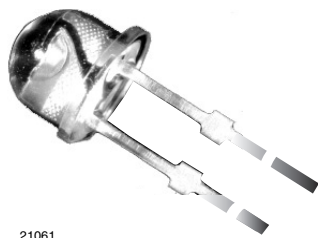


High Speed Infrared Emitting Diode, 830 nm, GaAlAs Double Hetero



21061

DESCRIPTION

TSHG5510 is an infrared, 830 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: $\lambda_p = 830$ nm
- High reliability
- High radiant power
- High radiant intensity
- Angle of half intensity: $\varphi = \pm 38^\circ$
- Low forward voltage
- Suitable for high pulse current operation
- High modulation bandwidth: $f_c = 24$ MHz
- Good spectral matching to 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 radiation source for operation with CMOS cameras (illumination)
- High speed IR data transmission

PRODUCT SUMMARY

COMPONENT	I_e (mW/sr)	φ (deg)	λ_p (nm)	t_r (ns)
TSHG5510	32	± 38	830	15

Note

Test conditions see table "Basic Characteristics"

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
TSHG5510	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

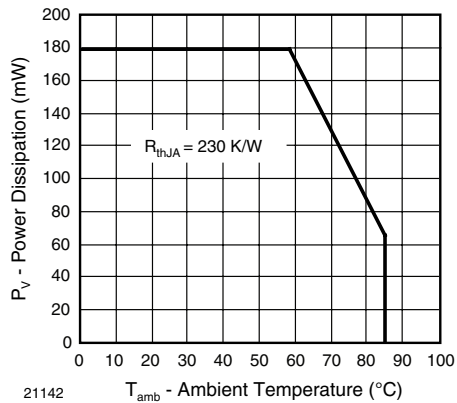


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

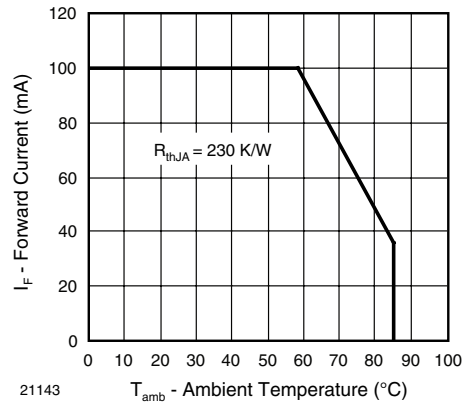


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$	V_F	1.3	1.45	1.7	V
	$I_F = 450 \text{ mA}$, $t_p = 100 \mu\text{s}$	V_F	1.5	1.75	2.1	V
	$I_F = 1 \text{ A}$, $t_p = 100 \mu\text{s}$	V_F		2.1		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		110		pF
Radiant intensity	$I_F = 100 \text{ mA}$, $t_p = 20 \text{ ms}$	I_e	18	32	54	mW/sr
	$I_F = 1 \text{ A}$, $t_p = 100 \mu\text{s}$	I_e		320		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		± 38		deg
Peak wavelength	$I_F = 100 \text{ mA}$	λ_p		830		nm
Spectral bandwidth	$I_F = 100 \text{ mA}$	$\Delta\lambda$		55		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		15		ns
Fall time	$I_F = 100 \text{ mA}$	t_f		15		ns
Cut-off frequency	$I_{DC} = 70 \text{ mA}$, $I_{AC} = 30 \text{ mA pp}$	f_c		24		MHz

Note

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

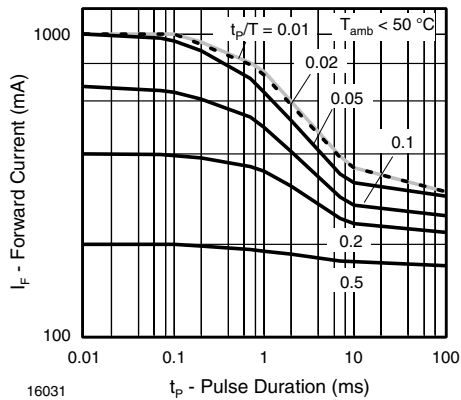
BASIC CHARACTERISTICS
 $T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified


Fig. 3 - Pulse Forward Current vs. Pulse Duration

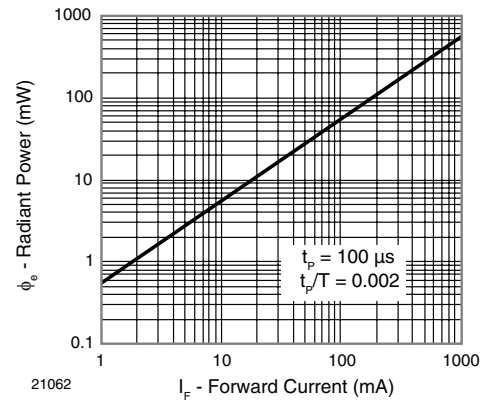


Fig. 6 - Radiant Power vs. Forward Current

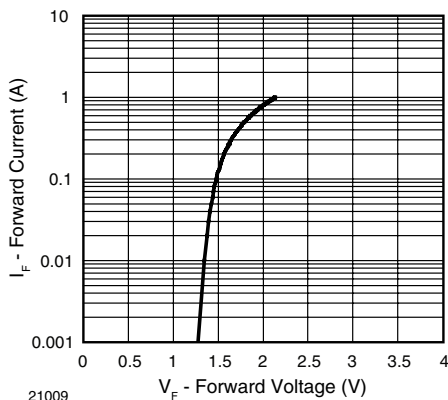


Fig. 4 - Forward Current vs. Forward Voltage

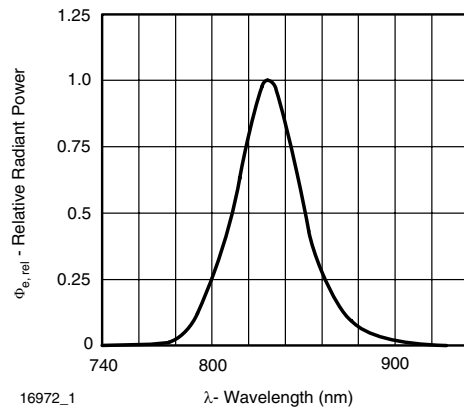


Fig. 7 - Relative Radiant Power vs. Wavelength

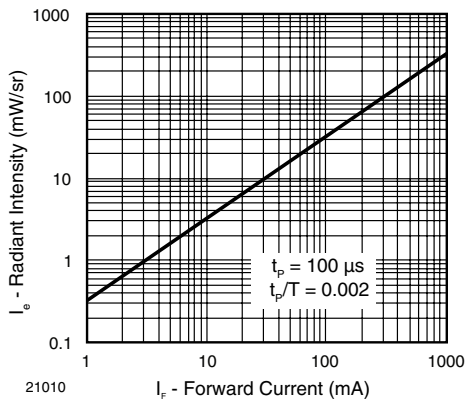


Fig. 5 - Radiant Intensity vs. Forward Current

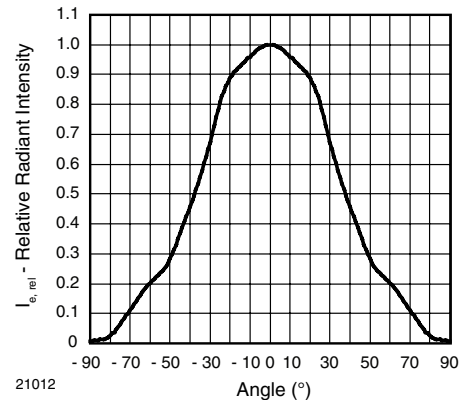
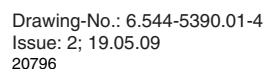


Fig. 8 - Relative Radiant Intensity vs. Angular Displacement

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





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