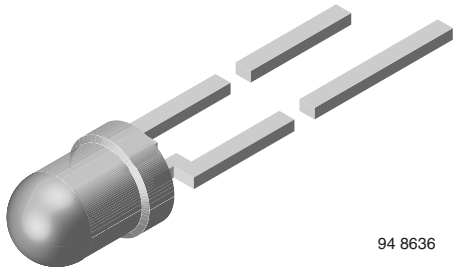
Infrared Emitting Diode, 875 nm, GaAlAs



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FEATURES

- Package type: leaded
- Package form: T-1
- Dimensions (in mm): Ø 3
- Peak wavelength: λ_p = 875 nm
- High reliability
- Angle of half intensity: φ = ± 20°
- Low forward voltage
- Suitable for high pulse current operation
- Good spectral matching with Si photodetectors
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

e2

RoHS COMPLIANT

HALOGEN FREE

GREEN (5-2008)

DESCRIPTION

The TSHA440. series are infrared, 875 nm emitting diodes in GaAlAs technology, molded in a clear, untinted plastic package.

APPLICATIONS

- Infrared remote control and free air data transmission systems with comfortable radiation angle
- This emitter series is dedicated to systems with panes in transmission space between emitter and detector, because of the low absorption of 875 nm radiation in glass

PRODUCT SUMMARY				
COMPONENT	I_e (mW/sr)	φ (deg)	λ_p (nm)	t_r (ns)
TSHA4400	20	± 20	875	600
TSHA4401	30	± 20	875	600

Note

- Test conditions see table “Basic Characteristics”

ORDERING INFORMATION			
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
TSHA4400	Bulk	MOQ: 5000 pcs, 5000 pcs/bulk	T-1
TSHA4401	Bulk	MOQ: 5000 pcs, 5000 pcs/bulk	T-1

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}	2	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}	300	K/W

For technical questions, contact: emittertechsupport@vishay.com

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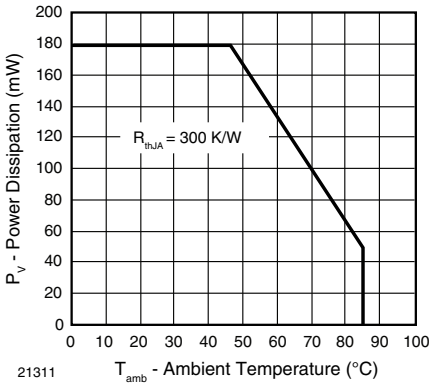

Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

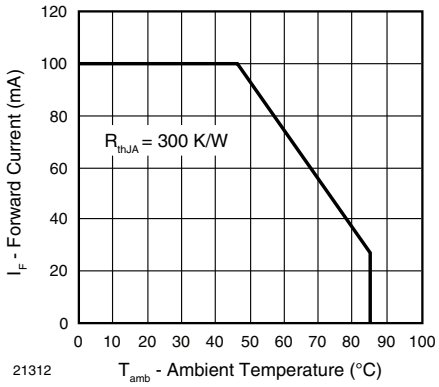

Fig. 2 - Forward Current Limit vs. Ambient Temperature

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		1.5	1.8	V
	I_F = 1.5 A, t_p = 100 µs	V_F		3.2	4.9	V
Temperature coefficient of V_F	I_F = 100 mA	TK_{VF}		-1.6		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		20		pF
Temperature coefficient of ϕ_e	I_F = 100 mA	$TK\phi_e$		-0.7		%/K
Angle of half intensity		φ		± 20		deg
Peak wavelength	I_F = 100 mA	λ_p		875		nm
Spectral bandwidth	I_F = 100 mA	$\Delta\lambda$		80		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		600		ns
	I_F = 1.5 A	t_r		300		ns
Fall time	I_F = 100 mA	t_f		600		ns
	I_F = 1.5 A	t_f		300		ns
Virtual source diameter		d		1.8		mm

TYPE DEDICATED CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)							
PARAMETER	**TEST CONDITION**	**PART**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Radiant intensity	I_F = 100 mA, t_p = 20 ms	TSHA4400	I_e	12	20	60	mW/sr
		TSHA4401	I_e	16	30	60	mW/sr
	I_F = 1.5 mA, t_p = 100 µs	TSHA4400	I_e	140	240		mW/sr
		TSHA4401	I_e	190	360		mW/sr
Radiant power	I_F = 100 mA, t_p = 20 ms	TSHA4400	ϕ_e		20		mW
		TSHA4401	ϕ_e		24		mW

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

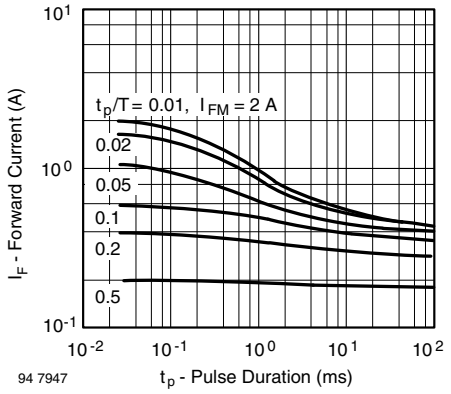

Fig. 3 - Pulse Forward Current vs. Pulse Duration

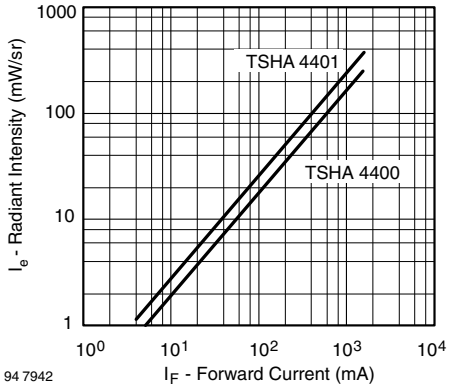

Fig. 6 - Radiant Intensity vs. Forward Current

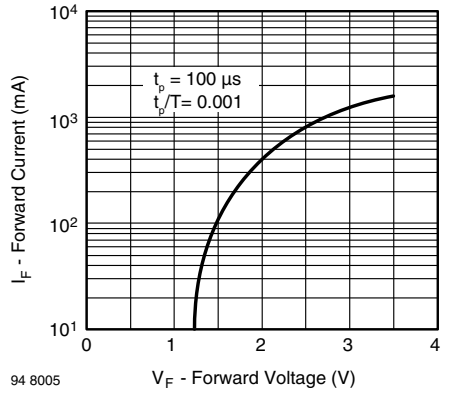

Fig. 4 - Forward Current vs. Forward Voltage

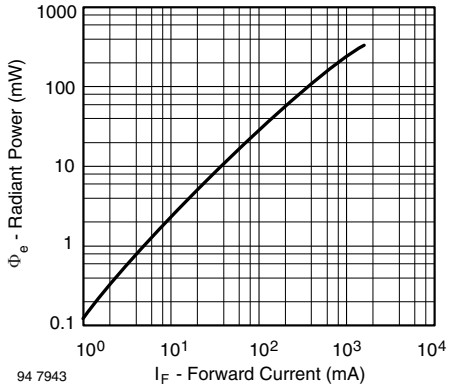

Fig. 7 - Radiant Power vs. Forward Current

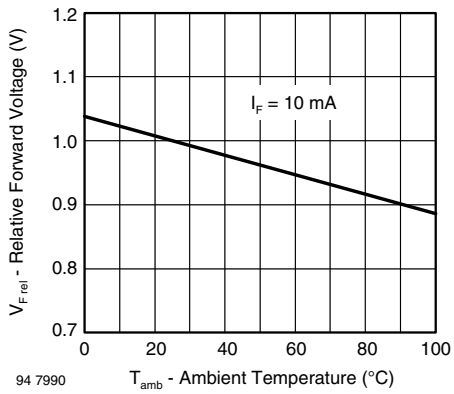

Fig. 5 - Relative Forward Voltage vs. Ambient Temperature

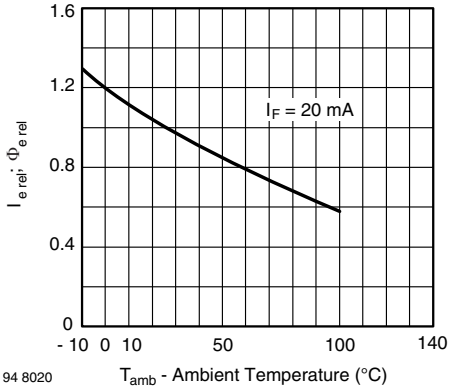

Fig. 8 - Relative Radiant Intensity/Power vs. Ambient Temperature

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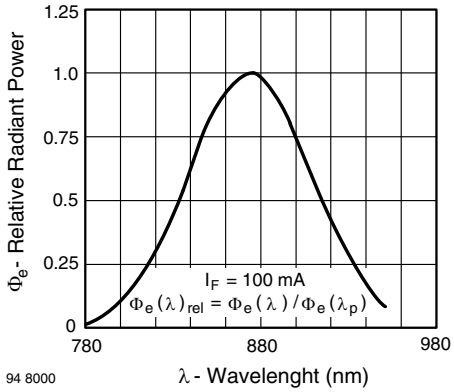


Fig. 9 - Relative Radiant Power vs. Wavelength

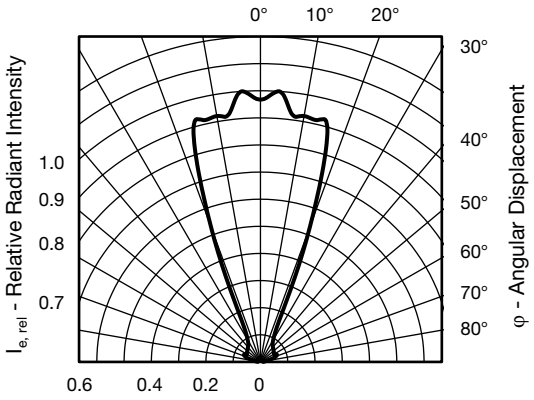
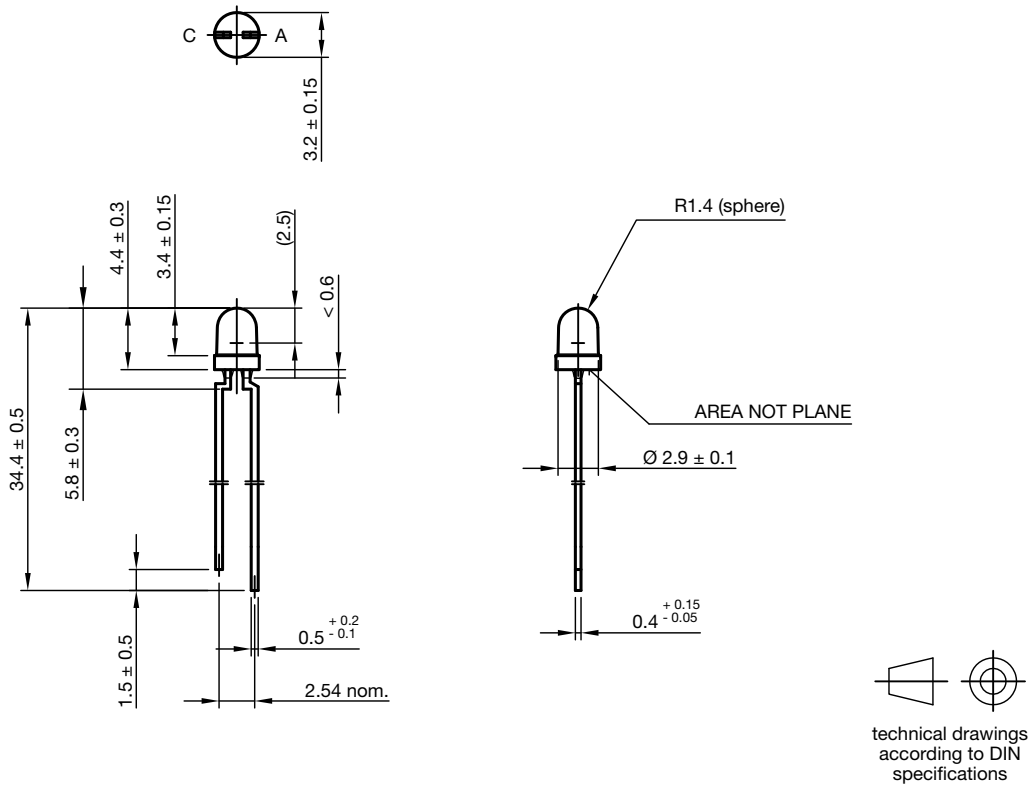


Fig. 10 - Relative Radiant Intensity vs. Angular Displacement

PACKAGE DIMENSIONS in millimeters



Drawing-No.: 6.544-5264.01-4
Issue: 4; 28.07.14

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