TSHG5410



Vishay Semiconductors

High Speed Infrared Emitting Diode, 850 nm, **GaAlAs Double Hetero**



TSHG5410 is an infrared, 850 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 = 850 nm
- · High reliability
- · High radiant power
- High radiant intensity
- Angle of half intensity: $\varphi = \pm 18^{\circ}$
- Low forward voltage
- · Suitable for high pulse current operation
- High modulation bandwidth: f_c = 18 MHz
- · Good spectral matching with CMOS cameras
- · 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 radiation source for operation with CMOS cameras
- High speed IR data transmission

PRODUCT SUMMARY λ_p (nm) COMPONENT Ie (mW/sr) φ (deg) tr (ns) TSHG5410 90 ± 18 850 20

Note

DESCRIPTION

Test conditions see table "Basic Characteristics"

ORDERING INFORMATION							
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM				
TSHG5410	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			
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/ambient	J-STD-051, leads 7 mm, soldered on PCB	R _{thJA}	230	K/W			

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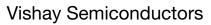
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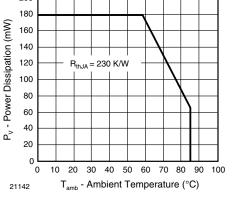


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

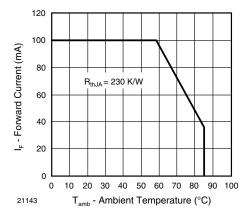


Fig. 1 - Forward Current Limit vs. Ambient Temperature

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		
	I _F = 1 A, t _p = 100 μs	V _F		2.3		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	$V_{R} = 0 V, f = 1 MHz, E = 0$	Cj		125		pF		
De die statistes eite	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	l _e	45	90	135	mW/sr		
Radiant intensity	$I_F = 1 \text{ A}, t_p = 100 \ \mu \text{s}$	l _e		900		mW/sr		
Radiant power	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	\$e		55		mW		
Temperature coefficient of ϕ_{e}	I _F = 100 mA	TK¢e		- 0.35		%/K		
Angle of half intensity		φ		± 18		deg		
Peak wavelength	I _F = 100 mA	λρ	820	850	880	nm		
Spectral bandwidth	I _F = 100 mA	Δλ		40		nm		
Temperature coefficient of λ_p	I _F = 100 mA	ΤΚλ _p		0.25		nm/K		
Rise time	I _F = 100 mA	t _r		20		ns		
Fall time	I _F = 100 mA	t _f		13		ns		
Cut-off frequency	$I_{DC} = 70 \text{ mA}, I_{AC} = 30 \text{ mA pp}$	f _c		18		MHz		
Virtual source diameter		d		2.1		mm		





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

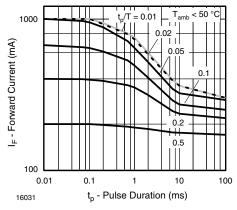


Fig. 2 - Pulse Forward Current vs. Pulse Duration

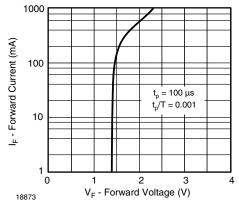


Fig. 3 - Forward Current vs. Forward Voltage

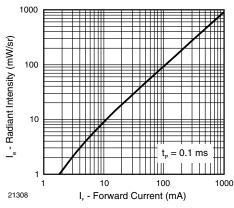
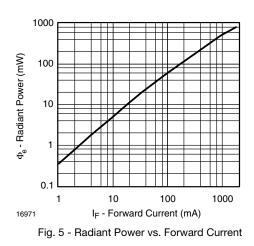
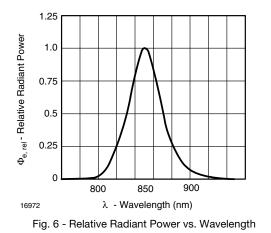


Fig. 4 - Radiant Intensity vs. Forward Current





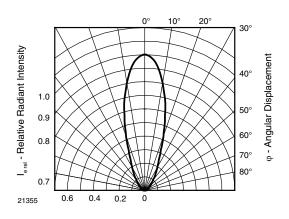


Fig. 7 - Relative Radiant Intensity vs. Angular Displacement

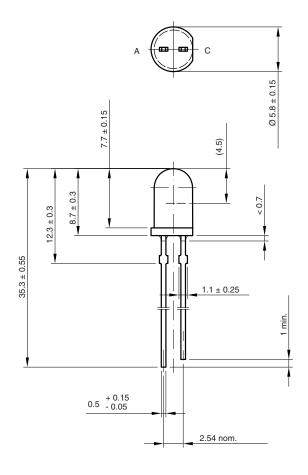
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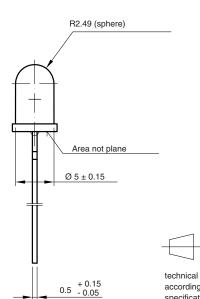


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PACKAGE DIMENSIONS in millimeters







technical drawings according to DIN specifications

Drawing-No.: 6.544-5258.11-4 Issue: 2; 19.05.09 21797



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