



High Speed Infrared Emitting Diode in T-1 $\frac{3}{4}$ Package

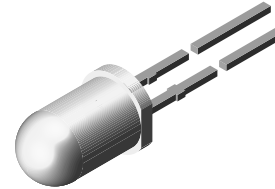
Description

TSHF5210 is a high speed infrared emitting diode in GaAlAs double hetero (DH) technology, molded in a clear, untinted plastic package.

TSHF5210 combines high speed with high radiant power at wavelength of 890 nm.

Features

- High modulation bandwidth
- Extra high radiant power and radiant intensity
- Low forward voltage
- Suitable for high pulse current operation
- Standard package T-1 $\frac{3}{4}$ (\varnothing 5 mm)
- Angle of half intensity $\varphi = \pm 10^\circ$
- Peak wavelength $\lambda_p = 890$ nm
- High reliability
- Good spectral matching to Si photodetectors
- Lead (Pb)-free component
- Component in accordance with RoHS 2002/95/EC and WEEE 2002/96/EC



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Applications

Infrared high speed remote control and free air data transmission systems with high modulation frequencies or high data transmission rate requirements.

TSHF5210 is ideal for the design of transmission systems according to IrDA requirements and for carrier frequency based systems (e.g. ASK / FSK - coded, 450 kHz or 1.3 MHz).

Parts Table

Part	Remarks
TSHF5210	MOQ: 4000 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	180	mW
Junction Temperature		T_j	100	$^\circ\text{C}$
Operating Temperature Range		T_{amb}	- 40 to + 85	$^\circ\text{C}$
Storage Temperature Range		T_{stg}	- 40 to + 100	$^\circ\text{C}$
Soldering Temperature	$t \leq 5$ sec, 2 mm from case	T_{sd}	260	$^\circ\text{C}$
Thermal Resistance Junction/Ambient		R_{thJA}	270	K/W

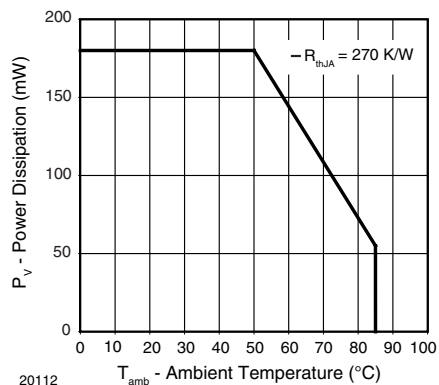


Figure 1. Power Dissipation Limit vs. Ambient Temperature

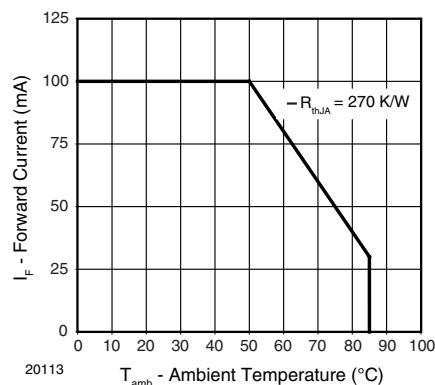


Figure 2. Forward Current Limit vs. Ambient Temperature

Basic Characteristics

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

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Forward Voltage	$I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$	V_F		1.4	1.6	V
	$I_F = 1\text{ A}$, $t_p = 100\text{ }\mu\text{s}$	V_F		2.3		V
Temp. Coefficient of V_F	$I_F = 100\text{ mA}$	TK_{V_F}		-2.1		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		125		pF
Radiant Intensity	$I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$	I_e	68	140	340	mW/sr
	$I_F = 1\text{ A}$, $t_p = 100\text{ }\mu\text{s}$	I_e		1400		mW/sr
Radiant Power	$I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$	ϕ_e		48		mW
Temp. Coefficient of ϕ_e	$I_F = 100\text{ mA}$	TK_{ϕ_e}		-0.35		%/K
Angle of Half Intensity		ϕ		± 10		deg
Peak Wavelength	$I_F = 100\text{ mA}$	λ_p		890		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}		0.25		nm/K
Rise Time	$I_F = 100\text{ mA}$	t_r		30		ns
Fall Time	$I_F = 100\text{ mA}$	t_f		30		ns
Cut-Off Frequency	$I_{DC} = 70\text{ mA}$, $I_{AC} = 30\text{ mA pp}$	f_c		12		MHz
Virtual Source Diameter		\emptyset		3.7		mm

Typical Characteristics

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

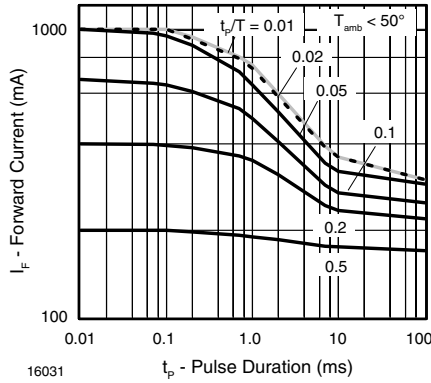


Figure 3. Pulse Forward Current vs. Pulse Duration

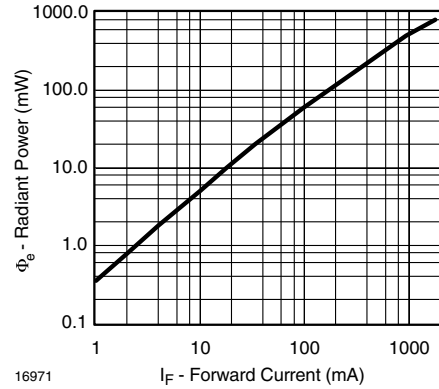


Figure 6. Radiant Power vs. Forward Current

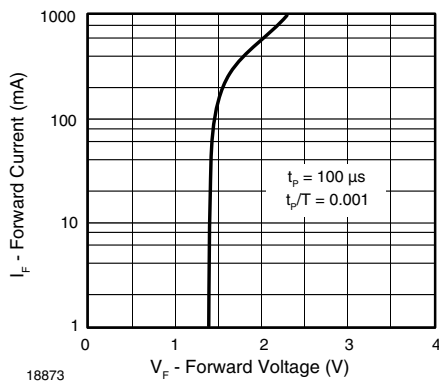


Figure 4. Forward Current vs. Forward Voltage

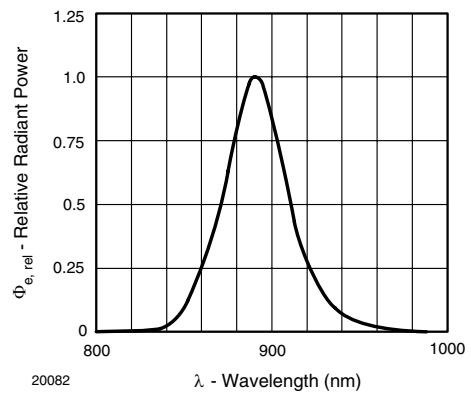


Figure 7. Relative Radiant Power vs. Wavelength

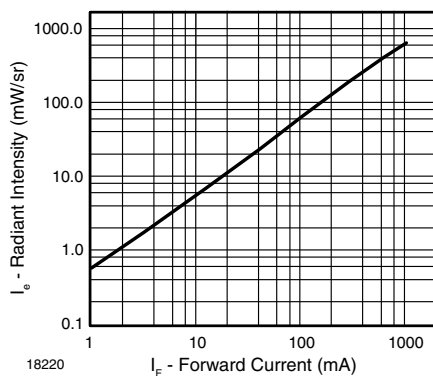


Figure 5. Radiant Intensity vs. Forward Current

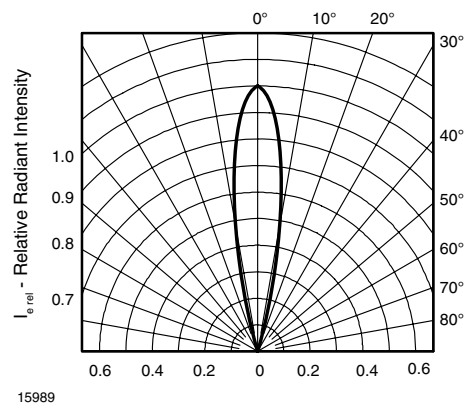


Figure 8. Relative Radiant Intensity vs. Angular Displacement



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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