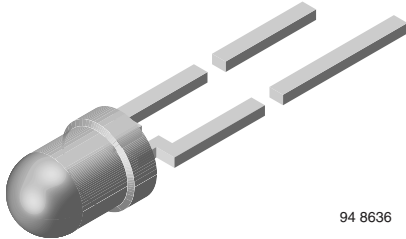


# High Power Infrared Emitting Diode, 940 nm, GaAlAs/GaAs



## DESCRIPTION

TSAL4400 is an infrared, 940 nm emitting diode in GaAlAs/GaAs technology with high radiant power molded in a blue-gray plastic package.

## FEATURES

- Package type: leaded
- Package form: T-1
- Dimensions (in mm):  $\varnothing 3$
- Peak wavelength:  $\lambda_p = 940$  nm
- High reliability
- High radiant power
- High radiant intensity
- Angle of half intensity:  $\varphi = \pm 25^\circ$
- Low forward voltage
- Suitable for high pulse current operation
- Good spectral matching with Si photodetectors
- Package matches with detector TEFT4300
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC



## Note

\*\* Please see document "Vishay Material Category Policy": [www.vishay.com/doc?99902](http://www.vishay.com/doc?99902)

## APPLICATIONS

- Infrared remote control units
- Free air transmission systems
- Infrared source for optical counters and card readers

## PRODUCT SUMMARY

COMPONENT	$I_e$ (mW/sr)	$\varphi$ (deg)	$\lambda_p$ (nm)	$t_r$ (ns)
TSAL4400	30	$\pm 25$	940	800

## Note

- Test conditions see table "Basic Characteristics"

## ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
TSAL4400	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	$t_p = 100 \mu\text{s}$	$I_{FSM}$	1.5	A
Power dissipation		$P_V$	160	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/ambient	J-STD-051, leads 7 mm, soldered on PCB	$R_{thJA}$	300	K/W

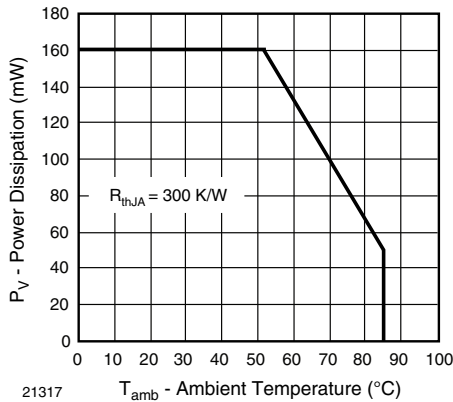


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

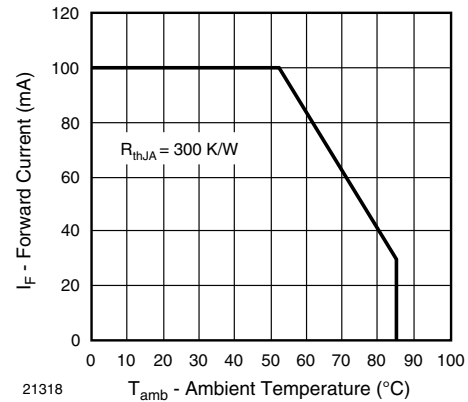


Fig. 2 - Forward Current Limit vs. Ambient Temperature

<b>BASIC CHARACTERISTICS</b> (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>		1.35	1.6	V
	I <sub>F</sub> = 1 A, t <sub>p</sub> = 100 μs	V <sub>F</sub>		2.6	3	V
Temperature coefficient of V <sub>F</sub>	I <sub>F</sub> = 1 mA	TK <sub>V<sub>F</sub></sub>		- 1.8		mV/K
Reverse current	V <sub>R</sub> = 5 V	I <sub>R</sub>			10	μA
Junction capacitance	V <sub>R</sub> = 0 V, f = 1 MHz, E = 0	C <sub>j</sub>		25		pF
Radiant intensity	I <sub>F</sub> = 100 mA, t <sub>p</sub> = 20 ms	I <sub>e</sub>	16	30	80	mW/sr
	I <sub>F</sub> = 1 A, t <sub>p</sub> = 100 μs	I <sub>e</sub>	135	240		mW/sr
Radiant power	I <sub>F</sub> = 100 mA, t <sub>p</sub> = 20 ms	φ <sub>e</sub>		35		mW
Temperature coefficient of φ <sub>e</sub>	I <sub>F</sub> = 20 mA	TK <sub>φ<sub>e</sub></sub>		- 0.6		%/K
Angle of half intensity		φ		± 25		deg
Peak wavelength	I <sub>F</sub> = 100 mA	λ <sub>p</sub>		940		nm
Spectral bandwidth	I <sub>F</sub> = 100 mA	Δλ		50		nm
Temperature coefficient of λ <sub>p</sub>	I <sub>F</sub> = 100 mA	TK <sub>λ<sub>p</sub></sub>		0.2		nm/K
Rise time	I <sub>F</sub> = 100 mA	t <sub>r</sub>		800		ns
Fall time	I <sub>F</sub> = 100 mA	t <sub>f</sub>		800		ns
Virtual source diameter	Method: 63 % encircled energy	d		1.9		mm

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

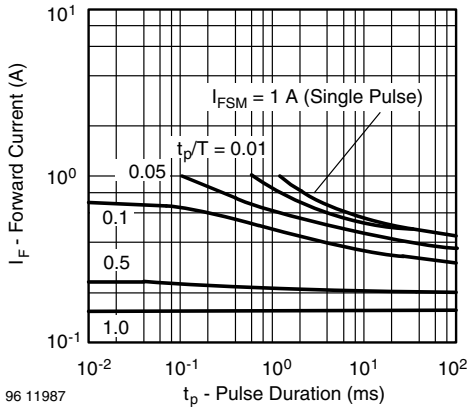


Fig. 3 - Pulse Forward Current vs. Pulse Duration

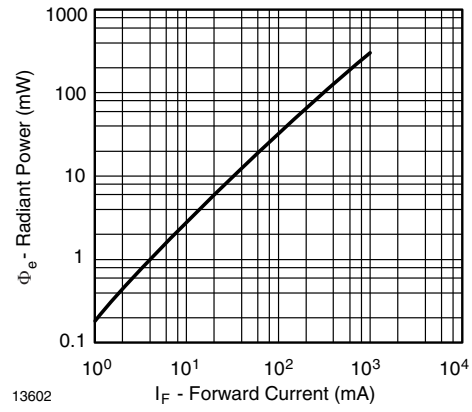


Fig. 6 - Radiant Power vs. Forward Current

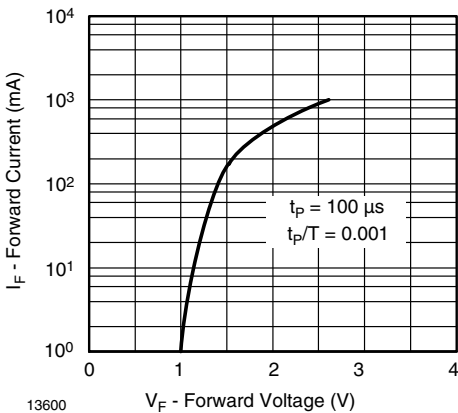


Fig. 4 - Forward Current vs. Forward Voltage

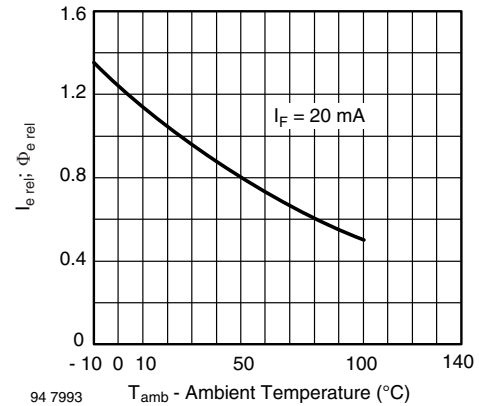


Fig. 7 - Rel. Radiant Intensity/Power vs. Ambient Temperature

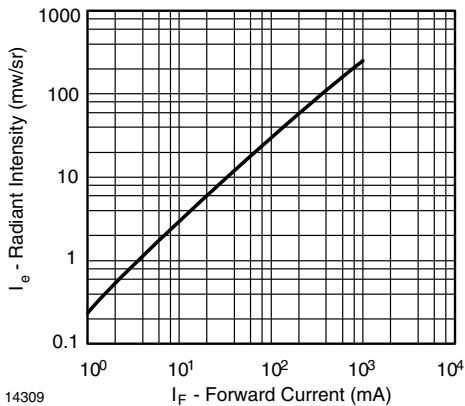


Fig. 5 - Radiant Intensity vs. Forward Current

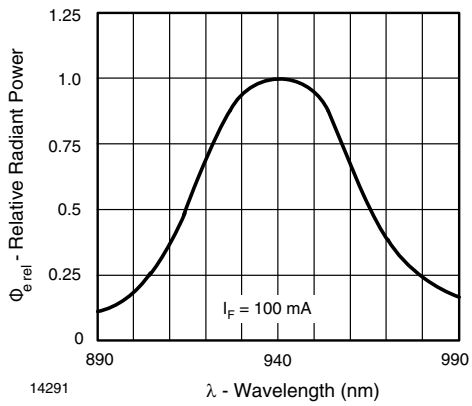
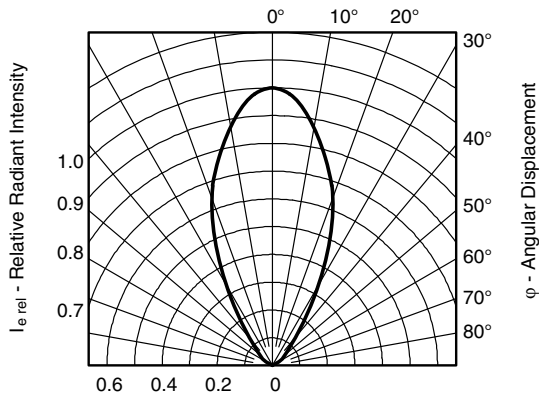


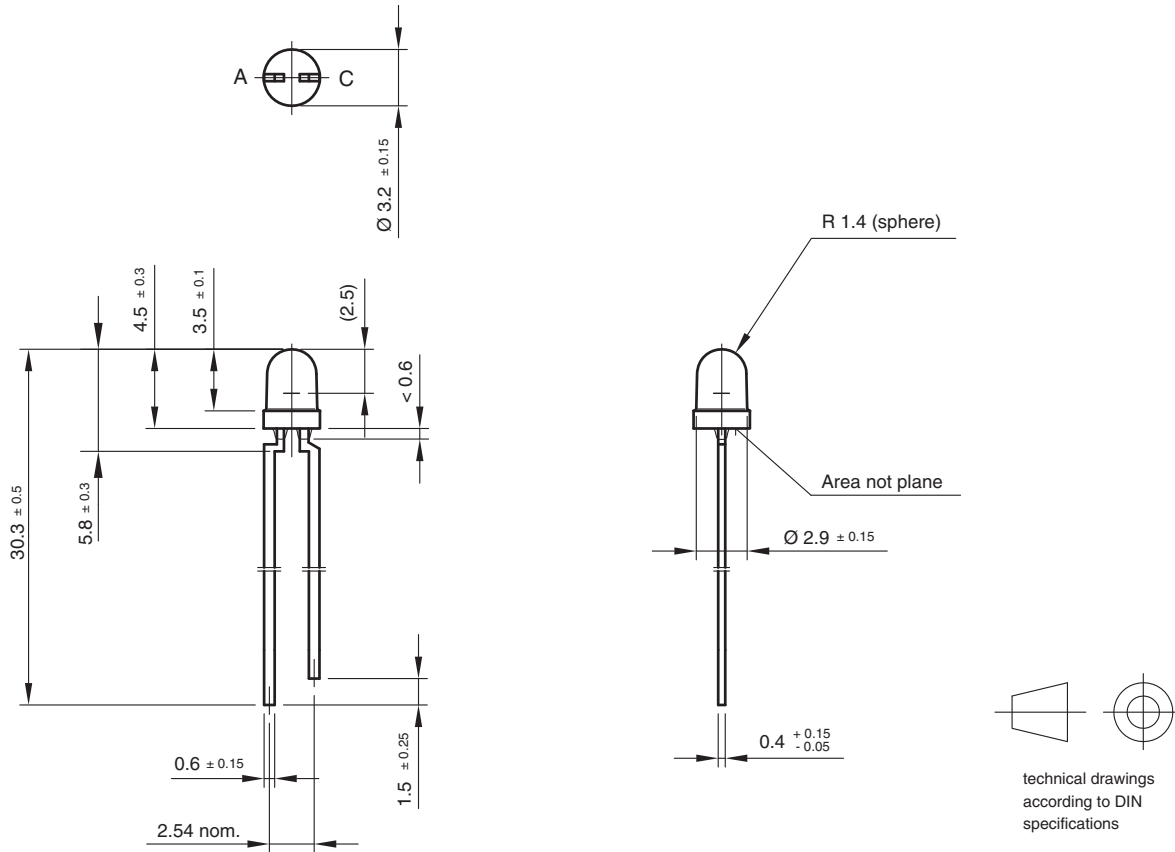
Fig. 8 - Relative Radiant Power vs. Wavelength



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Fig. 9 - Relative Radiant Intensity vs. Angular Displacement

**PACKAGE DIMENSIONS** in millimeters



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