infrared emitting diodes

Features 880 nm

- Nine standard packages in hermetic and low-cost epoxy
- End- and side-radiating packages
- Graded Output
- High efficiency GaAIAs, 880 nm LPE process Delivers twice the power of conventional GaAs 940 nm emitters

Features 940 nm

- Three standard packages in hermetic and low-cost epoxy
- End-radiating packages
- High power GaAs, 940 nm LPE process

Typical Applications

- Computer/Business Equipment
  - Write-Protect Control
  - Margin Controls—Printers
- Industrial
  - LED Light Source—Light Pens
  - Security Systems
  - Safety Shields
- Consumer
  - Coin Counters
  - Lottery Card Readers
  - Position Sensors—Joysticks
  - Remote Controllers—Toys, Appliances, Audio/Visual Equipment
  - Games—Laser Tag
  - Camera Shutter Control

Principle of Operation

Because they emit at wavelengths which provide a close match to the peak spectral response of silicon photodetectors, both GaAs and GaAIAs IREDs are often used with phototransistors.

Datasheets available upon request

Description

Light Emitting Diodes (LEDs) are solid-state P-N junction devices that emit light when forward biased. An IRED is an Infrared Emitting Diode, a term specifically applied to PerkinElmer IR emitters. Unlike incandescent lamps, which emit light over a very broad range of wavelengths, LEDs emit light over such a narrow bandwidth that they appear to be emitting a single "color". Their small size, long operating lifetimes, low power consumption, compatibility with solid-state drive circuitry, and relatively low cost make LEDs the preferred light source in many applications.

LEDs are made from a wide range of semiconductor materials. The emitted peak wavelength depends on the semiconductor material chosen and how it is processed. LEDs can be made that emit in the visible or near-infrared part of the spectrum.

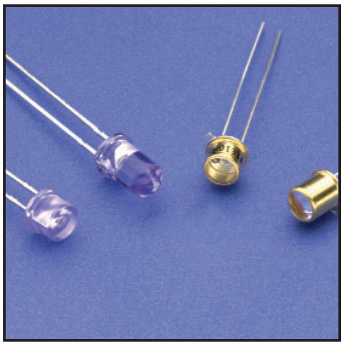
The P-N junction is formed by doping one region of the material with donor atoms and the adjacent region with acceptor atoms. Like all P-N junction devices, LEDs exhibit the familiar diode current-voltage characteristics. LEDs emit light only when they are biased in the forward direction. Under forward-biased conditions, carriers are given enough energy to overcome the potential barrier existing at the junction. After crossing the junction, these carriers will recombine. A percentage of the carriers will recombine by a radiative process in which the hole-electron recombination energy is released as a photon of light. The remaining carriers recombine by a non-radiative process and give up their energy in the form of heat. The amount of light generated, or power output of the LED, varies almost linearly with forward current. Doubling the forward current approximately doubles the power output.

880nm IREDs

This series of infrared emitting diodes (IREDs) consists of three standard chips in nine different packages that provide a broad range of mounting, lens and power-output options.

940nm IREDs

This series of infrared emitting diodes (IREDs) consists of two standard chips in three different packages.



Infrared Emitting Diodes—
VTE Formats 880 nm and 940 nm

GaAlAs Infrared Emitting Diodes
TO-46 Flat Window Package
VTE1063

TO-46 Lensed Package
VTE1163

T- 1 3/4 (5 mm) Plastic Package
VTE1261 VTE1281F VTE1291-2
VTE1262 VTE1281W-1 VTE1291W-1
VTE1281-1 VTE1281W-2 VTE1291W-2
VTE1281-2 VTE1291-1

T- 1 3/4 (5 mm) Bullet Package
VTE1285 VTE1295

Long T-1 (3 mm) Plastic Package
VTE3372LA VTE3374LA

Molded Lateral Package
VTE7172 VTE7173

GaAs Infrared Emitting Diodes
TO-46 Flat Window Package
VTE1013

TO-46 Lensed Package
VTE1113

Long T-1 Plastic Package
VTE3322LA VTE3324LA

VTE 880 nm Series

Technical Specification

Part Number	Irradiance E_e mW/cm^2 min.	Irradiance E_e mW/cm^2 typ.	Output: Irradiance Distance mm	Output: Cond. Diameter mm	Output: Radiant Intensity I_e mW/sr min.	Output: Total Power P_O mW typ.	Test Current I_{FT} mA Pulsed	Forward Drop V_F @ I_{FT} volts typ.	Forward Drop V_F @ I_{FT} volts max.	Half Power Beam Angle $\theta_{1/2}$ typ.
VTE1063	3.8	5	36	6.4	49	80	1000	2.8	3.5	±35°
VTE1163	22	28	36	6.4	285	110	1000	2.8	3.5	±10°
VTE1261	3	3.9	36	6.4	39	20	100	1.5	2	±10°
VTE1262	4	5.2	36	6.4	52	25	100	1.5	2	±10°
VTE1281-1	2.5	3.3	36	6.4	32	20	100	1.5	2	±10°
VTE1281-2	5	6.5	36	6.4	65	25	100	1.5	2	±10°
VTE1281F	0.16	0.21	36	6.4	2.1	20	100	1.5	2	±45°
VTE1281W-1	1.2	1.6	36	6.4	16	20	100	1.5	2	±25°
VTE1281W-2	2.5	3.3	36	6.4	32	25	100	1.5	2	±25°
VTE1285	3	5.5	36	6.4	39	20	100	1.5	2	±8°
VTE1291-1	2.5	3.3	36	6.4	32	20	100	1.5	2	±12°
VTE1291-2	5	6.5	36	6.4	65	25	100	1.5	2	±12°
VTE1291W-1	1.2	1.6	36	6.4	16	20	100	1.5	2	±25°
VTE1291W-2	2.5	3.3	36	6.4	32	25	100	1.5	2	±25°
VTE1295	3	5.5	36	6.4	39	20	100	1.5	2	±8°
VTE3372LA	2	2.6	10.16	2.1	2	3	20	1.3	1.8	±10°
VTE3374LA	4	5.2	10.16	2.1	4.1	5	20	1.3	1.8	±10°
VTE7172	0.4	0.6	16.7	4.6	1.1	2.5	20	1.3	1.8	±25°
VTE7173	0.6	0.8	16.7	4.6	1.7	5	20	1.3	1.8	±25°

Electro-Optical Characteristics @ 25°C

VTE 940 nm Series

Technical Specification

Part Number	Irradiance E_e mW/cm^2 min.	Irradiance E_e mW/cm^2 typ.	Output: Irradiance Distance mm	Output: Cond. Diameter mm	Output: Radiant Intensity I_e mW/sr min.	Output: Total Power P_O mW typ.	Test Current I_{FT} mA Pulsed	Forward Drop V_F @ I_{FT} volts typ.	Forward Drop V_F @ I_{FT} volts max.	Half Power Beam Angle $\theta_{1/2}$ typ.
VTE1013	2.1	2.7	36	6.4	27	30	1000	1.9	2.5	±35°
VTE1113	12	15	36	6.4	156	30	1000	1.9	2.5	±10°
VTE3322LA	1	1.3	10.16	2.1	1	1.5	20	1.25	1.6	±10°
VTE3324LA	2	2.6	10.16	2.1	2	2.5	20	1.25	1.6	±10°

Electro-Optical Characteristics @ 25°C