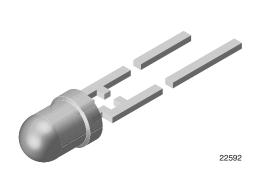
GREEN (5-2008)\*\*



## Vishay Semiconductors

# Infrared Emitting Diode, 950 nm, GaAs



### **DESCRIPTION**

TSUS3400 is an infrared, 950 nm emitting diode in GaAs technology, molded in a clear, blue tinted plastic package.

### **FEATURES**

Package type: leadedPackage form: T-1

• Dimensions (in mm): Ø 3

• Peak wavelength:  $\lambda_p = 950 \text{ nm}$ 

High reliability

• Angle of half intensity:  $\phi = \pm 18^{\circ}$ 

Low forward voltage

Radiant power: 20 mW at I<sub>F</sub> = 100 mA

· Suitable for DC and high pulse current operation

· Good spectral matching with Si photodetectors

 Compliant to RoHS Directive 2002/95/EC and in accordance with WEEE 2002/96/EC

#### Note

\*\* Please see document "Vishay Material Category Policy": www.vishay.com/doc?99902

### **APPLICATIONS**

Infrared source in photo interrupters, reflective and transmissive sensors

PRODUCT SUMMARY				
COMPONENT	I <sub>e</sub> (mW/sr)	φ (deg)	λ <sub>p</sub> (nm)	t <sub>r</sub> (ns)
TSUS3400	15	± 18	950	800

### Note

· Test conditions see table "Basic Characteristics"

ORDERING INFORMATION				
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM	
TSUS3400	Bulk	MOQ: 5000 pcs, 5000 pcs/bulk	T-1	

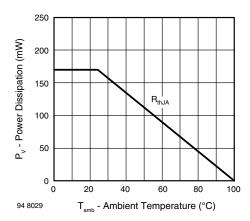
#### Note

MOQ: minimum order quantity

<b>ABSOLUTE MAXIMUM RATINGS</b> (T <sub>amb</sub> = 25 °C, unless otherwise specified)					
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT	
Reverse voltage		$V_{R}$	5	V	
Forward current		I <sub>F</sub>	100	mA	
Peak forward current	$t_p/T = 0.5, t_p = 100 \mu s$	I <sub>FM</sub>	200	mA	
Surge forward current	t <sub>p</sub> = 100 μs	I <sub>FSM</sub>	2	Α	
Power dissipation		P <sub>V</sub>	170	mW	
Junction temperature		Tj	100	°C	
Operating temperature range		T <sub>amb</sub>	- 40 to + 100	°C	
Storage temperature range		T <sub>stg</sub>	- 40 to + 100	°C	
Soldering temperature	$t \le 5$ s, 2 mm from case	T <sub>sd</sub>	260	°C	
Thermal resistance junction/ambient		R <sub>thJA</sub>	450	K/W	



# Vishay Semiconductors





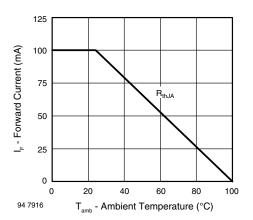


Fig. 2 - Forward Current vs. Ambient Temperature

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	$V_{F}$		1.3	1.7	V
	$I_F = 1.5 \text{ A}, t_p = 100 \mu \text{s}$	$V_{F}$		2.2		V
Temperature coefficient of V <sub>F</sub>	I <sub>F</sub> = 100 mA	TK <sub>VF</sub>		- 1.3		mV/K
Reverse current	V <sub>R</sub> = 5 V	I <sub>R</sub>			100	μΑ
Breakdown voltage	I <sub>R</sub> = 100 μA	V <sub>(BR)</sub>	5	40		V
Junction capacitance	$V_R = 0 \text{ V, } f = 1 \text{ MHz, } E = 0$	C <sub>i</sub>		30		pF
Dedient intensit.	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	l <sub>e</sub>	7	15	35	mW/sr
Radiant intensity	$I_F = 1.5 \text{ A}, t_p = 100 \mu\text{s}$	l <sub>e</sub>		140		mW/sr
Radiant power	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	фe		20		mW
Temperature coefficient of φ <sub>e</sub>	I <sub>F</sub> = 20 mA	TKφ <sub>e</sub>		- 0.8		%/K
Angle of half intensity		φ		± 18		deg
Peak wavelength	I <sub>F</sub> = 100 mA	$\lambda_{p}$		950		nm
Spectral bandwidth	I <sub>F</sub> = 100 mA	Δλ		50		nm
Temperature coefficient of $\lambda_p$	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>		800		ns
	I <sub>F</sub> = 1.5 A	t <sub>r</sub>		400		ns
E-III Co.	I <sub>F</sub> = 100 mA	t <sub>f</sub>		800		ns
Fall time	I <sub>F</sub> = 1.5 A	t <sub>f</sub>		400		ns
Virtual source diameter		d		2.1		mm

## **BASIC CHARACTERISTICS** (T<sub>amb</sub> = 25 °C, unless otherwise specified)

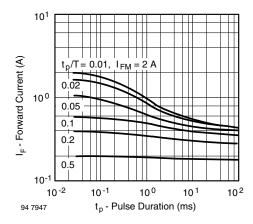


Fig. 3 - Pulse Forward Current vs. Pulse Duration

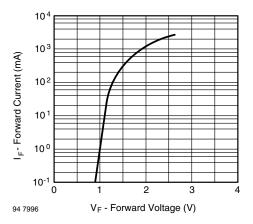


Fig. 4 - Forward Current vs. Forward Voltage

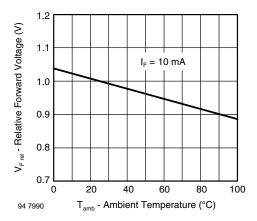


Fig. 5 - Relative Forward Voltage vs. Ambient Temperature

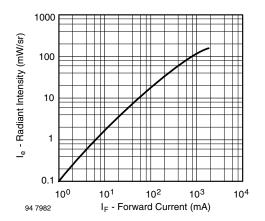


Fig. 6 - Radiant Intensity vs. Forward Current

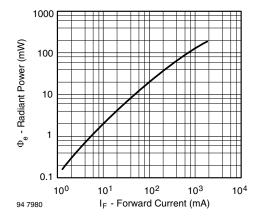


Fig. 7 - Radiant Power vs. Forward Current

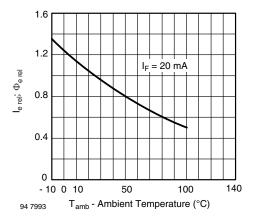


Fig. 8 - Relative Radiant Intensity/Power vs. Ambient Temperature



# Vishay Semiconductors

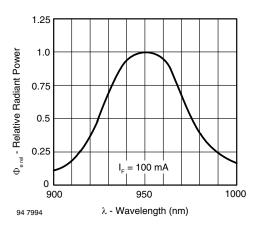


Fig. 9 - Relative Radiant Power vs. Wavelength

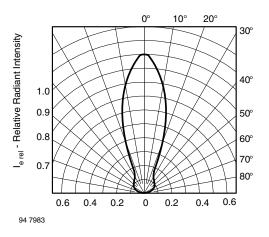
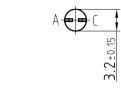
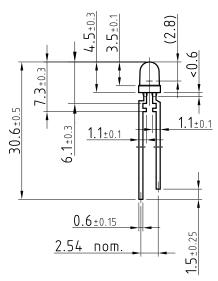


Fig. 10 - Relative Radiant Intensity vs. Angular Displacement

### **PACKAGE DIMENSIONS** in millimeters

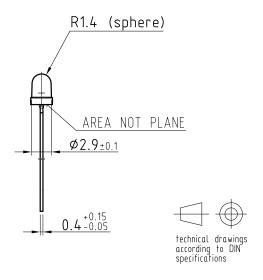




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Vishay

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