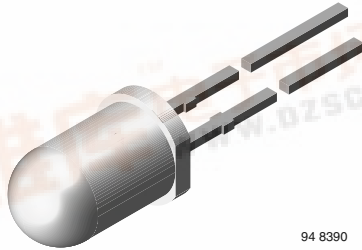


**TSHG5410**

Vishay Semiconductors

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



94 8390

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: $\varphi = \pm 18^\circ$
- Low forward voltage
- Suitable for high pulse current operation
- High modulation bandwidth: $f_c = 18$ MHz
- Good spectral matching with CMOS cameras
- Lead (Pb)-free component in accordance with RoHS 2002/95/EC and WEEE 2002/96/EC

**RoHS**
COMPLIANT**DESCRIPTION**

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.

APPLICATIONS

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

PRODUCT SUMMARY

COMPONENT	I_e (mW/sr)	φ (deg)	λ_p (nm)	t_r (ns)
TSHG5410	90	± 18	850	20

Note

Test conditions see table "Basic Characteristics"

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
TSHG5410	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	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
 $T_{amb} = 25$ $^\circ$ C, unless otherwise specified

TSHG5410



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

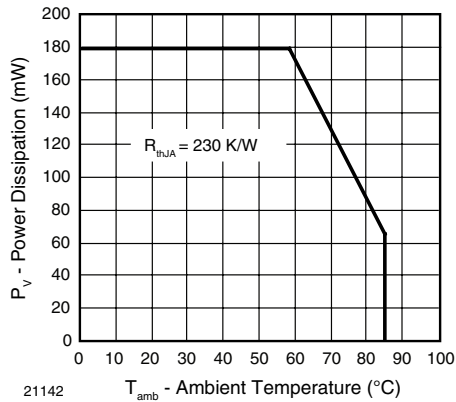


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

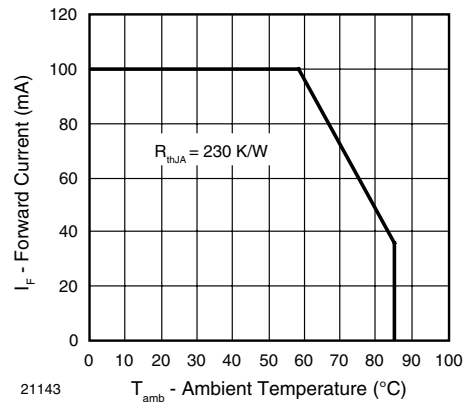


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$	V_F		1.5	1.8	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	90	135	mW/sr
	$I_F = 1 \text{ A}$, $t_p = 100 \mu\text{s}$	I_e		900		mW/sr
Radiant power	$I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$	ϕ_e		55		mW
Temperature coefficient of ϕ_e	$I_F = 100 \text{ mA}$	TK_{ϕ_e}		- 0.35		%/K
Angle of half intensity		φ		± 18		deg
Peak wavelength	$I_F = 100 \text{ mA}$	λ_p	820	850	880	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		20		ns
Fall time	$I_F = 100 \text{ mA}$	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

Note

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



TSHG5410

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

BASIC CHARACTERISTICS

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

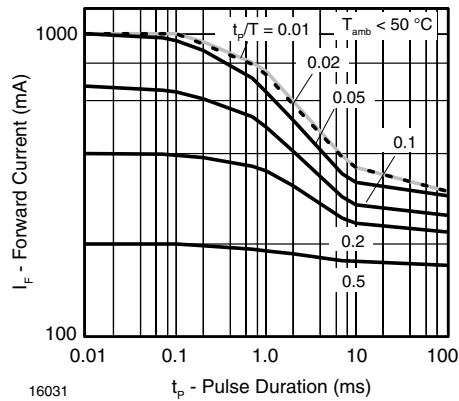


Fig. 3 - Pulse Forward Current vs. Pulse Duration

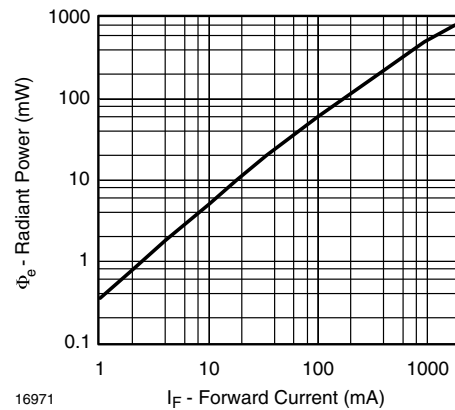


Fig. 6 - Radiant Power vs. Forward Current

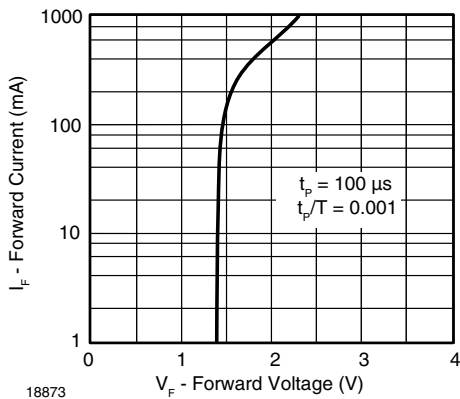


Fig. 4 - Forward Current vs. Forward Voltage

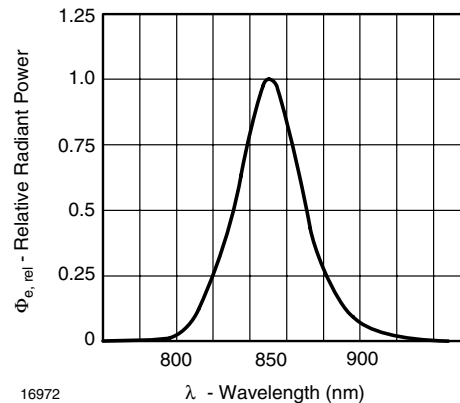


Fig. 7 - Relative Radiant Power vs. Wavelength

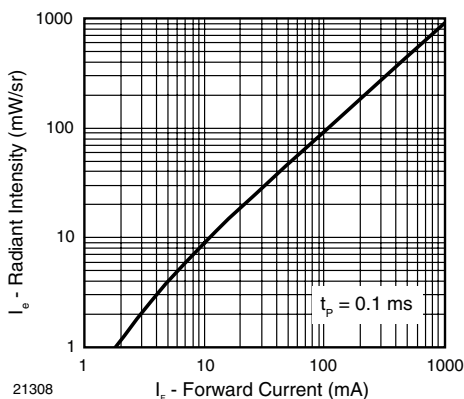


Fig. 5 - Radiant Intensity vs. Forward Current

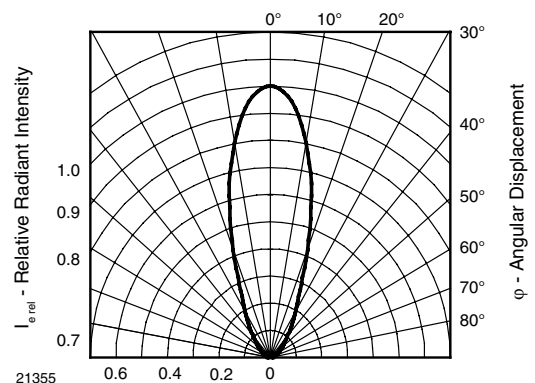
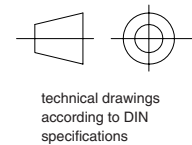


Fig. 8 - Relative Radiant Intensity vs. Angular Displacement

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



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