SE2220IRC-2A

2.2×1.95mm, Miniature 940nm Infrared Emitters

High Radiant Intensity Surface Mount (SMD) Infrared LED

Technical Data Sheet

Features

- Miniature package size: 2.2 × 1.95 × 0.9 mm
- Peak wavelength: 940 nm
- View angle: 40° (Typ.)
- Top-view optical configuration
- Low forward voltage
- SMT compatible: suitable for automatic placement and reflow soldering
- Pb-free, RoHS & EU REACH compliant
- Halogen-free: Br < 900 ppm, Cl < 900 ppm, Br+Cl < 1500 ppm

Description

The SE2220IRC-2A is a high-performance infrared emitting diode housed in a compact 2.2 × 1.95 × 0.9 mm miniature surface-mount package. The device is spectrally matched with standard silicon photodiodes and phototransistors.

Featuring a flat-top design, the IR emitter utilizes a highly reflective, gold-plated cavity filled with high-transmittivity optical encapsulation. This optimized internal structure delivers high radiant intensity at a peak wavelength of 940 nm in a convenient top-view orientation.

Applications

- Proximity sensing and gesture detection for smartphones, tablets, and consumer devices
- Optical switches, photointerrupters, and object counters
- Infrared communication links and remote controls
- Infrared (IR) illumination for security and compact cameras
- Industrial and security automation (including robotics, factory automation, access control, and automatic door systems)

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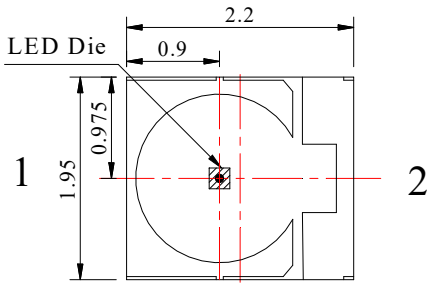
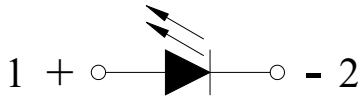
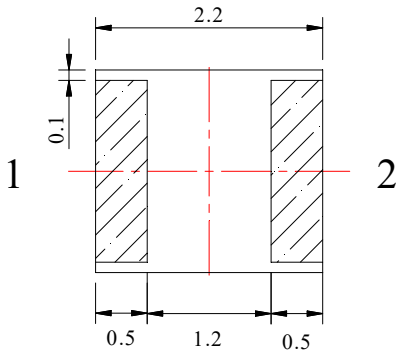
Package Dimension

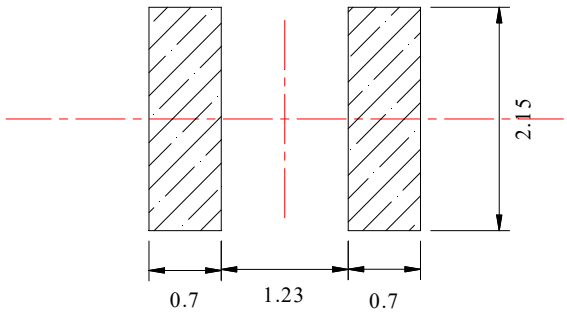




Polarity



Recommended Soldering Pad Dimensions



Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is ± 0.25 mm (0.010″) unless otherwise noted.

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Absolute Maximum Ratings (T_a = 25 ℃)

Parameter	Symbol	Rating	Unit
Power Dissipation	P_d	140	mW
Peak Forward Current (Pulse Width≦100 μs and Duty≦1%)	I_{FP}	700	mA
Continuous Forward Current	I_F	70	mA
Reverse Voltage	V_R	5	V
Operating Temperature Range	T_{opr}	−40 to +85	℃
Storage Temperature Range	T_{stg}	−40 to +100	℃
Soldering Temperature (Soldering time≦5 seconds)	T_{sol}	260	℃
Junction Temperature	T_j	≤115	℃

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Electrical Optical Characteristics (T_a = 25 ℃)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Radiant Intensity [a]	I_e	55	70	-	mW/sr	I_F=100 mA Pulse Width≦100 μs Duty≦1%
		28	53	-	mW/sr	I_F=70 mA, t_p=20 ms
Viewing Angle	$2\theta_{1/2}$	-	40	-	deg	I_F=20 mA
Peak Emission Wavelength	λ_p	-	940	-	nm	I_F=20 mA
Spectral Bandwidth	$\Delta\lambda$	-	30	-	nm	I_F=20 mA
Forward Voltage [b]	V_F	1.15	1.39	1.80	V	I_F=70 mA
		1.25	1.50	1.90	V	I_F=100 mA Pulse Width≦100 μs Duty≦1%
Reverse Current	I_R	-	-	10	μA	V_R=5V

Notes:

a Radiant Intensity tolerance is ± 10%.

b Forward voltage measurement tolerance: ±0.1V

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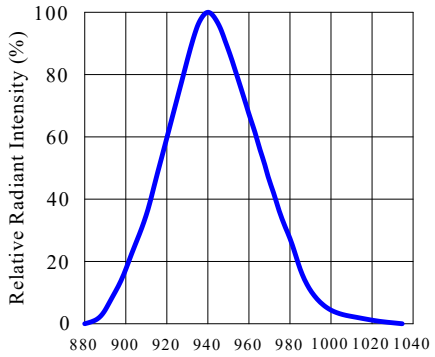
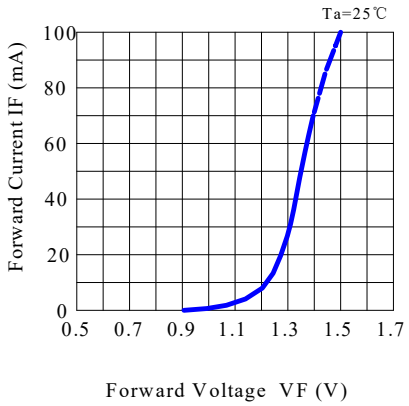
Typical Electrical / Optical Characteristics Curves (T_a=25 ℃)

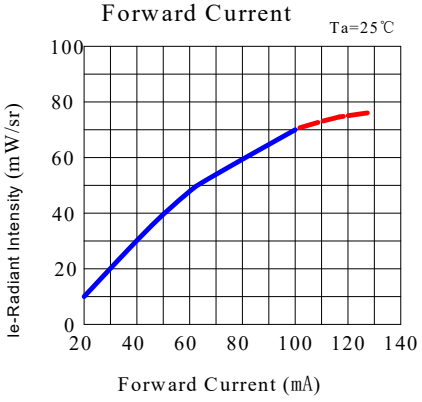
Spectral Distribution



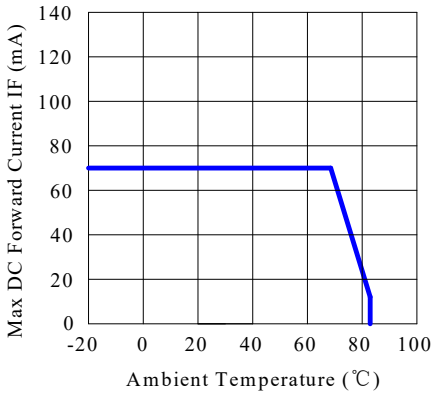
Forward Current & Forward Voltage



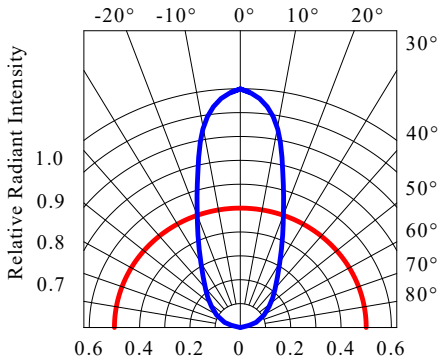
Radiant Intensity & Forward Current



Temperature Derating (Tj+115℃, Tja=450k/w)



Relative Radiant Intensity & Angular Displacement



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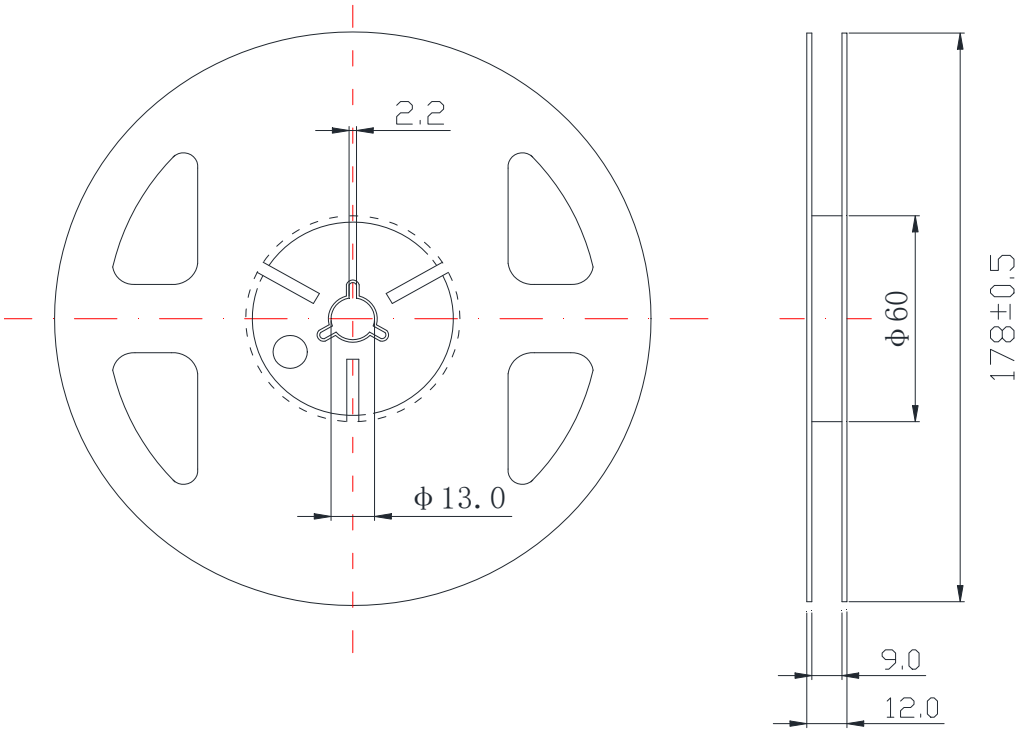
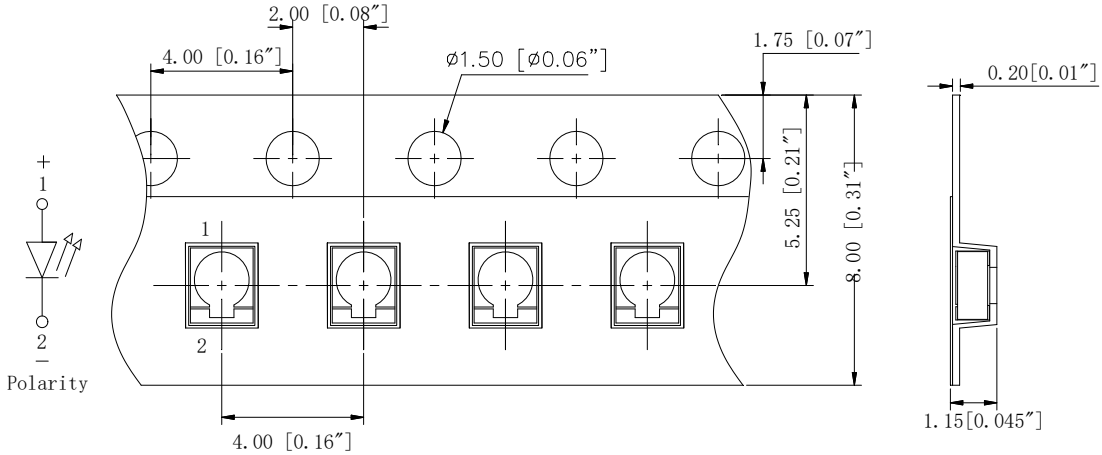
Reel Dimensions



Carrier Tape Dimensions

Loaded quantity 2'000 pcs per reel.



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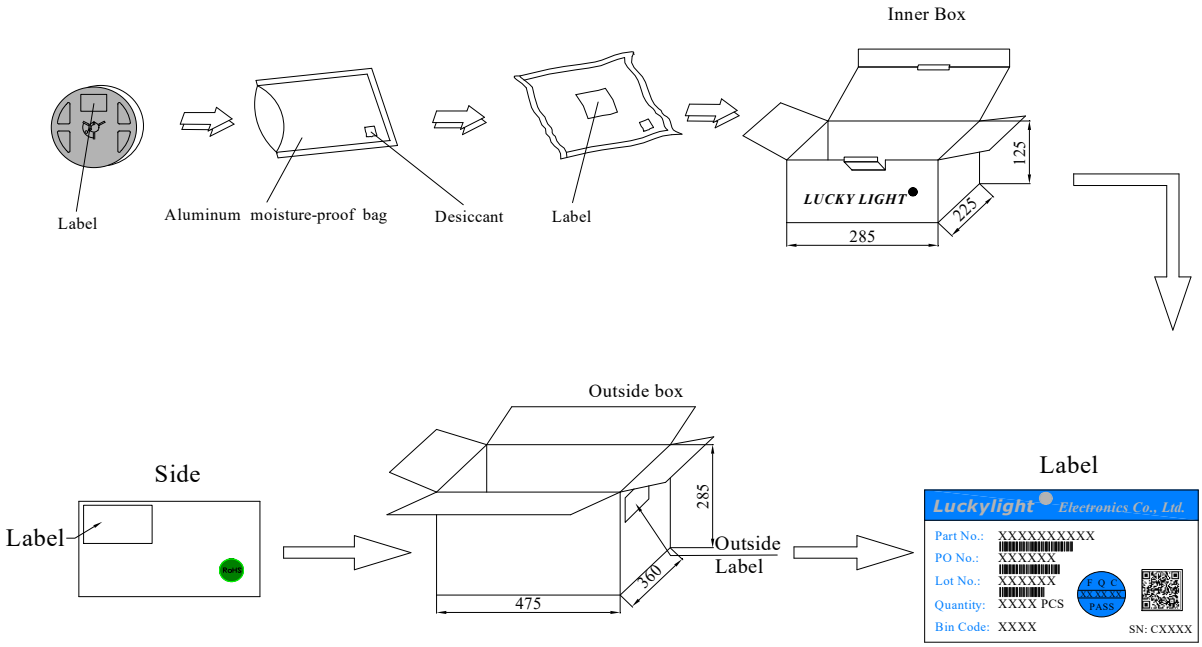
Packing & Label Specifications

Moisture Resistant Packaging



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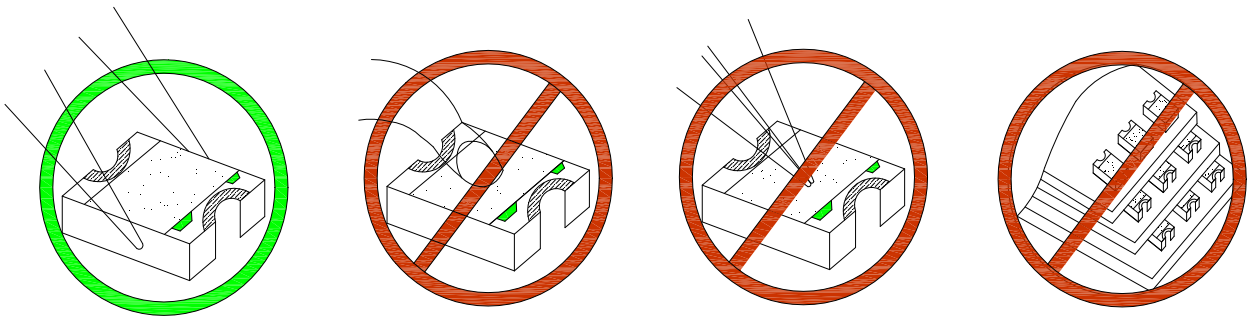
Precautions

Handling Precautions

- Handle the component along the side surfaces using forceps or appropriate tools.
- Do not directly touch or apply force to the lens surface. This may cause mechanical damage or break the internal wire bonds.
- Do not stack assembled PCBs containing exposed LEDs. The impact may scratch the lens surface or damage the internal circuitry.



- The lens and encapsulation may be susceptible to damage from external mechanical force. Special handling precautions must be observed during assembly. Failure to comply may lead to mechanical damage and premature failure of the LED.

Storage

- Do not open the moisture-proof bag before the products are ready for use.
- Before opening the package, the LEDs should be stored at 30 °C or less and 60% RH or less.
- The LEDs should be used within one year of storage in the sealed bag.
- After opening the package, the LEDs should be kept at 30 °C or less and 60% RH or less.
- The LEDs must be used within 168 hours (7 days) after opening the package.
- If the moisture-absorbent material (silica gel) has changed color or the LEDs have exceeded the recommended storage time, baking treatment must be performed under the following conditions: 65 °C ± 5 °C for 24 hours.

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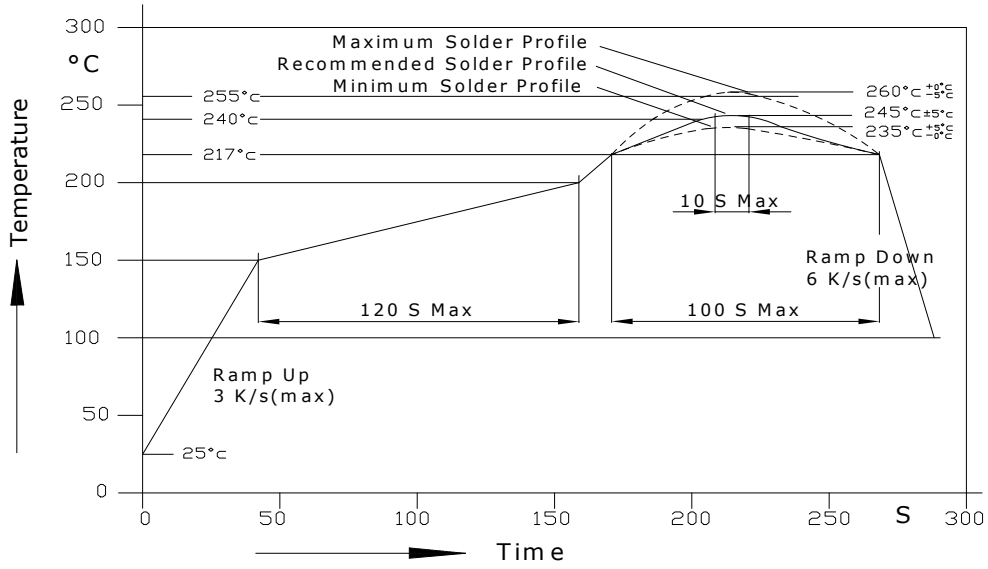
Soldering Condition

- Pb-free solder temperature profile



- Reflow soldering should not be performed more than two times.
- Do not apply mechanical stress to the LEDs during the heating phase of soldering.
- Do not warp or bend the circuit board after soldering.
- Recommended soldering conditions:

Reflow soldering		**Soldering iron**	
Pre-heat	150~200 °C	Temperature	300°C Max.
Pre-heat time	120 sec. Max.	Soldering time	3 sec. Max.
Peak temperature	260 °C Max.		(One time only)
Soldering time	10 sec. Max. (Max. two times)		

- Because different board designs use different numbers and types of components, solder pastes, reflow ovens, and PCB materials, no single temperature profile can fit all possible combinations. A trial run under actual production conditions is highly recommended.

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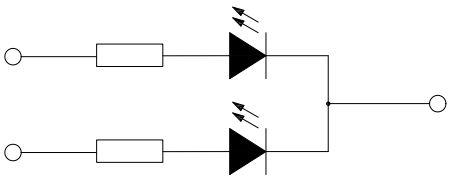
Drive Method

- An LED is a current-operated device. To ensure brightness uniformity when multiple LEDs are connected in parallel, it is highly recommended to incorporate a current-limiting resistor in series with each individual LED, as shown in Circuit Model A below.

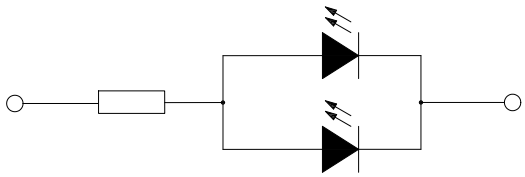
Circuit model A

LED



Circuit model B

LED



- Recommended circuit: Circuit model A
- If connected as shown in Circuit Model B, the brightness of each LED may vary significantly due to slight differences in the I-V (current-voltage) characteristics between individual LEDs.

- Over-Current Protection Warning:
  Customers must implement current-limiting resistors for circuit protection. Due to the steep exponential relationship of the LED's I-V characteristics, a slight shift in forward voltage (V_F) will cause a drastic, disproportionate change in forward current (I_F). Operating without proper resistor protection can easily lead to thermal runaway and catastrophic device burnout.

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Revision History

Version	Date	Revision History	Page
G-Rev-1	12-Sep-2017	Initial release	-
G-Rev-2	10-Oct-2017	Added radiant intensity data at I_F = 100 mA	P4
G-Rev-3	25-Oct-2017	Updated document title description	P1
G-Rev-4	08-Dec-2017	Added pulse test conditions for IF = 100 mA	P4
G-Rev-5	09-Dec-2023	Updated test conditions and electro-optical data	P4
Rev-6	24-May-2026	Updated product description, parameters, and disclaimers	P1,2, 4, 5, 11

Note:

From Rev-6 onward, the manufacturing-site code (previously used as the "G-" prefix) has been relocated to the Ref No. field in the footer. The revision number now reflects the document revision only.

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