



## Infrared Emitting Diode, 950 nm, GaAs

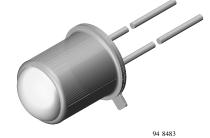
#### **Description**

TSTS710. series are infrared emitting diodes in standard GaAs technology in a hermetically sealed TO-18 package. Their glass lenses provide a very high radiant intensity without external optics.

#### **Features**

- Very high radiant intensity
- Suitable for pulse operation
- Narrow angle of half intensity  $\varphi = \pm 5^{\circ}$
- Peak wavelength  $\lambda_p = 950 \text{ nm}$
- High reliability
- · Good spectral matching to Si photodetectors
- Lead (Pb)-free component
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC





## **Applications**

• Radiation source in near infrared range

#### **Absolute Maximum Ratings**

T<sub>amb</sub> = 25 °C, unless otherwise specified

Parameter	Test condition	Symbol	Value	Unit
Reverse voltage		V <sub>R</sub>	5	V
Forward current	T <sub>case</sub> ≤ 25 °C	I <sub>F</sub>	250	mA
Peak forward current	$t_p/T = 0.5, t_p \le 100 \mu s,$ $T_{case} \le 25 ^{\circ}C$	I <sub>FM</sub>	500	mA
Surge forward current	t <sub>p</sub> ≤ 100 μs	I <sub>FSM</sub>	2.5	Α
Power dissipation		P <sub>V</sub>	170	mW
	T <sub>case</sub> ≤ 25 °C	P <sub>V</sub>	500	mW
Junction temperature		T <sub>j</sub>	100	°C
Storage temperature range		T <sub>stg</sub>	- 55 to + 100	°C
Thermal resistance junction/ ambient		R <sub>thJA</sub>	450	K/W
Thermal resistance junction/ case		R <sub>thJC</sub>	150	K/W

#### **Electrical Characteristics**

 $T_{amb}$  = 25 °C, unless otherwise specified

Parameter	Test condition	Symbol	Min	Тур.	Max	Unit
Forward voltage	$I_F = 100 \text{ mA}, t_p \le 20 \text{ ms}$	V <sub>F</sub>		1.3	1.7	V
Breakdown voltage	I <sub>R</sub> = 100 μA	V <sub>(BR)</sub>	5			V
Junction capacitance	$V_R = 0 \text{ V, } f = 1 \text{ MHz, } E = 0$	C <sub>j</sub>		30		pF

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#### **Optical Characteristics**

 $T_{amb}$  = 25 °C, unless otherwise specified

Parameter	Test condition	Symbol	Min	Тур.	Max	Unit
Radiant power	$I_F = 100 \text{ mA}, t_p \le 20 \text{ ms}$	φ <sub>e</sub>		7		mW
Temp. coefficient of φ <sub>e</sub>	I <sub>F</sub> = 100 mA	TKφ <sub>e</sub>		- 0.8		%/K
Angle of half intensity		φ		± 5		deg
Peak wavelength	I <sub>F</sub> = 100 mA	$\lambda_{p}$		950		nm
Spectral bandwidth	I <sub>F</sub> = 100 mA	Δλ		50		nm
Rise time	$I_F = 1.5 \text{ A}, t_p/T = 0.01, t_p \le 10 \mu\text{s}$	t <sub>r</sub>		400		ns
Fall time	$I_F = 1.5 \text{ A}, t_p/T = 0.01, t_p \le 10 \mu\text{s}$	t <sub>f</sub>		400		ns
Virtual source diameter		Ø		1.5		mm

#### **Type Dedicated Characteristics**

 $T_{amb}$  = 25 °C, unless otherwise specified

Parameter	Test condition	Symbol	Min	Тур.	Max	Unit
Radiant intensity	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	l <sub>e</sub>	10		50	mW/sr

### **Typical Characteristics**

 $T_{amb}$  = 25 °C, unless otherwise specified

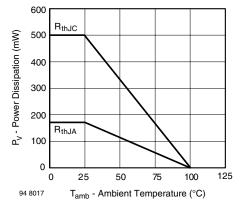


Figure 1. Power Dissipation vs. Ambient Temperature

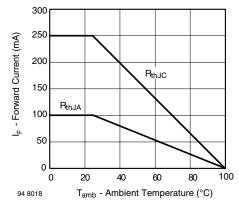


Figure 2. Forward Current vs. Ambient Temperature



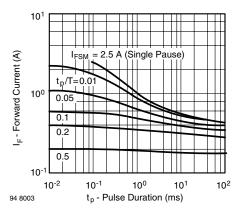


Figure 3. Pulse Forward Current vs. Pulse Duration

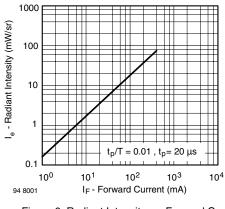


Figure 6. Radiant Intensity vs. Forward Current

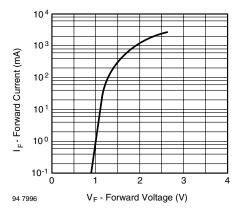


Figure 4. Forward Current vs. Forward Voltage

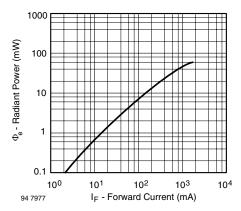


Figure 7. Radiant Power vs. Forward Current

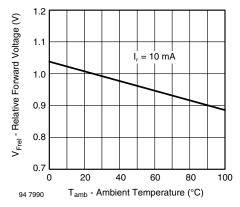


Figure 5. Relative Forward Voltage vs. Ambient Temperature

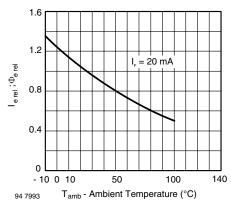
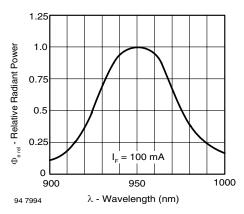


Figure 8. Rel. Radiant Intensity/Power vs. Ambient Temperature







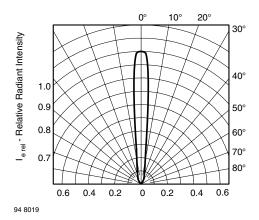
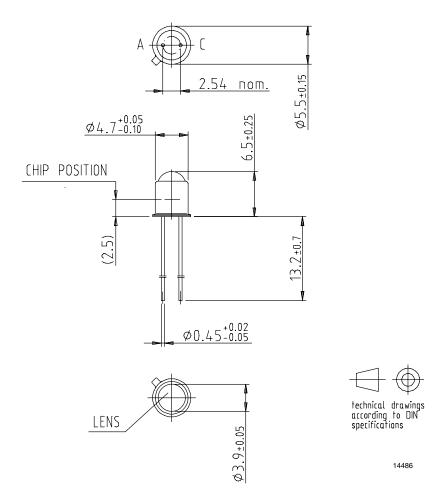


Figure 10. Relative Radiant Intensity vs. Angular Displacement

## **Package Dimensions in mm**





#### **Ozone Depleting Substances Policy Statement**

It is the policy of Vishay Semiconductor GmbH to

- 1. Meet all present and future national and international statutory requirements.
- 2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

Vishay Semiconductor GmbH has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

- 1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
- 2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
- 3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

Vishay Semiconductor GmbH can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

> We reserve the right to make changes to improve technical design and may do so without further notice.

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