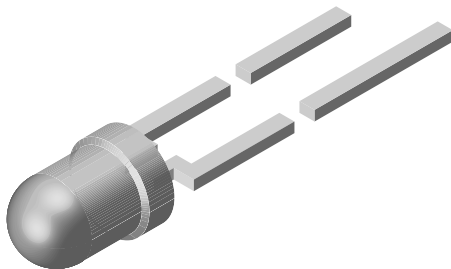




Infrared Emitting Diode, 875 nm, GaAlAs



FEATURES

- Package type: leaded
- Package form: T-1
- Dimensions (in mm): $\varnothing$ 3
- Peak wavelength: $\lambda_p = 875$ nm
- High reliability
- Angle of half intensity: $\phi = \pm 20^\circ$
- 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



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

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V_R	5	V
Forward current		I_F	100	mA
Peak forward current	$t_p/T = 0.5$, $t_p = 100 \mu\text{s}$	I_{FM}	200	mA
Surge forward current	$t_p = 100 \mu\text{s}$	I_{FSM}	2	A
Power dissipation		P_V	180	mW
Junction temperature		T_j	100	$^\circ\text{C}$
Operating temperature range		T_{amb}	-40 to +85	$^\circ\text{C}$
Storage temperature range		T_{stg}	-40 to +100	$^\circ\text{C}$
Soldering temperature	$t \leq 5$ s, 2 mm from case	T_{sd}	260	$^\circ\text{C}$
Thermal resistance junction to ambient	J-STD-051, leads 7 mm, soldered on PCB	R_{thJA}	300	K/W

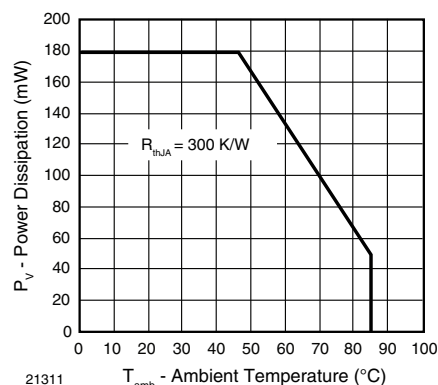


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

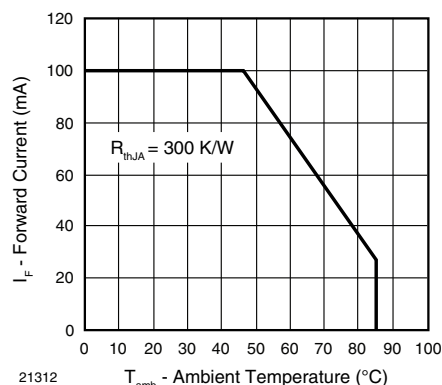


Fig. 2 - Forward Current Limit vs. Ambient Temperature

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
	$I_F = 1.5\text{ A}$, $t_p = 100\text{ }\mu\text{s}$	V_F	-	3.2	4.9	V
Temperature coefficient of V_F	$I_F = 100\text{ mA}$	TK_{VF}	-	-1.6	-	mV/K
Reverse current	$V_R = 5\text{ V}$	I_R	-	-	100	μA
Junction capacitance	$V_R = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0$	C_j	-	20	-	pF
Temperature coefficient of ϕ_e	$I_F = 100\text{ mA}$	$TK\phi_e$	-	-0.7	-	%/K
Angle of half intensity		ϕ	-	± 20	-	$^{\circ}$
Peak wavelength	$I_F = 100\text{ mA}$	λ_p	-	875	-	nm
Spectral bandwidth	$I_F = 100\text{ mA}$	$\Delta\lambda$	-	80	-	nm
Temperature coefficient of λ_p	$I_F = 100\text{ mA}$	$TK\lambda_p$	-	0.2	-	nm/K
Rise time	$I_F = 100\text{ mA}$	t_r	-	600	-	ns
	$I_F = 1.5\text{ A}$	t_r	-	300	-	ns
Fall time	$I_F = 100\text{ mA}$	t_f	-	600	-	ns
	$I_F = 1.5\text{ A}$	t_f	-	300	-	ns
Virtual source diameter		d	-	1.8	-	mm

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

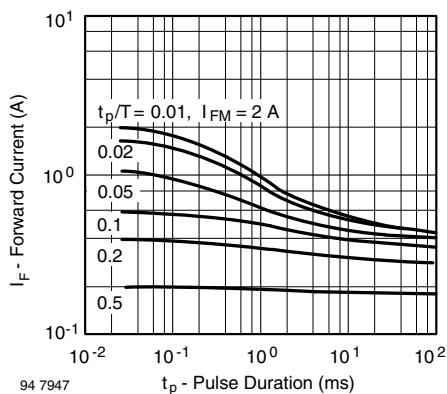
**BASIC CHARACTERISTICS** ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

Fig. 3 - Pulse Forward Current vs. Pulse Duration

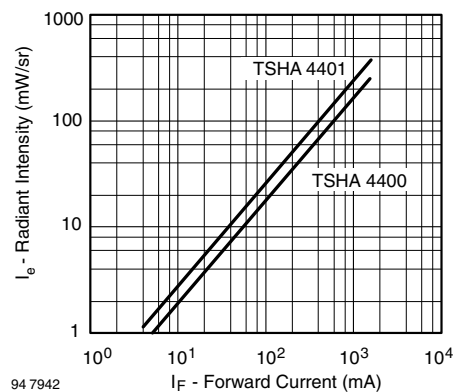


Fig. 6 - Radiant Intensity vs. Forward Current

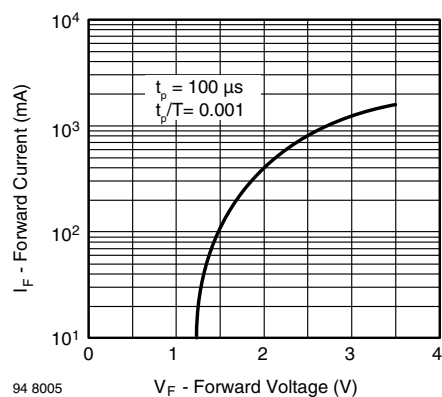


Fig. 4 - Forward Current vs. Forward Voltage

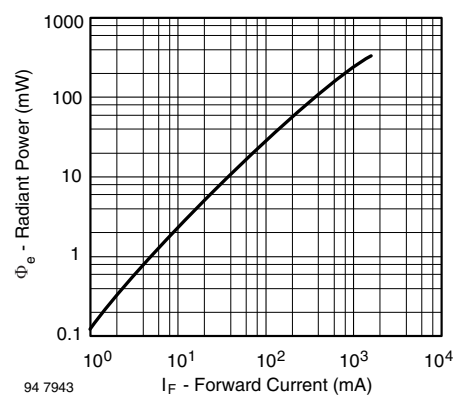


Fig. 7 - Radiant Power vs. Forward Current

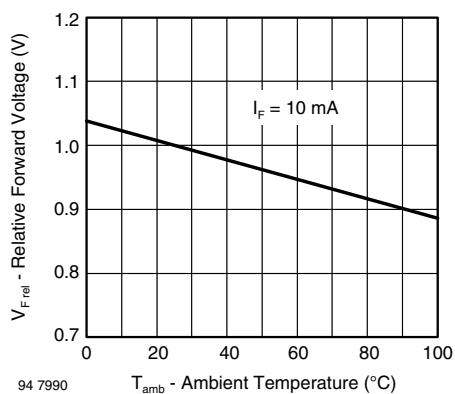


Fig. 5 - Relative Forward Voltage vs. Ambient Temperature

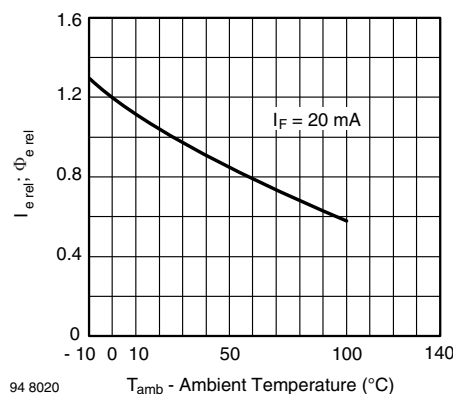


Fig. 8 - Relative Radiant Intensity/Power vs. Ambient Temperature

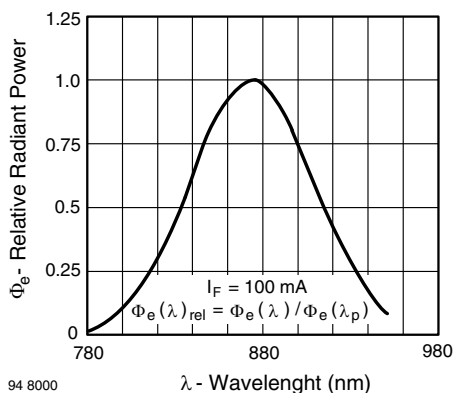


Fig. 9 - Relative Radiant Power vs. Wavelength

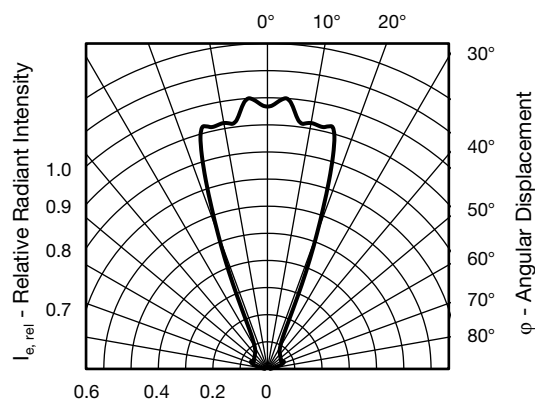
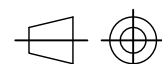
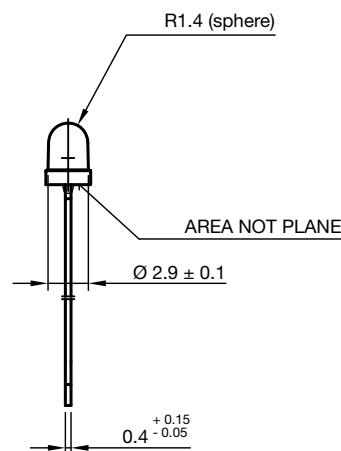
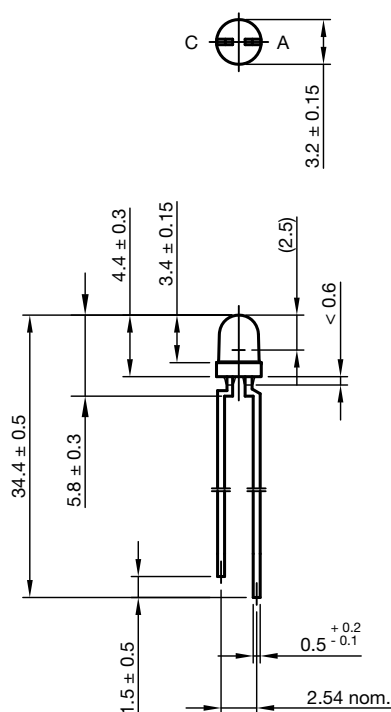


Fig. 10 - Relative Radiant Intensity vs. Angular Displacement

PACKAGE DIMENSIONS in millimeters

technical drawings
according to DIN
specifications

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



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