Infrared Emitter
LTE-36B2L-ED

1. Description

LTE-36B2L series is an infrared, 940nm emitting diode in GaAlAs technology with high radiant power. It is molded in T-1¾ package with a water clear lens. It has a narrow viewing angle of 20degrees.

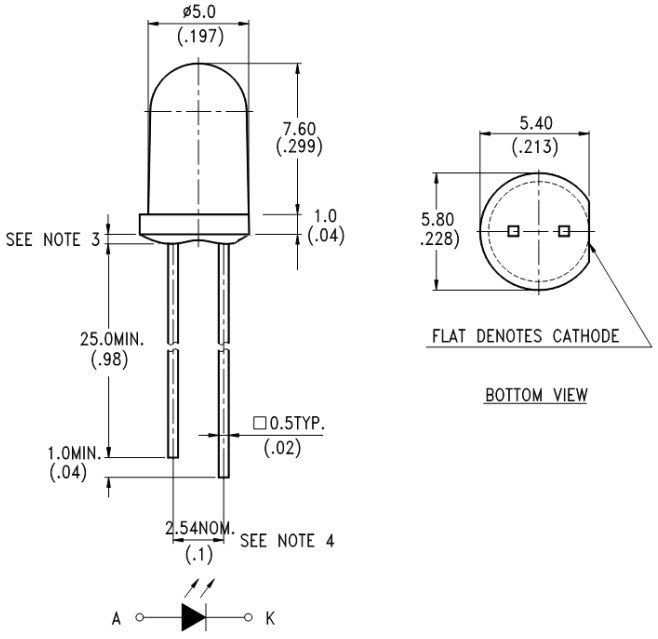
1. 1. Features

- Lead (Pb) free product and RoHS compliant
- 940nm high radiant emitter
- Half Angle= ±10°
- Available for pulse operating
- Water clear lens

1.2. Applications

- Infrared radiation source for cameras
- High speed IR data transmission
- Smoke detector
- Sensor technology

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 0.7mm (.0276”) 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	Symbol	Maximum Rating	Unit
Power Dissipation	P_V	185	mW
Surge Forward Current (tp=100μs)	I_{FSM}	1	A
Continuous Forward Current	I_F	100	mA
Reverse Voltage	V_R	5	V
ESD withstand voltage (MIL-STD-883G~HBM)	V_{ESD}	2	kV
Junction Temperature	Tj	100	°C
Thermal resistance junction – ambient (J-STD-051, leads 7mm soldered on PCB)	R_{thJA}	230	K/W
Operating Temperature Range	T_{amb}	-40°C to + 85°C	
Storage Temperature Range	T_{stg}	-40°C to + 100°C	
Lead Soldering Temperature [2.0mm From Body]	T_{sd}	260°C (max 5 Seconds)	

4. Electrical / Optical Characteristics at TA=25℃

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Radiant Intensity*(see note 1)	I_E	100	170	300	mW/sr	I_F = 100mA, tp=20mS
Radiant Power	Φ_E		45		mW	I_F = 100mA, tp=20mS
Peak Emission Wavelength	λ_P		940		nm	I_F = 100mA, tp=20mS
Spectral Bandwidth	$\Delta\lambda$		40		nm	I_F = 100mA, tp=20mS
Forward Voltage	V_F	1.3	1.4	1.65	V	I_F = 100mA, tp=20mS
Reverse Current*(see note 2)	I_R			10	μA	V_R = 5V
Rise and Fall Time	t_r, t_f		30		ns	I_F = 100mA, 10% to 90%
Half Angle*(see note 3)	$\theta_{1/2}$		±10		deg.	
Temperature Coefficient of λ_P	$TC_{\lambda P}$		0.2		nm/K	I_F = 100mA, tp=20mS
Temperature Coefficient of Φ_E	$TC_{\Phi E}$		-0.5		%/K	I_F = 100mA, tp=20mS
Temperature Coefficient of V_F	TC_{VF}		-1.3		mV/K	I_F = 100mA, tp=20mS

** Note 1: Tolerance ±15% should be considered.*

Note 2: The reverse voltage (Vr) condition is only for testing purpose. This device is not designed for reverse current operation.

Note 3: Viewing angle is emission angle measured at 50% intensity.

5. Typical Electrical / Optical Characteristics Curves

(25℃ Ambient Temperature Unless Otherwise Noted)

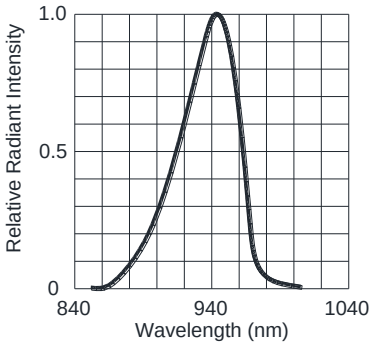


FIG.1 RELATIVE SPECTRAL DISTRIBUTION

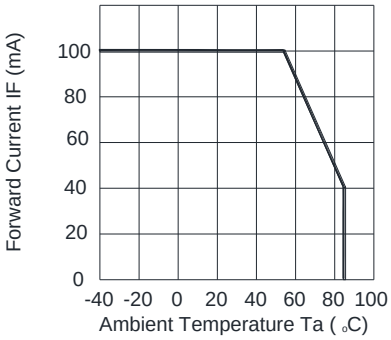


FIG.2 FORWARD CURRENT LIMIT vs. AMBIENT TEMPERATURE

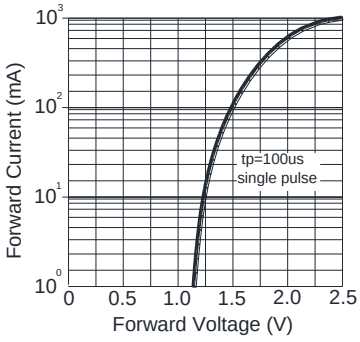


FIG.3 FORWARD CURRENT vs. FORWARD VOLTAGE

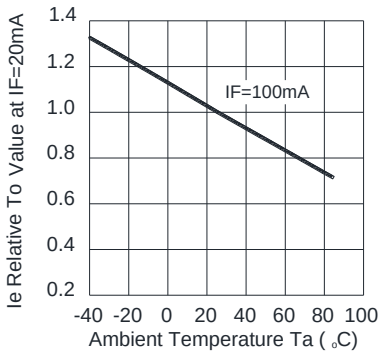


FIG.4 RELATIVE RADIANT INTENSITY vs. AMBIENT TEMPERATURE

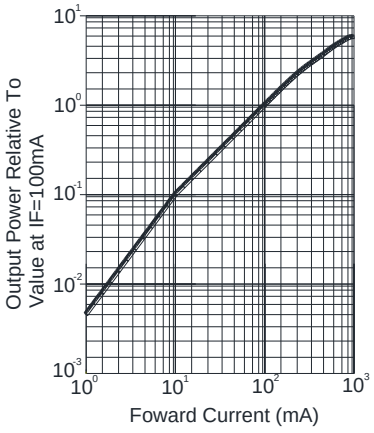


FIG.5 RELATIVE RADIANT INTENSITY VS. FORWARD CURRENT

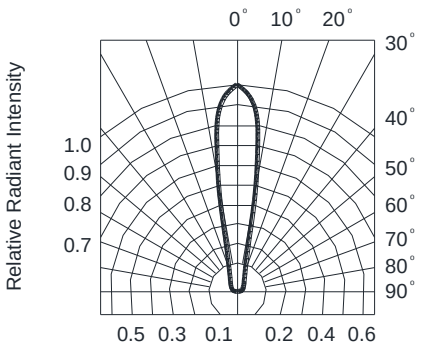


FIG.6 RADIATION DIAGRAM

6. CAUTIONS

6.1. Application

The LEDs described here are intended to be used for ordinary electronic equipment (such as office equipment, communication equipment and household applications). 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 and life support systems and safety devices).

6.2. Storage

The storage ambient for the LEDs should not exceed 30°C temperature or 70% relative humidity. It is recommended that LEDs out of their original packaging are used within three months. For extended storage out of their original packaging, it is recommended that the LEDs be stored in a sealed container with appropriate desiccant or in desiccators with nitrogen ambient. A year of warranty will be provided to this product upon shipment from Liteon. After warranty period, user is advised to seek for Liteon's advice before application.

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:

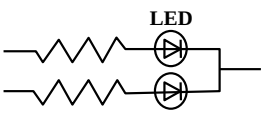
Soldering iron		Wave soldering	
Temperature	350°C Max.	Pre-heat	100°C Max.
Soldering time	3 seconds Max. (one time only)	Pre-heat time	60 seconds Max.
		Solder wave	260°C Max.
Position	No closer than 2mm from the base of the epoxy bulb	Soldering time	5 seconds Max.
		Dipping Position	No lower than 2mm 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.

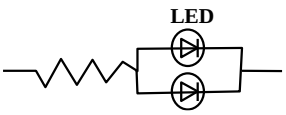
6.6. Drive Method

An 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 1 ft 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?
Note: *50V for Blue LED.

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?