

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



94 8390



RoHS
COMPLIANT
GREEN
(5-2008)**

FEATURES

- Package type: leaded
- Package form: T-1 1/4
- Dimensions (in mm): Ø 5
- Leads with stand-off
- Peak wavelength: $\lambda_p = 850$ nm
- High reliability
- High radiant power
- High radiant intensity
- Angle of half intensity: $\phi = \pm 18^\circ$
- Low forward voltage
- Suitable for high pulse current operation
- High modulation bandwidth: $f_c = 18$ MHz
- Good spectral matching with CMOS cameras
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Note

** Please see document "Vishay Material Category Policy":
www.vishay.com/doc?99902

APPLICATIONS

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

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.

PRODUCT SUMMARY

COMPONENT	I _e (mW/sr)	φ (deg)	λ _p (nm)	tr (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 1/4

Note

- MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)

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 µs	I _{FM}	200	mA
Surge forward current	t _p = 100 µs	I _{FSM}	1	A
Power dissipation		P _V	180	mW
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 ≤ 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

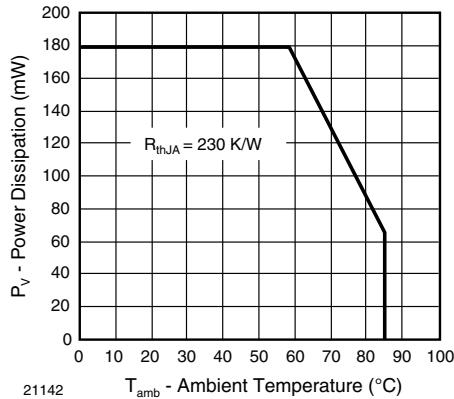


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

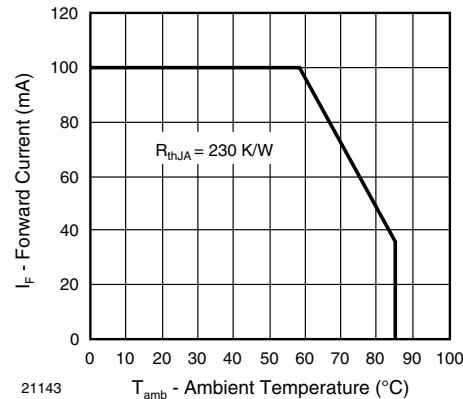


Fig. 1 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS ($T_{amb} = 25 \text{ }^{\circ}\text{C}$, 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		1.5	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_{VF}		- 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	$I_F = 100 \text{ mA}$	$TK\phi_e$		- 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	$I_F = 100 \text{ mA}$	$TK\lambda_p$		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

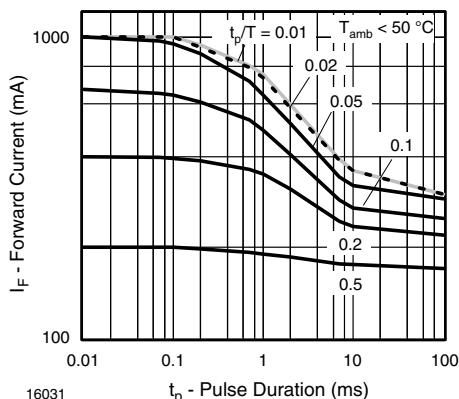
BASIC CHARACTERISTICS ($T_{amb} = 25^{\circ}\text{C}$, unless otherwise specified)


Fig. 2 - Pulse Forward Current vs. Pulse Duration

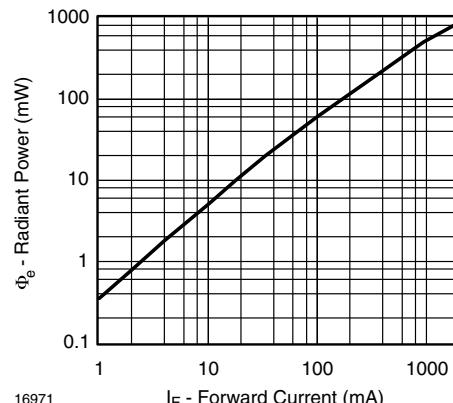


Fig. 5 - Radiant Power vs. Forward Current

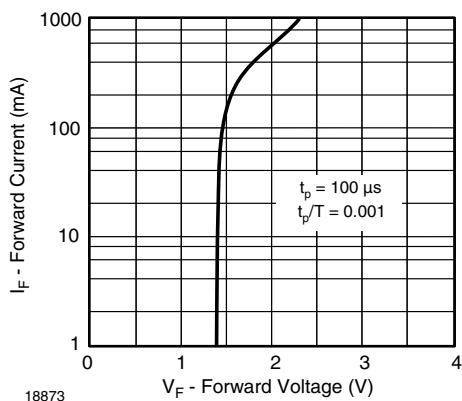


Fig. 3 - Forward Current vs. Forward Voltage

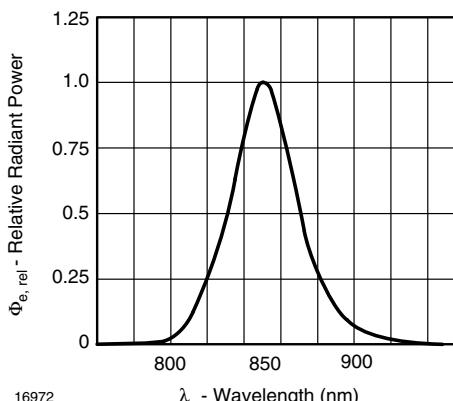


Fig. 6 - Relative Radiant Power vs. Wavelength

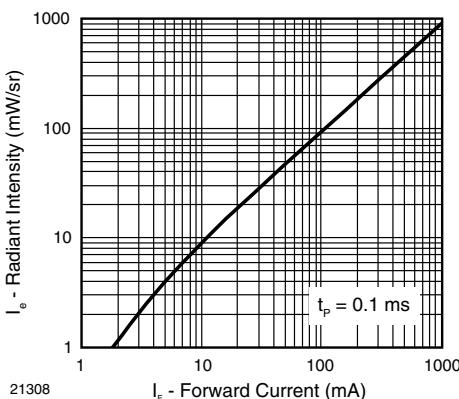


Fig. 4 - Radiant Intensity vs. Forward Current

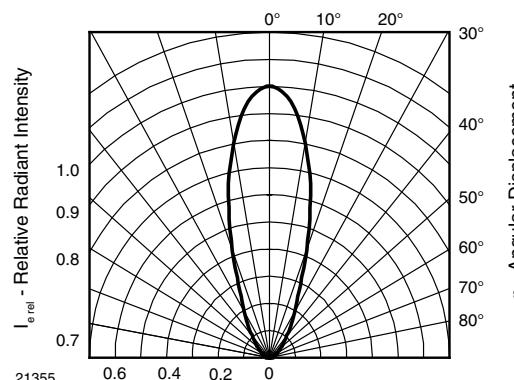
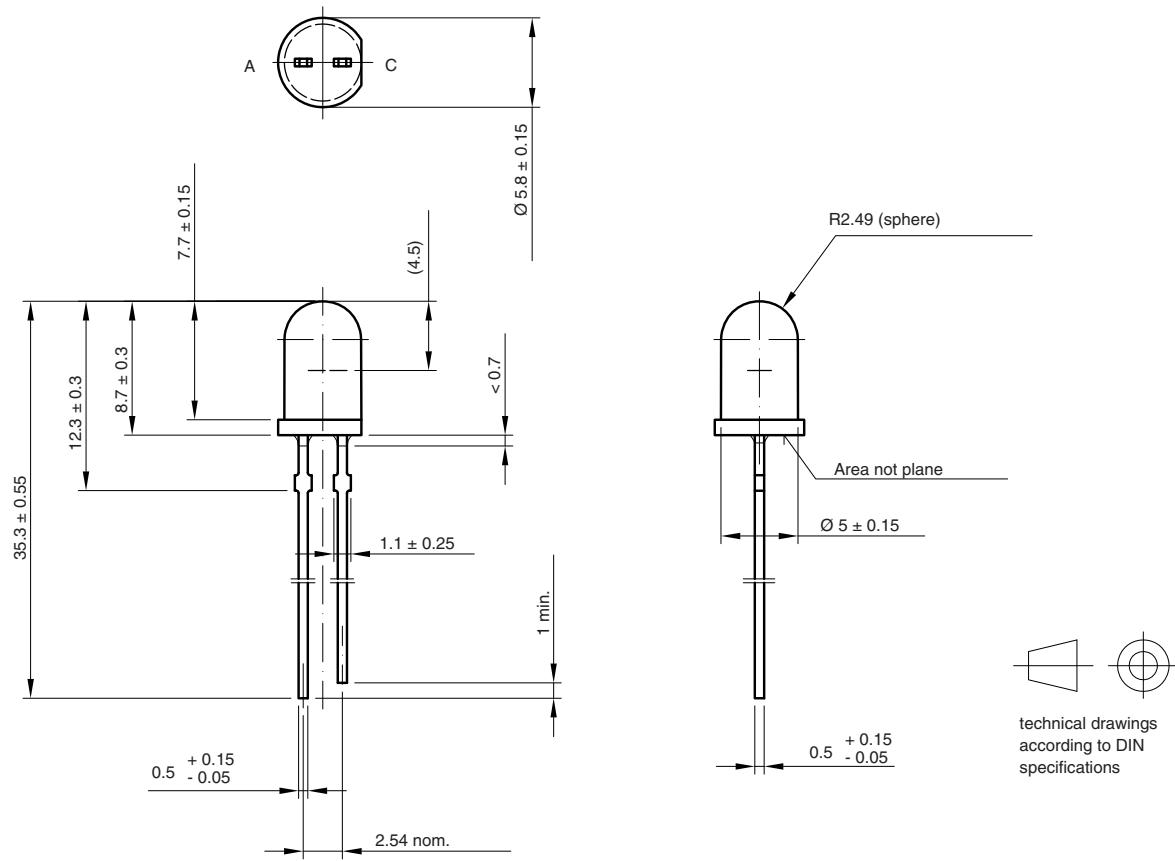


Fig. 7 - Relative Radiant Intensity vs. Angular Displacement

PACKAGE DIMENSIONS in millimeters



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