

# **TSSS2600**

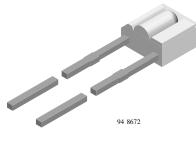
#### Vishay Semiconductors

# Infrared Emitting Diode, 950 nm, GaAs

#### Description

TSSS2600 is a miniature infrared emitting diode in GaAs on GaAs technology, molded in a clear, untinted plastic package with cylindrical side view lens.

The device is spectrally matched to silicon photodiodes and phototransistors.



#### Features

- Low forward voltage
- · Suitable for DC and high pulse current operation
- Side view emitter for miniature design
- Horizontal angle of half intensity ± 25°
- Vertical angle of half intensity ± 60°
- 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

#### Absolute Maximum Ratings

- 25 °C unless otherwise specified

I amb = 25 °C, unless otherwise	specified			
Parameter	Test condition	Symbol	Value	Unit
Reverse voltage		V <sub>R</sub>	5	V
Forward current		١ <sub>F</sub>	100	mA
Peak forward current	t <sub>p</sub> /T = 0.5, t <sub>p</sub> = 100 μs	I <sub>FM</sub>	200	mA
Surge forward current	t <sub>p</sub> = 100 μs	I <sub>FSM</sub>	2	A
Power dissipation		P <sub>V</sub>	170	mW
Junction temperature		Тj	100	°C
Operating temperature range		T <sub>amb</sub>	- 55 to + 100	°C
Storage temperature range		T <sub>stg</sub>	- 55 to + 100	°C
Soldering temperature	$t \leq$ 5 sec, 2 mm from case	T <sub>sd</sub>	260	°C
Thermal resistance junction/ ambient		R <sub>thJA</sub>	450	K/W



#### **Applications**

· Infrared source in miniature light barriers or reflective sensor systems with short transmission distances and low forward voltage requirements. Matching with silicon PIN photodiodes or phototransistors (e.g. TEST2600)

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### **Electrical Characteristics**

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

Parameter	Test condition	Symbol	Min	Тур.	Max	Unit
Forward voltage	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	V <sub>F</sub>		1.25	1.6	V
	I <sub>F</sub> = 1.5 A, t <sub>p</sub> = 100 μs	V <sub>F</sub>		2.2		V
Temp. coefficient of V <sub>F</sub>	I <sub>F</sub> = 100 mA	TK <sub>VF</sub>		- 1.3		mV/K
Reverse current	V <sub>R</sub> = 5 V	I <sub>R</sub>			100	μΑ
Junction capacitance	V <sub>R</sub> = 0 V, f = 1 MHz, E = 0	Cj		30		pF

## **Optical Characteristics**

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

Parameter	Test condition	Symbol	Min	Тур.	Max	Unit
Radiant intensity	$I_{F} = 100 \text{ mA}, t_{p} = 20 \text{ ms}$	Ι <sub>e</sub>	1	2.6	3	mW/sr
	$I_F = 1.5 \text{ A}, t_p = 100 \ \mu \text{s}$	Ι <sub>e</sub>		25		mW/sr
Radiant power	I <sub>F</sub> = 100 mA, t <sub>p</sub> = 20 ms	φ <sub>e</sub>		20		mW
Temp. coefficient of $\phi_{e}$	l <sub>F</sub> = 100 mA	TKφ <sub>e</sub>		- 0.8		%/K
Angle of half intensity	horizontal	φ1		± 25		deg
	vertical	φ <sub>2</sub>		± 60		deg
Peak wavelength	l <sub>F</sub> = 100 mA	λ <sub>p</sub>		950		nm
Spectral bandwidth	l <sub>F</sub> = 100 mA	Δλ		50		nm
Temp. coefficient of $\lambda_p$	l <sub>F</sub> = 100 mA	ΤΚλ <sub>p</sub>		0.2		nm/K
Rise time	l <sub>F</sub> = 100 mA	t <sub>r</sub>		800		ns
	I <sub>F</sub> = 1.5 A	t <sub>r</sub>		400		ns
Fall time	l <sub>F</sub> = 100 mA	t <sub>f</sub>		800		ns
	I <sub>F</sub> = 1.5 A	t <sub>f</sub>		400		ns
Virtual source diameter		Ø		2		mm

#### **Typical Characteristics**

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

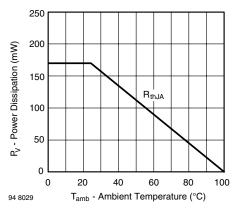


Figure 1. Power Dissipation vs. Ambient Temperature

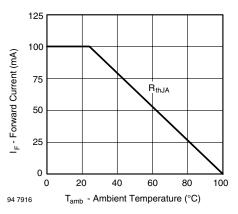


Figure 2. Forward Current vs. Ambient Temperature



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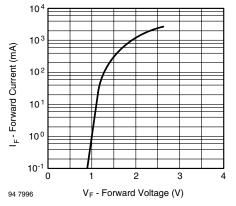


Figure 3. Forward Current vs. Forward Voltage

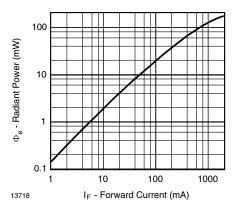


Figure 6. Radiant Power vs. Forward Current

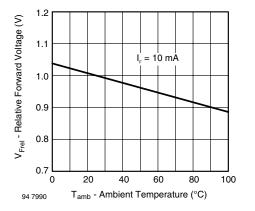


Figure 4. Relative Forward Voltage vs. Ambient Temperature

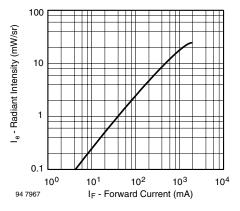


Figure 5. Radiant Intensity vs. Forward Current

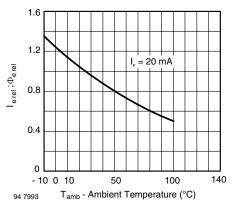


Figure 7. Rel. Radiant Intensity/Power vs. Ambient Temperature

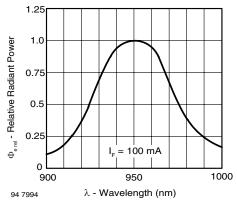


Figure 8. Relative Radiant Power vs. Wavelength

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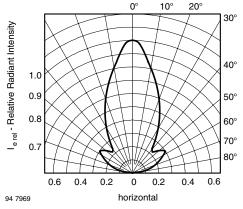


Figure 9. Relative Radiant Intensity vs. Angular Displacement

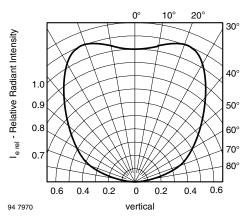
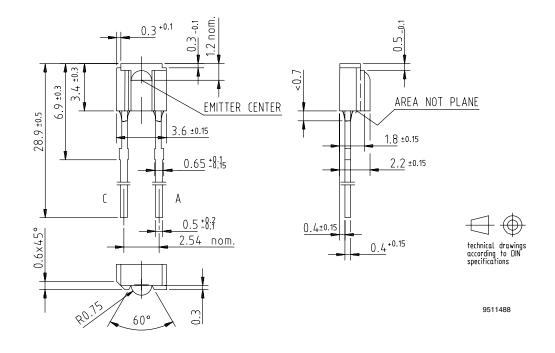


Figure 10. Relative Radiant Intensity vs. Angular Displacement



#### Package Dimensions in mm

4



### **Vishay Semiconductors**

### **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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