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TSFF5410

RoHS

HALOGEN

FREE

GREEN

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
- Material categorization: for definitions of compliance please see <u>www.vishav.com/doc?99912</u>



- 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 (°)	$\lambda_{\mathbf{p}}$ (nm)	t _r (ns)	
TSFF5410	70	± 22	870	15	

Note

· Test conditions see table "Basic Characteristics"

ORDERING INFORMATION					
ORDERING CODE	PACKAGING	REMARKS	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	
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	$t \le 5$ s, 2 mm from case	T _{sd}	260	°C	
Thermal resistance junction to ambient	J-STD-051, leads 7 mm, soldered on PCB	R _{thJA}	230	K/W	



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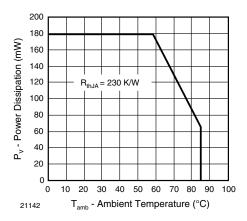


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

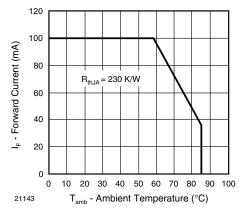


Fig. 2 - Forward Current Limit vs. Ambient Temperature

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	V _F	-	1.5	1.8	V
Forward voltage	I _F = 1 A, t _p = 100 μs	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	μA
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
	$I_F = 1 \text{ A}, t_p = 100 \ \mu\text{s}$	I _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	-	0
Peak wavelength	I _F = 100 mA	λ_{p}	-	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 mA, I _{AC} = 30 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)

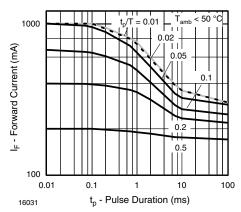


Fig. 3 - Pulse Forward Current vs. Pulse Duration

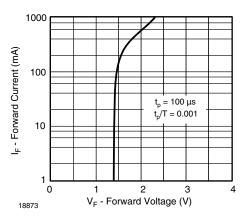


Fig. 4 - Forward Current vs. Forward Voltage

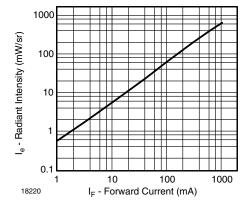


Fig. 5 - Radiant Intensity vs. Forward Current

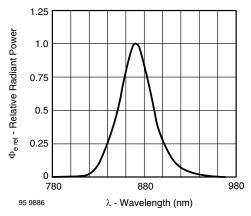


Fig. 6 - Relative Radiant Power vs. Wavelength

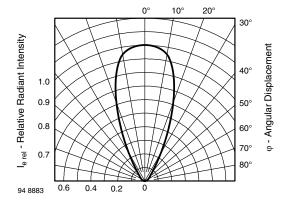


Fig. 7 - Relative Radiant Intensity vs. Angular Displacement

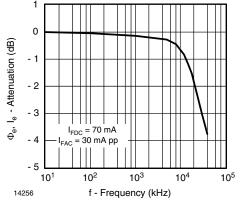
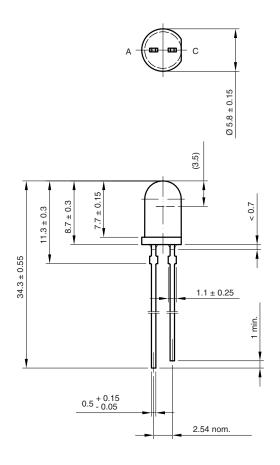


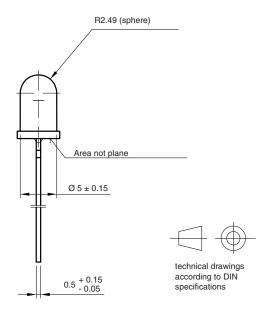
Fig. 8 - Attenuation vs. Frequency

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PACKAGE DIMENSIONS in millimeters





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