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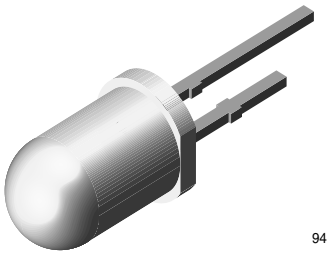
Infrared Emitting Diode, 950 nm, GaAs



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FEATURES

- Package type: leaded
- Package form: T-1¾
- Dimensions (in mm): Ø 5
- Leads with stand-off
- Peak wavelength: λ_p = 950 nm
- High reliability
- Angle of half intensity: φ = ± 22°
- 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

RoHS COMPLIANT

GREEN (5-2008)**

Note

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

DESCRIPTION

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

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-1¾
TSUS5401	Bulk	MOQ: 4000 pcs, 4000 pcs/bulk	T-1¾
TSUS5402	Bulk	MOQ: 4000 pcs, 4000 pcs/bulk	T-1¾

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	150	mA
Peak forward current	t_p/T = 0.5, t_p = 100 µs	I_{FM}	300	mA
Surge forward current	t_p = 100 µs	I_{FSM}	2.5	A
Power dissipation		P_V	170	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

For technical questions, contact: emittertechsupport@vishay.com

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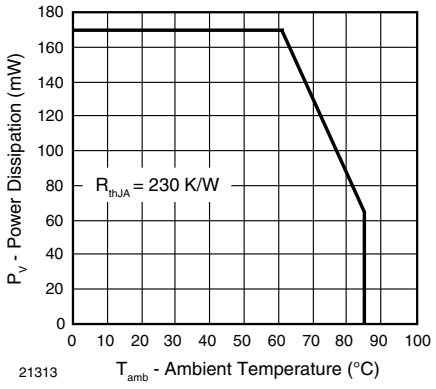

Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

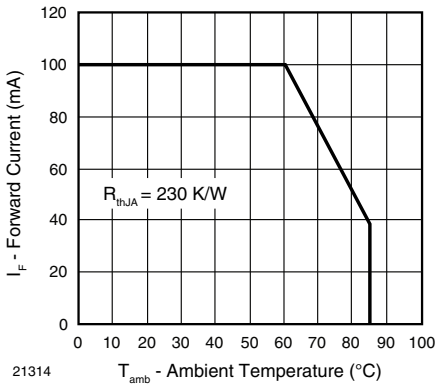

Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)						
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_{VF}		- 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	$TK\phi_e$		- 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	$\Delta\lambda$		50		nm
Temperature coefficient of λ_p	I_F = 100 mA	$TK\lambda_p$		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

TYPE DEDICATED CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)							
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

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BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

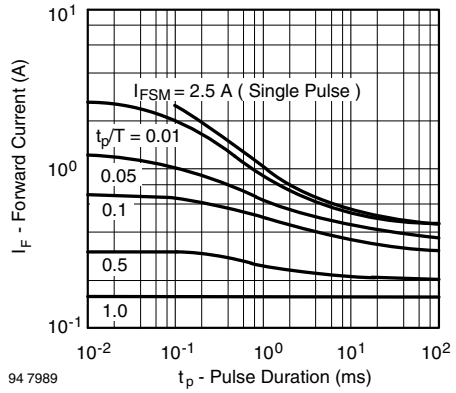

Fig. 3 - Pulse Forward Current vs. Pulse Duration

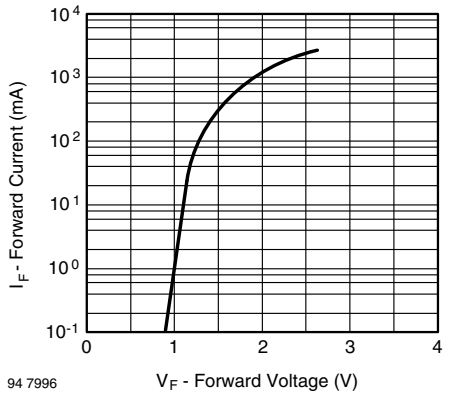

Fig. 4 - Forward Current vs. Forward Voltage

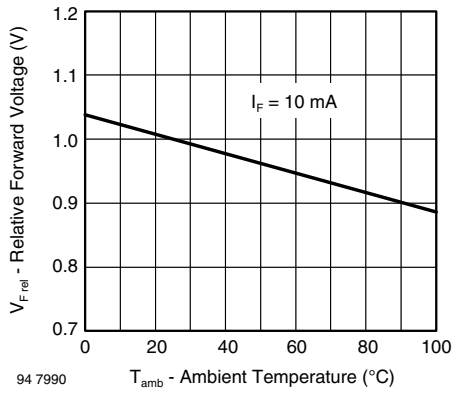

Fig. 5 - Relative Forward Voltage vs. Ambient Temperature

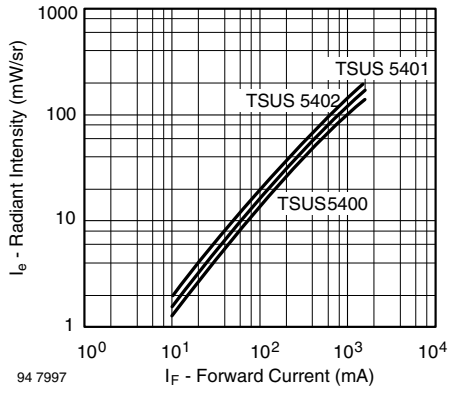

Fig. 6 - Radiant Intensity vs. Forward Current

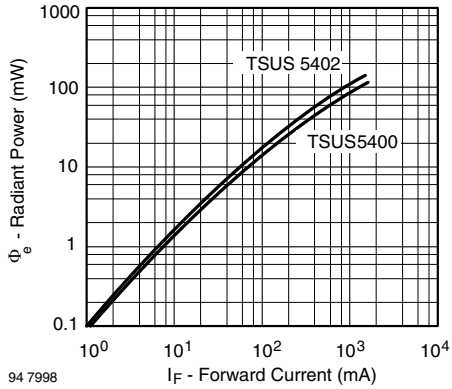

Fig. 7 - Radiant Power vs. Forward Current

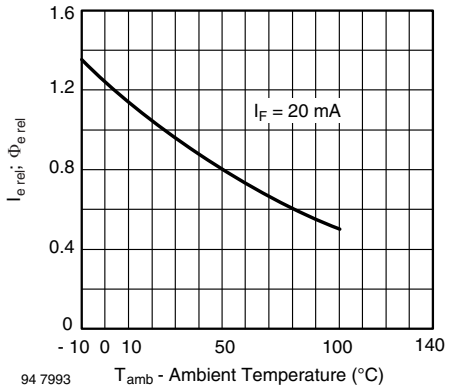

Fig. 8 - Relative Radiant Intensity/Power vs. Ambient Temperature

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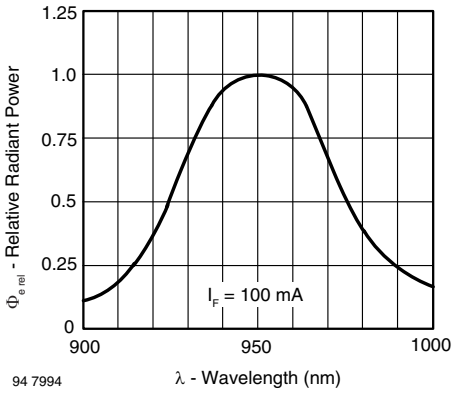


Fig. 9 - Relative Radiant Power vs. Wavelength

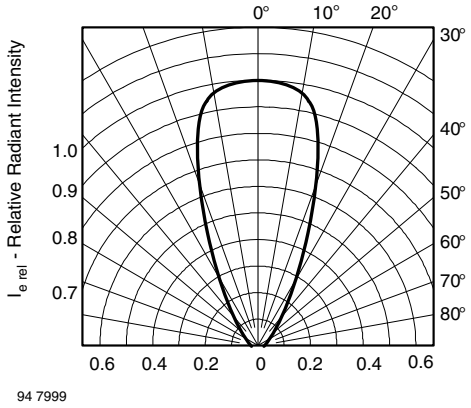
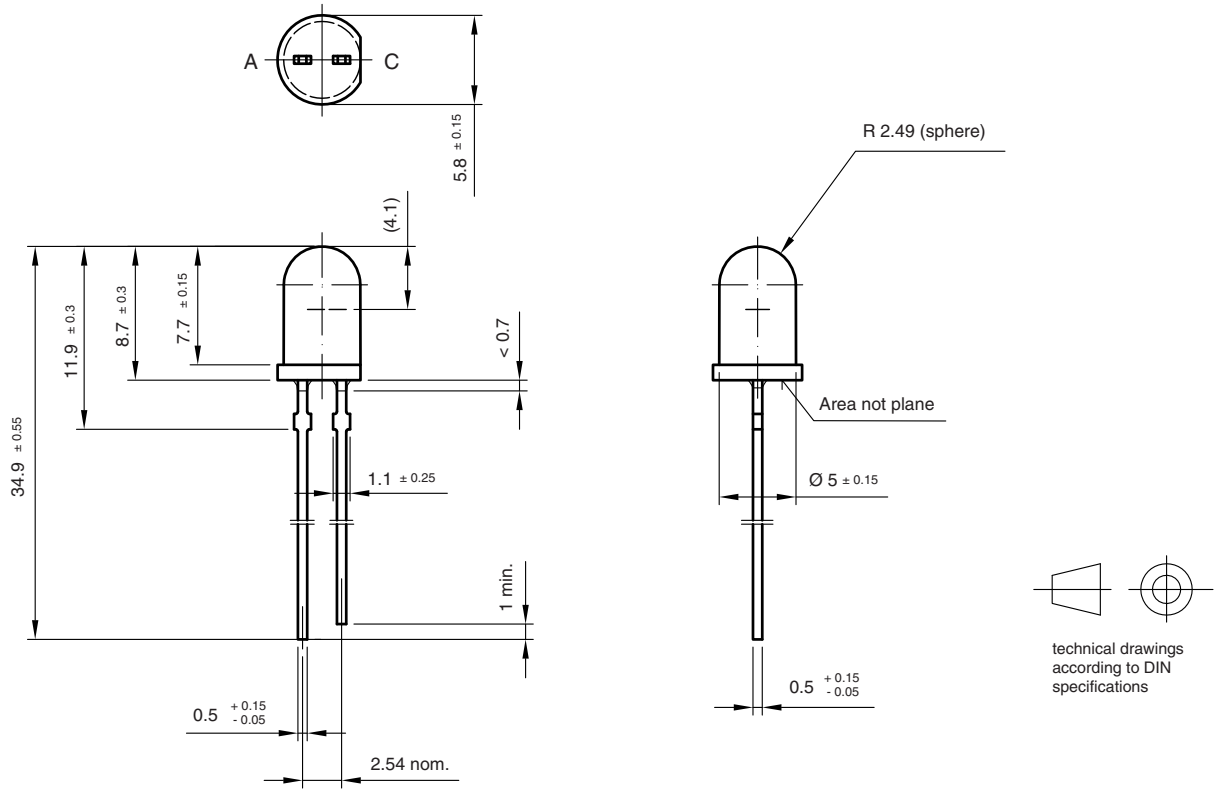


Fig. 10 - Relative Radiant Intensity vs. Angular Displacement

PACKAGE DIMENSIONS in millimeters



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