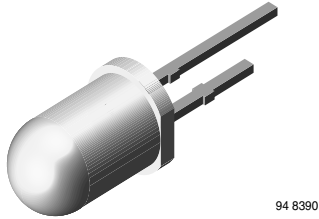


High Speed Infrared Emitting Diode, 850 nm, GaAlAs Double Hetero



DESCRIPTION

TSHG5210 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-1 $\frac{3}{4}$
- Dimensions (in mm): \varnothing 5
- Leads with stand-off
- Peak wavelength: $\lambda_p = 850$ nm
- High reliability
- High radiant power
- High radiant intensity
- Angle of half intensity: $\varphi = \pm 10^\circ$
- 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
- Halogen-free according to IEC 61249-2-21 definition



RoHS
COMPLIANT
HALOGEN
FREE

APPLICATIONS

- Infrared radiation source for operation with CMOS cameras
- High speed IR data transmission
- Smoke-automatic fire detectors

PRODUCT SUMMARY

COMPONENT	I_e (mW/sr)	φ (deg)	λ_p (nm)	t_r (ns)
TSHG5210	230	± 10	850	20

Note

Test conditions see table "Basic Characteristics"

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
TSHG5210	Bulk	MOQ: 4000 pcs, 4000 pcs/bulk	T-1 $\frac{3}{4}$

Note

MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS

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	$t_p = 100 \mu s$	I_{FSM}	1	A
Power dissipation		P_V	180	mW
Junction temperature		T_j	100	$^\circ C$
Operating temperature range		T_{amb}	- 40 to + 85	$^\circ C$
Storage temperature range		T_{stg}	- 40 to + 100	$^\circ C$
Soldering temperature	$t \leq 5$ s, 2 mm from case	T_{sd}	260	$^\circ C$
Thermal resistance junction/ambient	J-STD-051, leads 7 mm, soldered on PCB	R_{thJA}	230	K/W

Note

$T_{amb} = 25 \text{ }^\circ C$, unless otherwise specified

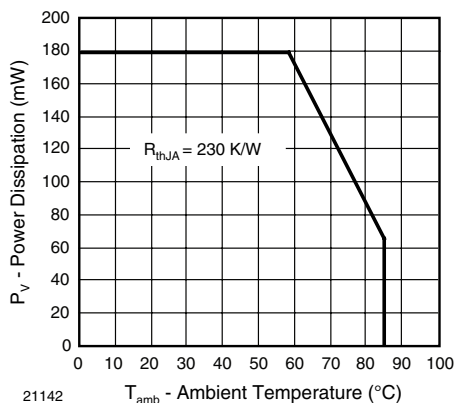


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

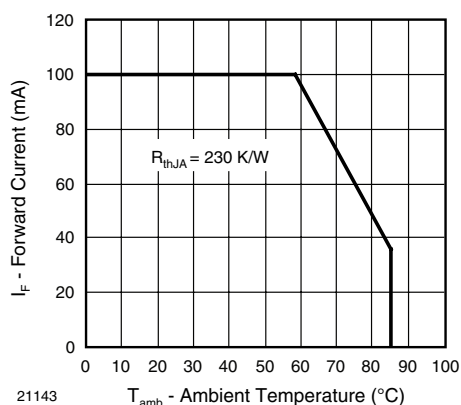


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	I _F = 100 mA, t _p = 20 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 _{V_F}		- 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	C _j		125		pF
Radiant intensity	I _F = 100 mA, t _p = 20 ms	I _e	140	230	420	mW/sr
	I _F = 1 A, t _p = 100 μs	I _e		2300		mW/sr
Radiant power	I _F = 100 mA, t _p = 20 ms	φ _e		55		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	λ _p	820	850	880	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		20		ns
Fall time	I _F = 100 mA	t _f		13		ns
Cut-off frequency	I _{DC} = 70 mA, I _{AC} = 30 mA pp	f _c		18		MHz
Virtual source diameter		d		3.7		mm

Note

T_{amb} = 25 °C, unless otherwise specified

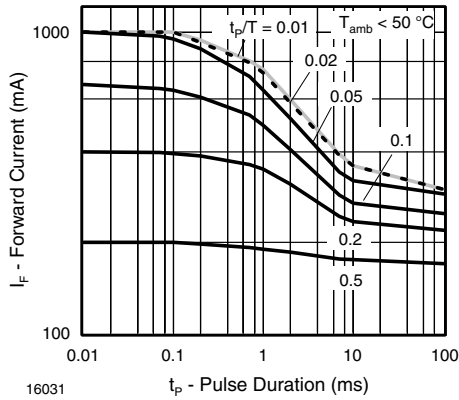
BASIC CHARACTERISTICS
 $T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified


Fig. 3 - Pulse Forward Current vs. Pulse Duration

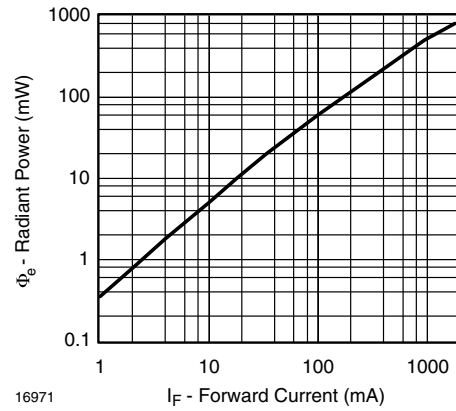


Fig. 6 - Radiant Power vs. Forward Current

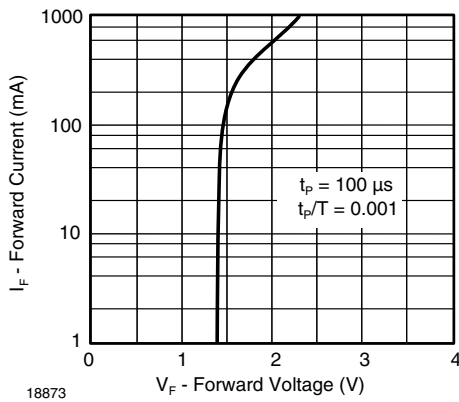


Fig. 4 - Forward Current vs. Forward Voltage

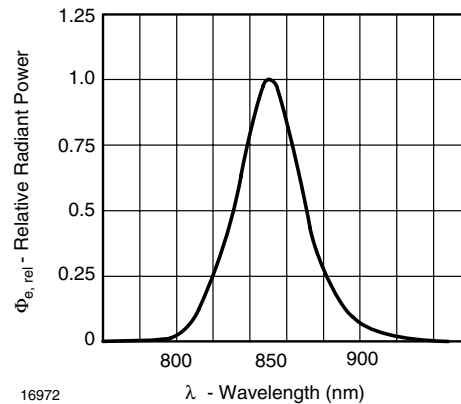


Fig. 7 - Relative Radiant Power vs. Wavelength

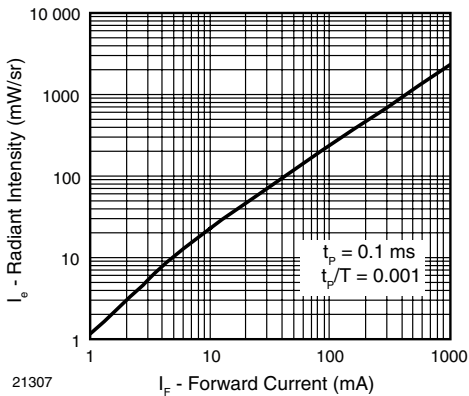


Fig. 5 - Radiant Intensity vs. Forward Current

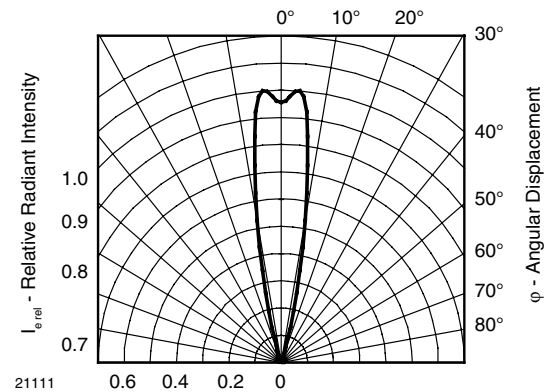


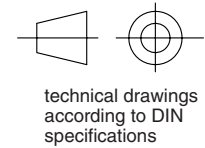
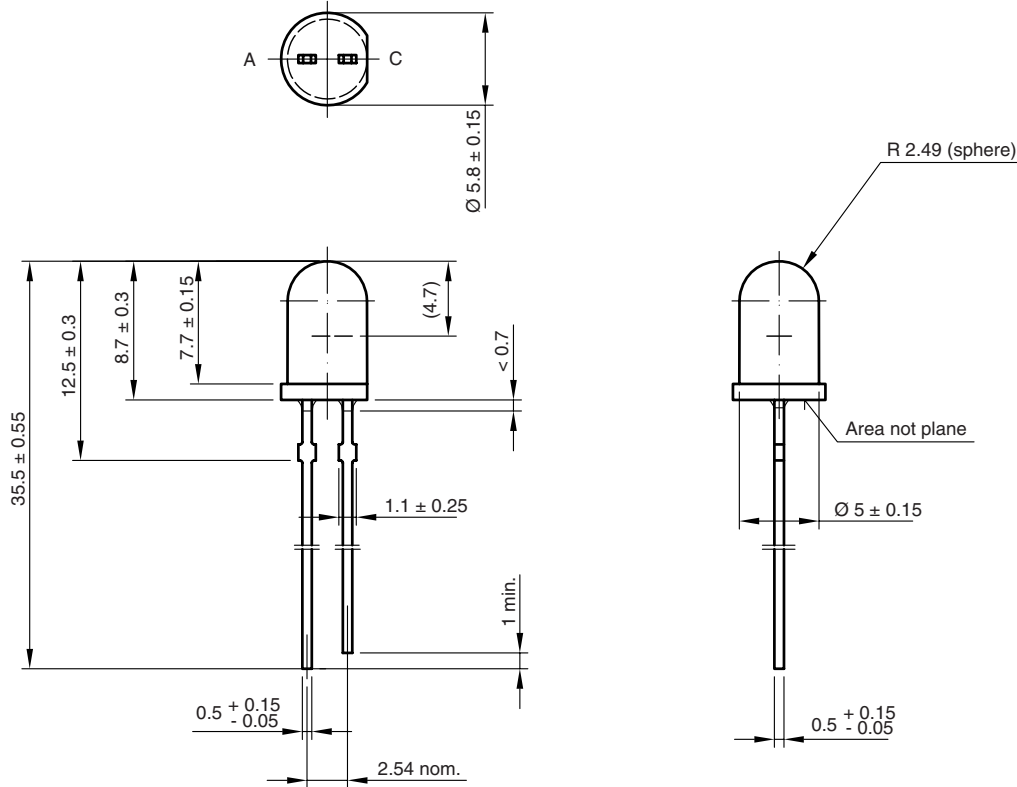
Fig. 8 - Relative Radiant Intensity vs. Angular Displacement

TSHG5210

Vishay Semiconductors High Speed Infrared Emitting Diode,
850 nm, GaAlAs Double Hetero



PACKAGE DIMENSIONS in millimeters



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Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: ocean@oceanchips.ru

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А