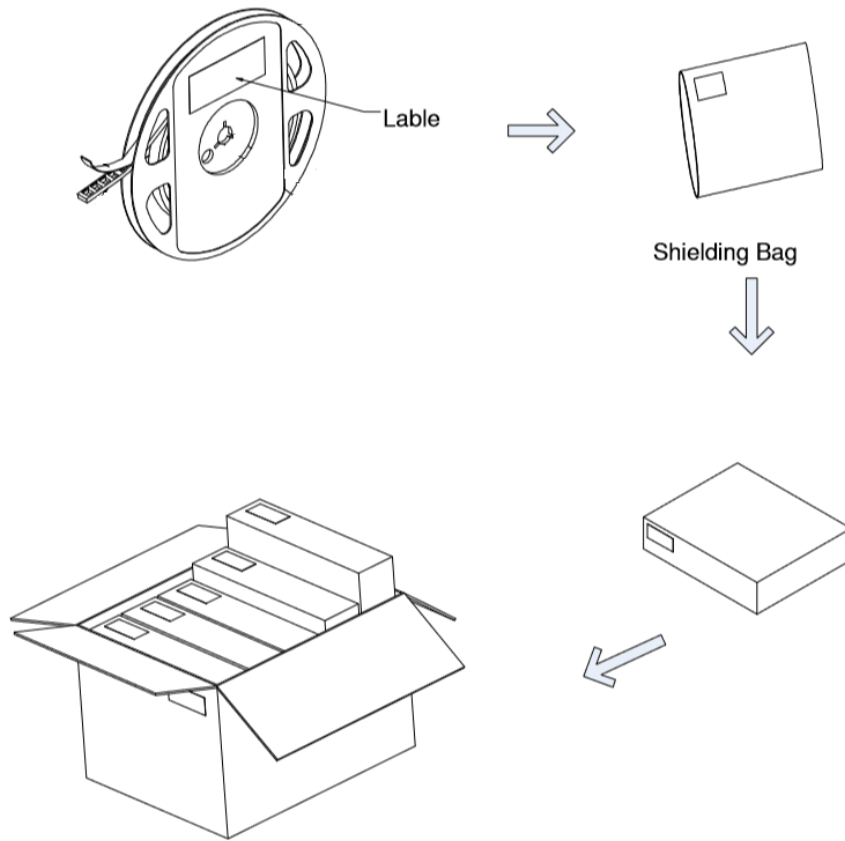


Taping and package Spec

- Tape Specification: 1,000 pcs Per Reel



Packaging



LabelStyle

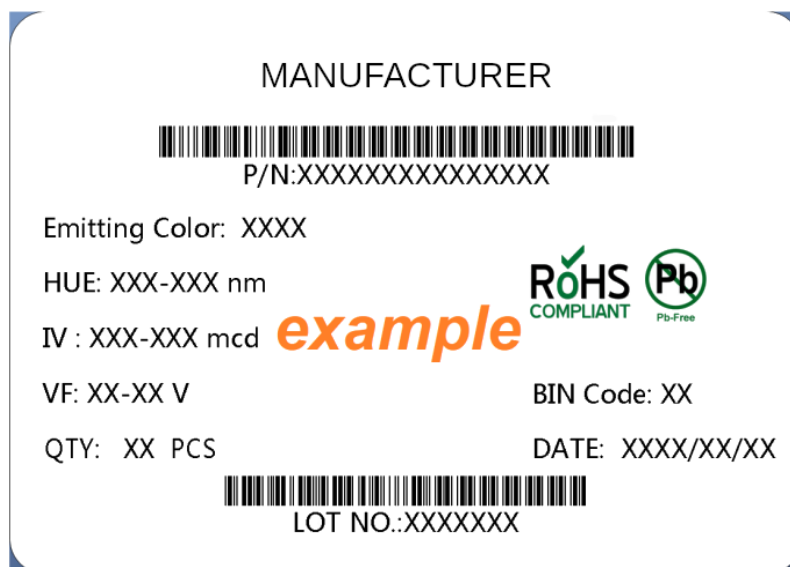
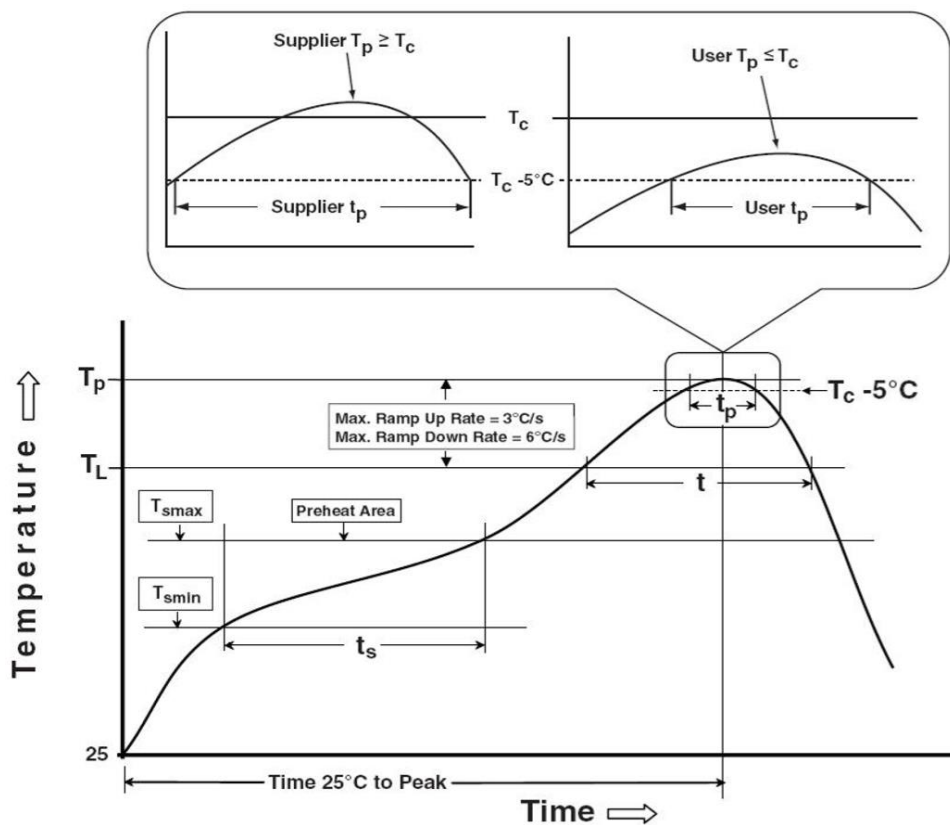


Table of Classification Reflow Profiles

Profile Feature	Sn Pb Eutectic Assembly	Pb Free Assembly
Preheat & Soak	100 °C	150 °C
Temperature min (T _{smin})	150°C	200 °C
Temperature max (T _{smax})	60 120 seconds	60 120 seconds
Time (T _{smin} to T _{smax}) (t _s)		
Average ramp up rate (T _{smax} to T _p)	3 °C/second max	3 °C/second max
Liquidous temperature (T _L)	183 °C	217 °C
Time at liquidous (t _L)	60 150 seconds	60 150 seconds
Peak package body temperature (T _p)*	230 °C ~235 °C	255 °C ~260 °C
Classification temperature (T _c)	235 °C	260 °C
Time (t _p) within 5 °C of the specified Classification temperature (T _c)	20 seconds	30 seconds
Average ramp down rate (T _p to T _{smax})	6 °C/second max	6 °C/second max
Time 25 °C to peak temperature	6 minutes max	8 minutes max

1. Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.
2. Tolerance for time at peak profile temperature (t_p) is defined as a supplier minimum and a user maximum.



Precautions

1. Storage:

- Moisture proof and anti electrostatic package with moisture absorbent material is used, to keep moisture to a minimum.
- Before opening the package, the product should be kept at 30°C or less and humidity less than 60% RH, and be used within a year.
- After opening the package, the product should be stored at 30°C or less and humidity less than 10%RH, and be soldered within 24 hours (1day). It is recommended that the product be operated at the workshop condition of 30°C or less and humidity less than 60%RH.
- If the moisture absorbent material has faded away or the LEDs have exceeded the storage time, baking treatment should be performed based on the following condition: (70±5)°C for 24 hours.



2. Static Electricity:

Static electricity or surge voltage damages the LEDs. Damaged LEDs will show some unusual characteristic such as the forward voltage becomes lower, or the LEDs do not light at the low current. even not light.

All devices, equipment and machinery must be properly grounded. At the same time, it is recommended that wrist bands or anti electrostatic gloves, anti electrostatic containers be used when dealing with the LEDs.

3. Vulcanization:

LED curing is due to sulfur being in bracket and the +1 price of silver in the chemical reaction generated Ag₂S in the process. It will lead to the capacity of reflecting of silver layer reducing, light color temperature drift and serious decline ,seriously affecting the performance of the product.So we should take corresponding measures to avoiding vulcanization, such as to avoid using sulphur volatile substances and keeping away from high sulphur content of the material.