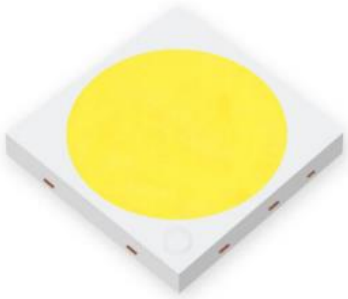
5050 EMC LED Datasheet



Features:

- Top View White LED
- Thermally Enhanced Package Design
- High Luminous Flux Output
- High Current Capability
- Good Color Uniformity
- Compact Package Size, Small LES Enables Good Optic Design
- Enviromental Friendly; ROHS Compliance

Applications:

- Down Lights, Interior Lights
- General Lighting, LED Indoor Lights
- Flood Light, High Bay Light, Tunel Light and other LED Outdoor Lights

TABLE OF CONTENTS

PRODUCT NAMING RULES

LKL	XXX	XX	XX	X	X
LEKOLED	Type	CCT	RA	No. of series chip	No. of parallel chip
LKL	E50	W27: 2700K	R7: Ra70	8: 8S	1: 1P
		W30: 3000K	R8: Ra80	2: 2S	...
		W40: 4000K	R9: Ra90	...	
		W50: 5000K	...		
		W57: 5700K			
		W65: 6500K			

X	X
Viewing Angle	Lighting Shape
0: 120°/140°	R: Round LES
...	S: Square LES
...	

CHARACTERISTICS

SPECIFICATIONS (Ta=25℃)						
Votage	Norminal CCT	Color Rendering	Luminous Flux	Efficacy (LM/W)	Current (mA)	Part Number
6V	2700K	70	550-650LM	153	640	LKL-E50W27R7240R
		80	500-570LM	142	640	LKL-E50W27R8240R
		90	420-490LM	120	640	LKL-E50W27R9240R
	3000K	70	550-650LM	158	640	LKL-E50W30R7240R
		80	500-600LM	149	640	LKL-E50W30R8240R
		90	420-490LM	124	640	LKL-E50W30R9240R
	4000K	70	600-700LM	166	640	LKL-E50W40R7240R
		80	550-650LM	156	640	LKL-E50W40R8240R
		90	450-550LM	134	640	LKL-E50W40R9240R
	5000K	70	600-700LM	166	640	LKL-E50W50R7240R
		80	550-650LM	156	640	LKL-E50W50R8240R
		90	450-550LM	134	640	LKL-E50W50R9240R
	5700K	70	600-700LM	166	640	LKL-E50W57R7240R
		80	550-650LM	156	640	LKL-E50W57R8240R
		90	450-550LM	134	640	LKL-E50W57R9240R
	6500K	70	600-700LM	166	640	LKL-E50W60R7240R
		80	550-650LM	156	640	LKL-E50W60R8240R
		90	450-550LM	132	640	LKL-E50W60R9240R
24V	2700K	70	550-650LM	153	160	LKL-E50W27R7810R
		80	500-570LM	142	160	LKL-E50W27R8810R
		90	420-490LM	120	160	LKL-E50W27R9810R
	3000K	70	550-650LM	158	160	LKL-E50W30R7810R
		80	500-600LM	149	160	LKL-E50W30R8810R
		90	420-490LM	124	160	LKL-E50W30R9810R
	4000K	70	600-700LM	166	160	LKL-E50W40R7810R
		80	550-650LM	156	160	LKL-E50W40R8810R
		90	450-550LM	134	160	LKL-E50W40R9810R
	5000K	70	600-700LM	166	160	LKL-E50W50R7810R
		80	550-650LM	156	160	LKL-E50W50R8810R
		90	450-550LM	134	160	LKL-E50W50R9810R
	5700K	70	600-700LM	166	160	LKL-E50W57R7810R
		80	550-650LM	156	160	LKL-E50W57R8810R
		90	450-550LM	134	160	LKL-E50W57R9810R
	6500K	70	600-700LM	166	160	LKL-E50W65R7810R
		80	550-650LM	156	160	LKL-E50W65R8810R
		90	450-550LM	132	160	LKL-E50W65R9810R

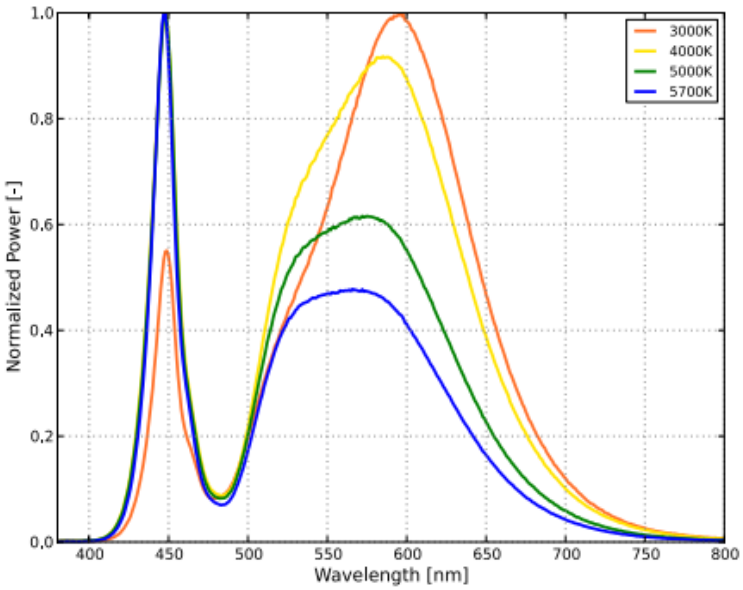
CHARACTERISTICS

Absolute Maximum Ratings at Tj=25°C		
Parameters	**Symbol**	**Maximum Performance**
Forward Current	I_F	960mA for 6V 240mA for 24V
Peak Pulsed Forward Current	I_{FP}	1440mA for 6V 350mA for 24V
Power Dissipation	P_D	6336mW
Reverse Voltage	V_R	5V
Viewing Angle	2θ 1/2	120°
Operating Temperature	T_{OPR}	-40 ~ +105°C
Storage Temperature	T_{STG}	-40 ~ +85°C
Junction Temperature	T_j	120°C
Soldering Temperature	T_{SLD}	Reflow Soldering: 230°C or 260°C for 10Sec

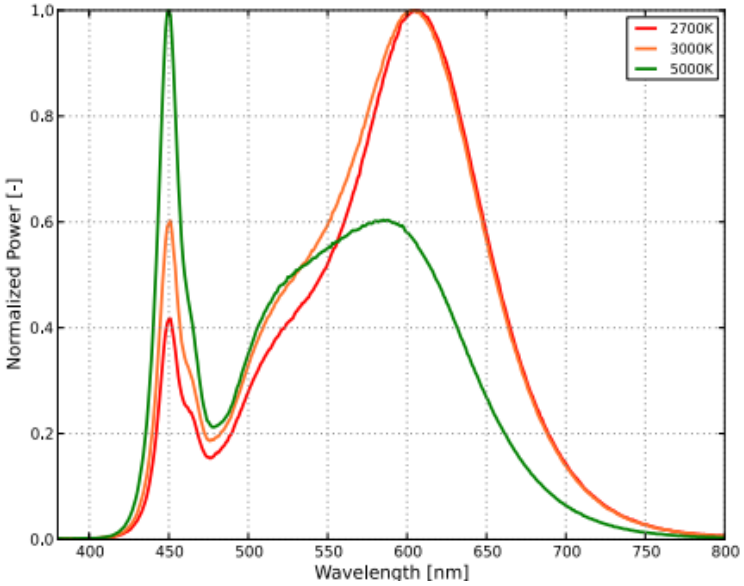
Electrical/ Optical Characteristics at Tj=25°C						
Parameters	**Symbol**	**Min**	**Type**	**Max**	**Unit**	**Condition**
Forward Voltage	v_F	5.8	6.2	6.6	V	IF=640mA
Forward Voltage	v_F	23.5	24.5	26.5	V	IF=160mA
Reverse Current	IR			10	μA	VR=5V
Thermal Resistance	Rth j-sp		2,5		°C/W	IF=640mA
Electrostatic Discharge	ESD	1000			V	HBM

RELATIVE SPECTRAL POWER DISTRIBUTION

RA70 Min

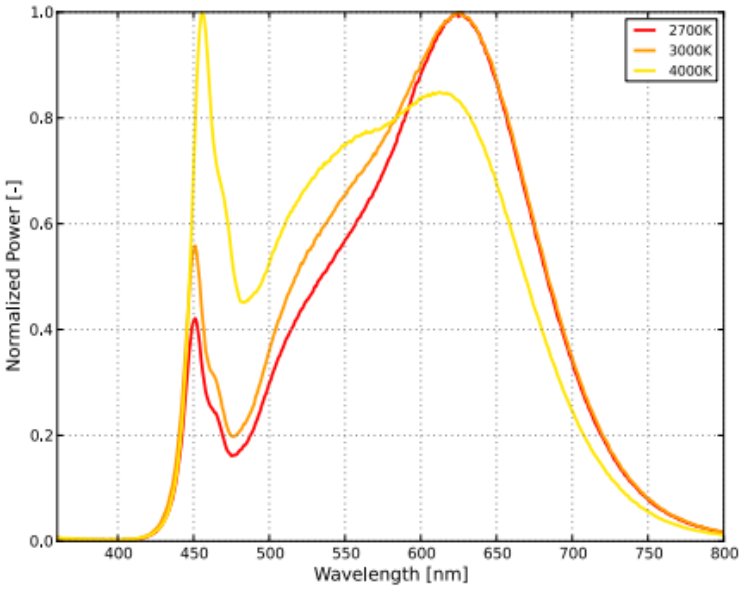


RA80 Min

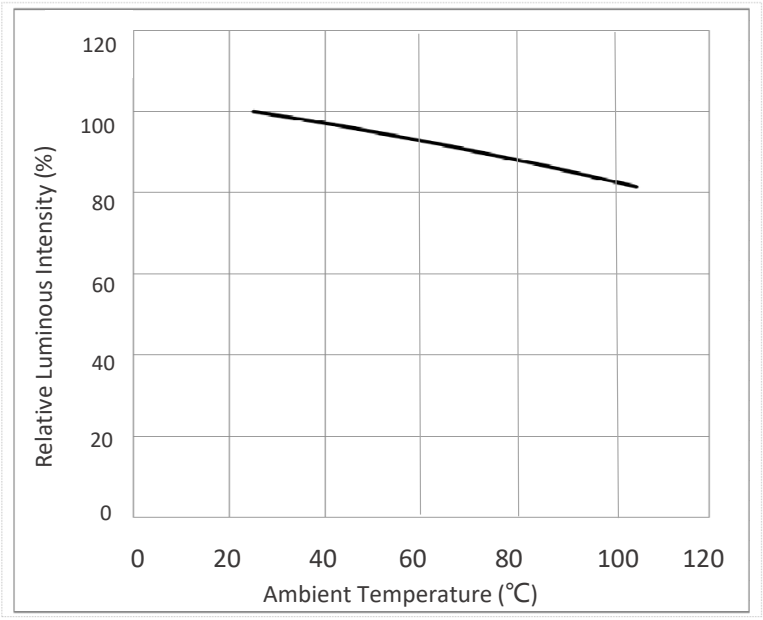


RELATIVE SPECTRAL POWER DISTRIBUTION

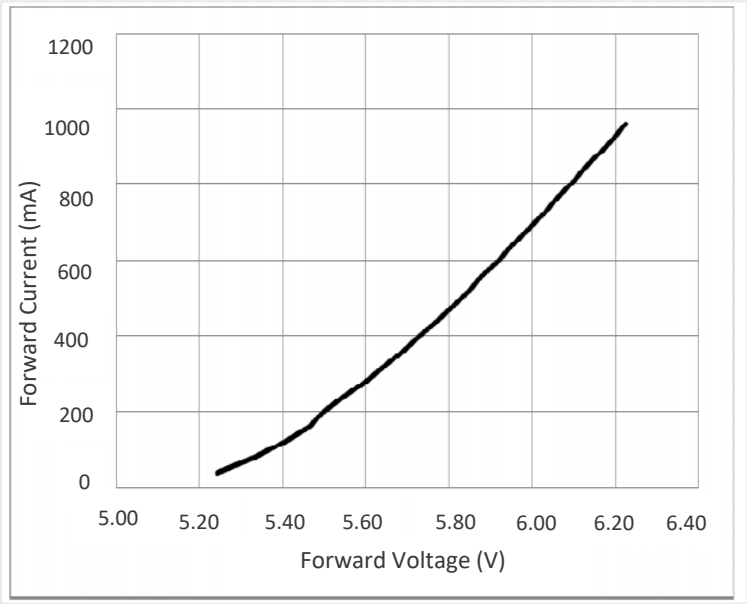
RA90 Min

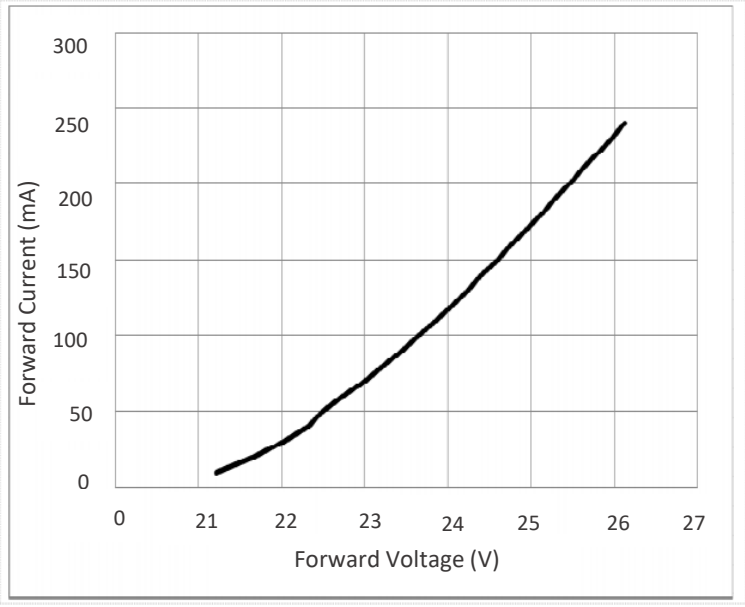


TYPICAL CHARACTERISTIC CURVES

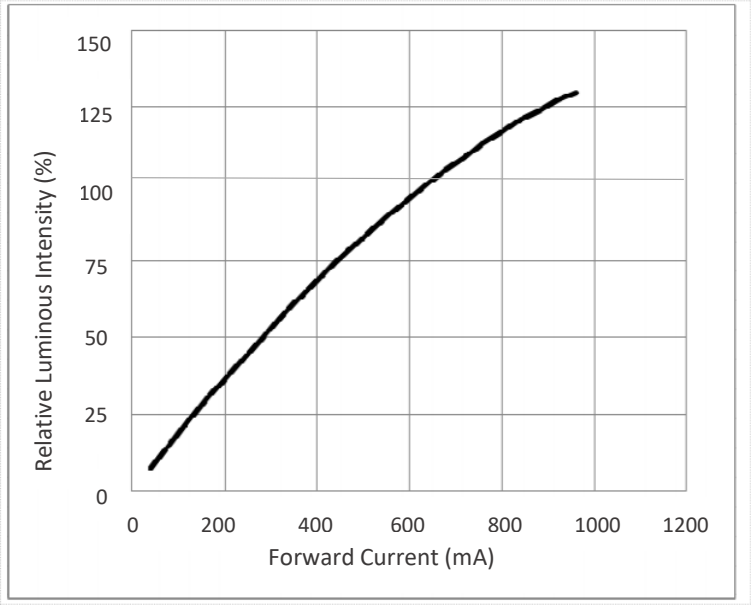


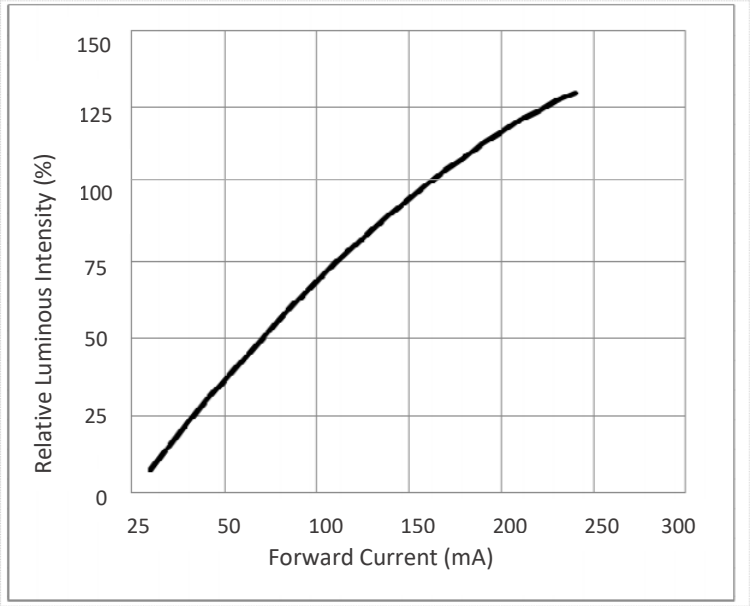
TYPICAL CHARACTERISTIC CURVES



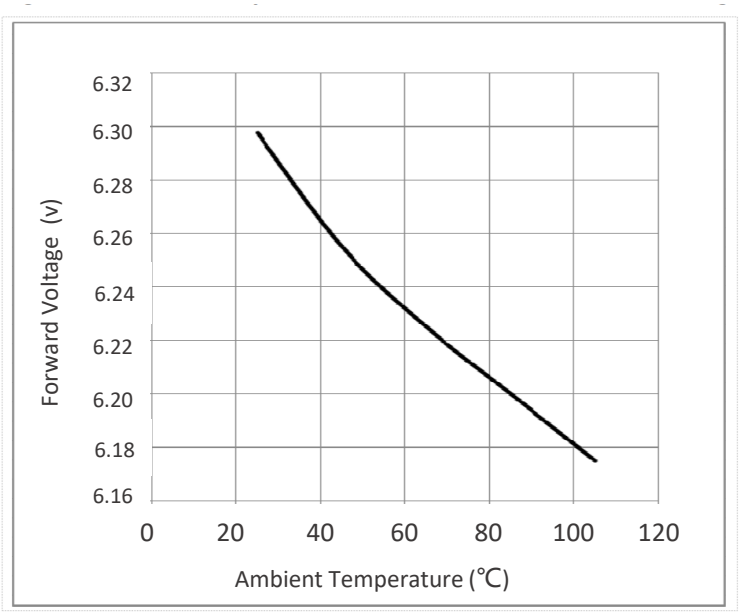


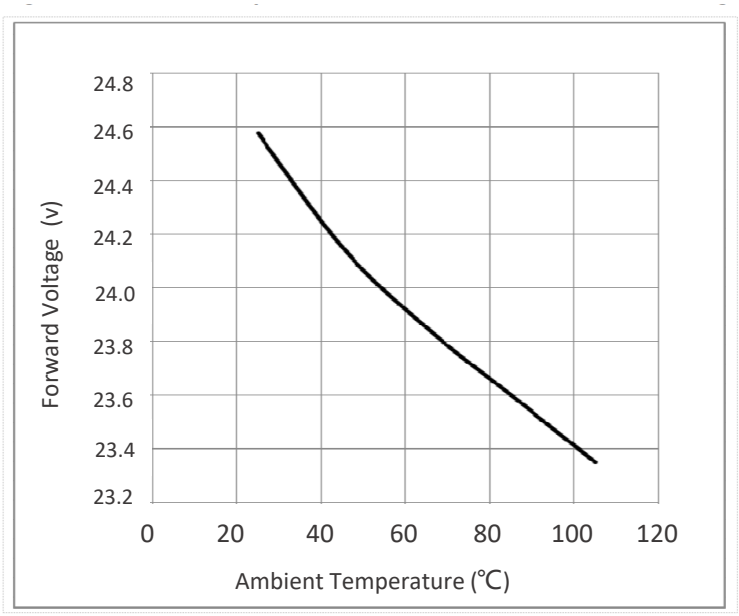
TYPICAL CHARACTERISTIC CURVES





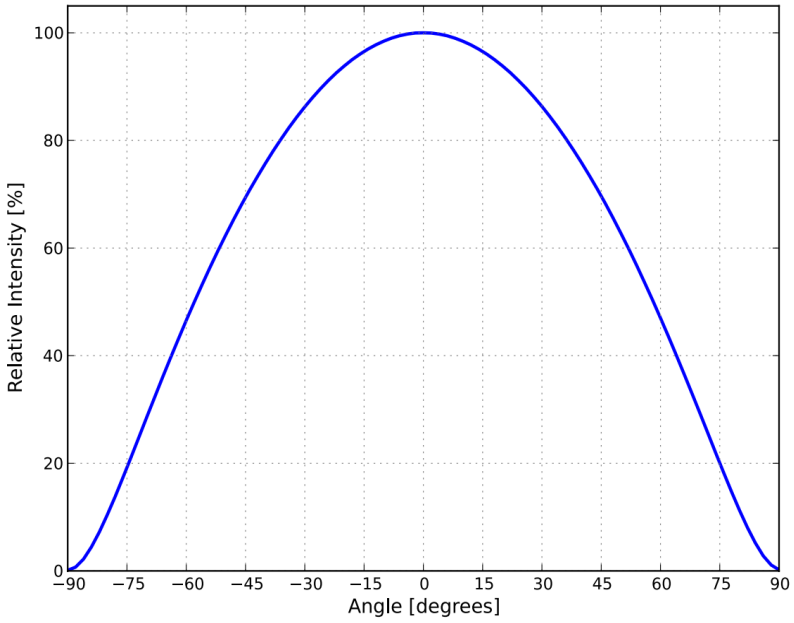
TYPICAL CHARACTERISTIC CURVES

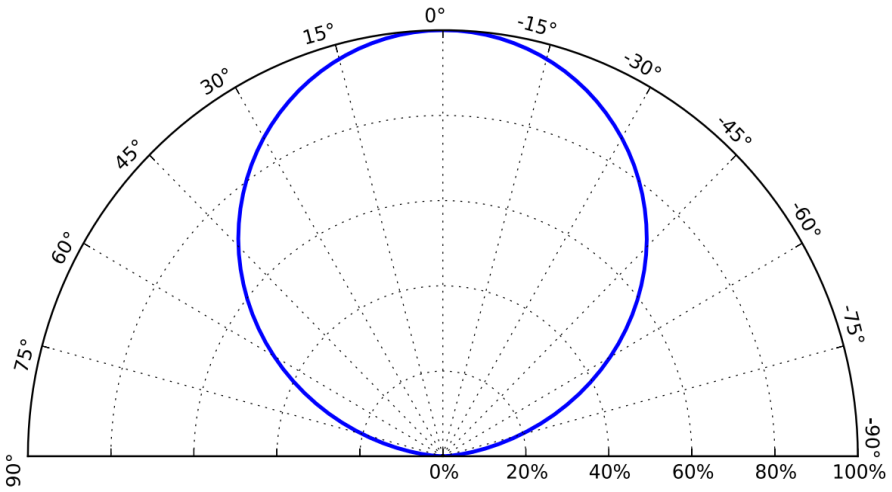




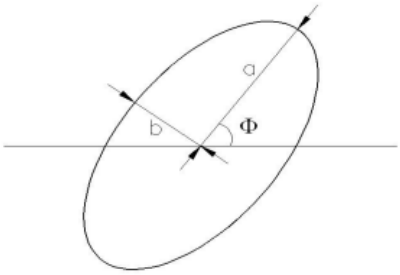
TYPICAL CHARACTERISTIC CURVES

RADIATION PATTERN CHARACTERISRICS





CIE BINNING INFORMATION



The color ranks have chromaticity ranges within 5-step MacAdam ellipse

Color Code	Center		Radius		Angle(deg)
	x	y	a	b	Φ
27R5	0.4620	0.4145	0.013500	0.007000	53.42
30R5	0.4383	0.4081	0.013900	0.006800	53.13
40R5	0.3875	0.3868	0.015650	0.006700	53.43
50R5	0.3507	0.3635	0.013700	0.005900	59.37
57R5	0.3348	0.3491	0.011175	0.005500	58.35
65R5	0.3187	0.3363	0.011150	0.004750	58.34

* Tolerance of measurements of the chromaticity Coordinate is ±0.005.

RELIABILITY TESTS

Test Items	Test Conditions	Sample QTY	Ac/Re
Aging Test	IF=160mA, Ta=25℃ x6000hrs IF=640mA, Ta=25℃ x6000hrs	22	0/1
	IF=160mA, Ta=85℃ x6000hrs IF=640mA, Ta=85℃ x6000hrs	22	0/1
High Temperature Storage	100℃ x1000hrs	22	0/1
Low Temperature Storage	-40℃ x1000hrs	22	0/1
High Temp & Humidity	IF=640mA, 85℃, 85% RH for 6000hrs IF=640mA, 85℃, 85% RH for 6000hrs	22	0/1
Temperature Shock	-40℃x30 min & +100℃x30 min, 100cycle	22	0/1
ESD(HBM)	1000V HBM/ 1 Time	10	0/1

Criteria for Judging LED Failure (Tc= 25℃)

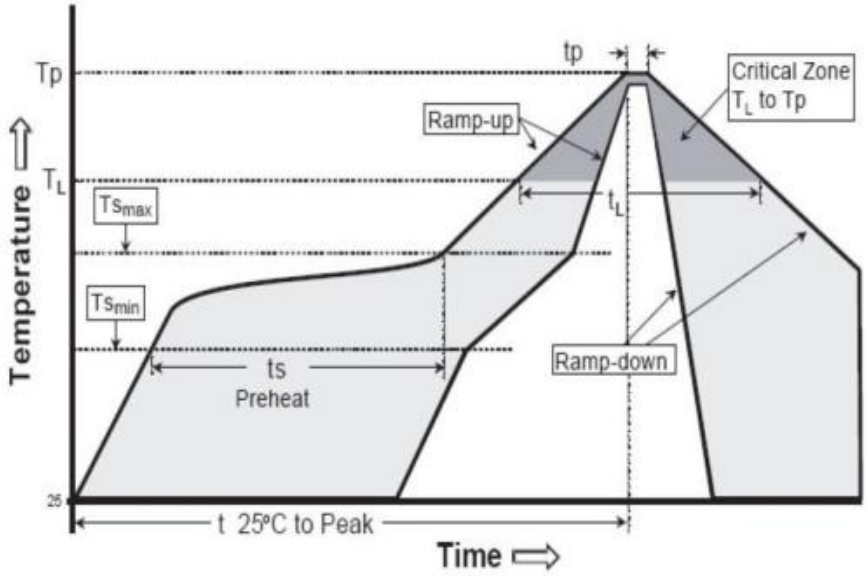
Items	Symbol	Test Conditions	Criteria for Judging LED Failure
Forward Voltage	VF	IF=160mA IF=640mA	>U x 1.1
Reverse Current	IR	VR=5V	IR>/= 10μA
Lumen	ΦV	IF=160mA IF=640mA	<S x 0.7

U refers to max value; S refers to initial value.

Notes: Judging criteria based on Tc=25℃.

TYPICAL CHARACTERISTIC CURVES

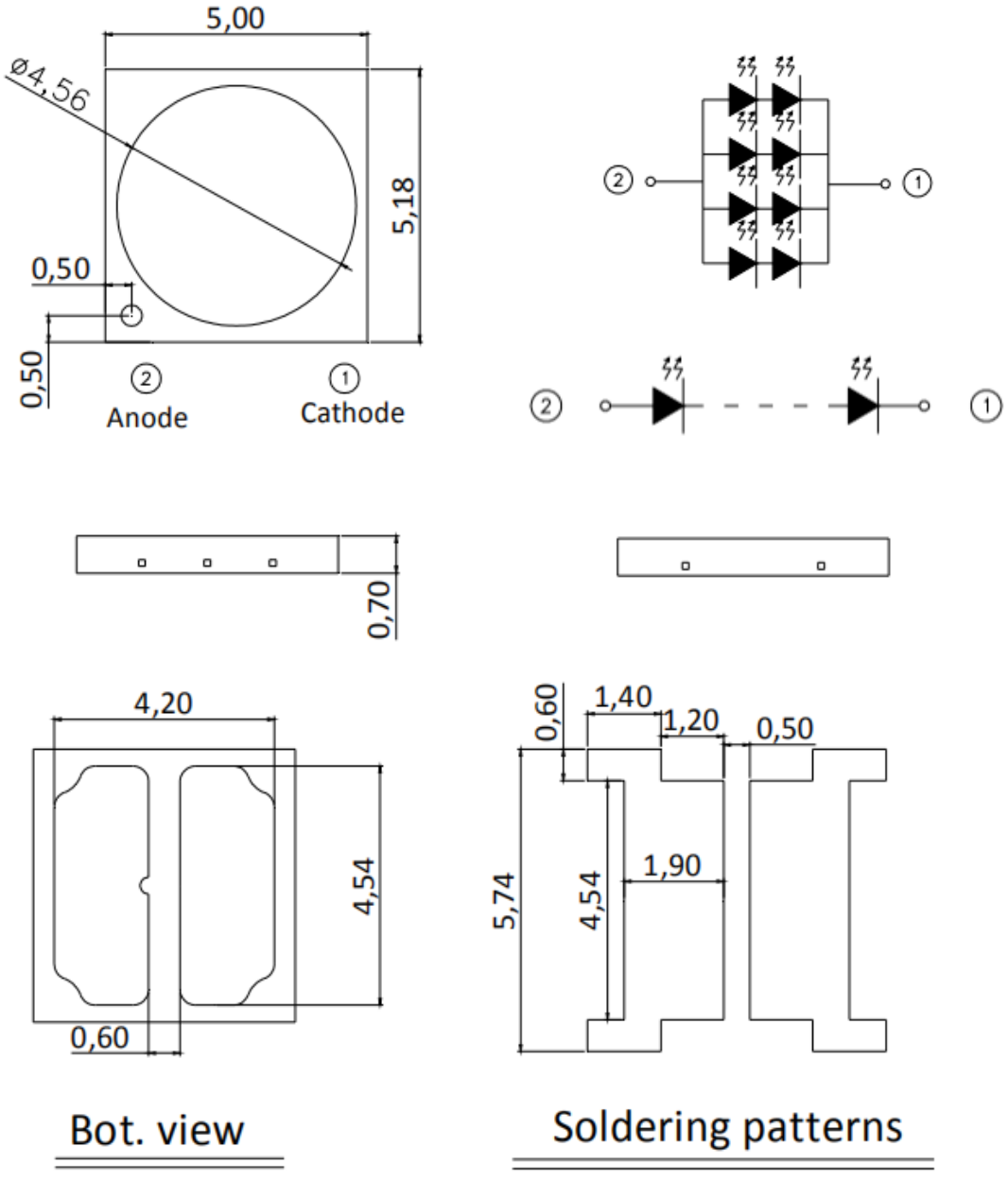
REFLOW SOLDERING PROFILE



Profile Features	Lead-free solder	Lead solder	Soldering by Manual
Ramp-up Speed(Ts max to Tp)	3 °C/ second max.	3 °C/ second max.	Max. temperature: 350°C 3 seconds/1 time
Preheat: Min. Temperature(Tsmin)	150 °C	100 °C	
Preheat: Max.Temperature(Tsmax)	200 °C	150 °C	
Preheat: Time (tsmin to tsmax)	60~180 seconds	60~120 seconds	
Temperature to Keep: (TL)	217 °C	183 °C	
Time to Keep: (tL)	60~150 seconds	60~150 seconds	
Peak Temperature (Tp)	260 °C	215 °C	
Time within the peak temperature (tp)	20~40 seconds	10~30 seconds	
Ramp-down Speed	6°C/ second max.	6°C/ second max.	
Time to the peak Temperature	8 minutes max.	6 minutes max.	

DIMENSIONS

Unit: mm



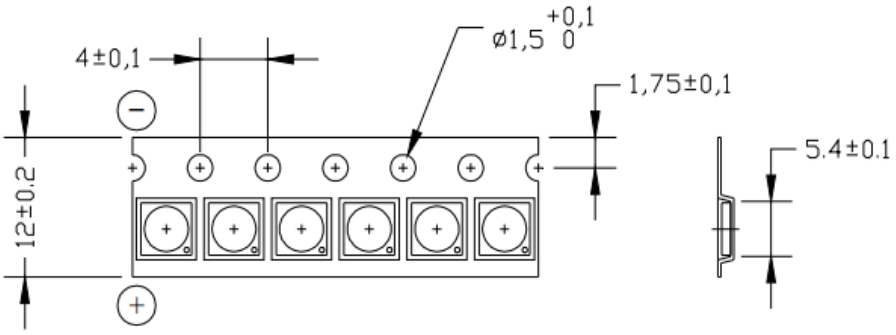
Notes：

*All dimensions are in millimeters.(tolerance:±0.1mm)

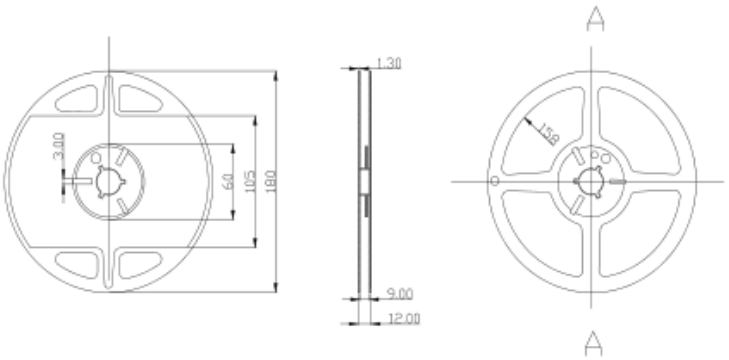
*The appearance and specifications of the product may be changed for improvement without notice.

PACKAGING

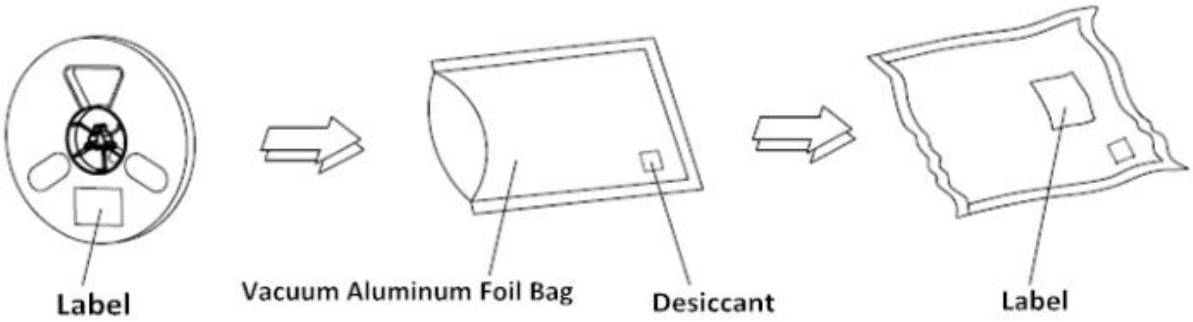
Tape Specifications (Units : mm) Package: 2K PCS Per REEL



Reel Dimensions



Moisture Resistant Packaging



PRECAUTIONS

Storage

1. Moisture proof and anti-electrostatic package with moisture absorbent material is used, to keep moisture to aminimum.
2. Before opening the package, the product should be kept at 30℃ or less and humidity less than 60% RH, and beused within a year.
3. After opening the package, the product should be stored at 30℃ or less and humidity less than 10%RH, and besoldered within 24 hrs (1day). It is recommended that the product be operated at the workshop condition of 30℃ or less and humidity less than 60%RH.
4. If the moisture absorbent material has fade away or the LEDs have exceeded the storage time, baking treatment should be performed based on the following condition: (80±5)℃ for 24 hours.

Static Electricity

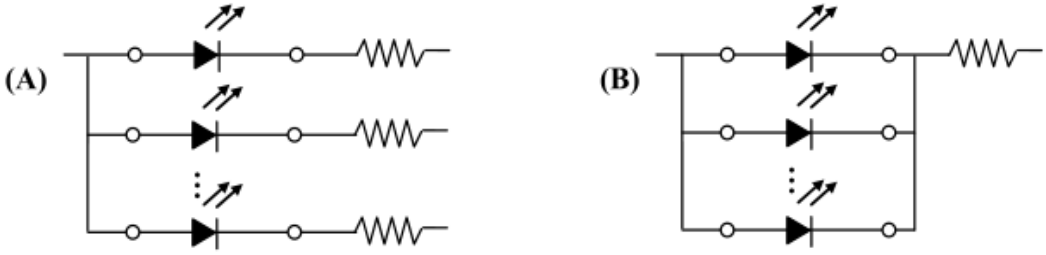
1. Static electricity or surge voltage damages the LEDs. Damaged LEDs will show some unusual characteristic such as the forward voltage becomes lower, or the LEDs do not light at the low current. even not light.
2. All devices, equipment and machinery must be properly grounded. At the same time, it is recommended that wrist bands or anti-electrostatic gloves, anti-electrostatic containers be used when dealing with the LEDs.

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 avioding vulcanization, such as to avoid using sulphur volatile substances and keeping away from high sulphur content of the material.

Design Consideration

1. In designing a circuit, the current through each LED must not exceed the absolute maximum rating specified for each LED. In the meanwhile, resistors for protection should be applied, otherwise slight voltage shift will cause big current change, burn out may happen.
2. It is recommended to use Circuit A which regulates the current flowing through each LED rather than Circuit B. When driving LEDs with a constant voltage in Circuit B, the current through the LEDs may vary due to the variation in Forward Voltage (VF) of the LEDs. In the worst case, some LED may be subjected to stresses in excess of the Absolute Maximum Rating.



3. Thermal Design is paramount importance because heat generation may result in the Characteristics decline, such as brightness decreased, Color changed and so on. Please consider the heat generation of the LEDs when making the system design.

PRECAUTIONS

Safety Advice For Human Eyes

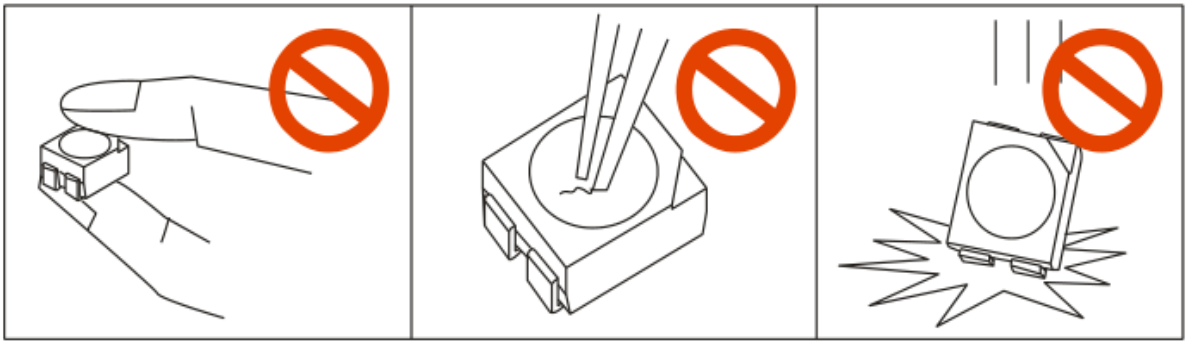
Viewing direct to the light emitting center of the LEDs, especially those of great Luminous Intensity will cause great hazard to human eyes. Please be careful.

The safe temperature for LEDs working

The high temperature will make the LEDs' Luminous Intensity decreased radically, if LEDs worked in hoteyes. Please be careful. environment for a long time, they will be disabled easily. When LEDs are working in a closed array, we suggest that the LEDs' surface temperature should be lower than 55℃ and the legs' temperature should be lower than 75℃.

Others

1. When handling the product, touching the encapsulant with bare hands will not only contaminate its surface, but also affect on its optical characteristics. Excessive force to the encapsulant might result in catastrophic failure of the LEDs due to Die breakage or wire deformation. For this reason, please do not put excessive stress on LEDs, especially when the LEDs are heated such as during Reflow Soldering.



2. The epoxy resin of encapsulant is fragile, so please avoid scratch or friction over the epoxy resin surface. While handling the product with tweezers, do not hold by the epoxy resin, be careful.