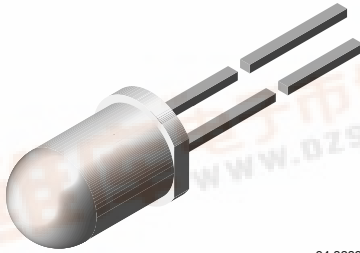


**TSHF6410**

Vishay Semiconductors

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



94 8389

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
- Lead (Pb)-free component in accordance with RoHS 2002/95/EC and WEEE 2002/96/EC

**RoHS**
COMPLIANT**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.

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	$t_p/T = 0.5$, $t_p = 100$ μ s	I_{FM}	200	mA
Surge forward current	$t_p = 100$ μ s	I_{FSM}	1.5	A
Power dissipation		P_V	160	mW



TSHF6410



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

ABSOLUTE MAXIMUM RATINGS

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Junction temperature		T_j	100	°C
Operating temperature range		T_{amb}	- 40 to + 85	°C
Storage temperature range		T_{stg}	- 40 to + 100	°C
Soldering temperature	$t \leq 5$ 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

Note

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

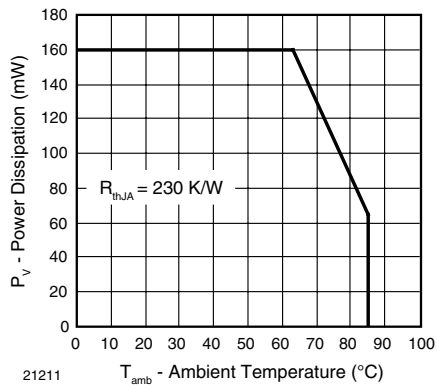


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

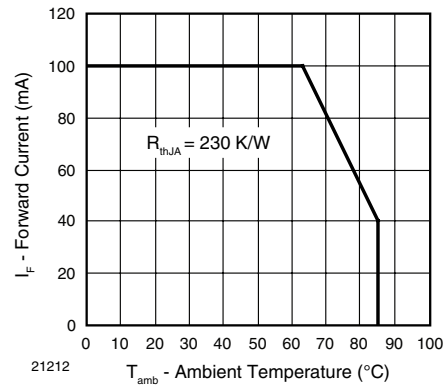


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 100$ mA, $t_p = 20$ ms	V_F		1.4	1.6	V
	$I_F = 1$ A, $t_p = 100$ μ s	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	μ A
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	45	70	135	mW/sr
	$I_F = 1$ A, $t_p = 100$ μ 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	TK_{ϕ_e}		- 0.35		%/K
Angle of half intensity		ϕ		± 22		deg
Peak wavelength	$I_F = 100$ mA	λ_p		890		nm
Spectral bandwidth	$I_F = 100$ mA	$\Delta\lambda$		40		nm
Temperature coefficient of λ_p	$I_F = 100$ mA	TK_{λ_p}		0.25		nm/K
Rise time	$I_F = 100$ mA	t_r		30		ns
Fall time	$I_F = 100$ mA	t_f		30		ns
Cut-off frequency	$I_{DC} = 70$ mA, $I_{AC} = 30$ mA pp	f_c		12		MHz
Virtual source diameter		d		2.1		mm

Note

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



TSHF6410

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

BASIC CHARACTERISTICS

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

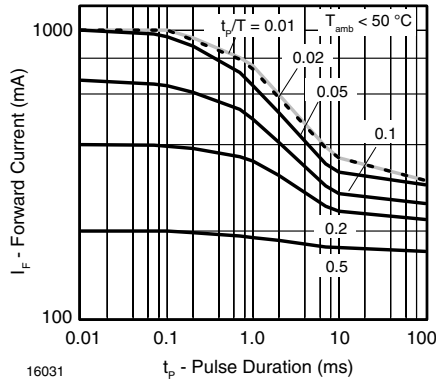


Fig. 3 - Pulse Forward Current vs. Pulse Duration

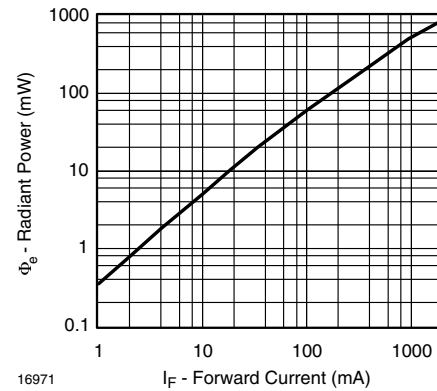


Fig. 6 - Radiant Power vs. Forward Current

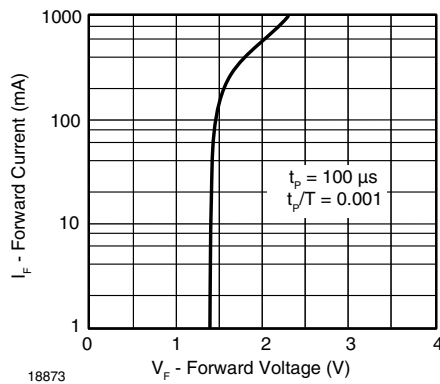


Fig. 4 - Forward Current vs. Forward Voltage

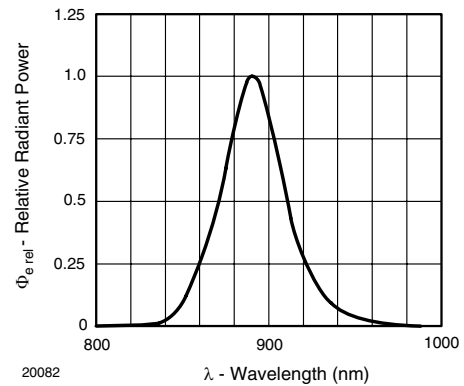


Fig. 7 - Relative Radiant Power vs. Wavelength

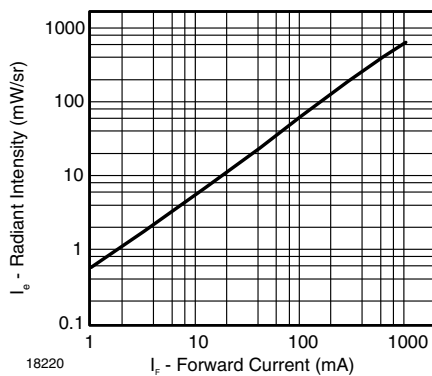


Fig. 5 - Radiant Intensity vs. Forward Current

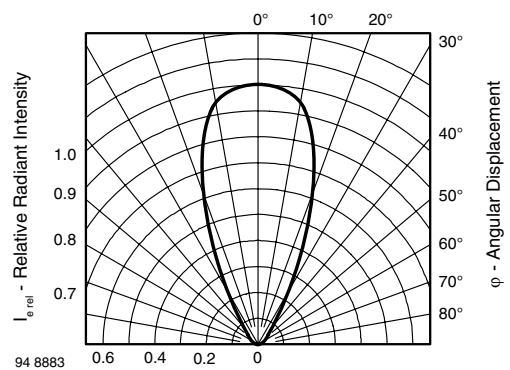


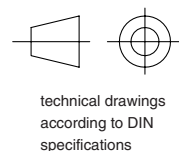
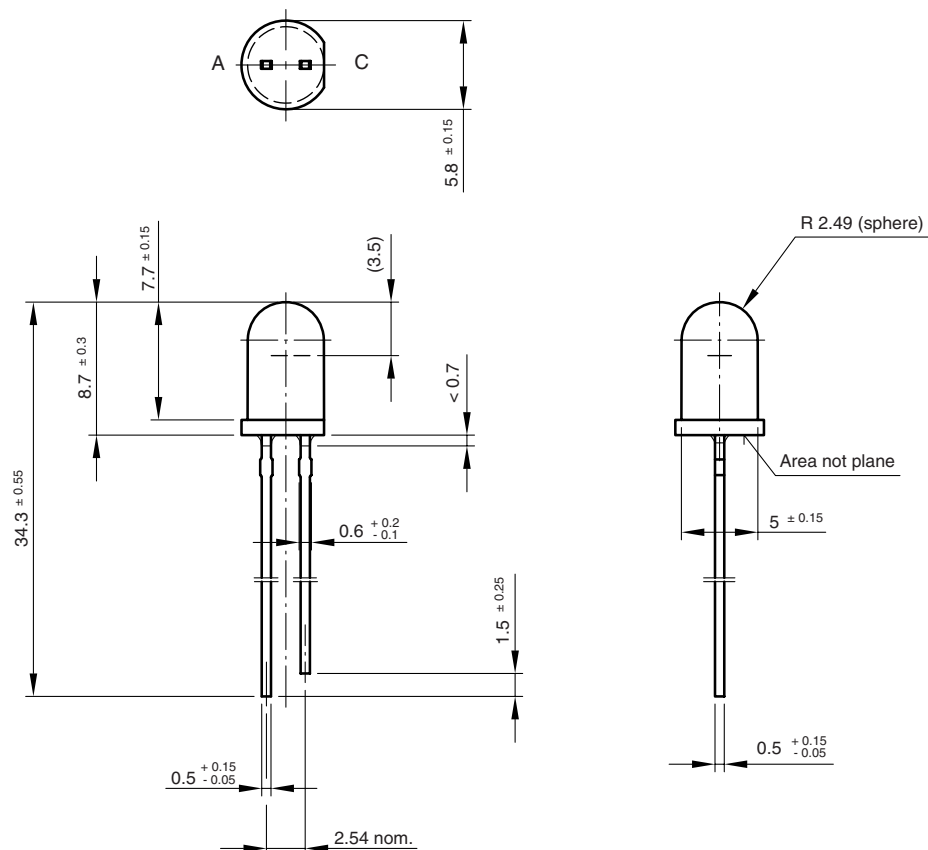
Fig. 8 - Relative Radiant Intensity vs. Angular Displacement

TSHF6410

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Compliant, 890 nm, GaAlAs Double Hetero



PACKAGE DIMENSIONS in millimeters



6.544-5259.06-4
Issue: 5; 27.09.05
19257



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