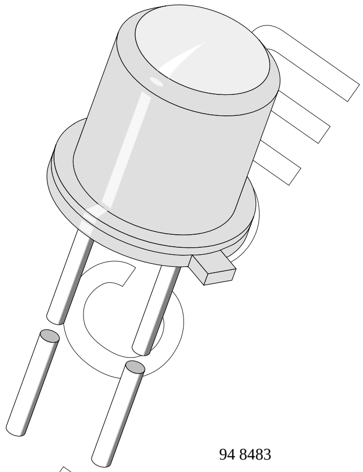
GaAs IR Emitting Diodes in Hermetically Sealed TO18 Case

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.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Features

- Very high radiant intensity
- Suitable for pulse operation
- Narrow angle of half intensity $\varphi = \pm 5^\circ$
- Peak wavelength λ_p = 950 nm
- High reliability
- Good spectral matching to Si photodetectors

Applications

Radiation source in near infrared range

Absolute Maximum Ratings

T_{amb} = 25°C

Parameter	Test Conditions	Symbol	Value	Unit
Reverse Voltage		V_R	5	V
Forward Current	$T_{case} \leqq 25$ °C	I_F	250	mA
Peak Forward Current	$t_p/T = 0.5$, $t_p \leqq 100$ µs, $T_{case} \leqq 25$ °C	I_{FM}	500	mA
Surge Forward Current	$t_p \leqq 100$ µs	I_{FSM}	2.5	A
Power Dissipation		P_V	170	mW
	$T_{case} \leqq 25$ °C	P_V	500	mW
Junction Temperature		T_j	100	°C
Storage Temperature Range		T_{stg}	–55...+100	°C
Thermal Resistance Junction/Ambient		R_{thJA}	450	K/W
Thermal Resistance Junction/Case		R_{thJC}	150	K/W

Basic Characteristics

T_{amb} = 25°C

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
Forward Voltage	I_F = 100 mA, t_p ≦ 20 ms	V_F		1.3	1.7	V
Breakdown Voltage	I_R = 100 μA	$V_{(BR)}$	5			V
Junction Capacitance	V_R = 0 V, f = 1 MHz, E = 0	C_j		30		pF
Radiant Power	I_F = 100 mA, t_p ≦ 20 ms	ϕ_e		7		mW
Temp. Coefficient of ϕ_e	I_F = 100 mA	$TK_{\phi e}$		–0.8		%/K
Angle of Half Intensity		φ		±5		deg
Peak Wavelength	I_F = 100 mA	λ_p		950		nm
Spectral Bandwidth	I_F = 100 mA	Δλ		50		nm
Rise Time	I_F = 1.5 A, t_p/T = 0.01, t_p ≦ 10 μs	t_r		400		ns
Fall Time	I_F = 1.5 A, t_p/T = 0.01, t_p ≦ 10 μs	t_f		400		ns

Type Dedicated Characteristics

T_{amb} = 25°C

Parameter	Test Conditions	Type	Symbol	Min	Typ	Max	Unit
Radiant Intensity	I_F=100mA, t_p=20ms	TSTS7100	I_e	10			mW/sr
		TSTS7101	I_e	12.5		25	mW/sr
		TSTS7102	I_e	20		40	mW/sr
		TSTS7103	I_e	32		64	mW/sr

Typical Characteristics (Tamb = 25°C unless otherwise specified)

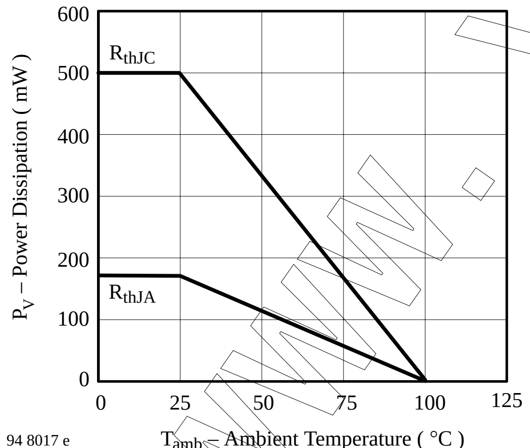


Figure 1. Power Dissipation vs. Ambient Temperature

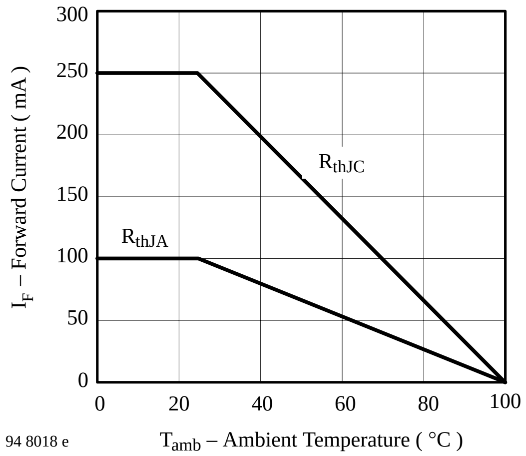


Figure 2. Forward Current vs. Ambient Temperature

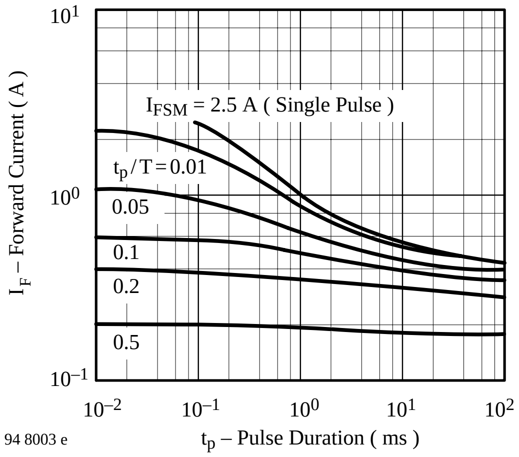


Figure 3. Pulse Forward Current vs. Pulse Duration

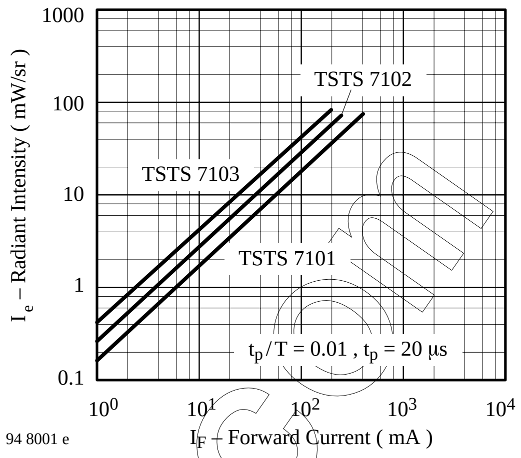


Figure 6. Radiant Intensity vs. Forward Current

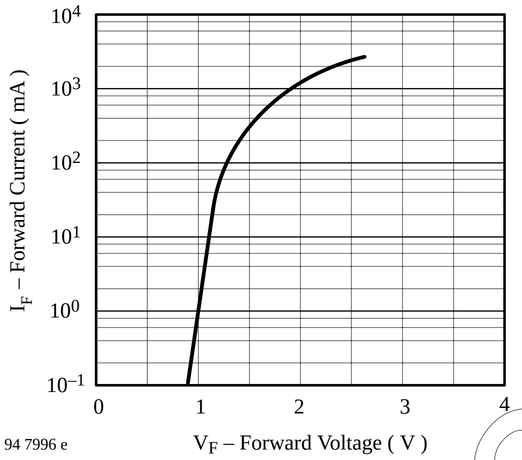


Figure 4. Forward Current vs. Forward Voltage

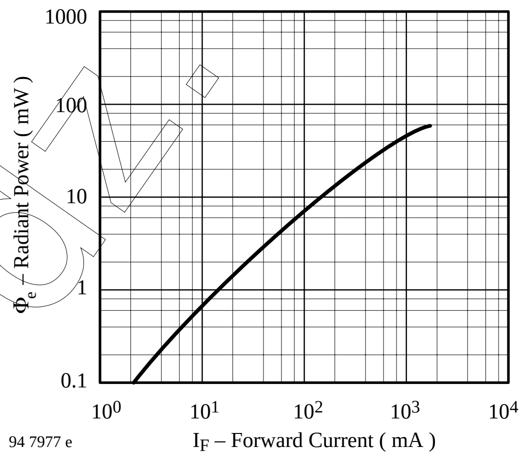


Figure 7. Radiant Power vs. Forward Current

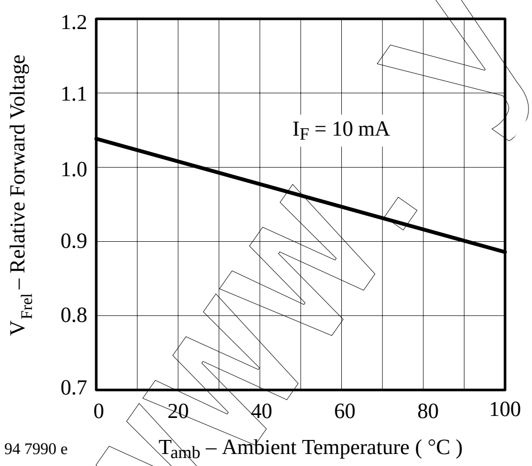


Figure 5. Relative Forward Voltage vs. Ambient Temperature

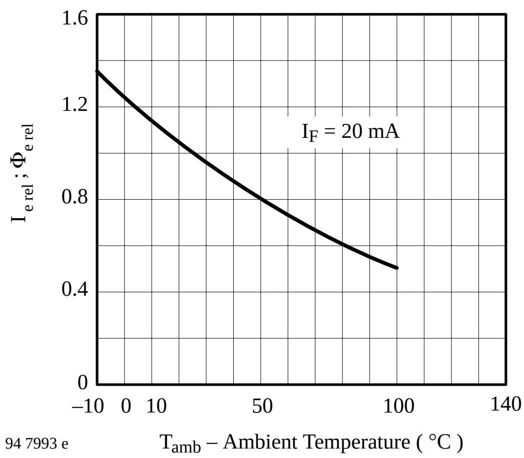


Figure 8. Rel. Radiant Intensity\Power vs. Ambient Temperature

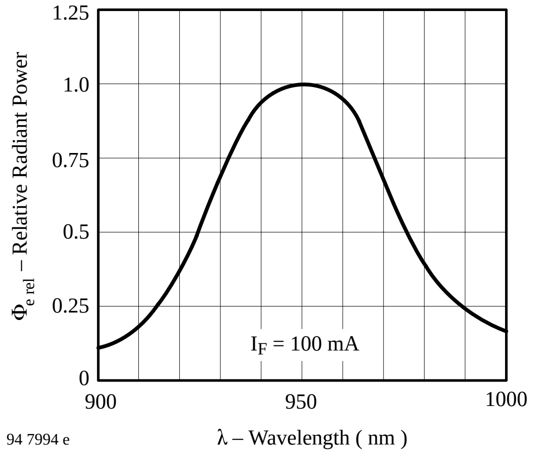


Figure 9. Relative Radiant Power vs. Wavelength

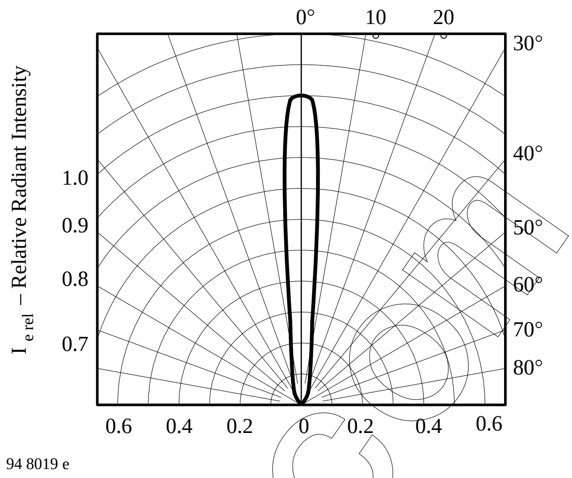
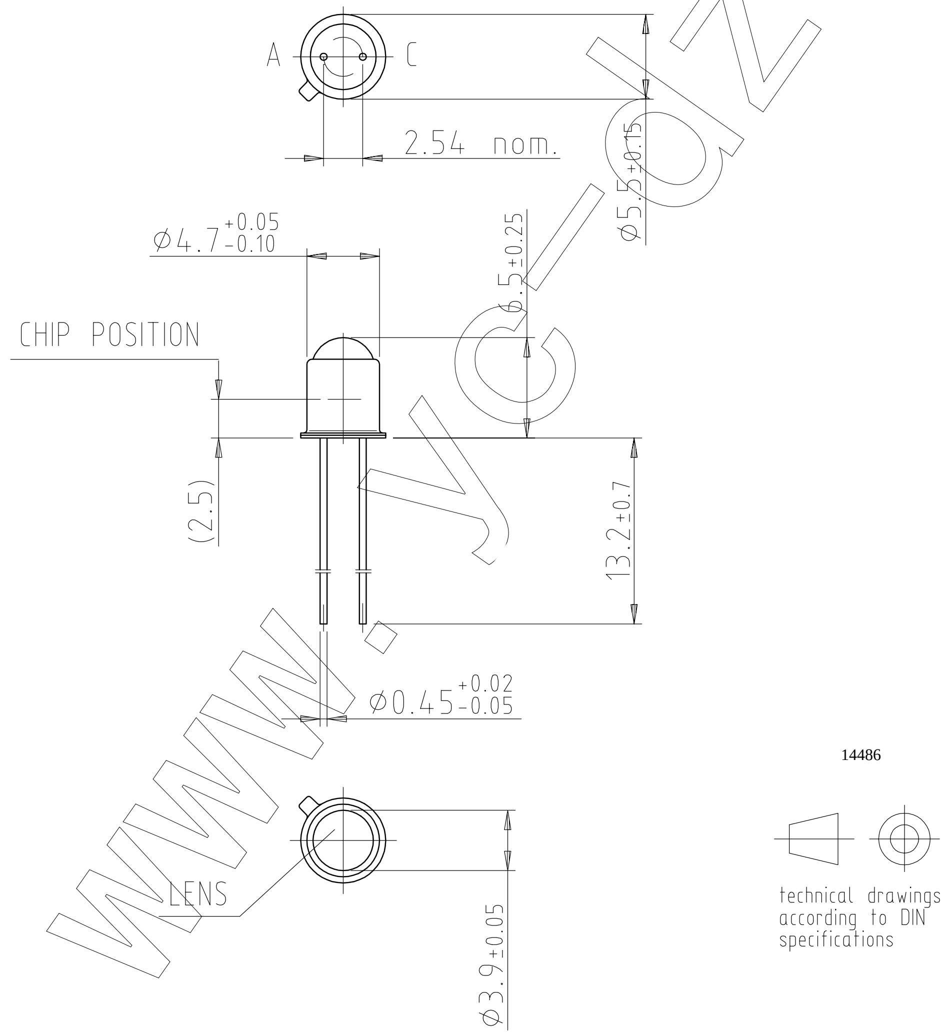


Figure 10. Relative Radiant Intensity vs. Angular Displacement

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.
Parameters can vary in different applications. All operating parameters must be validated for each customer application by the customer. Should the buyer use Vishay Semiconductors products for any unintended or unauthorized application, the buyer shall indemnify Vishay Semiconductors against all claims, costs, damages, and expenses, arising out of, directly or indirectly, any claim of personal damage, injury or death associated with such unintended or unauthorized use.

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