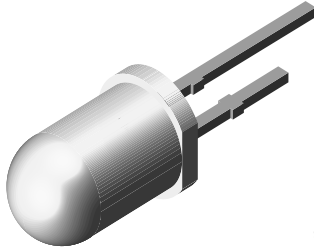


Infrared Emitting Diode, 950 nm, GaAs



94 8390

DESCRIPTION

TSUS5400 is an infrared, 950 nm emitting diode in GaAs technology molded in a blue-gray tinted plastic package.

FEATURES

- Package type: leaded
- Package form: T-1 $\frac{3}{4}$
- Dimensions (in mm): \varnothing 5
- Leads with stand-off
- Peak wavelength: $\lambda_p = 950$ nm
- High reliability
- Angle of half intensity: $\varphi = \pm 22^\circ$
- Low forward voltage
- Suitable for high pulse current operation
- 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 remote control and free air transmission systems with low forward voltage and small package requirements
- Emitter in transmissive sensors
- Emitter in reflective sensors

PRODUCT SUMMARY

COMPONENT	I_e (mW/sr)	φ (deg)	λ_p (nm)	t_r (ns)
TSUS5400	14	± 22	950	800
TSUS5401	17	± 22	950	800
TSUS5402	20	± 22	950	800

Note

Test conditions see table "Basic Characteristics"

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
TSUS5400	Bulk	MOQ: 4000 pcs, 4000 pcs/bulk	T-1 $\frac{3}{4}$
TSUS5401	Bulk	MOQ: 4000 pcs, 4000 pcs/bulk	T-1 $\frac{3}{4}$
TSUS5402	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	150	mA
Peak forward current	$t_p/T = 0.5, t_p = 100 \mu s$	I_{FM}	300	mA
Surge forward current	$t_p = 100 \mu s$	I_{FSM}	2.5	A
Power dissipation		P_V	170	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

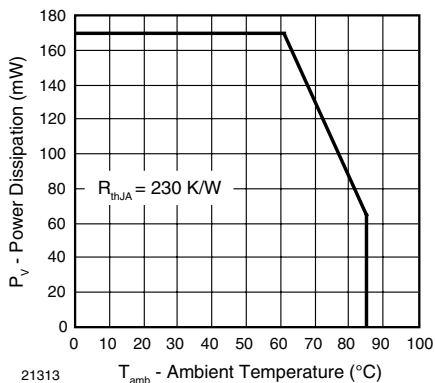


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

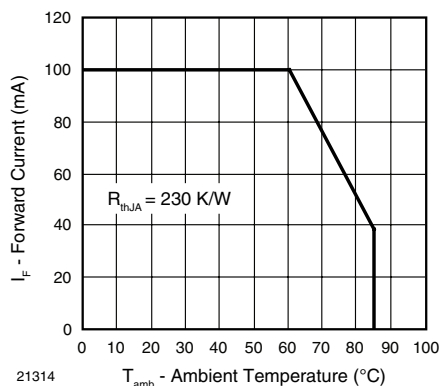


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	I _F = 100 mA, t _p = 20 ms	V _F		1.3	1.7	V
Temperature coefficient of V _F	I _F = 100 mA	TK _{V_F}		- 1.3		mV/K
Reverse current	V _R = 5 V	I _R			100	μA
Junction capacitance	V _R = 0 V, f = 1 MHz, E = 0	C _j		30		pF
Temperature coefficient of φ _e	I _F = 20 mA	TKφ _e		- 0.8		%/K
Angle of half intensity		φ		± 22		deg
Peak wavelength	I _F = 100 mA	λ _p		950		nm
Spectral bandwidth	I _F = 100 mA	Δλ		50		nm
Temperature coefficient of λ _p	I _F = 100 mA	TKλ _p		0.2		nm/K
Rise time	I _F = 100 mA	t _r		800		ns
	I _F = 1.5 A	t _r		400		ns
Fall time	I _F = 100 mA	t _f		800		ns
	I _F = 1.5 A	t _f		400		ns
Virtual source diameter		d		2.9		mm

Note

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

TYPE DEDICATED CHARACTERISTICS							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	I _F = 1.5 A, t _p = 100 μs	TSUS5400	V _F		2.2	3.4	V
		TSUS5401	V _F		2.2	3.4	V
		TSUS5402	V _F		2.2	2.7	V
Radiant intensity	I _F = 100 mA, t _p = 20 ms	TSUS5400	I _e	7	14	35	mW/sr
		TSUS5401	I _e	10	17	35	mW/sr
		TSUS5402	I _e	15	20	35	mW/sr
	I _F = 1.5 A, t _p = 100 μs	TSUS5400	I _e	60	140		mW/sr
		TSUS5401	I _e	85	160		mW/sr
		TSUS5402	I _e	120	190		mW/sr
Radiant power	I _F = 100 mA, t _p = 20 ms	TSUS5400	φ _e		13		mW
		TSUS5401	φ _e		14		mW
		TSUS5402	φ _e		15		mW

Note

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



TSUS5400, TSUS5401, TSUS5402

Infrared Emitting Diode, 950 nm, GaAs Vishay Semiconductors

BASIC CHARACTERISTICS

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

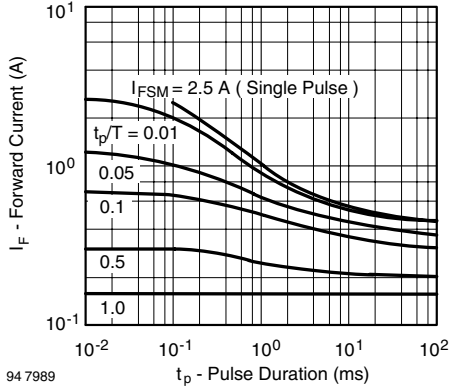


Fig. 3 - Pulse Forward Current vs. Pulse Duration

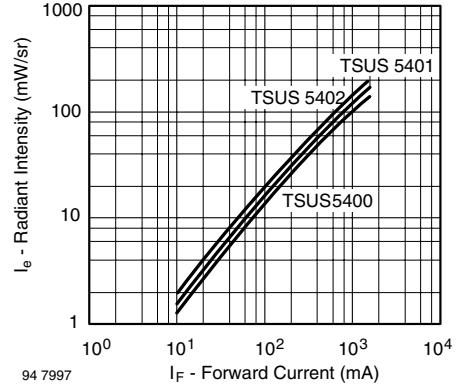


Fig. 6 - Radiant Intensity vs. Forward Current

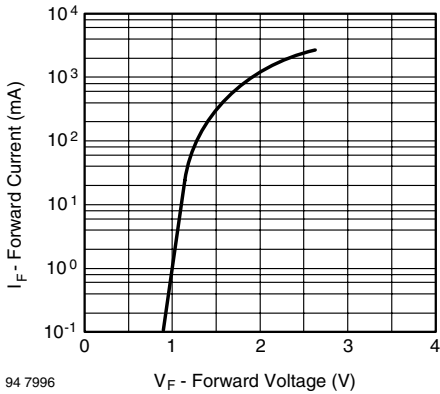


Fig. 4 - Forward Current vs. Forward Voltage

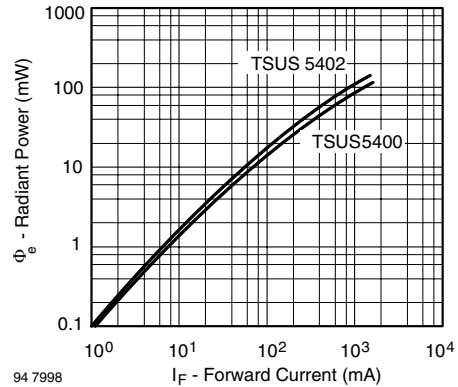


Fig. 7 - Radiant Power vs. Forward Current

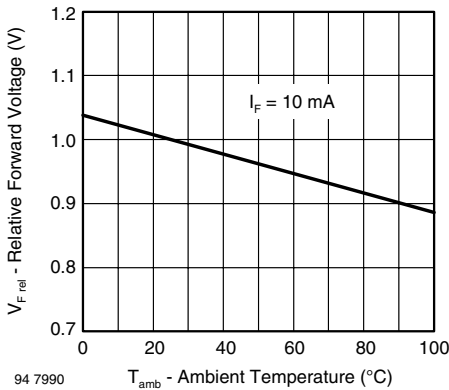


Fig. 5 - Relative Forward Voltage vs. Ambient Temperature

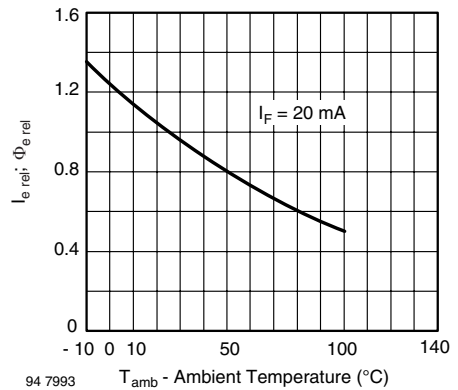


Fig. 8 - Relative Radiant Intensity/Power vs. Ambient Temperature

TSUS5400, TSUS5401, TSUS5402



Vishay Semiconductors Infrared Emitting Diode, 950 nm, GaAs

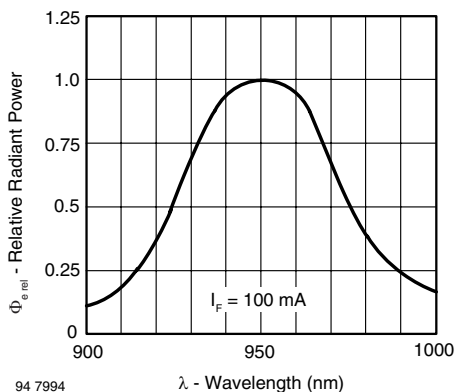


Fig. 9 - Relative Radiant Power vs. Wavelength

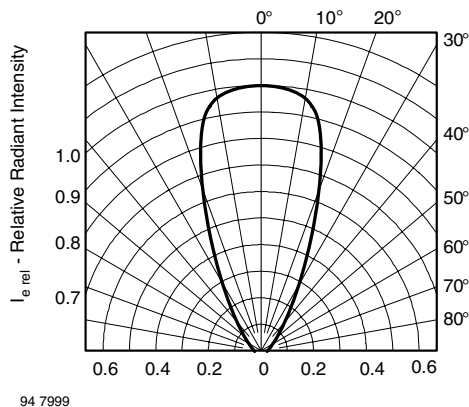
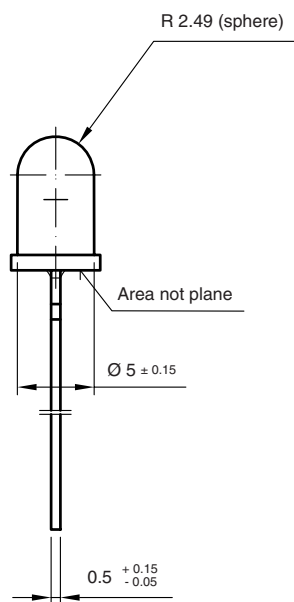
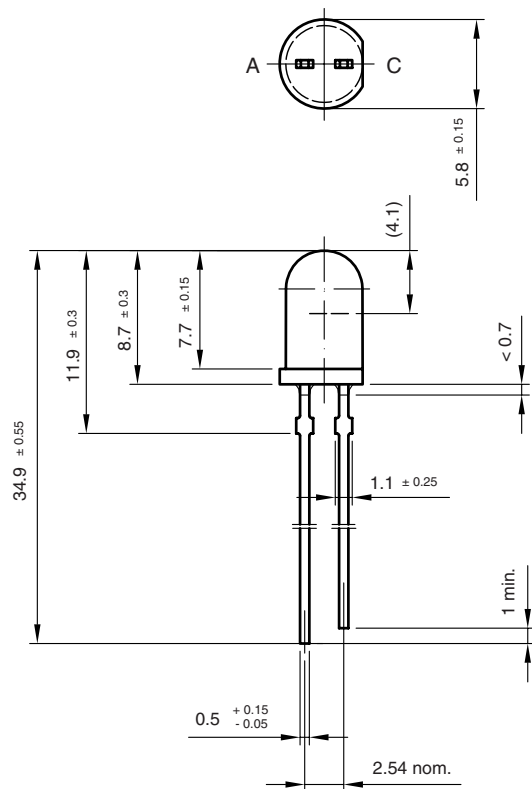


Fig. 10 - Relative Radiant Intensity vs. Angular Displacement

PACKAGE DIMENSIONS in millimeters



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Issue: 5; 19.05.09
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