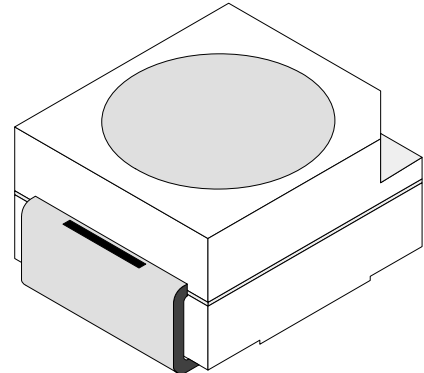


## GaAs Infrared Emitting Diode in SMT Package

### Description

TSMS3700 is a standard GaAs infrared emitting diode in a miniature PL-CC-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 wave-solder process
- Available in 8 mm tape
- Suitable for DC and high pulse current operation
- Wide angle of half intensity  $\varphi = \pm 60^\circ$
- Peak wavelength  $\lambda_p = 950 \text{ nm}$
- High reliability
- Matching to TEMT3700 phototransistor

### 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

### Absolute Maximum Ratings

$T_{amb} = 25^{\circ}\text{C}$

Parameter	Test Conditions	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...+100	$^{\circ}\text{C}$
Storage Temperature Range		$T_{stg}$	-55...+100	$^{\circ}\text{C}$
Soldering Temperature	$t \leq 10\text{sec}$	$T_{sd}$	260	$^{\circ}\text{C}$
Thermal Resistance Junction/Ambient	on PC board	$R_{thJA}$	450	K/W

### Basic Characteristics

$T_{amb} = 25^{\circ}\text{C}$

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
Forward Voltage	$I_F = 100\ \text{mA}$ , $t_p = 20\ \text{ms}$	$V_F$		1.3	1.7	V
	$I_F = 1\ \text{A}$ , $t_p = 100\ \mu\text{s}$	$V_F$		1.8		V
Temp. Coefficient of $V_F$	$I_F = 100\text{mA}$	$TK_{VF}$		-1.3		mV/K
Reverse Current	$V_R = 5\ \text{V}$	$I_R$			100	$\mu\text{A}$
Junction Capacitance	$V_R = 0\ \text{V}$ , $f = 1\ \text{MHz}$ , $E = 0$	$C_j$		30		pF
Radiant Intensity	$I_F = 100\ \text{mA}$ , $t_p = 20\ \text{ms}$	$I_e$	1.6	4.5		mW/sr
	$I_F = 1.5\ \text{A}$ , $t_p = 100\ \mu\text{s}$	$I_e$		35		mW/sr
Radiant Power	$I_F = 100\ \text{mA}$ , $t_p = 20\ \text{ms}$	$\phi_e$		15		mW
Temp. Coefficient of $\phi_e$	$I_F = 100\ \text{mA}$	$TK_{\phi_e}$		-0.8		%/K
Angle of Half Intensity		$\phi$		$\pm 60$		deg
Peak Wavelength	$I_F = 100\ \text{mA}$	$\lambda_p$		950		nm
Spectral Bandwidth	$I_F = 100\ \text{mA}$	$\Delta\lambda$		50		nm
Temp. Coefficient of $\lambda_p$	$I_F = 100\ \text{mA}$	$TK_{\lambda_p}$		0.2		nm/K
Rise Time	$I_F = 20\ \text{mA}$	$t_r$		800		ns
	$I_F = 1\ \text{A}$	$t_r$		400		ns
Fall Time	$I_F = 20\ \text{mA}$	$t_f$		800		ns
	$I_F = 1\ \text{A}$	$t_f$		400		ns

**Typical Characteristics** ( $T_{amb} = 25^{\circ}\text{C}$  unless otherwise specified)

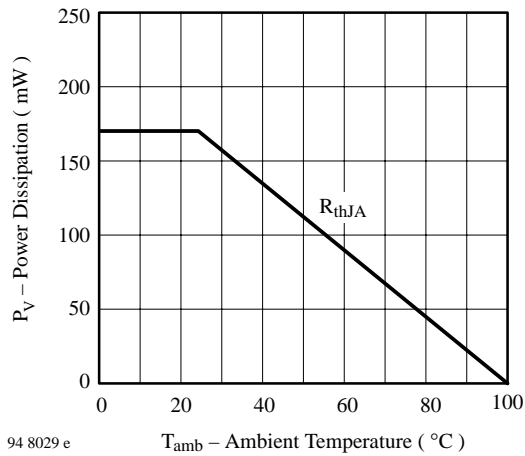


Figure 1. Power Dissipation vs. Ambient Temperature

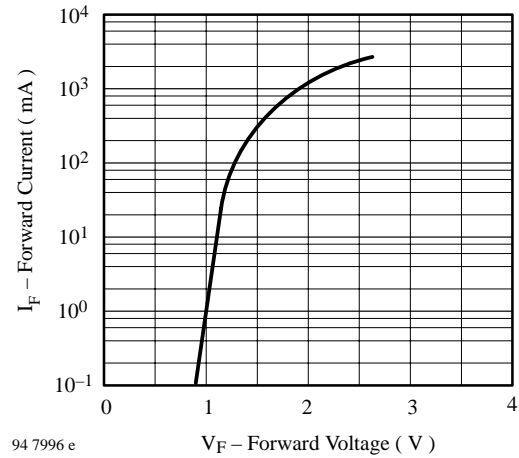


Figure 4. Forward Current vs. Forward Voltage

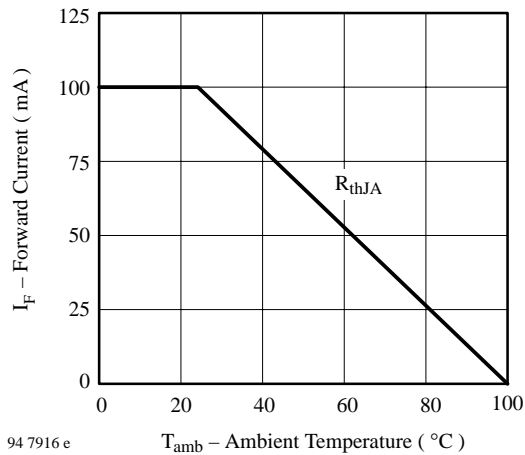


Figure 2. Forward Current vs. Ambient Temperature

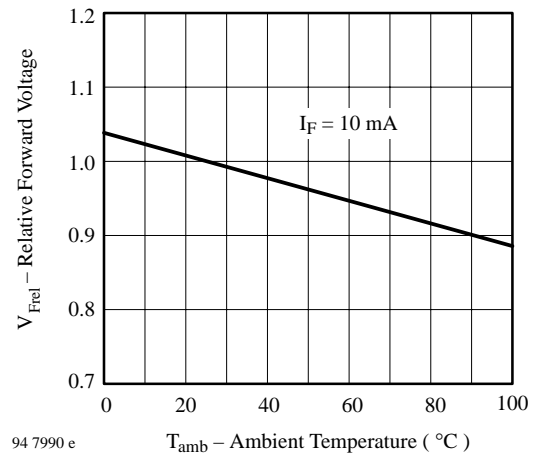


Figure 5. Relative Forward Voltage vs. Ambient Temperature

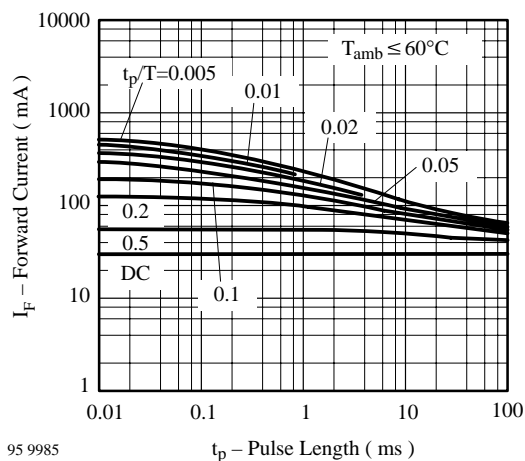


Figure 3. Pulse Forward Current vs. Pulse Duration

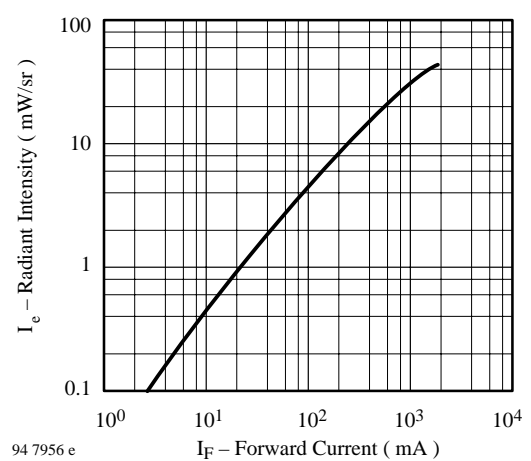


Figure 6. Radiant Intensity vs. Forward Current

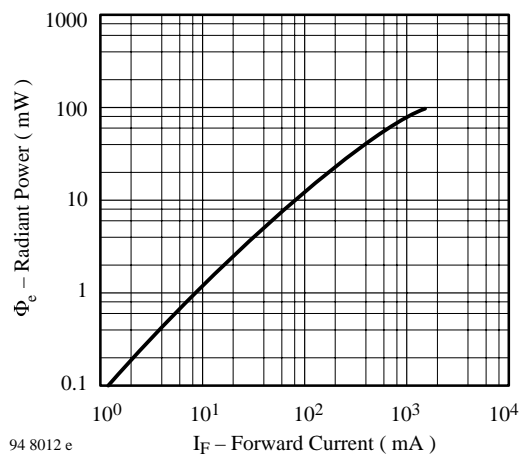


Figure 7. Radiant Power vs. Forward Current

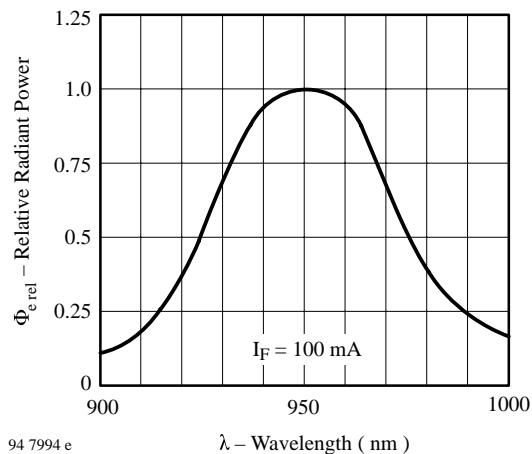


Figure 9. Relative Radiant Power vs. Wavelength

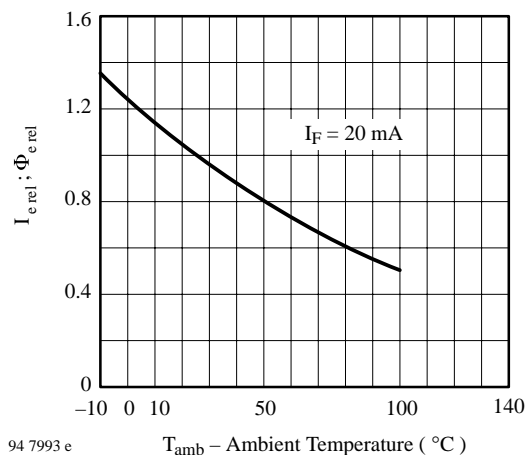


Figure 8. Rel. Radiant Intensity/Power vs. Ambient Temperature

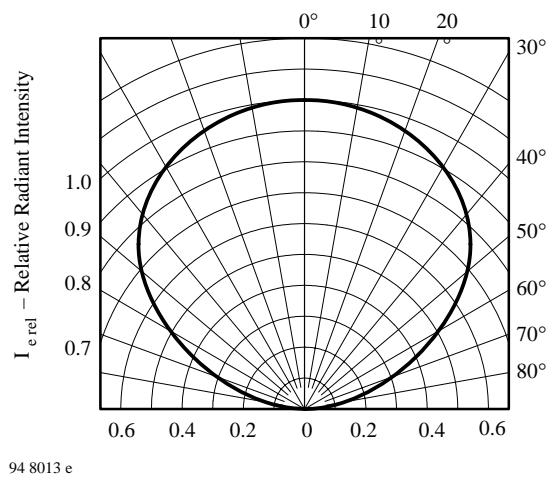
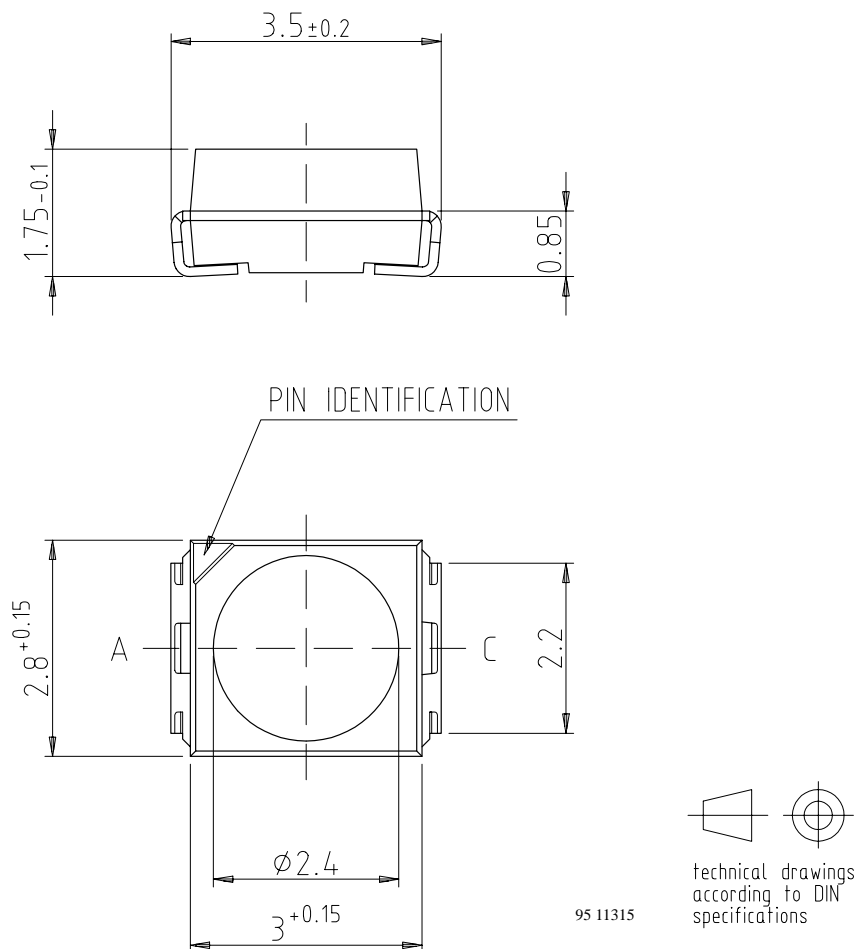


Figure 10. Relative Radiant Intensity vs. Angular Displacement

**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-Telefunken products for any unintended or unauthorized application, the buyer shall indemnify Vishay-Telefunken 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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