TOP LED:503FRC-66LS (5mm through-hole Deep Red)







CUSTOMER APPOVED SIGNATURES	SALES	APPROVED	CHECKED	PREPARED
	APPROVED	BY	BY	BY

1. Features

• Color :Deep Red

• Lens: Water clear

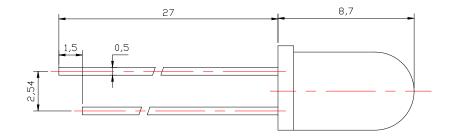
EIA STD Package

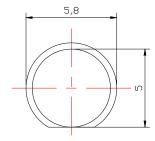
• Meet ROHS, Green Product

• Compatible With SMT Automatic Equipment

• Compatible With Infrared Reflow Solder And Wave Solder Process

2. Package Profile & Soldering PAD Suggested



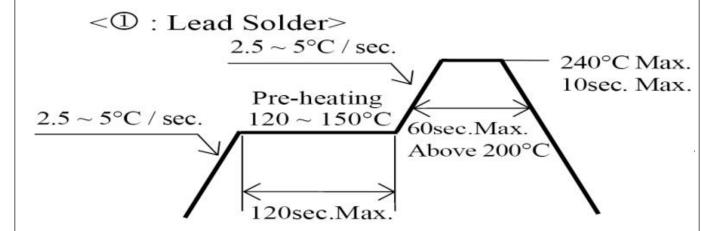


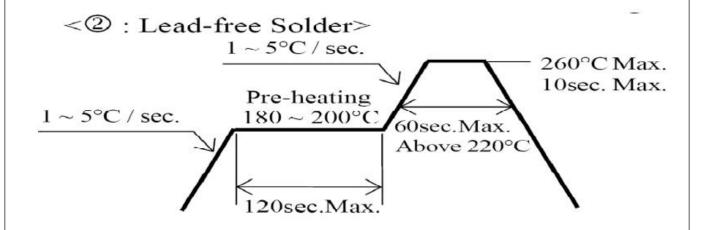
Notes: 1. All dimensions are in millimeters;

2. Tolerance is \pm 0.10 mm unless otherwise noted.

3. Soldering Profile Suggested

Reflow Soldering		Hand Soldering		
50	Lead Solder	Lead-free Solder		
Pre-heat	120 ~ 150°C	180 ~ 200°C	Temperature	350°C Max.
Pre-heat time	120 sec. Max.	120 sec. Max.	Soldering time	3 sec. Max.
Peak temperature	240°C Max.	260°C Max.		(one time only)
Soldering time	10 sec. Max.	10 sec. Max.		
Condition	refer to	refer to		
	Temperature - profile ①.	Temperature - profile ②.		
	**************************************	(N ₂ reflow is recommended.)		





4. Absolute Maximum Ratings At Ta=25°C

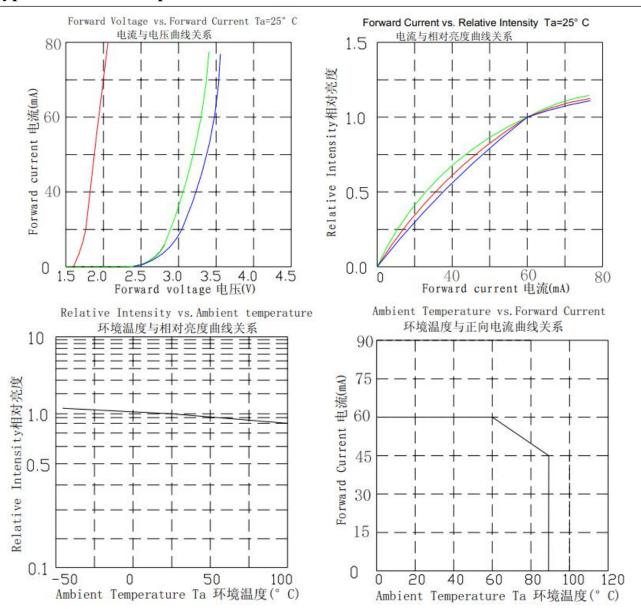
Parameter	Symbol	Rating	Unit
Power Dissipation	Pd	40	mW
Peak Forward Current (1/10 Duty Cycle, 0.1ms Pulse Width)	IFP	100	mA
DC Forward Current	IF	20	mA
Reverse Voltage	Vr	5	V
Operating Temperature Range	Topr	-25°C	~ +80°C
Storage Temperature Range	Tstg	-40°C	~ +80°C
Soldering Condition	Tsol	_	: 260°C For 5 Seconds :: 300°C For 3 Seconds
Electro-Static-Discharge(HBM)	ESD		1000V
Service life under normal conditions	Time		80000h
Service life under normal conditions	Time		2 years
Packing	pcs	40	000per reel

5. Electrical Optical Characteristics At Ta=25℃

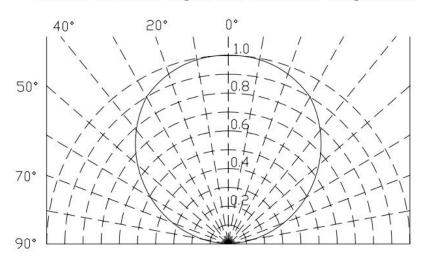
Parameter	Symbol	Min.	Тур.	Max.	Unit	Test Condition
Luminous Intensity	IV	1000		3000	mcd	IF=20mA
Viewing Angle	201/2		120		deg	IF=20mA
Peak Wavelength	λр	655	660	665	nm	IF=20mA
Dominant Wavelength	λd	640	650	655	nm	IF=20mA
Spectral Line Half Width	Δλ		12		nm	IF=20mA
Forward Voltage	VF	1.9	2.1	2.4	V	IF=20mA
Reverse Current	IR			5	uA	VR=5V

- Notes: 1. Luminous intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve.
 - $2. \theta 1/2$ is the off-axis angle at which the luminous intensity is half the axial luminous intensity.
 - 3. The dominant wavelength, λd is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.

6. Typical Electrical-Optical Characteristics Curves



Curves of beam angle and relative brightness



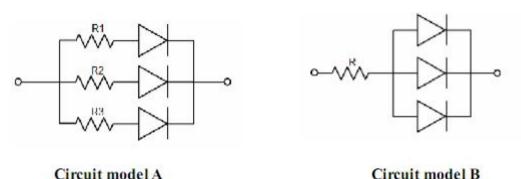
7. Reliability Test

Classification	Test Item	Test Condition	Reference Standard	Reference
CIGODITIOUTOII TOOL TOOM		Test Condition	Reference Standard	Standard
Ope	Operation Life	Ta= Under Room Temperature As Per	1000HRS	MIL-STD-750D:102 MIL-STD-883D:100
	Operation Life	Data Sheet Maximum Rating	(-24HRS,+72HRS)*@20mA	JIS C 7021:B-1
Endurance	High			
	Temperature,	IR-Reflow In-Board, 2 Times	240HRS±2HRS	MIL-STD-202F:10 JIS C 7021:B-11
	High	Ta= 65±5°C,RH= 90 ~ 95%		
Test	Humidity Storage			
	High Temperature	T 10515°C	1000HRS	MIL-STD-883D:10 JIS C 7021:B-10
	Storage	Ta= 105±5°C	(-24HRS,+72HRS)	
	Low Temperature		1000HRS	
	Storage	Ta= -55±5 ℃	(-24HRS,+72H RS)	JIS C 7021:B-12
	Temperature	105°C ~ 25°C ~ -55°C ~	10 Cycles	MIL-STD-202F:10
	•	25℃	10 Cycles	MIL-STD-750D:10 MIL-STD-883D:10 JIS C 7021:A-4
	Cycling	30mins 5mins 30mins		
	Thermal	IR-Reflow In-Board, 2 Times	10.5	MIL-STD-202F:10 MIL-STD-750D:10 MIL-STD-883D:10
		85 ± 5°C ~ -40°C ± 5°C	10 Cycles	
	Shock	10mins 10mins		
	Solder	T 1 200 + 5°C	10 + 1	MIL-STD-202F:21
	Resistance	T.sol= 260 ± 5 °C	$10 \pm 1 \text{secs}$	MIL-STD-750D:20 JIS C 7021:A-1
		Ramp-up rate(183 °C to Peak) +3 °C / second		
T		max		
Environmental Test	IR-Reflow	Temp. maintain at 125(±25) °C 120 seconds max Temp. maintain above 183 °C 60-150 seconds		MIL-STD-750D:203 J-STD-020C
Test	Normal Process	Peak temperature range 235°C+5/-0°C Time within 5°C of actual Peak Temperature		J-31D-020C
Pb Free Proc		(tp) 10-30 seconds		
		Ramp-down rate +6°C/second max Ramp-up rate(217°C to Peak) +3°C / second		
	IR-Reflow	max Temp. maintain at 175(±25) °C 180 seconds max		
		Temp. maintain above 217°C 60-150 seconds Peak temperature range 260°C+0/-5°C		MIL-STD-750D:20
	Pb Free Process	Time within 5°C of actual Peak Temperature (tp)		J-STD-020C
		20-40 seconds Ramp-down rate +6°C/second max		
		T.sol= 235 ± 5 °C	1	MIL-STD-202F:20
	Solderability	Immersion rate 25±2.5 mm/sec	Immersion time 2±0.5	MIL-STD-750D:20 MIL-STD-883D:20
		Coverage ≥95% of the dipped surface	sec	IEC 68 Part 2-2 JIS C 7021:A-2

8. Cautions

Application

- 1. A LED is a current-operated device. The slight shift of voltage will cause big change of current, which will damage LEDs. Customer should use resistors in series for the Over-Current-Proof.
- 2. In order to ensure intensity uniformity on multiple LEDs connected in parallel in an application, it is recommended to use individual resistor separately, as shown in Circuit A below. The brightness of each LED shown in Circuit B might appear difference due to the differences in the I-V characteristics of those LEDs.



3. High temperature may reduce LEDs' intensity and other performances, so keeping it away from heat source to get good performance is necessary.

Storage

1.Before opening original package, it is recommended to store them in the following environment:

Temperature: 5°C~30°C Humidity: 85%RH max.

- 2. After opening original package, the storage ambient for the LEDs should be in 5~30°C temperature and 60% or less relative humidity.
- 3. In order to avoid moisture absorption, it is recommended that the LEDs that out of the original package should be stored in a sealed container with appropriate desiccant, or in desiccators with nitrogen ambient.
- 4. The LEDs should be used within 168hrs (7 days) after opening the package. Once been mounted, soldering should be quick.
- 5. If the moisture absorbent material (silica gel) has faded away or the LEDs stored out of original package for more than 168hrs (7 days), baking treatment should be performed using the conditions: 60°C at least 24 hours.

ESD (Electrostatic Discharge)-Protection

A LED (especially the Blue. White and Green product) is an ESD sensitive component, and static electricity or power surge will damage the LED. ESD-damaged LEDs will exhibit abnormal characteristics such as high reverse leakage current, low forward voltage, or "no light-up" at low currents, etc. Some advice as below should be noticed:

- 1. A conductive wrist strap or anti-electrostatic glove should be worn when handling these LEDs.
- 2. All devices, equipment, machinery, work tables and storage racks, etc. must be properly grounded.

- 3. Use anti-static package or boxes to carry and storage LEDs. And ordinary plastic package or boxes is forbidden to use.
- 4. Use ionizer to neutralize the static charge during handling or operating.
- 5. All surfaces and objects within 1 ft close to LEDs measure less than 100V.

Cleaning

Use alcohol-based cleaning solvents such as IPA (isopropyl alcohol) to clean LEDs if necessary.

Soldering

- 1. Soldering condition refer to the draft "Soldering Profile Suggested" on page 1.
- 2. Reflow soldering should not be done more than 2 times.
- 3. Manual soldering is only suggested on repair and rework. The maximum soldering temperature should not exceed 300°C within 3 sec. And the maximum capacity of soldering iron is 30W in power.
- 4. During the soldering process, do not touch the lens at high temperature.
- 5. After soldering, any mechanical force on the lens or any excessive vibration shall not be accepted to apply, also the circuit board shall not be bent as well.

Others

- 1. The LEDs described here are intended to be used for ordinary electronic equipment (such as office equipment, communication equipment and household applications). Consult us Sales in advance for the applications in which exceptional reliability is required, particularly when the failure or malfunction of the LEDs may directly jeopardize life or health. (such as in aviation, transportation, traffic control equipment, medical and life support systems and safety devices).
- 2. The light output from the high luminous intensity LEDs may cause injury to human eyes when viewed directly.
- 3. The appearance and specifications of the product may be modified for improvement without prior notice.