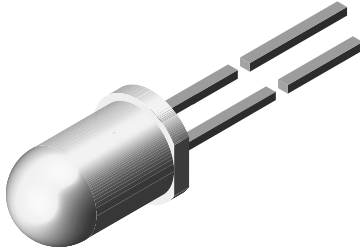


High Speed Infrared Emitting Diode, 890 nm, GaAlAs Double Hetero



94 8389

DESCRIPTION

TSHF6410 is an infrared, 890 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
- Peak wavelength: $\lambda_p = 890$ 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: $f_c = 12$ MHz
- Good spectral matching with Si photodetectors
- 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 high speed remote control and free air data transmission systems with high modulation frequencies or high data transmission rate requirements
- Transmission systems according to IrDA requirements and for carrier frequency based systems (e.g. ASK/FSK - coded, 450 kHz or 1.3 MHz)

PRODUCT SUMMARY

COMPONENT	I_e (mW/sr)	φ (deg)	λ_p (nm)	t_r (ns)
TSHF6410	70	± 22	890	30

Note

Test conditions see table "Basic Characteristics"

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
TSHF6410	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}	1.5	A
Power dissipation		P_V	160	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

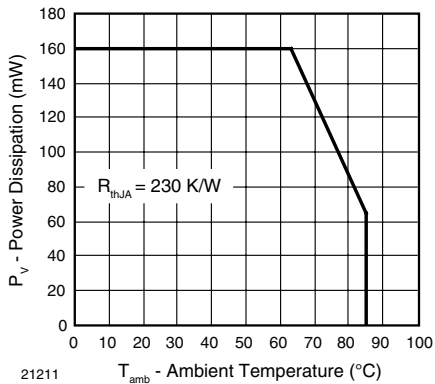


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

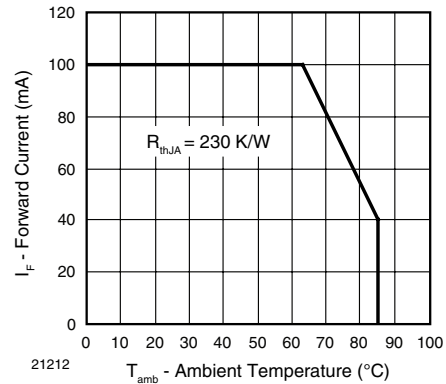


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$	V_F		1.4	1.6	V
	$I_F = 1 \text{ A}$, $t_p = 100 \mu\text{s}$	V_F		2.3		V
Temperature coefficient of V_F	$I_F = 1 \text{ mA}$	TK_{V_F}		- 1.8		mV/K
Reverse current	$V_R = 5 \text{ V}$	I_R			10	μA
Junction capacitance	$V_R = 0 \text{ V}$, $f = 1 \text{ MHz}$, $E = 0$	C_j		125		pF
Radiant intensity	$I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$	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	$I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$	ϕ_e		50		mW
Temperature coefficient of ϕ_e	$I_F = 100 \text{ mA}$	TK_{ϕ_e}		- 0.35		%/K
Angle of half intensity		φ		± 22		deg
Peak wavelength	$I_F = 100 \text{ mA}$	λ_p		890		nm
Spectral bandwidth	$I_F = 100 \text{ mA}$	$\Delta\lambda$		40		nm
Temperature coefficient of λ_p	$I_F = 100 \text{ mA}$	TK_{λ_p}		0.25		nm/K
Rise time	$I_F = 100 \text{ mA}$	t_r		30		ns
Fall time	$I_F = 100 \text{ mA}$	t_f		30		ns
Cut-off frequency	$I_{DC} = 70 \text{ mA}$, $I_{AC} = 30 \text{ mA pp}$	f_c		12		MHz
Virtual source diameter		d		2.1		mm

Note

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

BASIC CHARACTERISTICS

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

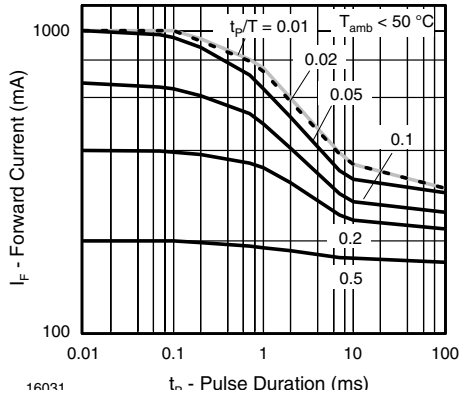


Fig. 3 - Pulse Forward Current vs. Pulse Duration

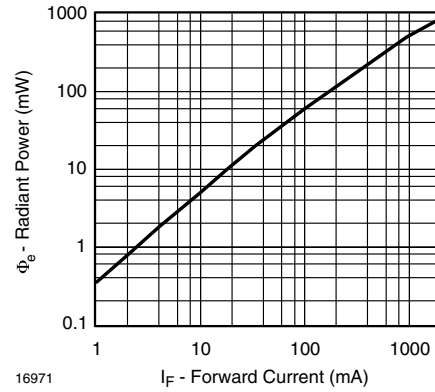


Fig. 6 - Radiant Power vs. Forward Current

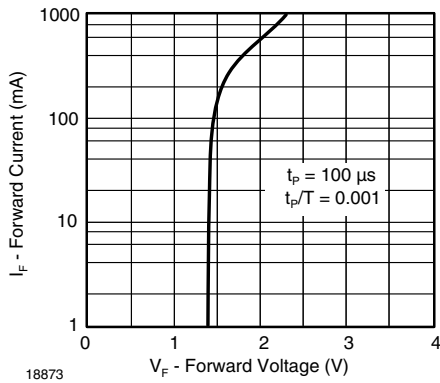


Fig. 4 - Forward Current vs. Forward Voltage

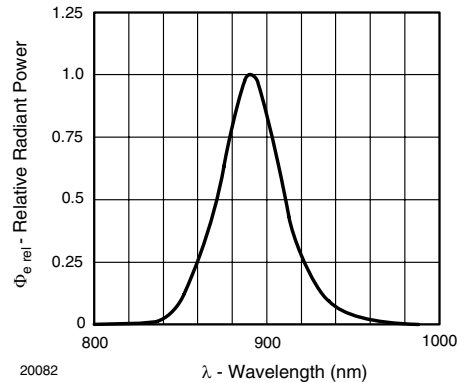


Fig. 7 - Relative Radiant Power vs. Wavelength

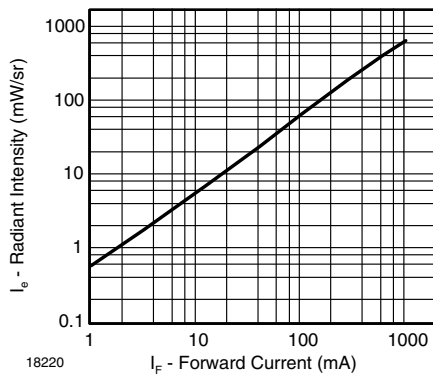


Fig. 5 - Radiant Intensity vs. Forward Current

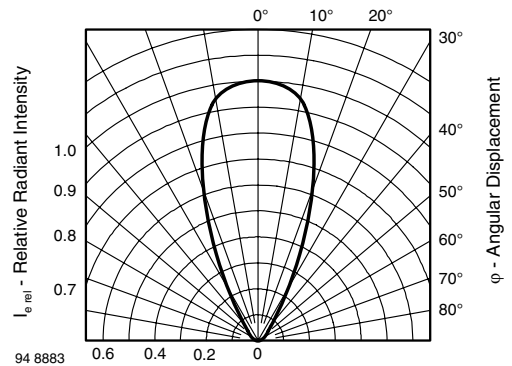


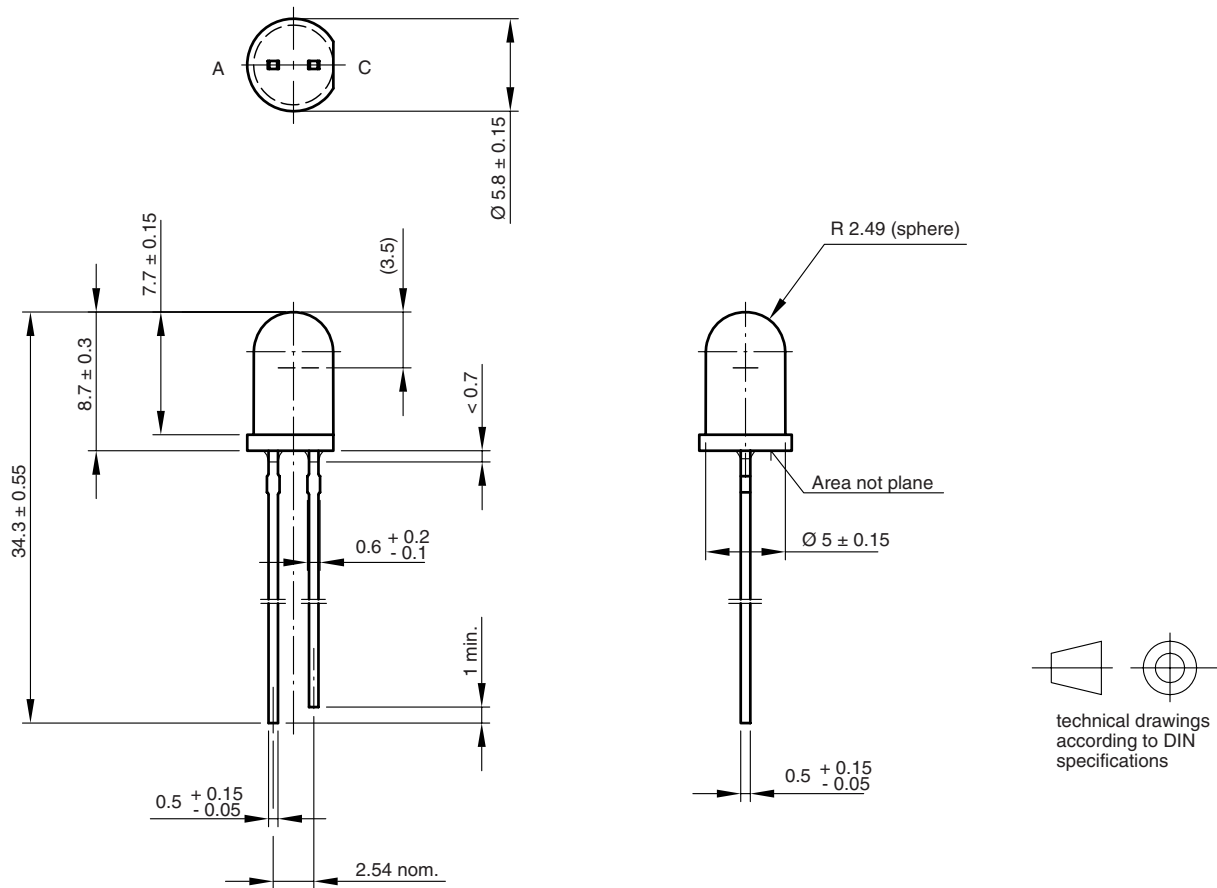
Fig. 8 - Relative Radiant Intensity vs. Angular Displacement

TSHF6410

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



PACKAGE DIMENSIONS in millimeters



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19257



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