

Specification

5050 Three Chip Red Color Top LED

Part No : YL-3D5050F-625nm(A)



■ Features:

PLCC LED dimensions: 5.0(L) x 5.0(W) x 1.6(H) mm:

Wide view angle 120°

Available on tape and reel with Anti-electrostatic bag
Compatible for all SMT Assembly and Lead-Free Soldering
RoHS Compliant



■ Applications:

Backlight for LCD Switch and Display

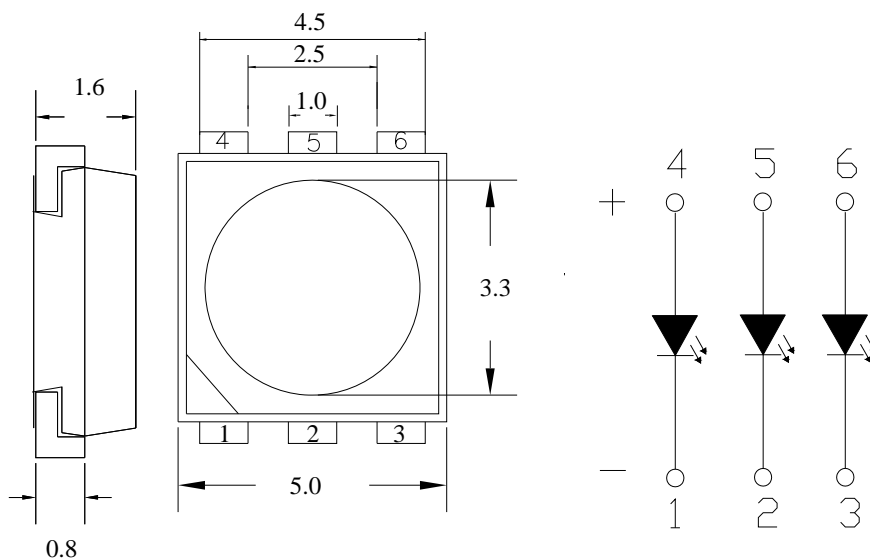
Decorative Lighting

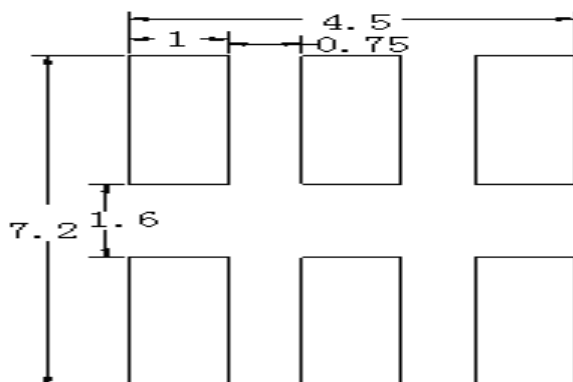
General Lighting

Automotive Interior Lighting

General Use

■ Package Dimensions:





Recommended Soldering Pads Dimensions

■ Recommended Soldering Pads Dimensions

All dimension units are in millimeters.

All dimension tolerances are $\pm 0.25\text{mm}$ unless otherwise noted.

■ Absolute Maximum Ratings:

Parameter	Symbol	Value	Unit
Power dissipation	P_d	200	mW
Continuous Forward Current	I_F	60	mA
Peak Forward Current (1/10 Duty Cycle, 0.1ms Pulse Width)	I_{FP}	100	mA
Reverse Voltage	V_R	5	V
Electrostatic Discharge (HBM)	ESD	1000	V
Operating Temperature Range	T_{opr}	-25 to +85	$^{\circ}\text{C}$
Storage Temperature Range	T_{stg}	-40 to +100	$^{\circ}\text{C}$
Lead Soldering Temperature	T_{sol}	260(for 5 sec)	$^{\circ}\text{C}$

Electrical Optical Characteristics:

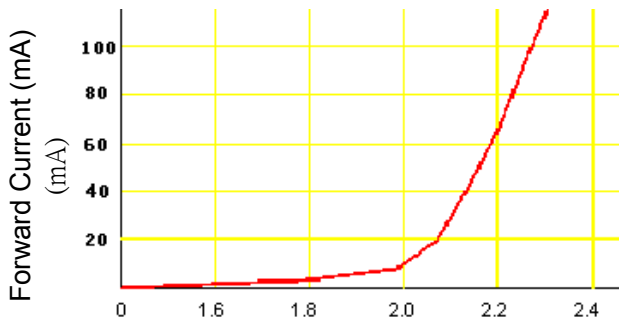
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Luminous Intensity	LV	1400	---	2100	mcd	I _F =60mA
Spectral	λ _d	620	---	630	nm	
Ref.Luminous Flux	Φ _v	---	---	---	Lm	
Viewing Angle	2θ _{1/2}	---	120	---	Deg	
Forward Voltage	VF	1.8	---	2.6	V	
Reverse Current	I _R	---	---	5	μA	V _R = 5V

Notes:

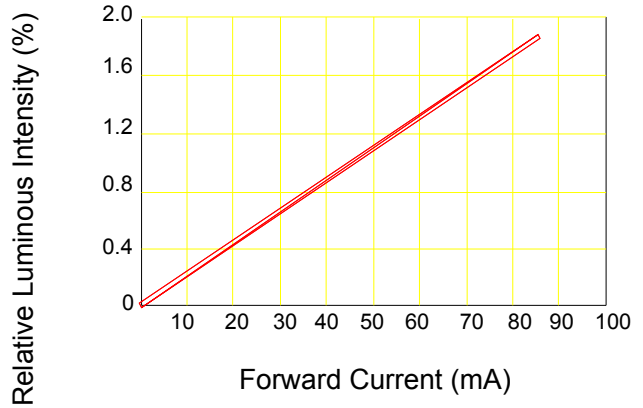
- 1、 YL maintains a tolerance of ±10% on flux and power measurements.
- 2、 λ_d ±1nm.
- 3、 A tolerance of ±0.1V on forward voltage measurements

Typical Optical Characteristics Curves

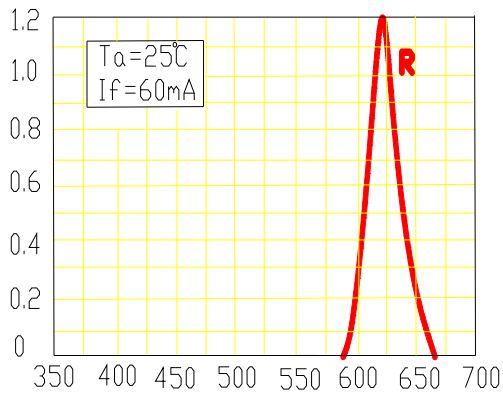
Forward Current vs Forward Voltage



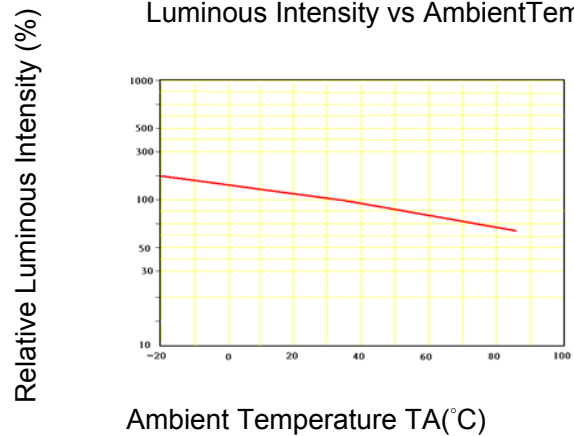
Forward Current vs Relative Luminous Intensity



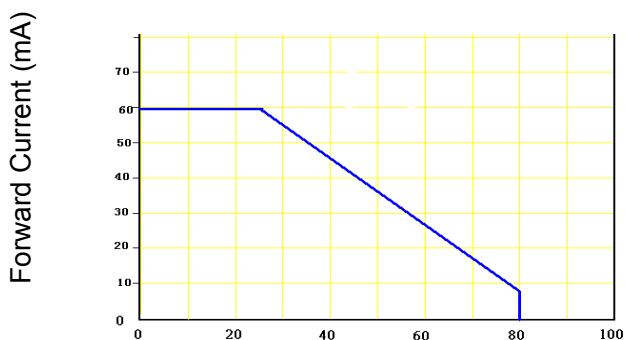
Spectral Distribution



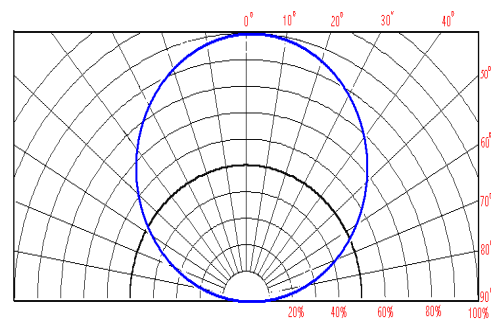
Luminous Intensity vs Ambient Temperature



Forward Current Derating Curve



Radiation Diagram



Ambient Temperature T_a ($^\circ\text{C}$)

■ Reliability Test :

No.	Test Item	Standard Test Method	Test Conditions	Duration	Failure Rate
1	Steady State Operating Life	JEITA ED-4701 100 103	I _f =60mA T _a =25°C	1000hrs	0/22
2	Low Temperature Storage	JEITA ED-4701 200 202	T _a =-40°C	1000hrs	0/22
3	High Temperature Storage	JEITA ED-4701 200 201	T _a =100°C	1000hrs	0/22
4	Temperature Humidity Storage	JEITA ED-4701 100 103	T _a =60°C RH=90%	1000hrs	0/22
5	Thermal Shock	JEITA ED-4701 300 307	0°C ~ +100°C 5min~ 15sec ~ 5min	10 cycles	0/22
6	Temperature Cycle	JEITA ED-4701 100 105	H: +100°C 30min. ∫ : +25°C 5min. L: -40°C 30min	100 cycles	0/22
7	Solder Heat	JEITA ED-4701 300 301	T _{sld} =260°C, 10sec (Max.)	2 times	0/22

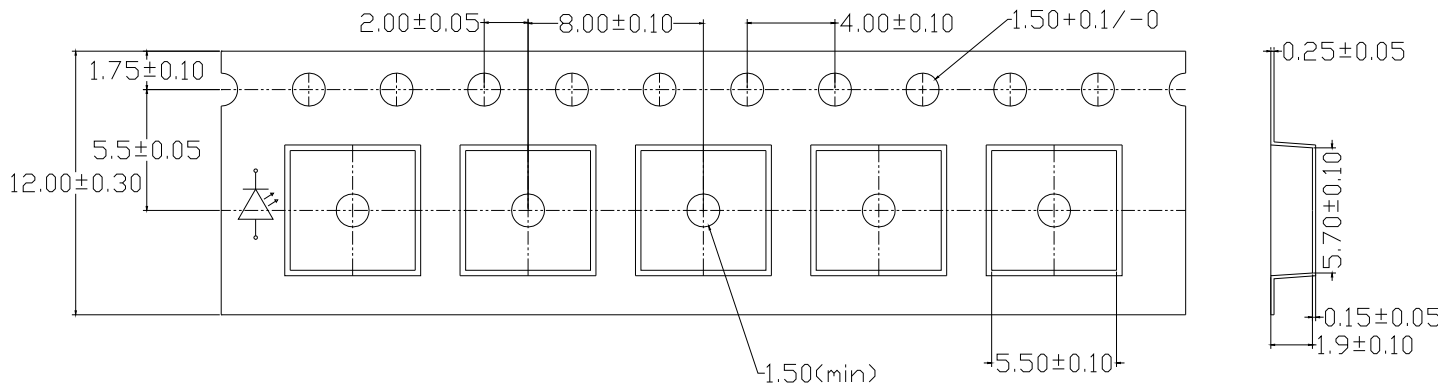
■ Failure Standard:

Item	Symbol	Test Condition	Min.	Max.
Forward Voltage	V _F	I _F = 60mA	--	*U.S.L×1.1
Reverse Current	I _R	V _R = 5V	--	*U.S.L×2.0
Luminous Intensity	I _v	I _F = 60mA	**L.S.L×0.7	--

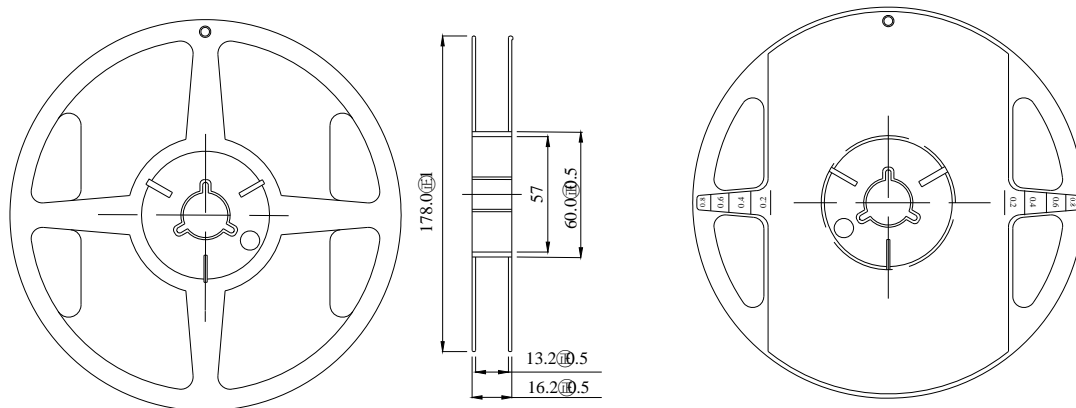
*U.S.L.: Upper Standard Level

** L.S.L.: Lower Standard Level

■ Dimensions of the tape:

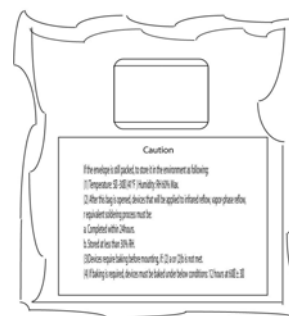
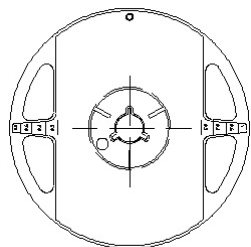


■ Dimensions of the reel:



■ Packing:

■ Moisture, anti-static vacuum sealed packages



■ Note:

All dimensions are in mm, tolerance is ± 2.0mm unless otherwise noted.

Storage

Recommended storage environment

Temperature: 5°C ~ 30°C (41°F ~ 86°F)

Humidity: 60% RH Max.

Moisture-proof bag sealed packaging can be stored up to 3 months, the starting date is according the date show on the label, this components should only be used when the bag is fully sealed and the humidity indicator haven't turned into pink color. After storage for 3 months, please according to section 2.2 for baking treatment before use.

Surface mount devices (SMDs) are moisture-sensitive components, moisture in the air penetrate into the material by diffusion. when SMD components are soldered onto the PCB board, the process is undergo a reflow with temperature 150 °C -260 °C. With this high temperature, if the component inside contains moisture, the moisture expansion produces vapor pressure, which is sufficient to damage or destroy the LED elements, this will appears crack in the plastic material, layered or gold wire losses and reliability failures of the component.;

Using condition:

Open the packing, First check the Humidity indicator (as show below), can be used if the 10%-circle is blue in color (Fig 1). If the 10%-circle is pink (others are all blue, Fig 2), please undergo the baking treatment with $75 \pm 5^\circ\text{C}$ for 12 hours before use. If both 10%- and 20%- circle is pink (others are all blue, Fig 3), please send back the component to us for baking and repacking. (for some limitations which cannot send the component back to us, please contact us for providing other dehumidification method)



Fig 1: no color change

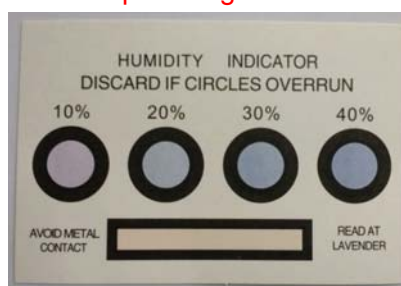


Fig 2: 10%-circle in pink color



Fig 3: 10%/20%-circle in pink color

Baking treatment : Open-static bag, the product and reel dial out from the Static bag, and then $75 \pm 5^\circ\text{C}$ for 12 hours baking treatment.

All un-sealed products are recommended to be used within 12 hours (under a condition of $\leq 30^\circ\text{C}$, $\leq 60\% \text{RH}$). Seal all remaining products in time, recommend storage in dry cabinet storage. It must be baking treatment when using the remaining product.

Soldering

A. Reflow Process

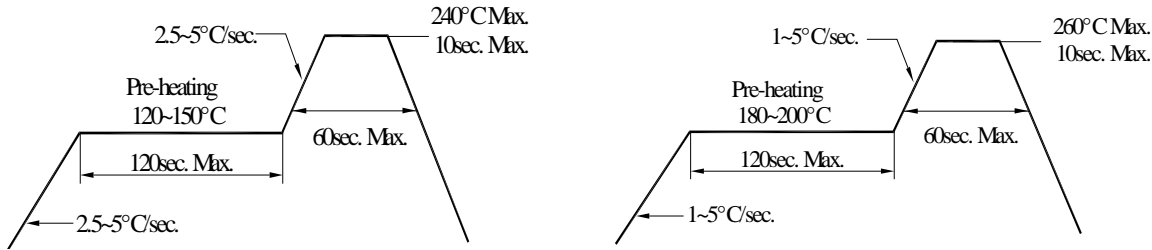
	Reflow Soldering	
	Lead Solder	Lead – free Solder
Pre-heat	120~150°C	180~200°C
Pre-heat time	120sec. Max.	120sec. Max.
Peak temperature	240°C Max.	260°C Max.
Soldering time	10sec. Max.	10sec. Max.
Condition	refer to Temperature-profile 1	refer to Temperature-profile 2

After reflow soldering rapid cooling should be avoided.

[Temperature-profile (Surface of circuit board)] Use the conditions shown to the under figure.

<1 : Lead Solder>

<2 : Lead-free Solder>



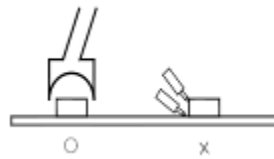
B. Manual Soldering Process

Hand Soldering	
Temperature	350°C Max.
Soldering time	3sec. Max. (one time only)

- For prototype builds or small series production runs it is possible to place and solder the LED by hand.
- Dispense thermal conductive glue or grease on the substrates and follow its curing specifications. Gently press LED housing to closely connect LED and substrate.
- It is recommended to hand solder the leads with a solder tip temperature of 280°C for less than 3 second, at a time with a soldering iron of less than 30W. Solder at intervals of two seconds or more.
- Take caution and be aware that damaged products are often a result of improper hand soldering technique.

Rework

- Customer must finish rework within 5 sec under 260°C
- The head of iron cannot touch the resin
- Twin-head type is preferred.



Cleaning :

The conditions of cleaning after soldering:

An alcohol-based solvent such as Isopropyl Alcohol(IPA) is recommended.

Temperature Time: <math>< 50^{\circ}\text{C} * 30\text{sec}</math>, or <math>< 30^{\circ}\text{C} * 3\text{min}</math>

Ultra sonic cleaning: <math>< 15\text{W}/\text{bath}</math>; Bath volume: 1liter max.

Curing: 100 max, <math>< 3\text{min}</math>

Cautions of Pick and Place:

It should be avoided to load stress on the resin during high temperature.

Avoid rubbing or scraping the resin by any object.

Electric-static may cause damage to the component. Please confirm that the equipment is grounding well. Using an ionizer fan is recommended.

Cautions of Design and Applications:

It should be done to connect with a current-limiting serial resistor. Avoid to drive reverse voltage over the specifications on LED when ON/OFF. Any application should refer to the specifications of absolute maximum ratings.

The dimensions of the recommended soldering pattern may not meet every users. Please confirm and study before designing the soldering pattern in order to obtain the best performance of soldering.

Do not contact with any component on the assembly board.

Static Electricity:

These products are so sensitive to static electricity charge so that all equipment and machinery must be properly grounded and it is recommended to use a wristband or anti-electrostatic glove when handing the SMD LED. Particularly if any over-current and over-voltage which exceed the Absolute Maximum Ratings of LED applied,

the more energy may cause damage or possibly result in electrical destruction of the Products.

A protection design should be installed in the LED driving circuit, which does not exceed the max. rating for surge current during on/off switching.

A tip if soldering iron is requested to be grounded .An ionizer should be installed when risk of static generation is high.

If the countermeasures mentioned above are implemented, LED can work well.

Users are required to check those countermeasures when problems occur by static electricity charge

Other:

Damaged SMD LED will show unusual characteristics such as leak current remarkably low current. Increase, turn-on voltage becomes lower and the SMD LED get unlighted at low current.

In automatic mounting of the SMD LEDs on printed circuit boards, any bending and pulling forces or shock against the SMD LEDs shall be kept min. to prevent them from expanding or electrical failures and mechanical damages of the devices.