Square With 5Φ Dome 4 Lead Ultra Red LED LED Technical Data Sheet

Part No.: DL-U50SRE-4SR45

◆ **Features:**

1. Fewer LEDs required.
2. Low profile.
3. Lowers lighting system cost.
4. Super flux output.
5. Viewing angle=45°.
6. Emission color coordinates: Ultra Red.
7. The product itself will remain within RoHS compliant Version.

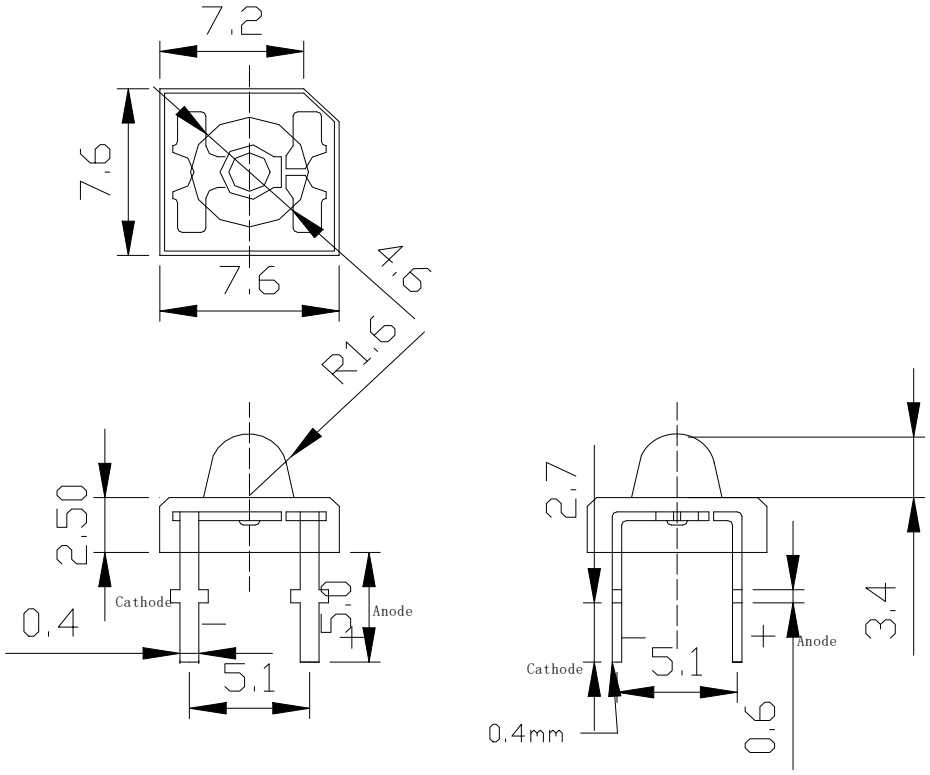
◆ **Descriptions:**

1. This revolutionary package design allows the light designer to reduce the number of LEDs required and provide a more uniform and unique illuminated appearance than with other LED solutions.
2. The low profile package can be easily coupled with reflectors or lenses to efficiently distribute light and provide the desired light appearance.
3. The white LED which was fabricated using a blue LED and a phosphor, and the phosphor is excited by blue light and emits yellow fluorescence the mixture of blue light and yellow light results in white emission.
4. Utilizing advanced InGaN chip technology.

◆ **Applications:**

1. Automotive exterior lighting.
2. Electronic signs and signals.
3. Special lighting application.

◆ **Package dimensions:**



Part No.	Chip Material	Lens Color	Source Color
DL-U50SRE-4SR45	AlGaInP	Water Clear	Ultra Red

Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is ±0.25mm (0.01”) unless otherwise specified.
3. Lead spacing is measured where the leads emerge from the package.
4. Specifications are subject to change without notice.

◆ **Absolute Maximum Ratings at Ta=25℃**

Parameter	MAX.	Unit
Power Dissipation	180	mW
Peak Forward Current (1/10 Duty Cycle, 0.1ms Pulse Width)	100	mA
Continuous Forward Current	50	mA
Derating Linear From 50℃	0.4	mA/℃
Reverse Voltage	5	V
Operating Temperature Range	-40℃ to +85℃	
Storage Temperature Range	-40℃ to +105℃	
Lead Soldering Temperature [4mm(.157") From Body]	260℃ for 5 Seconds	

Electrical Optical Characteristics at Ta=25℃

Parameters	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Luminous Intensity (Note 1) *	IV	1350	1600	---		IF=20mA
		2650	2950	---		IF=30mA
		4000	4500	---		IF=50mA
Luminous Flux (Note 1) *	Φ	0.80	1.55	---	lm	IF=30mA
		1.80	3.20	---		IF=50mA
Viewing Angle (Note 2) *	$2\theta_{1/2}$	---	45	---	Deg	IF=20mA
Peak Emission Wavelength	λp	---	632	---	nm	IF=20mA
Dominant Wavelength (Note 3)	λd	---	624	---	nm	IF=20mA
Spectrum Radiation Bandwidth	Δλ	---	20	---	nm	IF=20mA
Forward Voltage	VF	1.80	2.20	2.60	V	IF=20mA
Reverse Current	IR	---	---	10	μA	V_R=5V

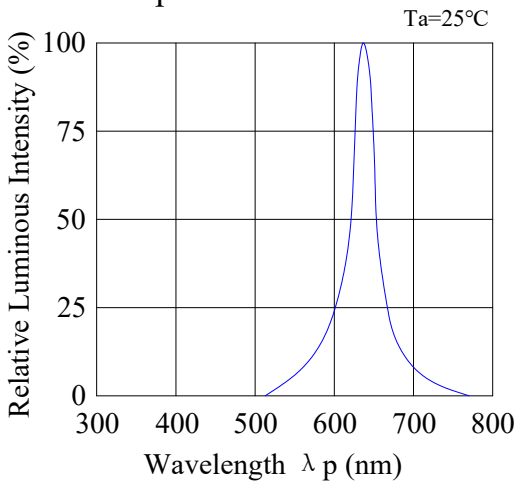
Notes:

1. Luminous Intensity (Flux) 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. It use many parameters that correspond to the CIE 1931 2°. X, Y, and Z are CIE 1931 2°values of Red, Green and Blue content of the measurement.

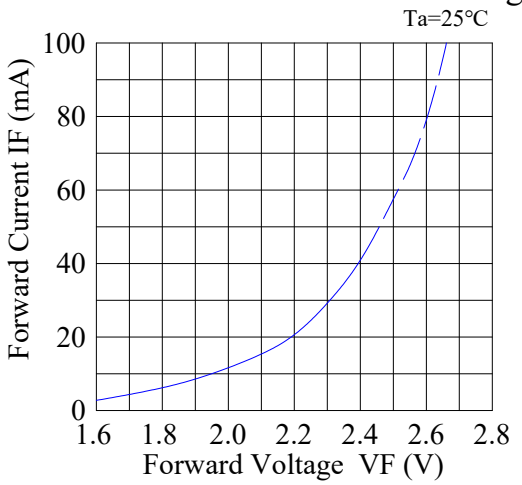
◆ **Typical Electrical / Optical Characteristics Curves**

(25℃ Ambient Temperature Unless Otherwise Noted)

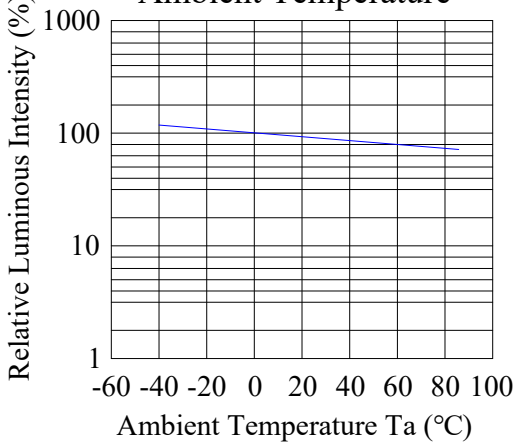
Spectrum Distribution



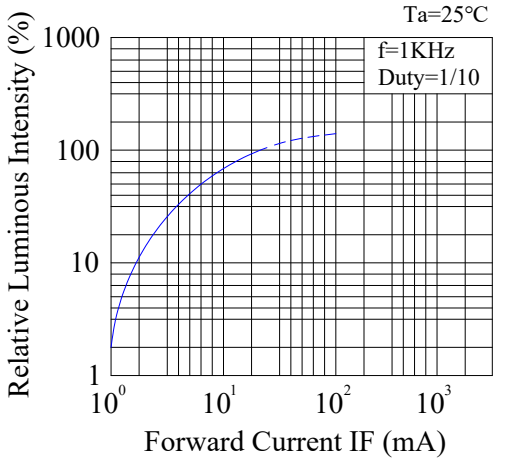
Forward Current & Forward Voltage



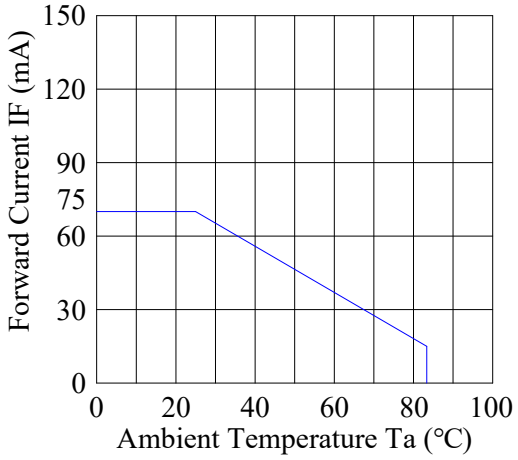
Luminous Intensity & Ambient Temperature



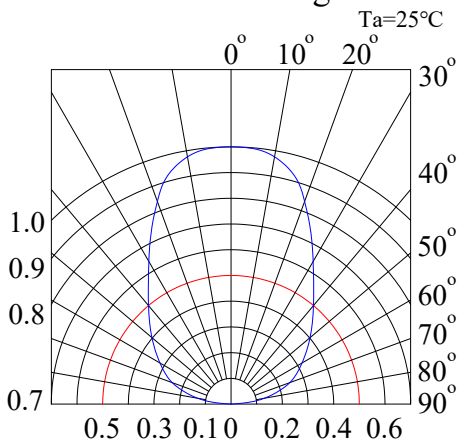
Luminous Intensity & Forward Current



Forward Current Derating Curve



Radiation Diagram



◆ **Reliability Test Items And Conditions:**

The reliability of products shall be satisfied with items listed below:

Confidence level: 90%. LTPD: 10%.

1) Test Items and Results:

Test Item	Standard Test Method	Test Conditions	Note	Number of Damaged
Resistance to Soldering Heat	JEITA ED-4701 300 302	Tsld=260±5℃, 10sec 3mm from the base of the epoxy bulb	1 time	0/100
Solder ability	JEITA ED-4701 300 303	Tsld=235±5℃, 5sec (using flux)	1time over 95%	0/100
Thermal Shock	JEITA ED-4701 300 307	0℃~100℃ 15sec, 15sec	100 cycles	0/100
Temperature Cycle	JEITA ED-4701 100 105	-40℃~25℃~100℃~25℃ 30min,5min,30min,5min	100 cycles	0/100
Moisture Resistance Cycle	JEITA ED-4701 200 203	25℃~65℃~-10℃ 90%RH 24hrs/1cycle	10 cycles	0/100
High Temperature Storage	JEITA ED-4701 200 201	Ta=100℃	1000hrs	0/100
Terminal Strength (Pull test)	JEITA ED-4701 400 401	Load 10N (1kgf) 10±1sec	No noticeable damage	0/100
Terminal Strength (bending test)	JEITA ED-4701 400 401	Load 5N (0.5kgf) 0°~90°~0° bend 2 times	No noticeable damage	0/100
Temperature Humidity Storage	JEITA ED-4701 100 103	Ta=60℃, RH=90%	1000hrs	0/100
Low Temperature Storage	JEITA ED-4701 200 202	Ta=-40℃	1000hrs	0/100
Steady State Operating Life		Ta=25℃, IF=20mA	1000hrs	0/100
Steady State Operating Life of High Humidity Heat		Ta=60℃, RH=90%, IF=20mA	500hrs	0/100
Steady State Operating Life of Low Temperature		Ta=-30℃, IF=30mA	1000hrs	0/100

2) Criteria for Judging the Damage:

Item	Symbol	Test Conditions	Criteria for Judgment	
			Min	Max
Forward Voltage	VF	IF=20mA	---	F.V.*)×1.1
Reverse Current	IR	VR=5V	---	F.V.*)×2.0
Luminous Intensity	IV	IF=20mA	F.V.*)×0.7	---

*) F.V.: First Value.

◆ **Please read the following notes before using the product:**

1. Over-current-proof

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

2. Storage

   2.1 Do not open moisture proof bag before the products are ready to use.

   2.2 Before opening the package, the LEDs should be kept at 30℃ or less and 90%RH or less.

   2.3 The LEDs should be used within a year.

   2.4 After opening the package, the LEDs should be kept at 30℃ or less and 70%RH or less.

   2.5 The LEDs should be used within 168 hours (7 days) after opening the package.

3. Soldering Condition

   3.1 Pb-free solder temperature profile

   3.2 Reflow soldering should not be done more than two times.

   3.3 When soldering, do not put stress on the LEDs during heating.

   3.4 After soldering, do not warp the circuit board.

4. Soldering Iron

   Each terminal is to go to the tip of soldering iron temperature less than 260℃ for 5 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering of each terminal. Be careful because the damage of the product is often started at the time of the hand solder.

5. Repairing

   Repair should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used. It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.

6. Caution in ESD

   Static Electricity and surge damages the LED. It is recommended to use a wrist band or anti-electrostatic glove when handling the LED. All devices equipment and machinery must be properly grounded.