Technical Data Sheet

Product Name：3MM red light emitting diode

Part Number：KGK-204-10SURD/S530-A3-L

Customer：3MM 红发红

Customer PN：

Version：A.2

Date：2021-11-08

Customer Approval		

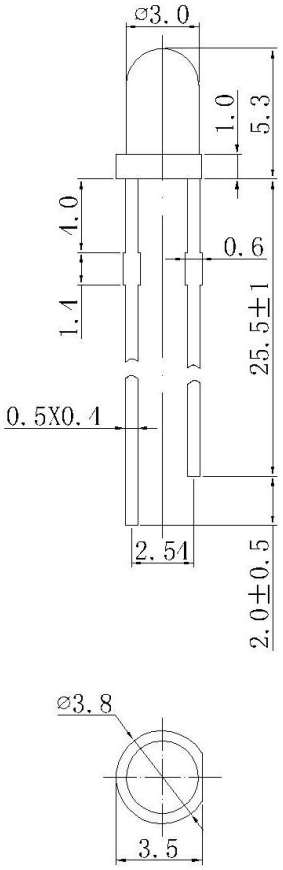
Instituted By： **Checked By:** **Approved By：**

Features

- Package (L/W/H) : 3 mm
- Color : Ultra Bright Standard red
- Lens: Red transparent colloid
- EIA STD Package
- Meet ROHS, Green Product

Package Profile & Soldering PAD Suggested

Package Profile：

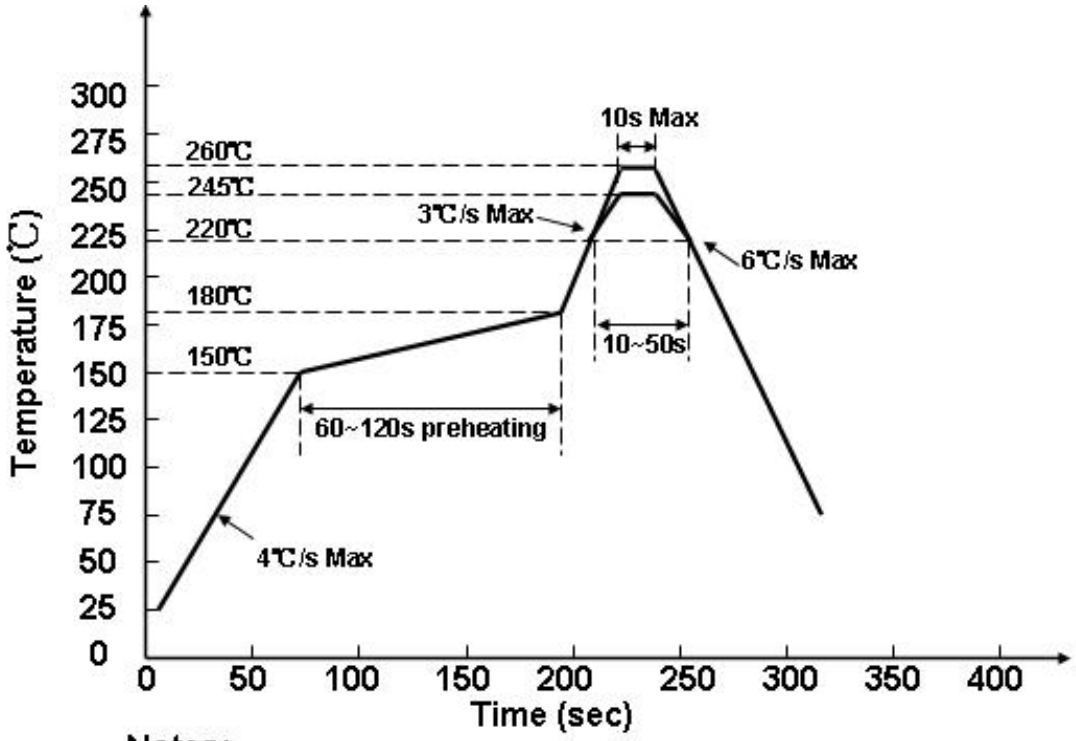


Notes: 1. All dimensions are in millimeters ;

2. Tolerance is ± 0.10 mm unless otherwise noted.

Soldering Profile Suggested

Wave soldering:



Notes:

We recommend the soldering temperature 245± 5℃ ;

The maximum temperature should be limited to 260 ℃.

1: soldering temperature: the temperature is about 350 DEG C, the welding time is about 2S

2: Solderability Test conditions: temperature of about 240~250 C / C, test time is 5S, test requirements after testing normal electrical performance, appearance no adverse.

Parameter	Symbol	Rating	Unit
Power Dissipation	Pd	75	mW
Peak Forward Current (1/10 Duty Cycle, 0.1ms Pulse Width)	I_{FP}	100	mA
DC Forward Current	I_F	20	mA
Reverse Voltage	V_R	5	**V**
Operating Temperature Range	Topr	-30°C ~ +85°C	
Storage Temperature Range	Tstg	-40°C ~ +90°C	
Soldering Condition	Tsol	Hand soldering: 300°C For 3 Seconds	
ESD CLASS	ESD	2000	V

General Characteristics

Bin Range of Luminous Intensity

Bin	Min	Max	Unit	Condition
T2	300	400	mcd	IF=20mA
U1	400	500		
U2	500	600		

Notes: Tolerance of Luminous Intensity: ± 11%

Bin Range of Wavelength

Bin	Min	Max	Unit	Condition
A	620	625	nm	IF=20mA
B	625	630		

Notes: Tolerance of Wavelength: ± 1nm

Bin Range of Forward Voltage

Bin	Min	Max	Unit	Condition
7	1.8	2.0	V	IF=20mA
8	2.0	2.2		
9	2.2	2.4		
H	2.4	2.6		

Notes: Tolerance of Forward Voltage: ± 0.02V

Typical Electrical-Optical Characteristics Curves

t

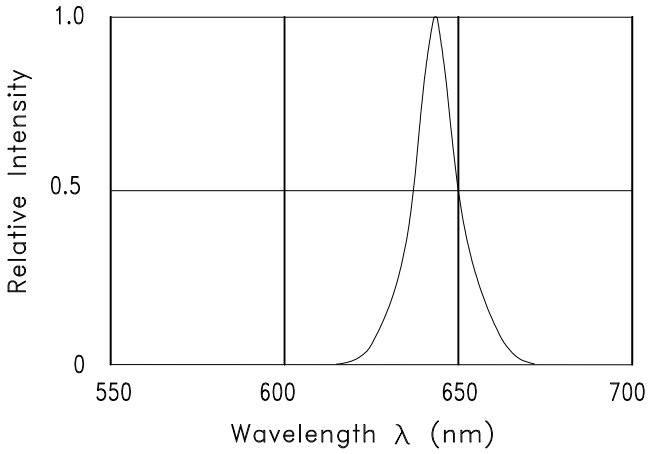


Fig.1 RELATIVE INTENSITY VS. WAVELENGTH

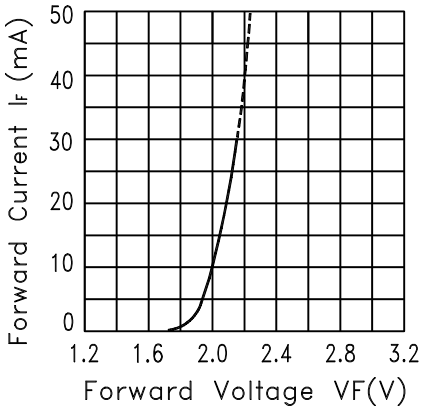


Fig.2 FORWARD CURRENT VS. FORWARD VOLTAGE

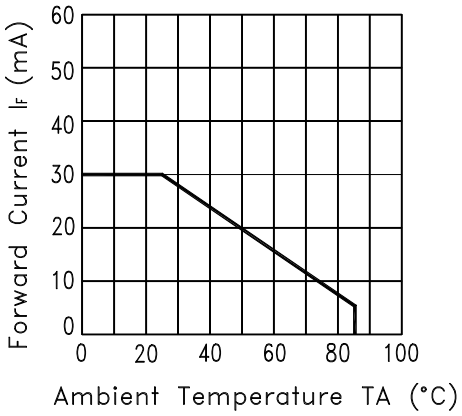


Fig.3 FORWARD CURRENT DERATING CURVE

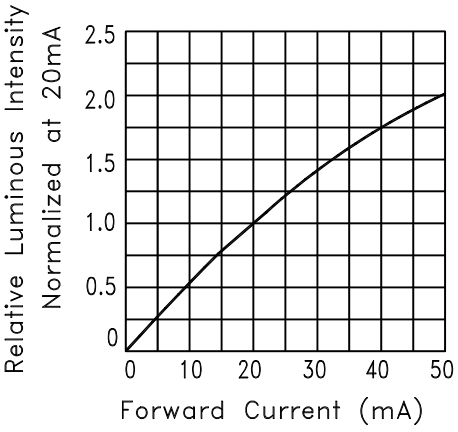


Fig.4 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

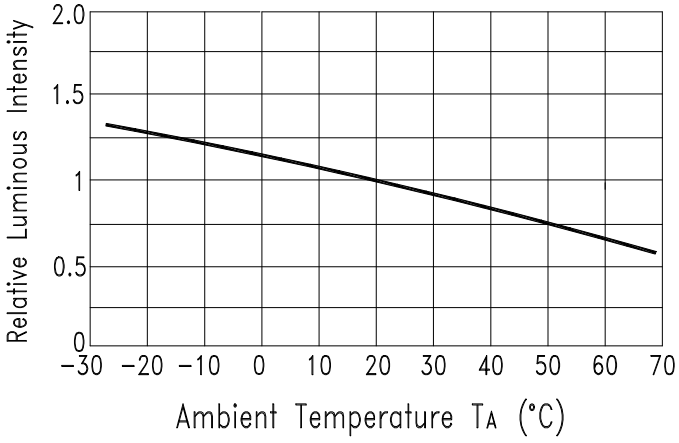


Fig.5 Luminous Intensity vs.Ambient Temperature

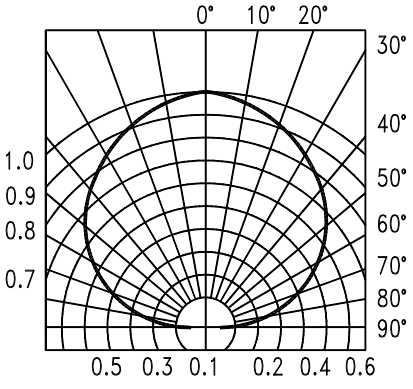


Fig.6 SPATIAL DISTRIBUTION

Label Explanation

CAT：Luminous Intensity Rank（unit : mcd）
HUE：CIE 1931 Coordinate Rank
REF：Forward Voltage Rank （unit : V）

Rank Tolerance:
a. Luminous Intensity: ± 11%
b. HUE: ±0.005
c. Forward Voltage: ± 0.02V

Reliability Test

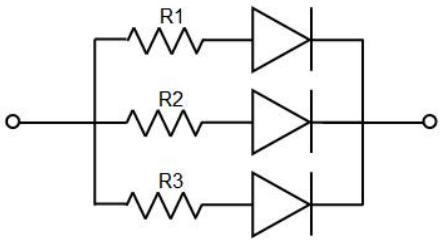
Classification	Test Item	Test Condition	Reference Standard	Reference Standard
Endurance Test	Operation Life	Ta= Under Room Temperature As Per Data Sheet Maximum Rating	1000HRS (-24HRS,+72HRS)*@20mA	MIL-STD-750D:1026 MIL-STD-883D:1005 JIS C 7021:B-1
	High Temperature, High Humidity Storage	IR-Reflow In-Board, 2 Times Ta= 85±5℃,RH= 85%	1000HRS±2HRS	JESD22-A101
	High Temperature Storage	Ta= 105±5℃	1000HRS (-24HRS,+72HRS)	MIL-STD-883D:1008 JIS C 7021:B-10
	Low Temperature Storage	Ta= -55±5℃	1000HRS (-24HRS,+72H RS)	JIS C 7021:B-12
Environmental Test	Temperature Cycling	105℃ ～ 25℃ ～ -55℃ ～ 25℃ 30mins 5mins 30mins 5mins	10 Cycles	MIL-STD-202F:107D MIL-STD-750D:1051 MIL-STD-883D:1010 JIS C 7021:A-4
	Thermal Shock	IR-Reflow In-Board, 2 Times 85 ± 5℃ ～ -40℃ ± 5℃ 10mins 10mins	10 Cycles	MIL-STD-202F:107D MIL-STD-750D:1051 MIL-STD-883D:1011
	Solder Resistance	T.sol= 260 ± 5℃	10 ± 1secs	MIL-STD-202F:210A MIL-STD-750D:2031 JIS C 7021:A-1
	IR-Reflow Normal Process	Ramp-up rate(183℃ to Peak) +3℃/ second max Temp. maintain at 125(±25)℃ 120 seconds max Temp. maintain above 183℃ 60-150 seconds Peak temperature range 235℃+5/-0℃		MIL-STD-750D:2031.2 J-STD-020C

		Time within 5°C of actual Peak Temperature (tp) 10-30 seconds Ramp-down rate +6℃/second max	--------	
	IR-Reflow Pb Free Process	Ramp-up rate(217℃ to Peak) +3℃/ second max Temp. maintain at 175(±25)℃ 180 seconds max Temp. maintain above 217℃ 60-150 seconds Peak temperature range 260℃+0/-5℃ Time within 5°C of actual Peak Temperature (tp) 20-40 seconds Ramp-down rate +6℃/second max	--------	MIL-STD-750D:2031.2 J-STD-020C
	Solderability	T.sol= 235 ± 5℃ Immersion rate 25±2.5 mm/sec Coverage ≧95% of the dipped surface	Immersion time 2±0.5 sec	MIL-STD-202F:208D MIL-STD-750D:2026 MIL-STD-883D:2003 IEC 68 Part 2-20 JIS C 7021:A-2

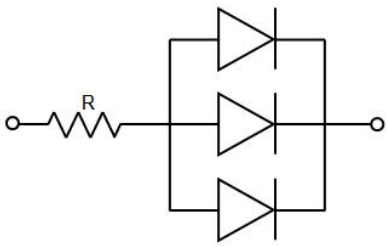
Cautions

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.



Circuit model A



Circuit model B

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℃~30℃； Humidity: 85%RH max.When the inventory over 2 months,Should be done before treatment using dehumidification, Temperature: 60℃/8 hours.

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 48hrs (2 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 48hrs (2 days), baking treatment should be performed using the conditions: 60℃ 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 Harvatek’s 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.
4. LED operating environment and sulfur element composition cannot be over 100PPM in the LED mating.