RoHS

GREEN

<u>(5-2008)</u>**



Vishay Semiconductors

High Speed Infrared Emitting Diode, 890 nm, GaAlAs Double Hetero



DESCRIPTION

TSHF5410 is an infrared, 890 nm emitting diode in GaAlAs double hetero (DH) technology with high radiant power and high speed, molded in a clear, untinted plastic package.

FEATURES

Package type: leaded
Package form: T-1¾
Dimensions (in mm): Ø 5

Leads with stand-off

Peak wavelength: λ_p = 890 nm

High reliability

· High radiant power

· High radiant intensity

• Angle of half intensity: $\varphi = \pm 22^{\circ}$

· Low forward voltage

· Suitable for high pulse current operation

• High modulation bandwidth: f_c = 12 MHz

Good spectral matching with Si photodetectors

 Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Note

** Please see document "Vishay Material Category Policy": www.vishay.com/doc?99902

APPLICATIONS

- Infrared high speed remote control and free air data transmission systems with high modulation frequencies or high data transmission rate requirements
- Transmission systems according to IrDA requirements and for carrier frequency based systems (e.g. ASK/FSK coded, 450 kHz or 1.3 MHz)

PRODUCT SUMMARY					
COMPONENT	I _e (mW/sr)	φ (deg)	λ _p (nm)	t _r (ns)	
TSHF5410	70	± 22	890	30	

Note

· Test conditions see table "Basic Characteristics"

ORDERING INFORMATION					
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM		
TSHF5410	Bulk	MOQ: 4000 pcs, 4000 pcs/bulk	T-1¾		

Note

• MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS (T _{amb} = 25 °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	$t_p/T = 0.5, t_p = 100 \mu s$	I _{FM}	200	mA	
Surge forward current	t _p = 100 μs	I _{FSM}	1.5	Α	
Power dissipation		P _V	160	mW	
Junction temperature		Tj	100	°C	
Operating temperature range		T _{amb}	- 40 to + 85	°C	
Storage temperature range		T _{stg}	- 40 to + 100	°C	
Soldering temperature	t ≤ 5 s, 2 mm from case	T _{sd}	260	°C	
Thermal resistance junction/ambient	J-STD-051, leads 7 mm, soldered on PCB	R _{thJA}	230	K/W	





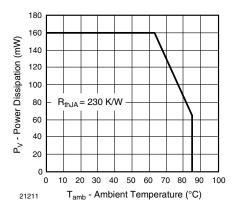


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

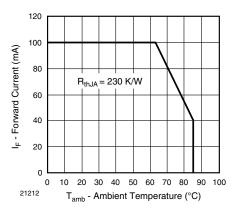


Fig. 2 - Forward Current Limit vs. Ambient Temperature

PARAMETER	CS (T _{amb} = 25 °C, unless other TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	I _F = 100 mA, t _p = 20 ms	V _F		1.4	1.6	V
	$I_F = 1.66 \text{ Hz}, t_p = 2.6 \text{ Hz}$	V _F		2.3	1.0	V
Temperature coefficient of V _F	I _F = 1 mA	TK _{VF}		- 1.8		mV/K
Reverse current	V _R = 5 V	I _R			10	μΑ
Junction capacitance	$V_R = 0 \text{ V, } f = 1 \text{ MHz, } E = 0$	C _i		125		pF
Radiant intensity	I _F = 100 mA, t _p = 20 ms	I _e	45	70	135	mW/sr
	I _F = 1 A, t _p = 100 μs	l _e		700		mW/sr
Radiant power	I _F = 100 mA, t _p = 20 ms	φ _e		50		mW
Temperature coefficient of φ _e	I _F = 100 mA	TKφ _e		- 0.35		%/K
Angle of half intensity		φ		± 22		deg
Peak wavelength	I _F = 100 mA	λ_{p}		890		nm
Spectral bandwidth	I _F = 100 mA	Δλ		40		nm
Temperature coefficient of λ_p	I _F = 100 mA	TKλ _p		0.25		nm/K
Rise time	I _F = 100 mA	t _r		30		ns
Fall time	I _F = 100 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		d		2.1		mm



BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

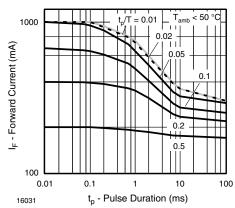


Fig. 3 - Pulse Forward Current vs. Pulse Duration

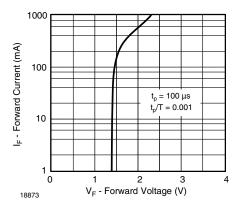


Fig. 4 - Forward Current vs. Forward Voltage

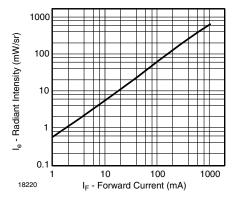


Fig. 5 - Radiant Intensity vs. Forward Current

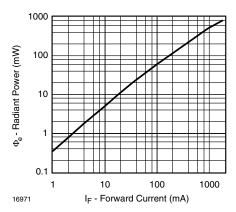


Fig. 6 - Radiant Power vs. Forward Current

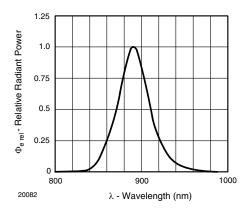


Fig. 7 - Relative Radiant Power vs. Wavelength

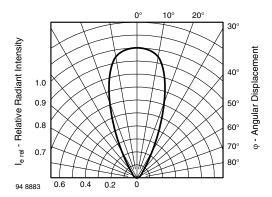
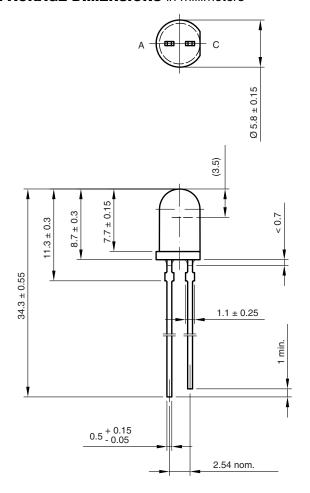


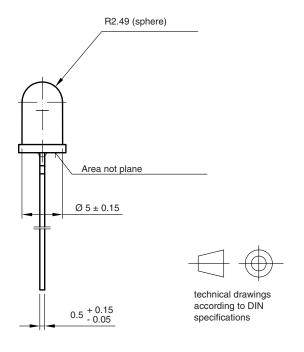
Fig. 8 - Relative Radiant Intensity vs. Angular Displacement



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PACKAGE DIMENSIONS in millimeters





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