



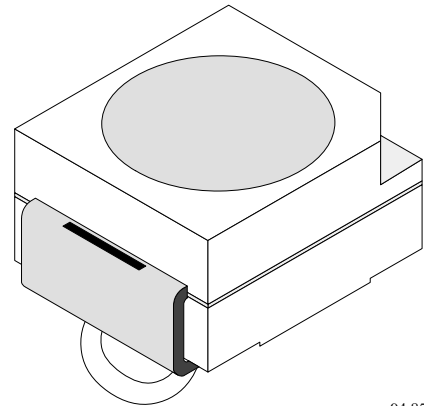
GaAlAs/GaAlAs Infrared Emitting Diode in SMT Package

Description

TSMF3700 is a high speed infrared emitting diode in GaAlAs on GaAlAs double hetero (DH) technology in a miniature PL-CC-2 SMD package.

It has been designed to meet the increasing demand on optoelectronic devices for surface mounting.

The package consists of a lead frame which is surrounded with a white thermoplast. The reflector inside the package is filled up with clear epoxy.



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Features

- SMT IRED with extra 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 pulse current operation
- Extra wide angle of half intensity $\phi = \pm 60^\circ$
- Peak wavelength $\lambda_p = 870 \text{ nm}$
- High reliability

Applications

Infrared source in tactile keyboards

IR diode in low space applications

High performance PCB mounted infrared sensors

High power infrared emitter for miniature light barriers

Absolute Maximum Ratings

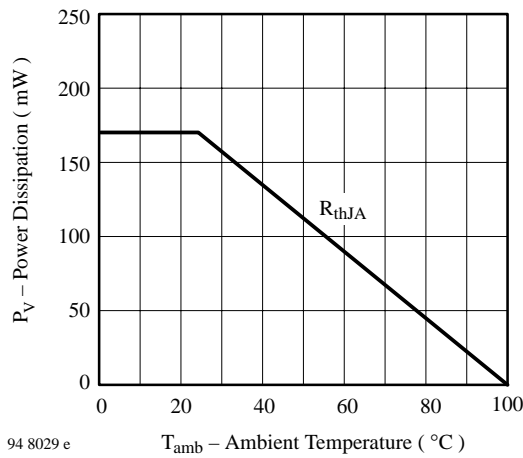
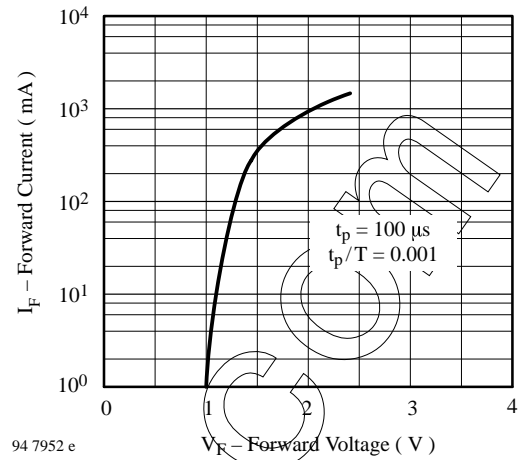
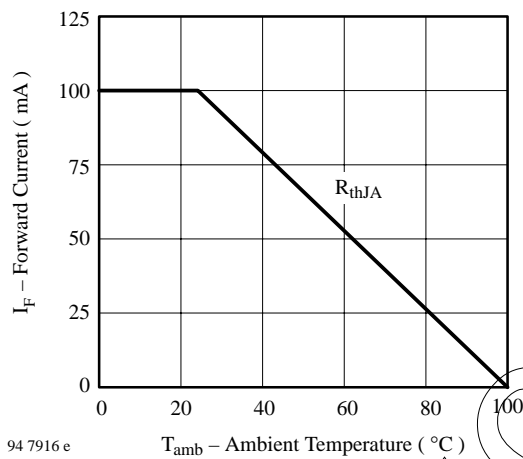
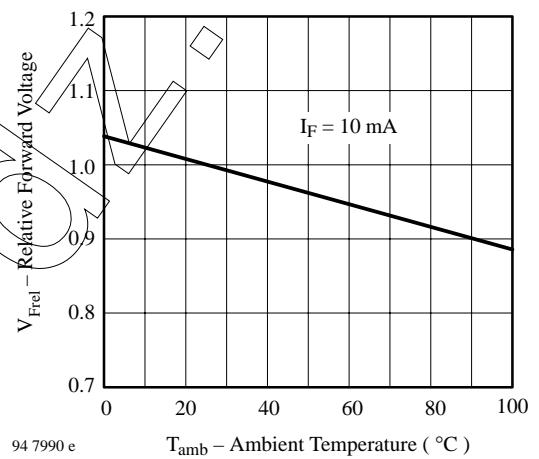
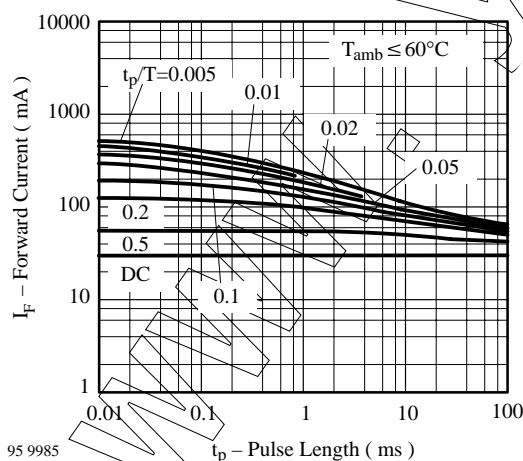
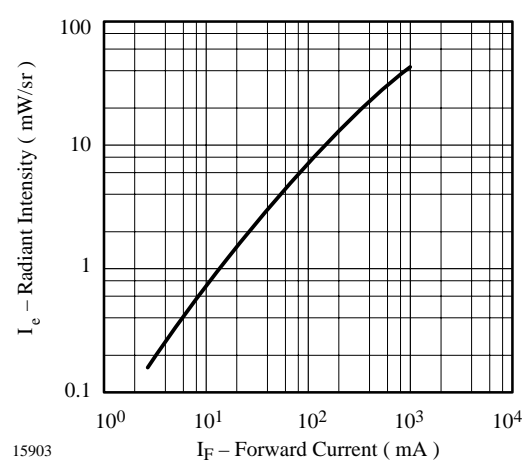
 $T_{amb} = 25^{\circ}\text{C}$

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	A
Power Dissipation		P_V	160	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		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		1.4	1.7	V
	$I_F = 1\ \text{A}$, $t_p = 100\ \mu\text{s}$	V_F		2.4		V
Temp. Coefficient of V_F	$I_F = 100\ \text{mA}$	TK_{VF}		-1.7		mV/K
Reverse Current	$V_R = 5\ \text{V}$	I_R			10	μA
Junction Capacitance	$V_R = 0\ \text{V}$, $f = 1\ \text{MHz}$, $E = 0$	C_j		160		pF
Radiant Intensity	$I_F = 100\ \text{mA}$, $t_p = 20\ \text{ms}$	I_e		7		mW/sr
	$I_F = 1\ \text{A}$, $t_p = 100\ \mu\text{s}$	I_e		60		mW/sr
Radiant Power	$I_F = 100\ \text{mA}$, $t_p = 20\ \text{ms}$	ϕ_e		32		mW
Temp. Coefficient of ϕ_e	$I_F = 100\ \text{mA}$	TK_{ϕ_e}		-0.8		%/K
Angle of Half Intensity		ϕ		± 60		deg
Peak Wavelength	$I_F = 100\ \text{mA}$	λ_p		870		nm
Spectral Bandwidth	$I_F = 100\ \text{mA}$	$\Delta\lambda$		40		nm
Temp. Coefficient of λ_p	$I_F = 100\ \text{mA}$	TK_{λ_p}		0.2		nm/K
Rise Time	$I_F = 100\ \text{mA}$	t_r		30		ns
Fall Time	$I_F = 100\ \text{mA}$	t_f		30		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

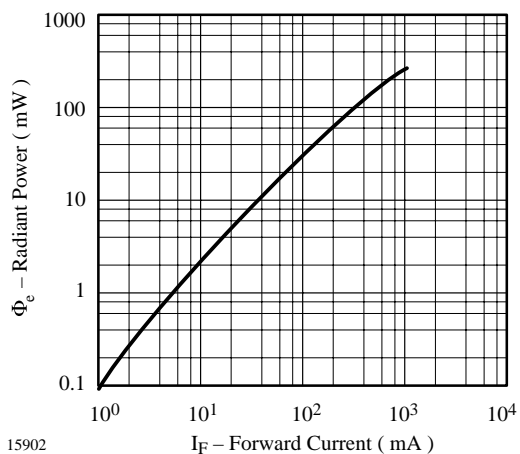


Figure 7. Radiant Power vs. Forward Current

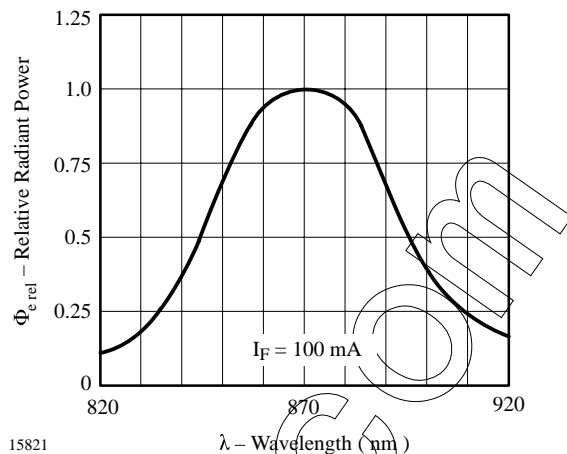


Figure 9. Relative Radiant Power vs. Wavelength

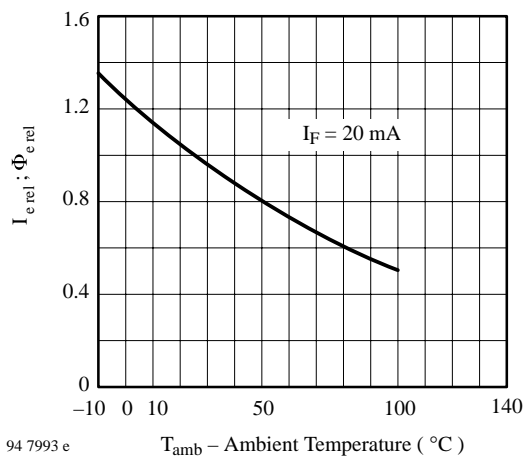


Figure 8. Rel. Radiant Intensity/Power vs. Ambient Temperature

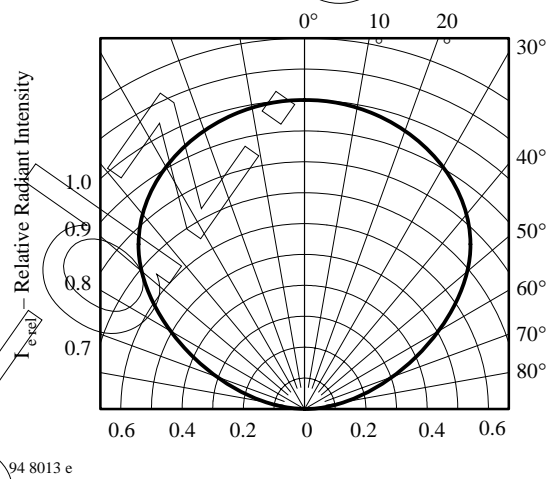
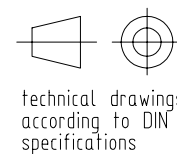
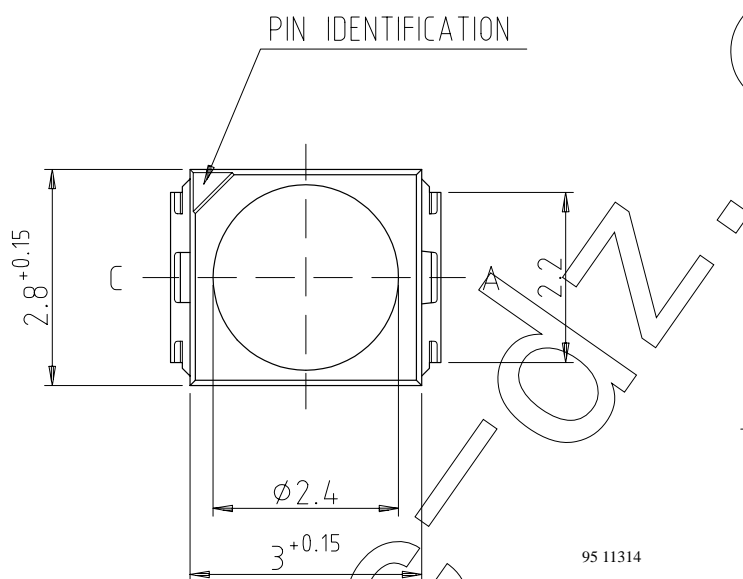
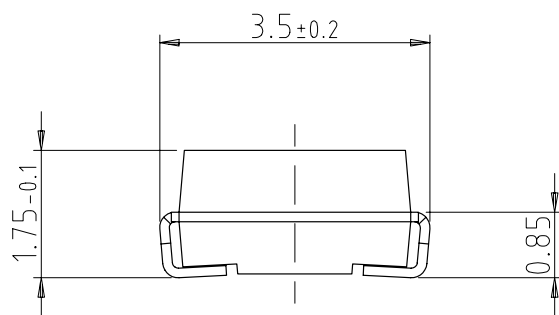
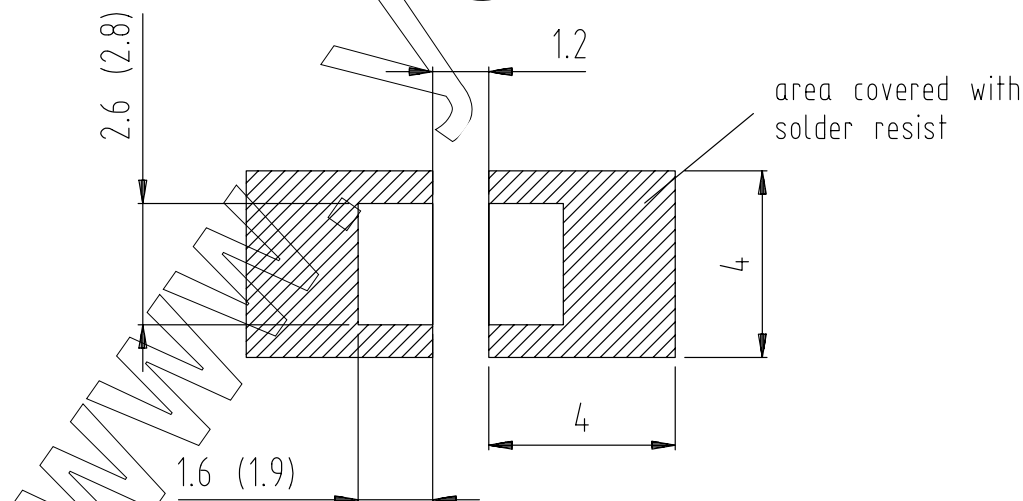


Figure 10. Relative Radiant Intensity vs. Angular Displacement

Dimensions in mm

Solderpad Design in mm


Dimensions: IR and Vaporphase
(Wave Soldering)

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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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