

Vishay Semiconductors

High Speed Infrared Emitting Diode, 870 nm, **GaAlAs Double Hetero**



FEATURES

- Package type: leaded
- · Package form: T-1 3/4
- Dimensions (in mm): Ø 5
- Leads with stand-off
- Peak wavelength: λ_p = 870 nm
- High reliability
- · High radiant power
- · High radiant intensity
- Angle of half intensity: $\phi = \pm 10^{\circ}$
- · Low forward voltage
- · Suitable for high pulse current operation
- High modulation bandwidth: f_c = 24 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 video data transmission between camcorder and TV set
- Free air data transmission systems with high modulation frequencies or high data transmission rate requirements
- Smoke-automatic fire detectors

DESCRIPTION

TSFF5210 is an infrared, 870 nm emitting diode in GaAlAs double hetero (DH) technology with high radiant power and high speed, molded in a clear, untinted plastic package.

PRODUCT SUMMARY				
COMPONENT	l _e (mW/sr)	φ (deg)	λ _p (nm)	t _r (ns)
TSFF5210	180	± 10	870	15

Note

Test conditions see table "Basic Characteristics"

ORDERING INFORMATION				
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM	
TSFF5210	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	A
Power dissipation		Pv	180	mW



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TSFF5210

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25 \text{ °C}$, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
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	$t \leq 5$ 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

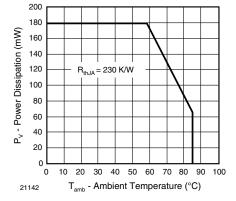


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

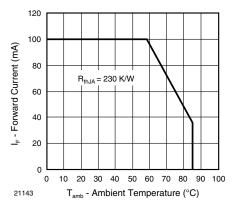


Fig. 2 - Forward Current Limit vs. Ambient Temperature

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Famuend weltere	I _F = 100 mA, t _p = 20 ms	V _F		1.5	1.8	V
Forward voltage	I _F = 1 A, t _p = 100 μs	V _F		2.3 3.0 -1.8 10 125 180 1800 360 50 50	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	μA
Junction capacitance	V _R = 0 V, f = 1 MHz, E = 0	Cj		125		pF
Radiant intensity	I _F = 100 mA, t _p = 20 ms	l _e	120	180	360	mW/sr
	I _F = 1 A, t _p = 100 μs	l _e		1800		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		± 10		deg
Peak wavelength	I _F = 100 mA	λρ		870		nm
Spectral bandwidth	I _F = 100 mA	Δλ		40		nm
Temperature coefficient of λ_p	I _F = 100 mA	ΤΚλρ		0.25		nm/K
Rise time	I _F = 100 mA	t _r		15		ns
Fall time	I _F = 100 mA	t _f		15		ns
Cut-off frequency	$I_{DC} = 70 \text{ mA}, I_{AC} = 30 \text{ mA pp}$	f _c		24		MHz
Virtual source diameter		d		3.7		mm

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BASIC CHARACTERISTICS (Tamb = 25 °C, unless otherwise specified)

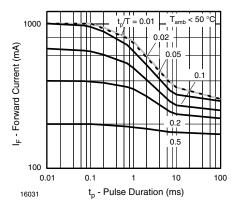


Fig. 3 - Pulse Forward Current vs. Pulse Duration

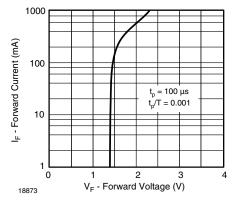


Fig. 4 - Forward Current vs. Forward Voltage

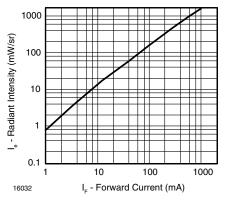


Fig. 5 - Radiant Intensity vs. Forward Current

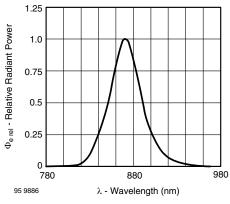


Fig. 6 - Relative Radiant Power vs. Wavelength

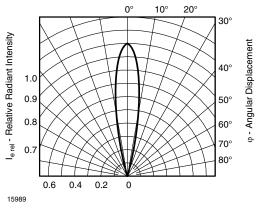


Fig. 7 - Relative Radiant Intensity vs. Angular Displacement

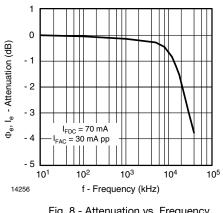


Fig. 8 - Attenuation vs. Frequency

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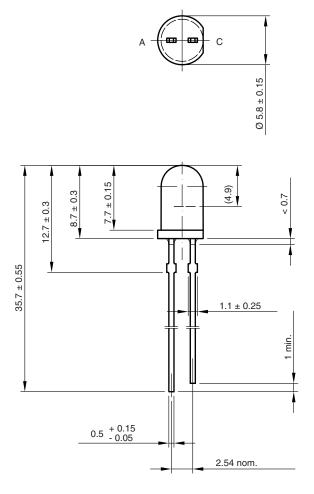
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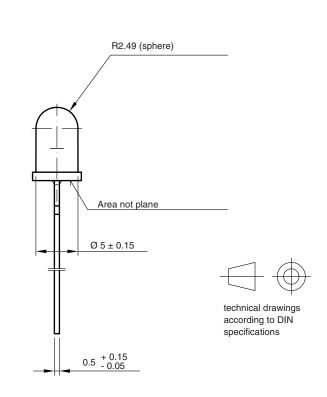
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WISHAY, www.vishay.com

PACKAGE DIMENSIONS in millimeters





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