

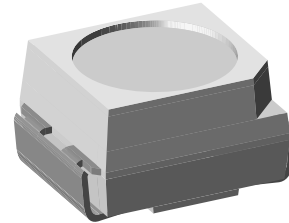
GaAs Infrared Emitting Diode in SMT Package

Description

TSMS3700 is a standard GaAs infrared emitting diode in a miniature PLCC-2 package.

Its flat window provides a wide aperture, making it ideal for use with external optics.

The diode is case compatible to the TEMT3700 phototransistor, allowing the user to assemble his own optical interrupters.



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Features

- SMT IRED with high radiant power
- Low forward voltage
- Compatible with automatic placement equipment
- EIA and ICE standard package
- Suitable for infrared, vapor phase and wavesolder process
- Available in 8 mm tape
- Suitable for DC and high pulse current operation
- Wide angle of half intensity $\phi = \pm 60^\circ$
- Peak wavelength $\lambda_p = 950 \text{ nm}$
- High reliability
- Matching to TEMT3700 phototransistor
- Lead-free device

Applications

- Infrared source in tactile keyboards
- IR diode in low space applications
- Matching with phototransistor TEMT3700 in reflective sensors
- PCB mounted infrared sensors
- Infrared emitter for miniature light barriers

Parts Table

Part	Ordering code	Remarks
TSMS3700	TSMS3700-GS08 TSMS3700-GS18	MOQ: 7500 pcs MOQ: 8000 pcs

Absolute Maximum Ratings

$T_{amb} = 25^\circ\text{C}$, unless otherwise specified

Parameter	Test condition	Symbol	Value	Unit
Reverse Voltage		V_R	5	V
Forward current		I_F	100	mA
Peak Forward Current	$t_p/T = 0.5$, $t_p = 100 \mu\text{s}$	I_{FM}	200	mA
Surge Forward Current	$t_p = 100 \mu\text{s}$	I_{FSM}	1.5	A
Power Dissipation		P_V	170	mW
Junction Temperature		T_j	100	$^\circ\text{C}$
Operating Temperature Range		T_{amb}	- 55 to + 100	$^\circ\text{C}$

Parameter	Test condition	Symbol	Value	Unit
Storage Temperature Range		T_{stg}	- 55 to + 100	°C
Soldering Temperature	$t \leq 10$ sec	T_{sd}	260	°C
Thermal Resistance Junction/Ambient	on PC board	R_{thJA}	450	K/W

Electrical Characteristics

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

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Forward Voltage	$I_F = 100$ mA, $t_p = 20$ ms	V_F		1.3	1.7	V
	$I_F = 1$ A, $t_p = 100$ μ s	V_F		1.8		V
Temp. Coefficient of V_F	$I_F = 100$ mA	TK_{VF}		- 1.3		mV/K
Reverse Current	$V_R = 5$ V	I_R			100	μ A
Junction capacitance	$V_R = 0$ V, $f = 1$ MHz, $E = 0$	C_j		30		pF

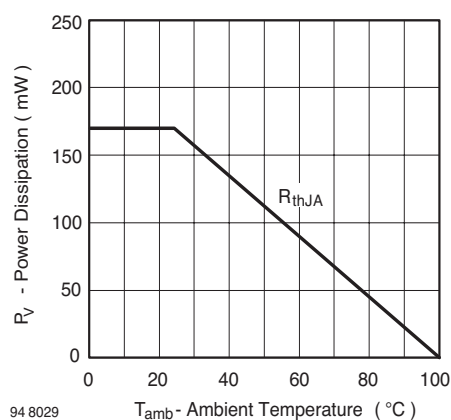
Optical Characteristics

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

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Radiant Intensity	$I_F = 100$ mA, $t_p = 20$ ms	I_e	1.6	4.5	8	mW/sr
	$I_F = 1.5$ A, $t_p = 100$ μ s	I_e		35		mW/sr
Radiant Power	$I_F = 100$ mA, $t_p = 20$ ms	ϕ_e		15		mW
Temp. Coefficient of ϕ_e	$I_F = 100$ mA	TK_{ϕ_e}		- 0.8		%/K
Angle of Half Intensity		ϕ		± 60		deg
Peak Wavelength	$I_F = 100$ mA	λ_p		950		nm
Spectral Bandwidth	$I_F = 100$ mA	$\Delta\lambda$		50		nm
Temp. Coefficient of λ_p	$I_F = 100$ mA	TK_{λ_p}		0.2		nm/K
Rise Time	$I_F = 20$ mA	t_r		800		ns
	$I_F = 1$ A	t_r		400		ns
Fall Time	$I_F = 20$ mA	t_f		800		ns
	$I_F = 1$ A	t_f		400		ns
Virtual Source Diameter		\emptyset		0.5		mm

Typical Characteristics ($T_{amb} = 25$ °C unless otherwise specified)

Figure 1. Power Dissipation vs. Ambient Temperature



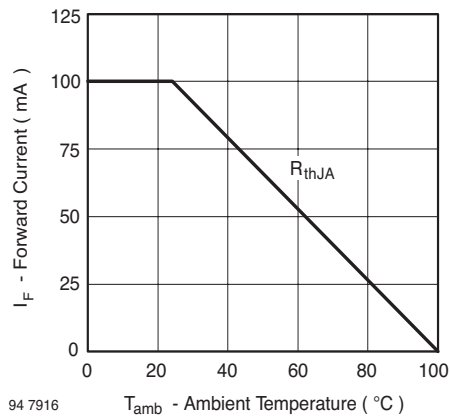


Figure 2. Forward Current vs. Ambient Temperature

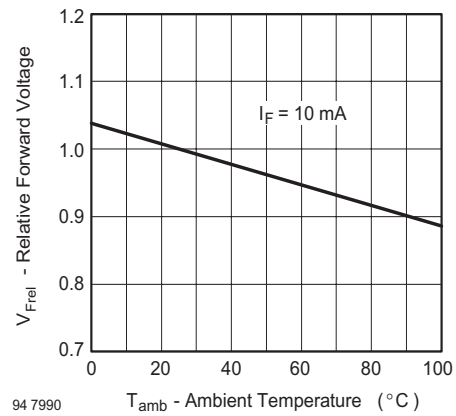


Figure 5. Relative Forward Voltage vs. Ambient Temperature

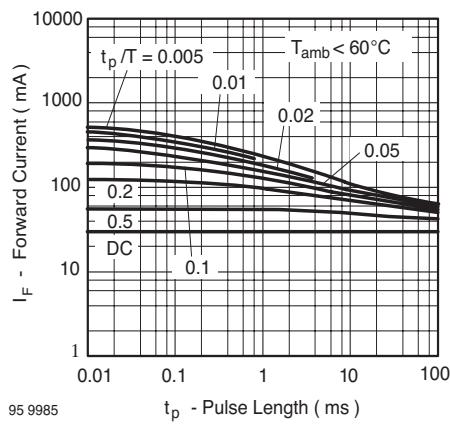


Figure 3. Pulse Forward Current vs. Pulse Duration

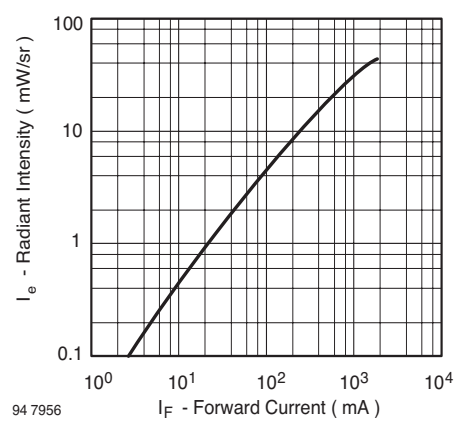


Figure 6. Radiant Intensity vs. Forward Current

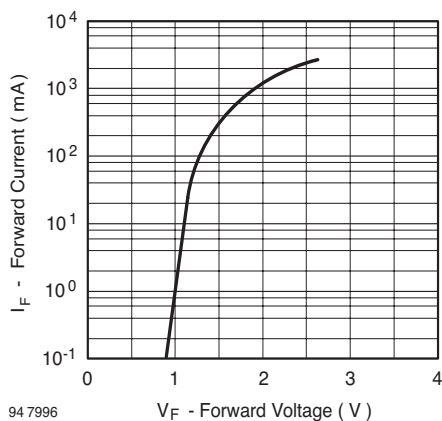


Figure 4. Forward Current vs. Forward Voltage

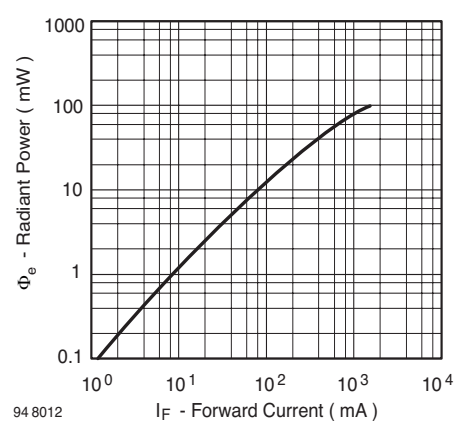


Figure 7. Radiant Power vs. Forward Current

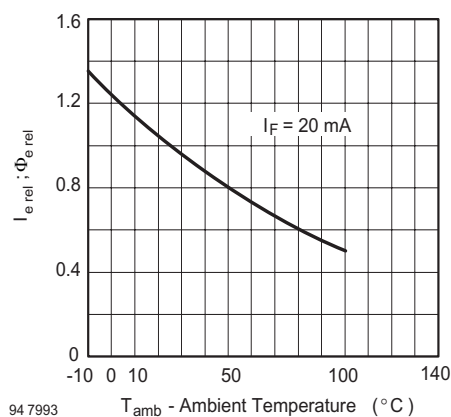


Figure 8. Rel. Radiant Intensity/Power vs. Ambient Temperature

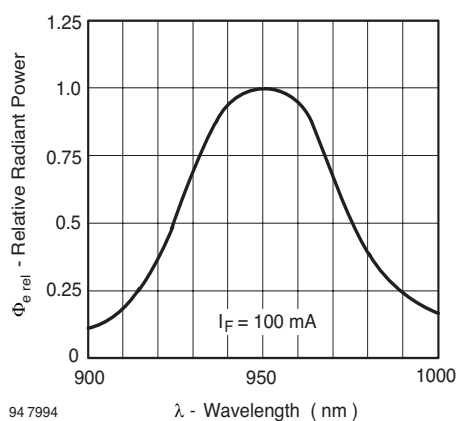


Figure 9. Relative Radiant Power vs. Wavelength

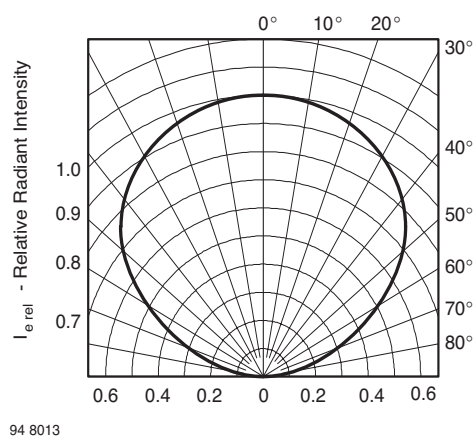
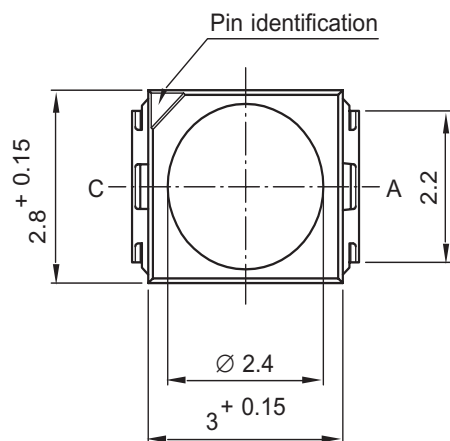
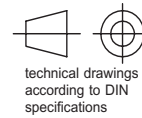
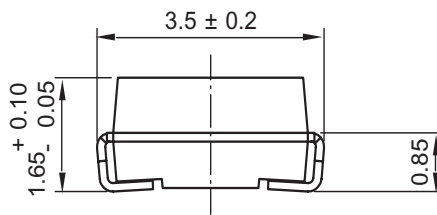
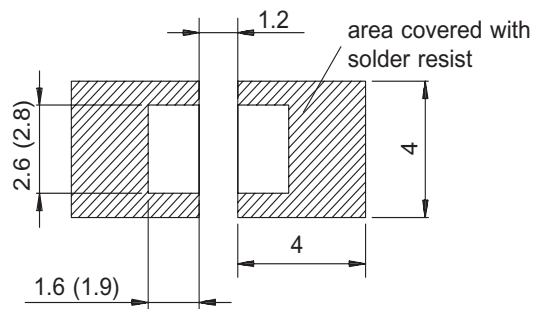


Figure 10. Relative Radiant Intensity vs. Angular Displacement

Package Dimensions in mm



Mounting Pad Layout



Dimensions: IR and Vaporphase
(Wave Soldering)

Drawing-No. : 6.541-5025.01-4
Issue: 7; 05.04.04

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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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