RoHS

GREEN (5-2008)*



Vishay Semiconductors

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



DESCRIPTION

TSFF5410 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.

FEATURES

Package type: leadedPackage form: T-1¾

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: $\varphi = \pm 22^{\circ}$
- · Low forward voltage
- · Suitable for high pulse current operation
- High modulation bandwidth: f_c = 24 MHz
- · Good spectral matching to 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

PRODUCT SUMMARY				
COMPONENT	I _e (mW/sr)	φ (deg)	λ _p (nm)	t _r (ns)
TSFF5410	70	± 22	870	15

Note

Test conditions see table "Basic Characteristics"

ORDERING INFORMATION				
ORDERING CODE	PACKAGING REMARK		PACKAGE FORM	
TSFF5410	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	Α
Power dissipation		P _V	180	mW



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ABSOLUTE MAXIMUM RATINGS (T _{amb} = 25 °C, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Junction temperature		T _j	100	°C
Operating temperature range		T _{amb}	- 40 to + 85	°C
Storage temperature range		T _{stg}	- 40 to + 100	°C
Soldering temperature	$t \le 5$ 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

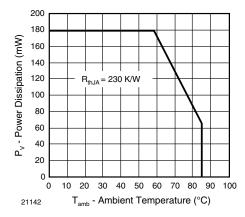


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

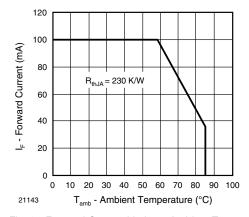


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS (T _{amb} = 25 °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		1.5	1.8	V
Forward voltage	$I_F = 1 \text{ A}, t_p = 100 \mu \text{s}$	V _F		2.3	3	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 V, f = 1 MHz, E = 0	Cj		125		pF
B. II	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	I _e	45	70	135	mW/sr
Radiant intensity	$I_F = 1 \text{ A}, t_p = 100 \ \mu\text{s}$	l _e		700		mW/sr
Radiant power	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	фe		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	λρ		870		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		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		2.1		mm

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

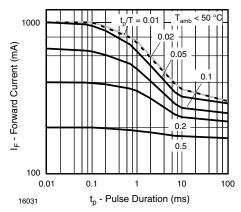


Fig. 3 - Pulse Forward Current vs. Pulse Duration

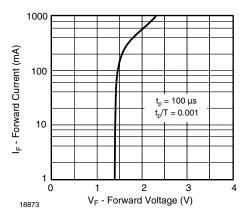


Fig. 4 - Forward Current vs. Forward Voltage

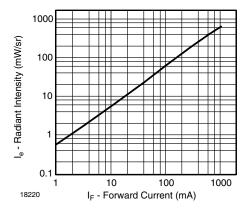


Fig. 5 - Radiant Intensity vs. Forward Current

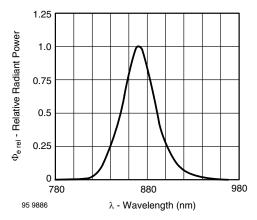


Fig. 6 - Relative Radiant Power vs. Wavelength

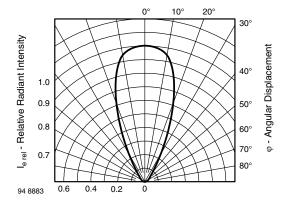


Fig. 7 - Relative Radiant Intensity vs. Angular Displacement

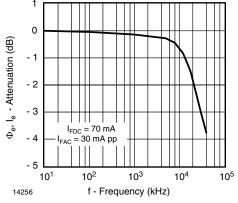
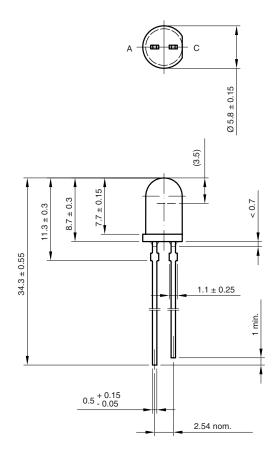


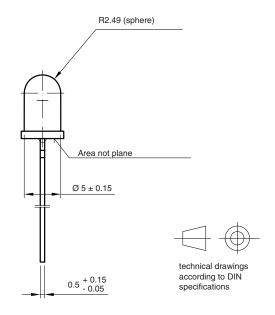
Fig. 8 - Attenuation vs. Frequency



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PACKAGE DIMENSIONS in millimeters





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