



element14

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[VTL13D7-20H](#)

[VTE1281FH](#)

**EN**  
This Datasheet is presented by  
the manufacturer

**DE**  
Dieses Datenblatt wird vom  
Hersteller bereitgestellt

**FR**  
Cette fiche technique est  
présentée par le fabricant

# 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
- ▶ **Features 770 nm, 870 nm, 950 nm**
  - Multiple SMD-packages on ceramic substrate
  - High thermal conductivity
  - Superior light uniformity
  - Wide viewing angle
  - End-to-end and side-to-side stackable
- ▶ **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.

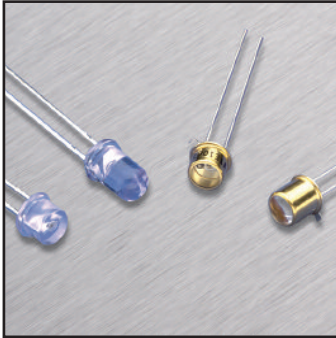
## 880 nm IREDS

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.

## 940 nm IREDS

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

**All infrared emitting diodes are RoHS compliant.**



**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

**Coax Hermetic (with case lead)**

VTE3175L VTE3176L

**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



**CR50IRDA**

- Surface mounting device

**VTE 880 nm Series**

**Technical Specification**

Part Number	Irradiance $E_e$ mW/cm <sup>2</sup>		Irradiance Distance mm	Output Cond. Diameter mm	Radiant Intensity $I_e$ mW/sr min.	Total Power $P_0$ mW typ.	Test Current $I_{FT}$ mA Pulsed	Forward Drop $V_F$ @ $I_{FT}$ volts		Half Power Beam Angle $\theta_{1/2}$ typ.
	min.	typ.						typ.	max.	
VTE1063H	3.8	5	36	6.4	49	80	1000	2.8	3.5	±35°
VTE1163H	22	28	36	6.4	285	110	1000	2.8	3.5	±10°
VTE1261H	3	3.9	36	6.4	39	20	100	1.5	2	±10°
VTE1262H	4	5.2	36	6.4	52	25	100	1.5	2	±10°
VTE1281-1H	2.5	3.3	36	6.4	32	20	100	1.5	2	±10°
VTE1281-2H	5	6.5	36	6.4	65	25	100	1.5	2	±10°
VTE1281FH	0.16	0.21	36	6.4	2.1	20	100	1.5	2	±45°
VTE1281W-1H	1.2	1.6	36	6.4	16	20	100	1.5	2	±25°
VTE1281W-2H	2.5	3.3	36	6.4	32	25	100	1.5	2	±25°
VTE1285H	3	5.5	36	6.4	39	20	100	1.5	2	±8°
VTE1291-1H	2.5	3.3	36	6.4	32	20	100	1.5	2	±12°
VTE1291-2H	5	6.5	36	6.4	65	25	100	1.5	2	±12°
VTE1291W-1H	1.2	1.6	36	6.4	16	20	100	1.5	2	±25°
VTE1291W-2H	2.5	3.3	36	6.4	32	25	100	1.5	2	±25°
VTE1295H	3	5.5	36	6.4	39	20	100	1.5	2	±8°
VTE3175LH	0.65	—	13.6	5.1	1.2	—	20	1.3	1.8	±10°
VTE3176LH	1.65	—	13.6	5.1	3.1	—	20	1.3	1.8	±10°
VTE3372LAH	2	2.6	10.16	2.1	2	3	20	1.3	1.8	±10°
VTE3374LAH	4	5.2	10.16	2.1	4.1	5	20	1.3	1.8	±10°
VTE7172H	0.4	0.6	16.7	4.6	1.1	2.5	20	1.3	1.8	±25°
VTE7173H	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 <sup>2</sup>		Irradiance Distance mm	Output Cond. Diameter mm	Radiant Intensity $I_e$ mW/sr min.	Total Power $P_0$ mW typ.	Test Current $I_{FT}$ mA Pulsed	Forward Drop $V_F$ @ $I_{FT}$ volts		Half Power Beam Angle $\theta_{1/2}$ typ.
	min.	typ.						typ.	max.	
VTE1013H	2.1	2.7	36	6.4	27	30	1000	1.9	2.5	±35°
VTE1113H	12	15	36	6.4	156	30	1000	1.9	2.5	±10°
VTE3322LAH	1	1.3	10.16	2.1	1	1.5	20	1.25	1.6	±10°
VTE3324LAH	2	2.6	10.16	2.1	2	2.5	20	1.25	1.6	±10°

Electro-Optical Characteristics @ 25°C

**Technical Specification**

Part Number	Package*	Peak Wavelength	Radiant Flux $\Phi_e$		Rise/Fall Time tr/tf (ns)	Forward Voltage $V_F$		Forward Current $I_F$	Orientation
			50 mA	20 mA		50 mA	20 mA		
CR10IRD	Ceramic SMD (A1)	770	6.3	2.4	40/30	1.75	1.6	75	Anode
CR10IRDA	Ceramic SMD (A1)	870	20	8.2	30/15	1.5	1.4	75	Anode
CR10IRH	Ceramic SMD (A1)	870	10.6	4.5	1500/800	N/A	1.35	75	Anode
CR10IRK	Ceramic SMD (A1)	950	11.4	4.4	500/500	1.35	1.2	80	Anode
CR50IRD	Ceramic SMD (A2)	770	6.3	2.4	40/30	1.75	1.6	75	Anode
CR50IRDA	Ceramic SMD (A2)	870	20	8.2	30/15	1.5	1.4	75	Cathode
CR50IRH	Ceramic SMD (A2)	870	10.6	4.5	1500/800	N/A	1.35	75	Anode
CR50IRK	Ceramic SMD (A2)	950	11.4	4.4	500/500	1.35	1.2	80	Cathode

\* All packages are listed on our website.



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