GREEN

(5-2008)¹



Vishay Semiconductors

High Speed Infrared Emitting Diode, 830 nm, GaAlAs Double Hetero



TSHG5510 is an infrared, 830 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 5Leads with stand-off

• Peak wavelength: $\lambda_n = 830 \text{ nm}$

High reliability

• High radiant power

High radiant intensity

• Angle of half intensity: $\varphi = \pm 38^{\circ}$

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

APPLICATIONS

- Infrared radiation source for operation with CMOS cameras (illumination)
- High speed IR data transmission

PRODUCT SUMMARY					
COMPONENT	I _e (mW/sr)	φ (deg)	λ _p (nm)	t _r (ns)	
TSHG5510	32	± 38	830	15	

Note

DESCRIPTION

• Test conditions see table "Basic Characteristics"

ORDERING INFORMATION					
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM		
TSHG5510	Bulk	MOQ: 4000 pcs, 4000 pcs/bulk	T-1¾		

Note

· MOQ: minimum order quantity

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V _R	5	V
Forward current		l _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/ambient	J-STD-051, leads 7 mm soldered on PCB	R _{thJA}	230	K/W





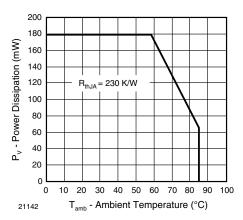


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

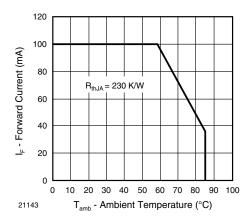


Fig. 2 - Forward Current Limit vs. Ambient Temperature

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	1.3	1.45	1.7	V
	$I_F = 450 \text{ mA}, t_p = 100 \mu \text{s}$	V _F	1.5	1.75	2.1	V
	I _F = 1 A, t _p = 100 μs	V_{F}		2.1		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	C _i		110		pF
Radiant intensity	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	l _e	18	32	54	mW/sr
	$I_F = 1 \text{ A, t}_p = 100 \mu\text{s}$	I _e		320		mW/sr
Radiant power	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	φ _e		55		mW
Temperature coefficient of φ _e	I _F = 100 mA	TΚφ _e		- 0.35		%/K
Angle of half intensity		φ		± 38		deg
Peak wavelength	I _F = 100 mA	λ_{p}		830		nm
Spectral bandwidth	I _F = 100 mA	Δλ		55		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



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

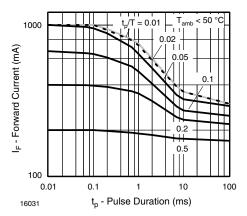


Fig. 3 - Pulse Forward Current vs. Pulse Duration

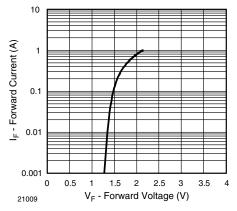


Fig. 4 - Forward Current vs. Forward Voltage

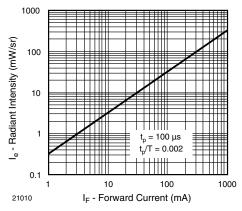


Fig. 5 - Radiant Intensity vs. Forward Current

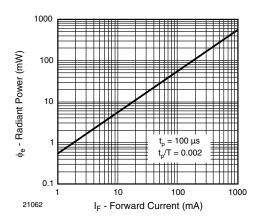


Fig. 6 - Radiant Power vs. Forward Current

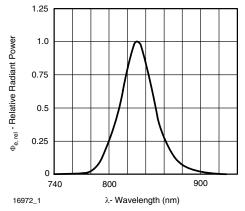


Fig. 7 - Relative Radiant Power vs. Wavelength

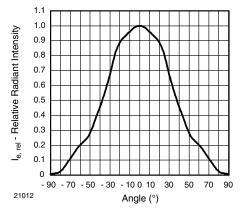
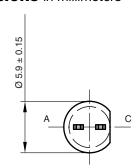
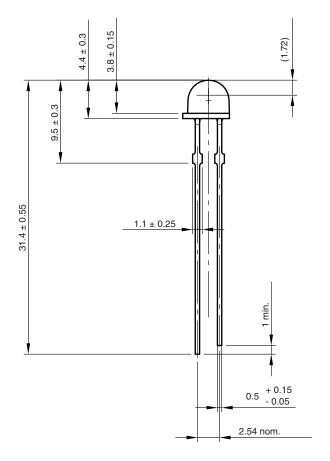


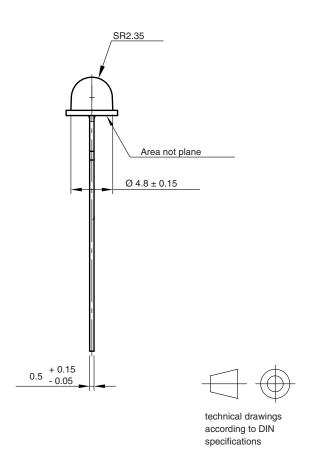
Fig. 8 - Relative Radiant Intensity vs. Angular Displacement

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PACKAGE DIMENSIONS in millimeters







Drawing-No.: 6.544-5390.01-4

Issue: 2; 19.05.09

20796



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