

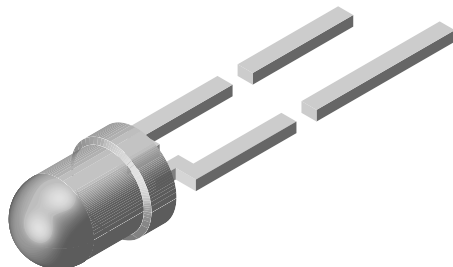


THE DATASHEET OF TSHA4401





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



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

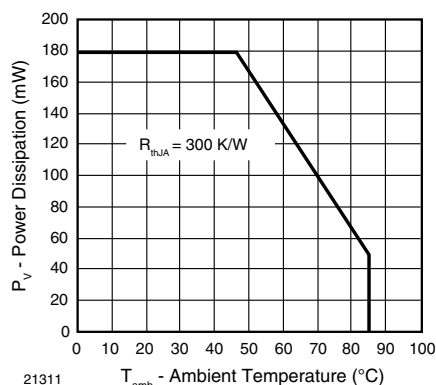


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

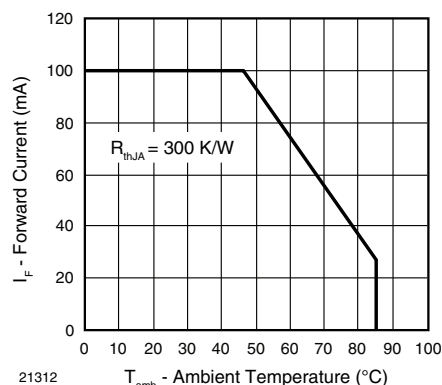


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS (T _{amb} = 25 °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 _{V_F}	-	-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	TKφ _e	-	-0.7	-	%/K
Angle of half intensity		φ	-	± 20	-	°
Peak wavelength	I _F = 100 mA	λ _p	-	875	-	nm
Spectral bandwidth	I _F = 100 mA	Δλ	-	80	-	nm
Temperature coefficient of λ _p	I _F = 100 mA	TKλ _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



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

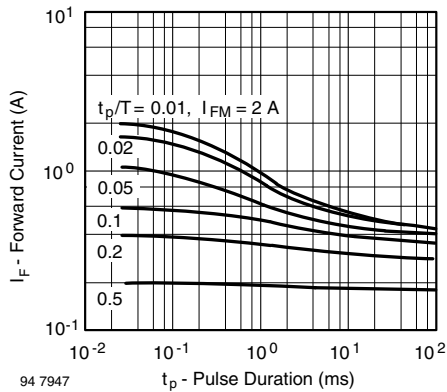


Fig. 3 - Pulse Forward Current vs. Pulse Duration

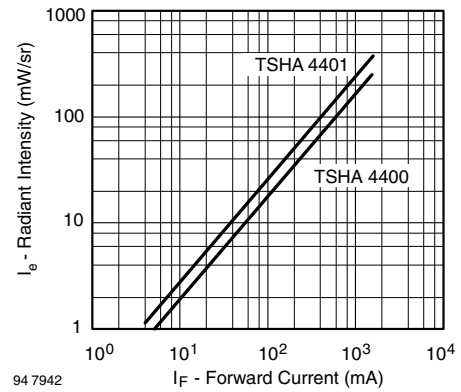


Fig. 6 - Radiant Intensity vs. Forward Current

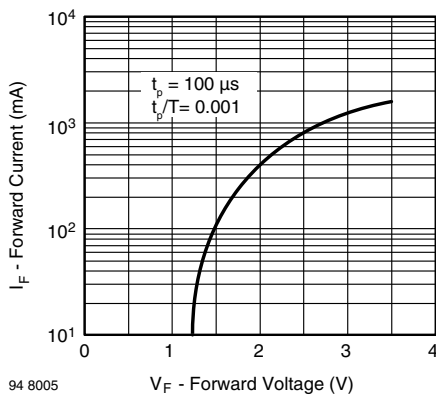


Fig. 4 - Forward Current vs. Forward Voltage

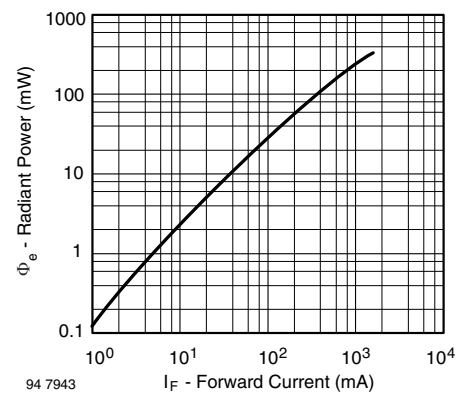


Fig. 7 - Radiant Power vs. Forward Current

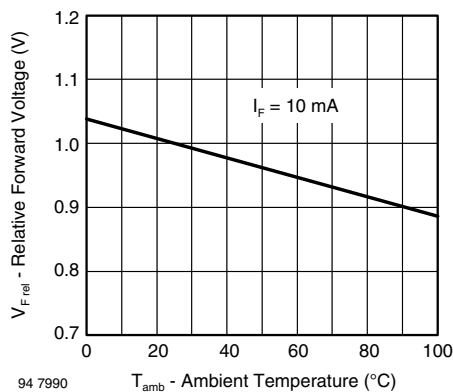


Fig. 5 - Relative Forward Voltage vs. Ambient Temperature

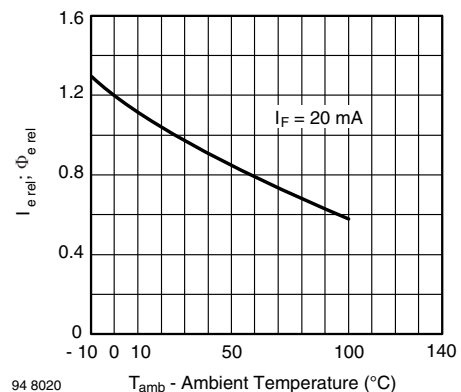


Fig. 8 - Relative Radiant Intensity/Power vs. Ambient Temperature

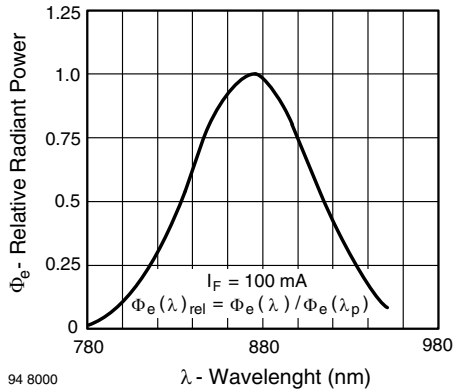


Fig. 9 - Relative Radiant Power vs. Wavelength

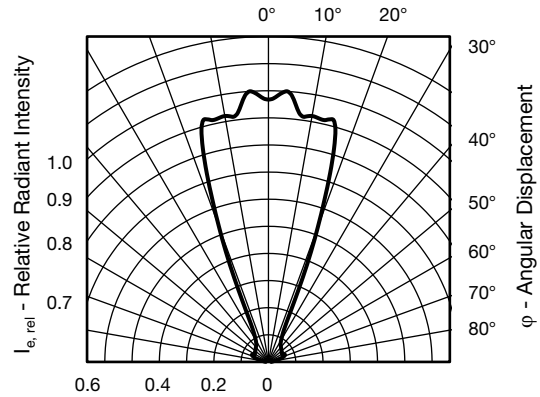
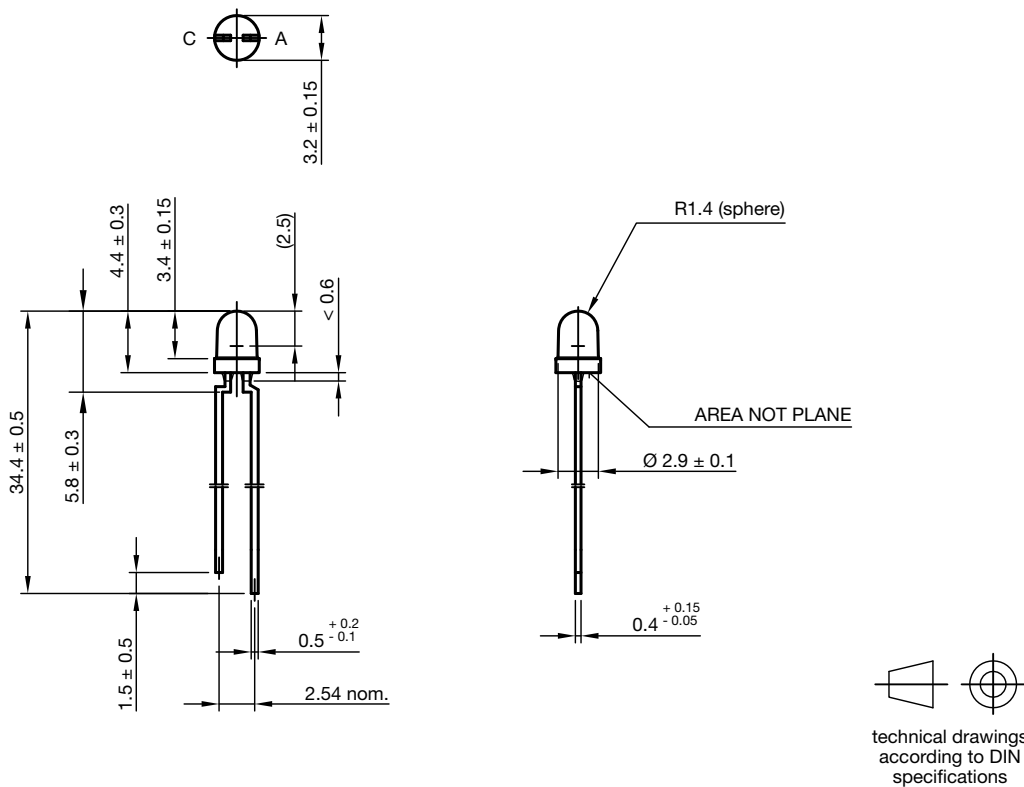


Fig. 10 - Relative Radiant Intensity vs. Angular Displacement

PACKAGE DIMENSIONS in millimeters



Drawing-No.: 6.544-5264.01-4
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