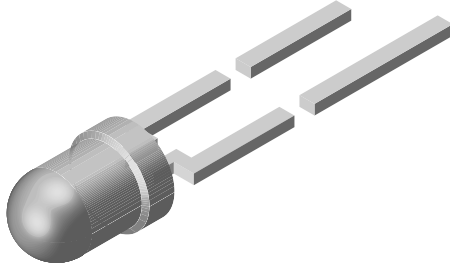




## Infrared Emitting Diode, 875 nm, GaAlAs



### 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:  $\varphi = \pm 20^\circ$
- 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](http://www.vishay.com/doc?99912)



### 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)	$\varphi$ (°)	$\lambda_p$ (nm)	$t_r$ (ns)
TSHA4400	20	$\pm 20$	875	600
TSHA4401	30	$\pm 20$	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

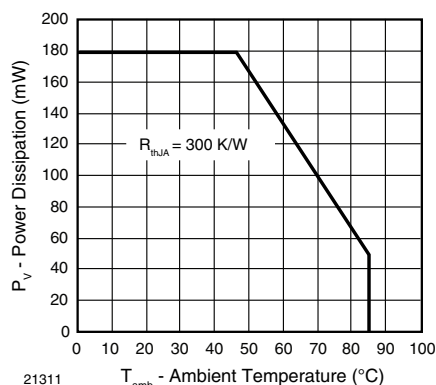


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

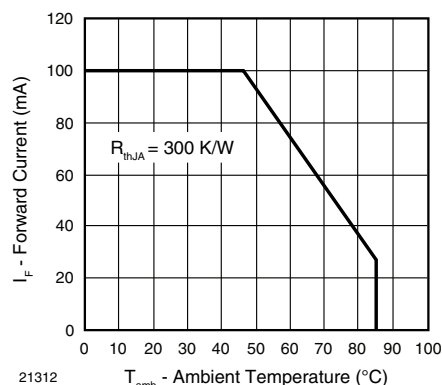


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS (T <sub>amb</sub> = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	I <sub>F</sub> = 100 mA, t <sub>p</sub> = 20 ms	V <sub>F</sub>	-	1.5	1.8	V
	I <sub>F</sub> = 1.5 A, t <sub>p</sub> = 100 μs	V <sub>F</sub>	-	3.2	4.9	V
Temperature coefficient of V <sub>F</sub>	I <sub>F</sub> = 100 mA	TK <sub>V<sub>F</sub></sub>	-	-1.6	-	mV/K
Reverse current	V <sub>R</sub> = 5 V	I <sub>R</sub>	-	-	100	μA
Junction capacitance	V <sub>R</sub> = 0 V, f = 1 MHz, E = 0	C <sub>j</sub>	-	20	-	pF
Temperature coefficient of φ <sub>e</sub>	I <sub>F</sub> = 100 mA	TKφ <sub>e</sub>	-	-0.7	-	%/K
Angle of half intensity		φ	-	± 20	-	°
Peak wavelength	I <sub>F</sub> = 100 mA	λ <sub>p</sub>	-	875	-	nm
Spectral bandwidth	I <sub>F</sub> = 100 mA	Δλ	-	80	-	nm
Temperature coefficient of λ <sub>p</sub>	I <sub>F</sub> = 100 mA	TKλ <sub>p</sub>	-	0.2	-	nm/K
Rise time	I <sub>F</sub> = 100 mA	t <sub>r</sub>	-	600	-	ns
	I <sub>F</sub> = 1.5 A	t <sub>r</sub>	-	300	-	ns
Fall time	I <sub>F</sub> = 100 mA	t <sub>f</sub>	-	600	-	ns
	I <sub>F</sub> = 1.5 A	t <sub>f</sub>	-	300	-	ns
Virtual source diameter		d	-	1.8	-	mm

TYPE DEDICATED CHARACTERISTICS (T <sub>amb</sub> = 25 °C, unless otherwise specified)							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Radiant intensity	I <sub>F</sub> = 100 mA, t <sub>p</sub> = 20 ms	TSHA4400	I <sub>e</sub>	12	20	60	mW/sr
		TSHA4401	I <sub>e</sub>	16	30	60	mW/sr
	I <sub>F</sub> = 1.5 mA, t <sub>p</sub> = 100 μs	TSHA4400	I <sub>e</sub>	140	240	-	mW/sr
		TSHA4401	I <sub>e</sub>	190	360	-	mW/sr
Radiant power	I <sub>F</sub> = 100 mA, t <sub>p</sub> = 20 ms	TSHA4400	φ <sub>e</sub>	-	20	-	mW
		TSHA4401	φ <sub>e</sub>	-	24	-	mW



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

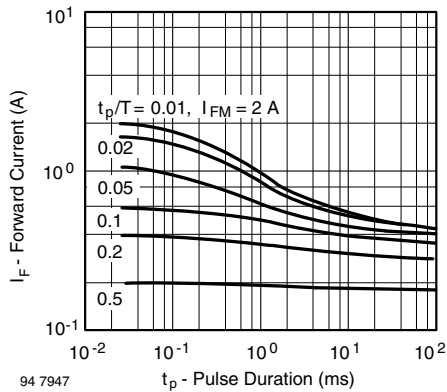


Fig. 3 - Pulse Forward Current vs. Pulse Duration

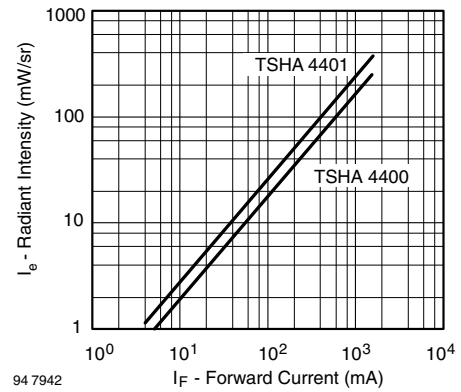


Fig. 6 - Radiant Intensity vs. Forward Current

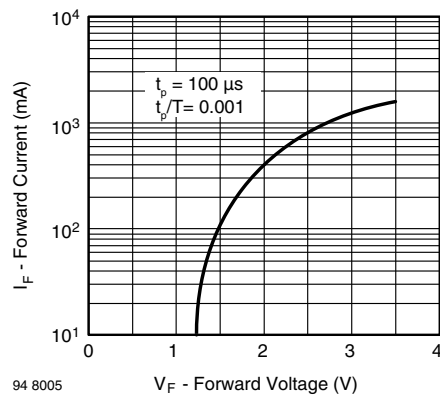


Fig. 4 - Forward Current vs. Forward Voltage

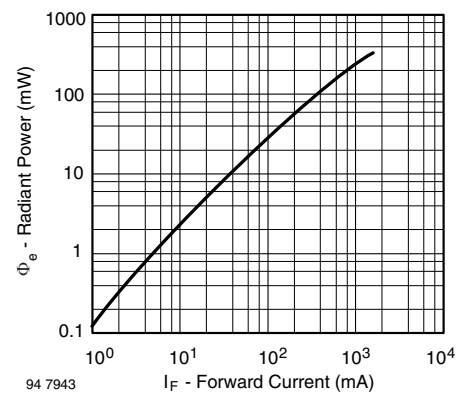


Fig. 7 - Radiant Power vs. Forward Current

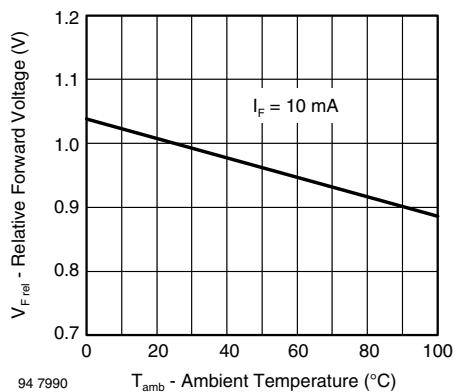


Fig. 5 - Relative Forward Voltage vs. Ambient Temperature

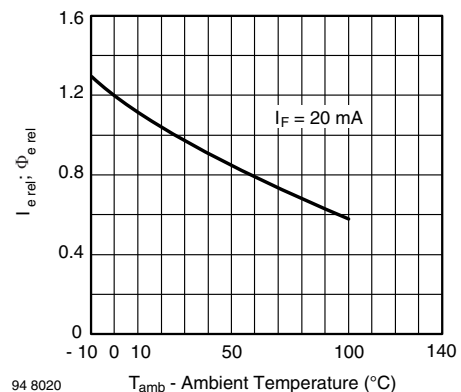


Fig. 8 - Relative Radiant Intensity/Power vs. Ambient Temperature

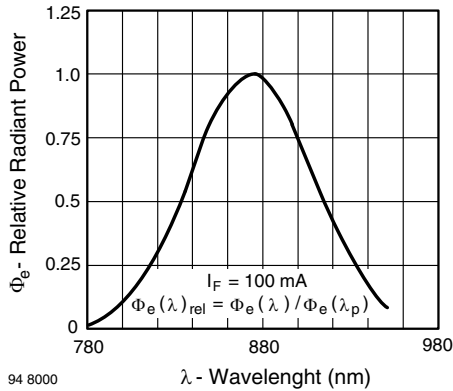


Fig. 9 - Relative Radiant Power vs. Wavelength

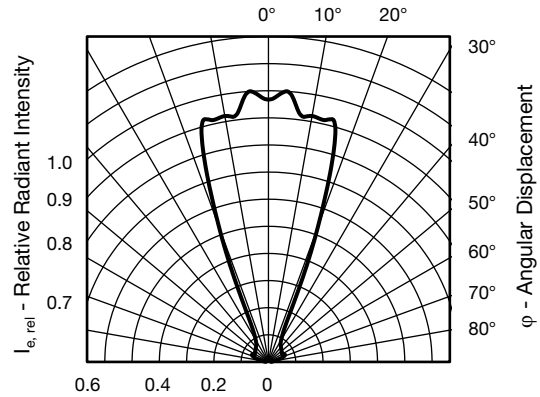
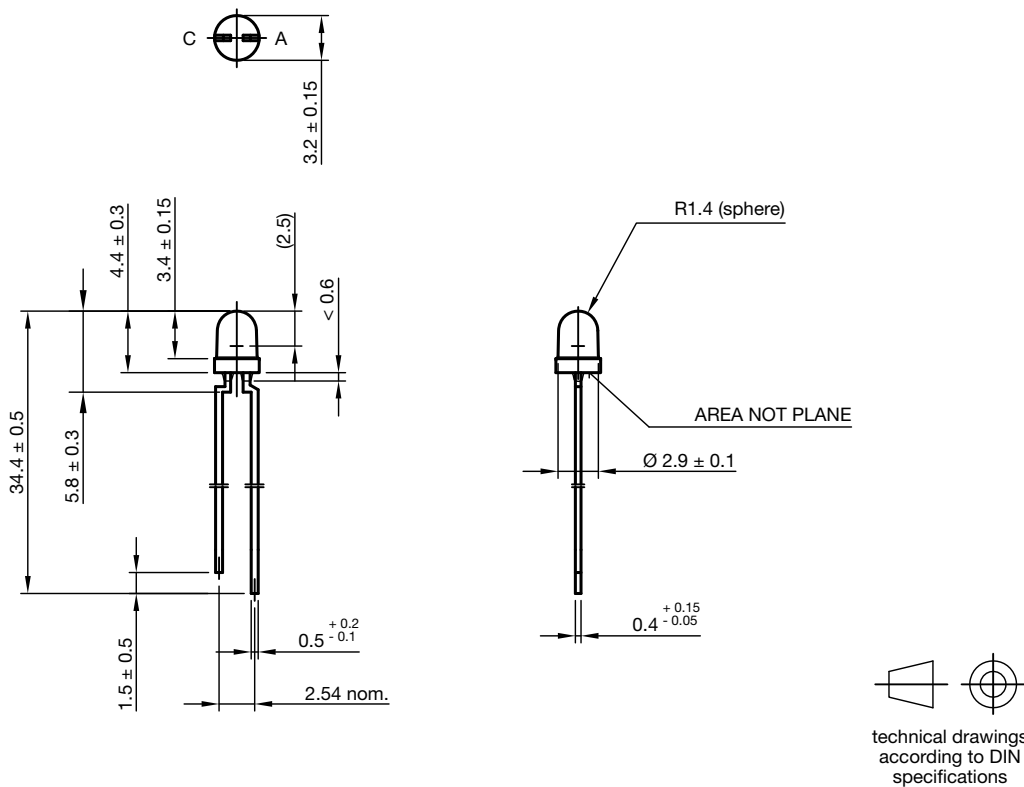


Fig. 10 - Relative Radiant Intensity vs. Angular Displacement

**PACKAGE DIMENSIONS** in millimeters



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



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