

## **TSAL6200**

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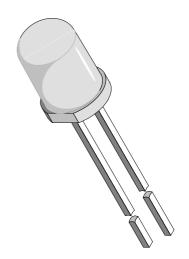
Vishay Telefunken

# GaAs/GaAlAs IR Emitting Diode in ø 5 mm (T–1<sup>3</sup>/<sub>4</sub>) Package

### Description

TSAL6200 is a high efficiency infrared emitting diode in GaAIAs on GaAs technology, molded in clear, bluegrey tinted plastic packages.

In comparison with the standard GaAs on GaAs technology these emitters achieve more than 100 % radiant power improvement at a similar wavelength. The forward voltages at low current and at high pulse current roughly correspond to the low values of the standard technology. Therefore these emitters are ideally suitable as high performance replacements of standard emitters.



## Features

- Extra high radiant power and radiant intensity
- High reliability
- Low forward voltage
- Suitable for high pulse current operation
- Standard T–1<sup>3</sup>/<sub>4</sub> (ø 5 mm) package
- Angle of half intensity  $\varphi = \pm 17^{\circ}$
- Peak wavelength  $\lambda_p = 940 \text{ nm}$
- Good spectral matching to Si photodetectors

## Applications

Infrared remote control units with high power requirements Free air transmission systems Infrared source for optical counters and card readers IR source for smoke detectors

#### **Absolute Maximum Ratings**

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

Parameter	Test Conditions	Symbol	Value	Unit
Reverse Voltage		V <sub>R</sub>	5	V
Forward Current		١ <sub>F</sub>	100	mA
Peak Forward Current	$t_p/T = 0.5, t_p = 100 \ \mu s$	I <sub>FM</sub>	200	mA
Surge Forward Current	t <sub>p</sub> = 100 μs	I <sub>FSM</sub>	1.5	А
Power Dissipation		PV	210	mW
Junction Temperature		Т <sub>і</sub>	100	°C
Operating Temperature Range		T <sub>amb</sub>	-55+100	°C
Storage Temperature Range		T <sub>stg</sub>	-55+100	°C
Soldering Temperature	$t \leq 5sec$ , 2 mm from case	T <sub>sd</sub>	260	°C
Thermal Resistance Junction/Ambient		R <sub>thJA</sub>	350	K/W

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#### **Basic Characteristics**

$I_{amb} = 25^{\circ}C$	T <sub>amb</sub>	=	25°	С
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Parameter	Test Conditions	Symbol	Min	Тур	Max	Unit
Forward Voltage	$I_{F} = 100 \text{ mA}, t_{p} = 20 \text{ ms}$	V <sub>F</sub>		1.35	1.6	V
	$I_{F} = 1 \text{ A}, t_{p} = 100 \mu\text{s}$	V <sub>F</sub>		2.6	3	V
Temp. Coefficient of V <sub>F</sub>	I <sub>F</sub> = 100 mA	TK <sub>VF</sub>		-1.3		mV/K
Reverse Current	$V_R = 5 V$	I <sub>R</sub>			10	μΑ
Junction Capacitance	V <sub>R</sub> = 0 V, f = 1 MHz, E = 0	Ci		25		pF
Radiant Intensity	$I_{F} = 100 \text{ mA}, t_{p} = 20 \text{ ms}$	l <sub>e</sub>	40	60		mW/sr
	$I_{\rm F} = 1.0 \text{ A}, t_{\rm p} = 100 \ \mu \text{s}$	Ι <sub>e</sub>	340	500		mW/sr
Radiant Power	$I_{\rm F} = 100 \text{ mA}, t_{\rm p} = 20 \text{ ms}$	φ <sub>e</sub>		35		mW
Temp. Coefficient of $\phi_e$	I <sub>F</sub> = 20 mA	$TK_{\phie}$		-0.6		%/K
Angle of Half Intensity		φ		±17		deg
Peak Wavelength	I <sub>F</sub> = 100 mA	λρ		940		nm
Spectral Bandwidth	I <sub>F</sub> = 100 mA	Δλ		50		nm
Temp. Coefficient of $\lambda_p$	I <sub>F</sub> = 100 mA	TK <sub>λp</sub>		0.2		nm/K
Rise Time	I <sub>F</sub> = 100 mA	tr		800		ns
Fall Time	I <sub>F</sub> = 100 mA	t <sub>f</sub>		800		ns
Virtual Source Diameter	method: 63% encircled energy	Ø		2.8		mm

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

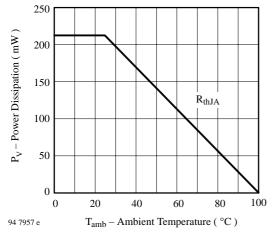


Figure 1. Power Dissipation vs. Ambient Temperature

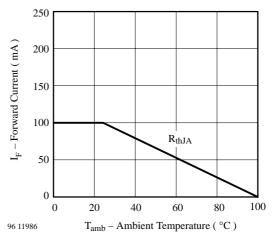
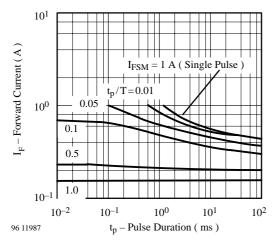


Figure 2. Forward Current vs. Ambient Temperature



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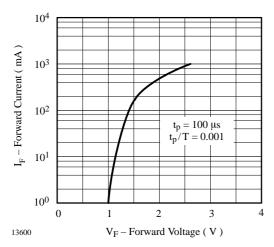
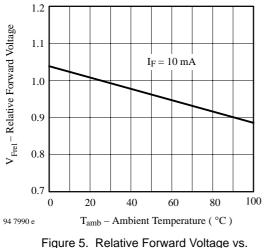


Figure 4. Forward Current vs. Forward Voltage



Ambient Temperature

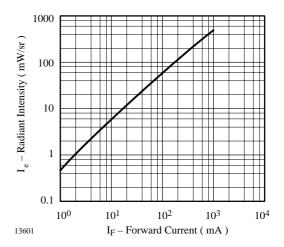


Figure 6. Radiant Intensity vs. Forward Current

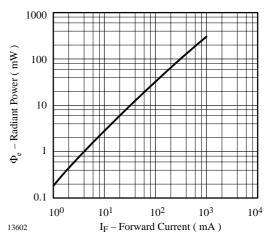


Figure 7. Radiant Power vs. Forward Current

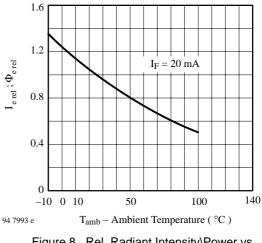


Figure 8. Rel. Radiant Intensity\Power vs. Ambient Temperature

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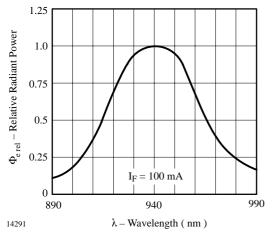
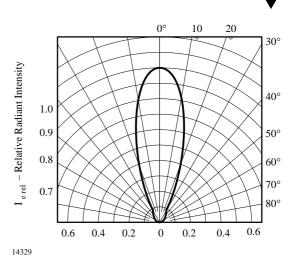


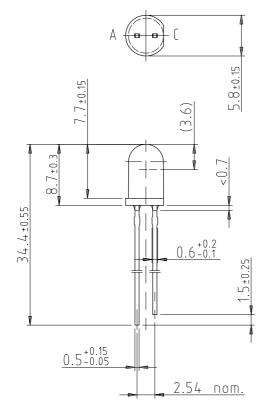
Figure 9. Relative Radiant Power vs. Wavelength

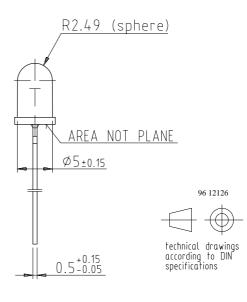


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## **Dimensions in mm**







### **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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