LITEON®
OPTOELECTRONICS

Infrared
Product Data Sheet
LTE-4208

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LITE-ON DCC

RELEASE

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Infrared Emitter
LTE-4208

1. Description

LTE-4208 series is a 940nm IR emitting diode with high radiant power. It is molded in T-1¾ package with a water clear lens.

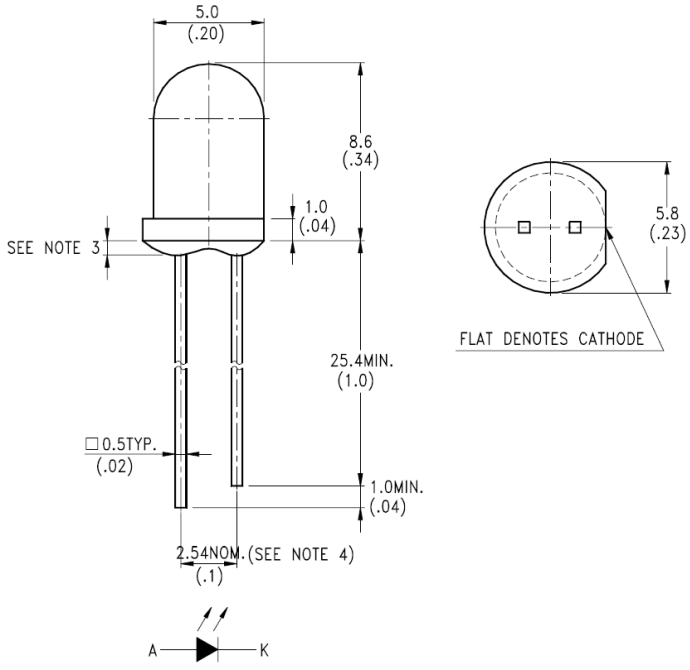
1. 1. Features

- Water clear lens
- Peak wavelength: 940nm
- Available for pulse operating the LTR-3208 Series of phototransistor.
- Mechanically and spectrally matched
- Lead (Pb) free product and RoHS compliant.

1.2. Applications

- Smoke detector
- IR emitter

2. Outline Dimensions



Notes :

1. All dimensions are in millimeters (inches).
2. Tolerance is ±0.25mm (.010") unless otherwise noted.
3. Protruded resin under flange is 1.0mm (.039") max.
4. Lead spacing is measured where the leads emerge from the package.
5. Specifications are subject to change without notice.

3. Absolute Maximum Ratings at TA=25℃

Parameter	Maximum Rating	Unit
Power Dissipation	100	mW
Peak Forward Current (300pps, 10μs pulse)	3	A
Continuous Forward Current	50	mA
Reverse Voltage	5	V
Operating Temperature Range	-40℃ to + 85℃	
Storage Temperature Range	-55℃ to + 100℃	
Lead Soldering Temperature [1.6mm (.063") From Body]	260℃ for 5 Seconds	

4. Electrical / Optical Characteristics at TA=25℃

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition	BIN NO
Radiant Intensity	I_E	3.31		7.22	mW/sr	I_F = 20mA	BIN A
		4.81		9.02			BIN B
		6.02		12.63			BIN C
		8.40		14.58			BIN D1
		9.72		19.08			BIN D2
		12.72		23.58			BIN D3
		15.72					BIN D4
Peak Emission Wavelength	λ_{Peak}		940		nm	I_F = 20mA	
Spectral Line Half-Width	Δλ		50		nm	I_F = 20mA	
Forward Voltage	V_F		1.2	1.6	V	I_F = 20mA	
Reverse Current (See Note 1)	I_R			100	μA	V_R = 5V	
Viewing Angle (See Fig.6)	$2\theta_{1/2}$		20		deg.		

Note 1: The reverse voltage (Vr) condition is only for testing purpose. This device is not designed for reverse current operation.

5. Typical Electrical / Optical Characteristics Curves

(25℃ Ambient Temperature Unless Otherwise Noted)

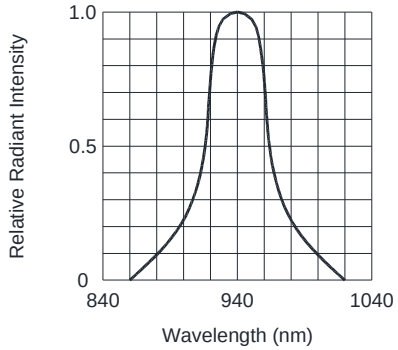


FIG.1 SPECTRAL DISTRIBUTION

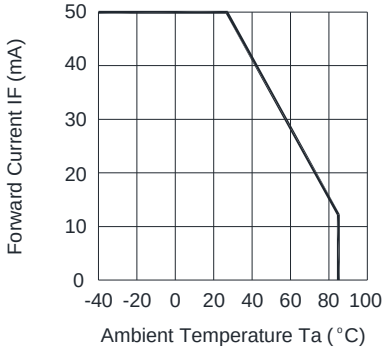


FIG.2 FORWARD CURRENT VS. AMBIENT TEMPERATURE

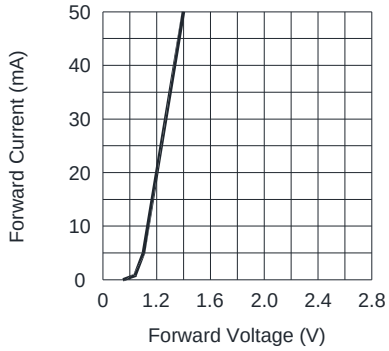


FIG.3 FORWARD CURRENT VS. FORWARD VOLTAGE

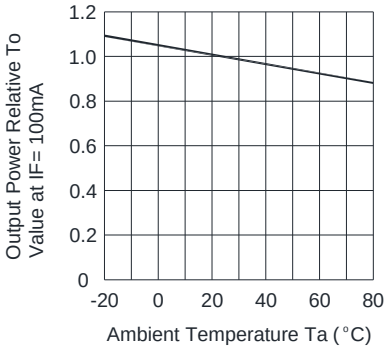


FIG.4 RELATIVE RADIANT INTENSITY VS. AMBIENT TEMPERATURE

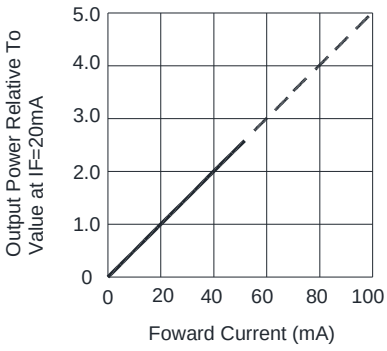


FIG.5 RELATIVE RADIANT INTENSITY VS. FORWARD CURRENT

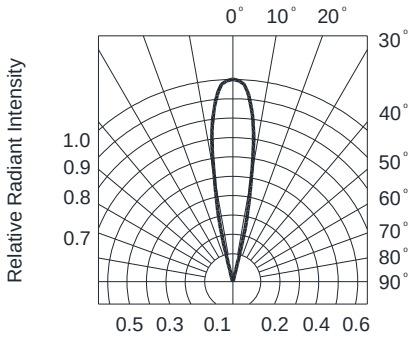


FIG.6 RADIATION DIAGRAM

6. CAUTIONS

6.1. Application

The LEDs described here are intended to be used for ordinary electronic equipment. Consult Liteon's Sales in advance for information on 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, traffic control equipment, medical & life support systems and safety devices).

6.2. Storage

The storage ambient for this component should be <30℃ temperature and < 70% relative humidity, also t he component should be assembled within 3 months upon the delivery date. To extend the storage life when the part still in original packing, the component should be stored in a sealed container with appropriate desiccant or in desiccators with nitrogen ambient but not over a year; after opening the package, the component must be consumed within 3months under controlled environment of <25℃ and <60%RH. Please avoid rapid transitions in ambient temperature, especially in high humidity environment where condensation can occur. If storage conditions do not meet above criteria, the component's pin may become oxidized then solderability assessment and re-sorting must be performed before use

6.3. Cleaning

Use alcohol-based cleaning solvents such as isopropyl alcohol to clean the LEDs if necessary.

6.4. Lead Forming & Assembly

During lead forming, the leads should be bent at a point at least 3mm from the base of LED lens. Do not use the base of the lead frame as a fulcrum during forming. Lead forming must be done before soldering, at normal temperature. During assembly on PCB, use minimum clinch force possible to avoid excessive mechanical stress.

6.5. Soldering

Dipping the lens into the solder must be avoided. Do not apply any external stress to the lead frame during soldering while the LED is at high temperature.

Recommended soldering conditions:

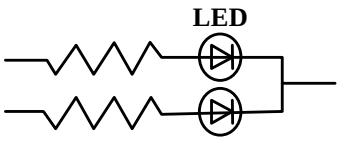
Lead Soldering		Wave soldering	
Temperature	350℃ Max.	Pre-heat	100℃ Max.
Soldering time	3 seconds Max. (one time only)	Pre-heat time	60 seconds Max.
		Solder wave	260℃ Max.
Position	No closer than 1.6mm from the base of the epoxy bulb	Soldering time	5 seconds Max.
		Dipping Position	No lower than 1.6 mm from the base of the epoxy bulb

Note: Excessive soldering temperature and/or time might result in deformation of the LED lens or catastrophic failure of the LED. IR reflow is not suitable process for through hole type LED lamp product.

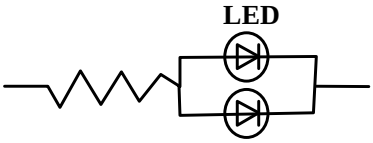
6.6. Drive Method

LED is a current-operated device. In order to ensure intensity uniformity on multiple LEDs connected in parallel in an application, it is recommended that a current limiting resistor be incorporated in the drive circuit, in series with each LED as shown in Circuit A below.

Circuit model (A)



Circuit model (B)



(A) Recommended circuit
(B) The brightness of each LED might appear different due to the differences in the I-V characteristics of those LEDs.

6.7. ESD (Electrostatic Discharge)

Static Electricity or power surge will damage the LED.

Suggestions to prevent ESD damage:

- Use a conductive wrist band or anti- electrostatic glove when handling these LEDs
- All devices, equipment, and machinery must be properly grounded
- Work tables, storage racks, etc. should be properly grounded
- Use ion blower to neutralize the static charge which might have built up on surface of the LEDs plastic lens as a result of friction between LEDs during storage and handing

Suggested checking list:

Training and Certification

6.7.1.1. Everyone working in a static-safe area is ESD-certified?
6.7.1.2. Training records kept and re-certification dates monitored?

Static-Safe Workstation & Work Areas

6.7.2.1. Static-safe workstation or work-areas have ESD signs?
6.7.2.2. All surfaces and objects at all static-safe workstation and within 1 ft measure less than 100V?
6.7.2.3. All ionizer activated, positioned towards the units?
6.7.2.4. Each work surface mats grounding is good?

Personnel Grounding

6.7.3.1. Every person (including visitors) handling ESD sensitive (ESDS) items wear wrist strap, heel strap or conductive shoes with conductive flooring?
6.7.3.1. If conductive footwear used, conductive flooring also present where operator stand or walk?
6.7.3.2. Garments, hairs or anything closer than 1ft to ESD items measure less than 100V*?
6.7.3.3. Every wrist strap or heel strap/conductive shoes checked daily and result recorded for all DLs?
6.7.3.4. All wrist strap or heel strap checkers calibration up to date?

Device Handling

6.7.4.1. Every ESDS items identified by EIA-471 labels on item or packaging?
6.7.4.2. All ESDS items completely inside properly closed static-shielding containers when not at static-safe workstation?
6.7.4.3. No static charge generators (e.g. plastics) inside shielding containers with ESDS items?
6.7.4.4. All flexible conductive and dissipative package materials inspected before reuse or recycle?

Others

6.7.5.1. Audit result reported to entity ESD control coordinator?
6.7.5.2. Corrective action from previous audits completed?
6.7.5.3. Are audit records complete and on file?