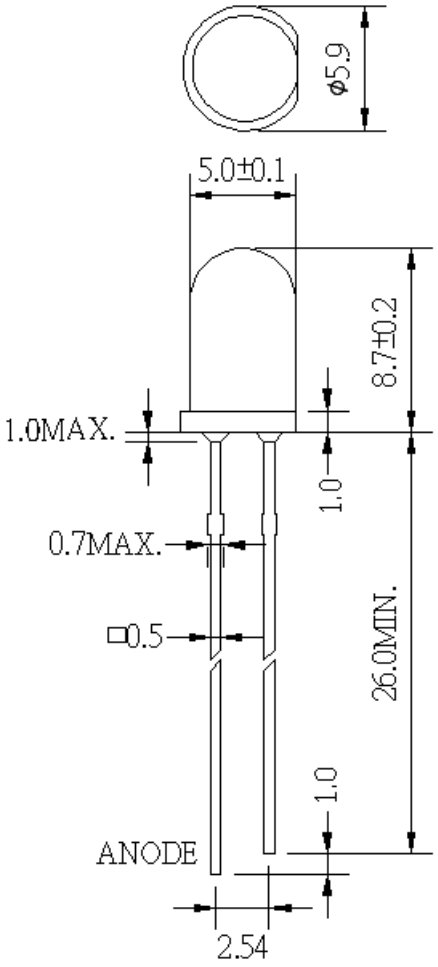
American Opto Plus LED Corp.
L513HD
5mm Red Diffused LED Lamp

PACKAGE DIMENSIONS



Item	Material
Lens color	Red Diffused
Dice	AlInGaP
Emitted color	Super Red
View angle	45

Note: All tolerance shall be ±0.01 inch/0.25mm unless otherwise noted.

ABSOLUTE MAXIMUM RATINGS (TA=25℃)

Parameter	Symbol	Rating	Unit
Power dissipation	Pd	85	mW
Peak forward current (duty 1/10@1KHZ)	IF (Peak)	100	mA
Recommended operating current	IF (Rec)	25	mA
Electrostatic discharge	ESD_{HBM}	2000	V
Operating temperature range	T_{OPR}	-40 ~ +85	℃
Storage temperature range	T_{STG}	-40 ~ +100	℃
Lead soldering temperature range 【1.6 mm (1/16 inch) from body】	Reflow Soldering:260℃ for 5 sec. Hand Soldering:350℃ for 3 sec.		

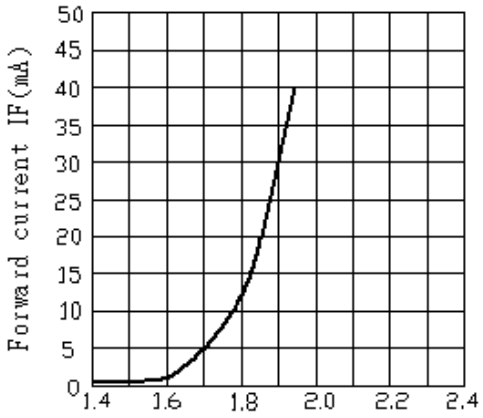
ELECTRICAL/OPTICAL CHARACTERISITCS (TA=25℃)

Parameter	Symbol	Min	Typ	Max	Unit	Condition
Luminous Intensity	IV	20	30	45	mcd	IF-20mA
Viewing angle	2θ1/2		45		deg	
Peak emission wavelength	λp		650		nm	
Dominant wavelength	λD	635	640	645	nm	
Spectral line half-width	△λ		20		nm	
Forward voltage	VF	1.8	1.9	2.2	V	
Reverse current	Ir	-	-	10	uA	VR=5V

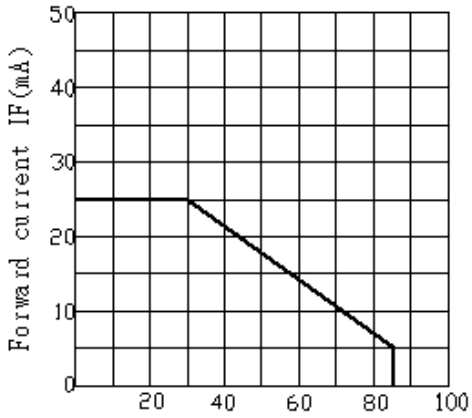
* Luminous intensity (IV) ±10%, Forward Voltage (VF) ±0.1V, Wavelength (λd) ±0.5nm.

TYPICAL ELECTRO-OPTICAL CHARACTERISTICS CURVES

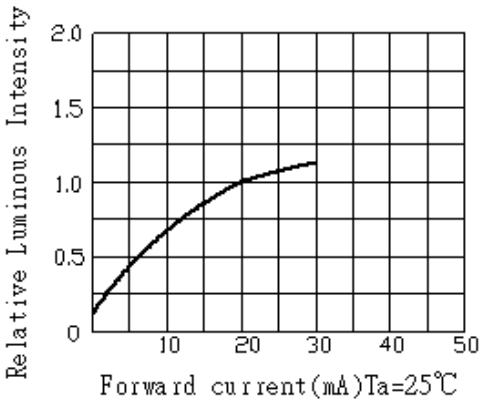
Super Red (AlInGaP λd=640nm)



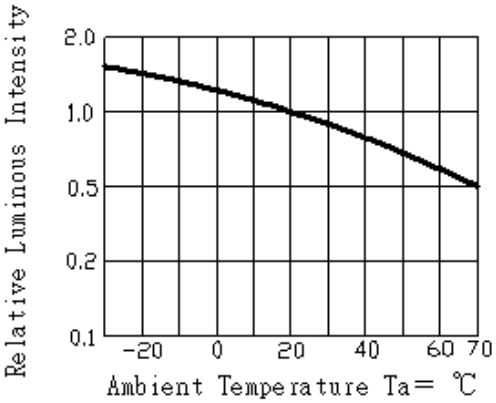
Forward current vs. Forward Voltage



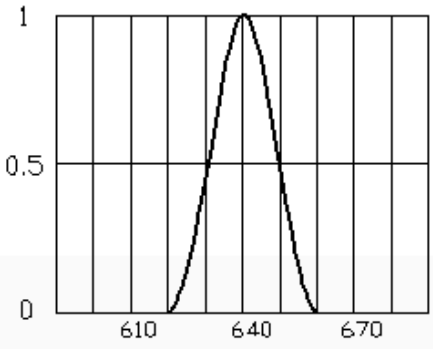
Forward current Derating curve



Luminous Intensity vs.Forward current



Luminous Intensity vs.Ambient Temperature

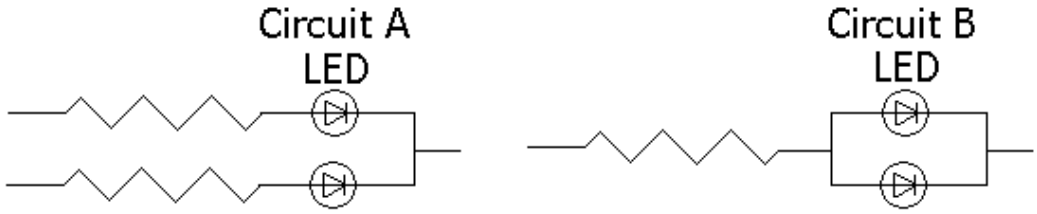


Relative Intensity VS. wavelength

PRECAUTIONS FOR USE LED

- **Drive Method**

  LED is current-operated device. In order to ensure intensity uniformity on multiple LEDs connected in parallel in a application, it is recommended that a current limiting resistor be incorporated in the drive circuit.



a) Circuit A it is recommended circuit.
b) Circuit B the brightness of each LED might appear different due to the differences in the I-V characteristics of those LEDs.

- **Over-current-proof**

  Customer must apply resistors for protection, otherwise slight voltage shift will cause big current change(Burn out will happen).

- **Storage**

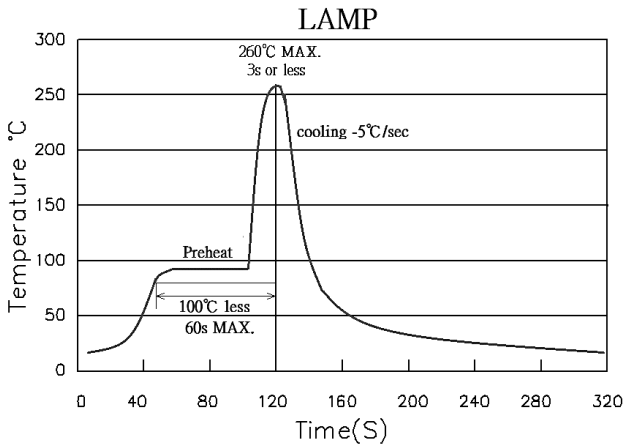
a) The Storage temperature and RH are: 5℃~30℃, RH 60% or less. Once the package is opened, the products should be used with in a week. Otherwise, they should be kept in moisture proof package with moisture absorbent material (silica gel).
b) we suggest our customers to use our products within a year. If the moisture absorbent material (silica gel) has faded away or the LEDs exceeded the storage time, baking treatment should be performed using the following conditions.
c) Baking treatment: more than 24 hours at 60℃ ±5℃

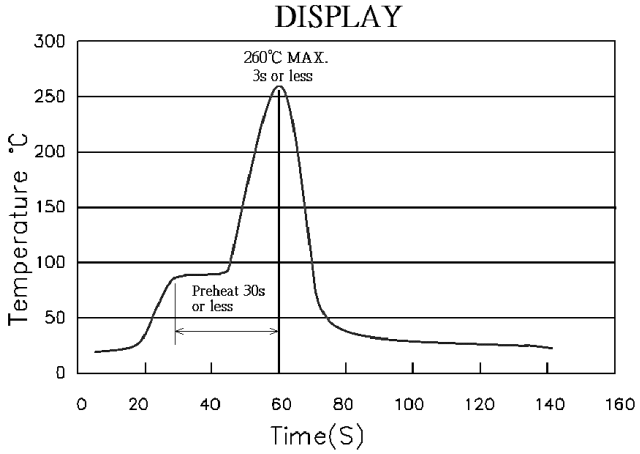
- **Electrostatic Discharge (ESD)**

a) Static electricity or surge voltage will damage the LEDs.
b) Suggestions to prevent ESD damage: Use of a conductive wrist band or ante-electrostatic glove when handing these LEDs.
c) All devices, equipment, and machinery must be properly grounded. Work tables storage racks, etc. should be properly grounded. In the events of manual working in process, make sure the devices are well protected from ESD at any time.

- **Others**
  a) If want to have the uniform luminance and color, please use the same binning number, and avoid using intermix to cause the differences of luminance and color.
  b) The appearance and specifications of the product may be modified for improvement without prior notice.

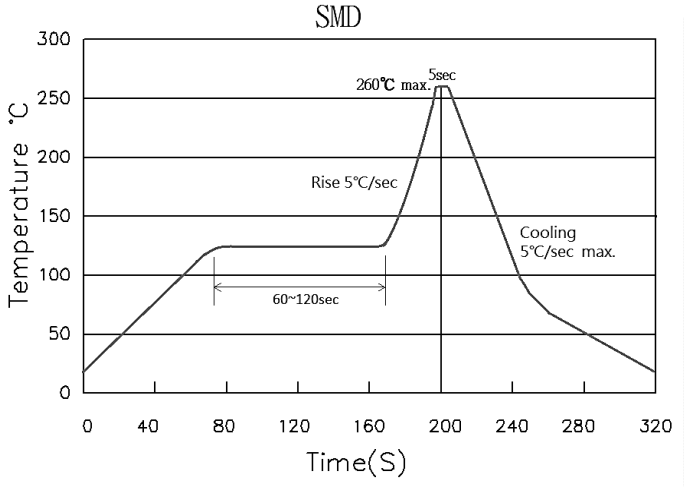
- **Soldering**
  Recommended soldering condition as shown below:
  - Soldering heat (DIP)





  - Soldering iron
    1. Temperature at tip of iron: 350℃ Max.
    2. Soldering time: 3 sec±1sec.(one time only).
    3. If temperature is higher, time should be shorter.

  - **Reflow Temp./Time(SMD)**


SMD
300
250
200
150
100
50
0
Temperature ℃
260℃ max.
5sec
Rise 5℃/sec
Cooling
5℃/sec max.
60~120sec
0
40
80
120
160
200
240
280
320
Time(S)