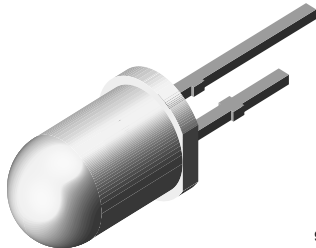




## Infrared Emitting Diode, 950 nm, GaAs



94 8390

### FEATURES

- Package type: leaded
- Package form: T-1 $\frac{3}{4}$
- Dimensions (in mm):  $\varnothing$  5
- Leads with stand-off
- Peak wavelength:  $\lambda_p = 950$  nm
- High reliability
- Angle of half intensity:  $\varphi = \pm 15^\circ$
- 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)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)

### DESCRIPTION

TSUS5200 is an infrared, 950 nm emitting diode in GaAs technology molded in a blue-gray tinted plastic package.

### APPLICATIONS

- Infrared remote control and free air transmission systems with low forward voltage and small package requirements
- Emitter in transmissive sensors
- Emitter in reflective sensors

### PRODUCT SUMMARY

COMPONENT	$I_e$ (mW/sr)	$\varphi$ ( $^\circ$ )	$\lambda_p$ (nm)	$t_r$ (ns)
TSUS5200	20	$\pm 15$	950	800
TSUS5201	25	$\pm 15$	950	800
TSUS5202	30	$\pm 15$	950	800

#### Note

- Test conditions see table "Basic Characteristics"

### ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
TSUS5200	Bulk	MOQ: 4000 pcs, 4000 pcs/bulk	T-1 $\frac{3}{4}$
TSUS5201	Bulk	MOQ: 4000 pcs, 4000 pcs/bulk	T-1 $\frac{3}{4}$
TSUS5202	Bulk	MOQ: 4000 pcs, 4000 pcs/bulk	T-1 $\frac{3}{4}$

#### Note

- MOQ: minimum order quantity

### ABSOLUTE MAXIMUM RATINGS ( $T_{amb} = 25$ $^\circ$ C, unless otherwise specified)

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		$V_R$	5	V
Forward current		$I_F$	150	mA
Peak forward current	$t_p/T = 0.5$ , $t_p = 100$ $\mu$ s	$I_{FM}$	300	mA
Surge forward current	$t_p = 100$ $\mu$ s	$I_{FSM}$	2.5	A
Power dissipation		$P_V$	170	mW
Junction temperature		$T_j$	100	$^\circ$ C
Operating temperature range		$T_{amb}$	-40 to +85	$^\circ$ C
Storage temperature range		$T_{stg}$	-40 to +100	$^\circ$ C
Soldering temperature	$t \leq 5$ s, 2 mm from case	$T_{sd}$	260	$^\circ$ C
Thermal resistance junction to ambient	J-STD-051, leads 7 mm, soldered on PCB	$R_{thJA}$	230	K/W

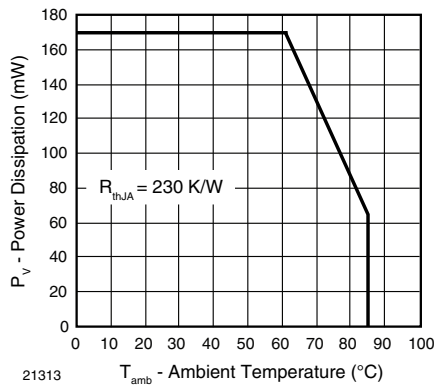


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

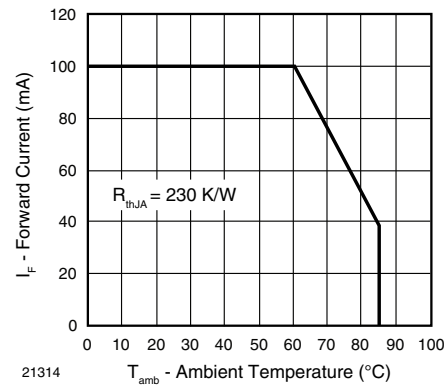


Fig. 2 - Forward Current Limit vs. Ambient Temperature

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>	-	1.3	1.7	V
Temperature coefficient of V <sub>F</sub>	I <sub>F</sub> = 100 mA	TK <sub>V<sub>F</sub></sub>	-	-1.3	-	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>	-	30	-	pF
Temperature coefficient of φ <sub>e</sub>	I <sub>F</sub> = 20 mA	TK <sub>φ<sub>e</sub></sub>	-	-0.8	-	%/K
Angle of half intensity		φ	-	± 15	-	°
Peak wavelength	I <sub>F</sub> = 100 mA	λ <sub>p</sub>	-	950	-	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	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
Fall time	I <sub>F</sub> = 100 mA	t <sub>f</sub>	-	800	-	ns
	I <sub>F</sub> = 1.5 A	t <sub>f</sub>	-	400	-	ns
Virtual source diameter		d	-	3.8	-	mm



TYPE DEDICATED CHARACTERISTICS ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 1.5\text{ A}$ , $t_p = 100\text{ }\mu\text{s}$	TSUS5200	$V_F$	-	2.2	3.4	V
		TSUS5201	$V_F$	-	2.2	3.4	V
		TSUS5202	$V_F$	-	2.2	2.7	V
Radiant intensity	$I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	TSUS5200	$I_e$	10	20	50	mW/sr
		TSUS5201	$I_e$	15	25	50	mW/sr
		TSUS5202	$I_e$	20	30	50	mW/sr
	$I_F = 1.5\text{ A}$ , $t_p = 100\text{ }\mu\text{s}$	TSUS5200	$I_e$	95	180	-	mW/sr
		TSUS5201	$I_e$	120	230	-	mW/sr
		TSUS5202	$I_e$	170	280	-	mW/sr
Radiant power	$I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	TSUS5200	$\phi_e$	-	13	-	mW
		TSUS5201	$\phi_e$	-	14	-	mW
		TSUS5202	$\phi_e$	-	15	-	mW

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

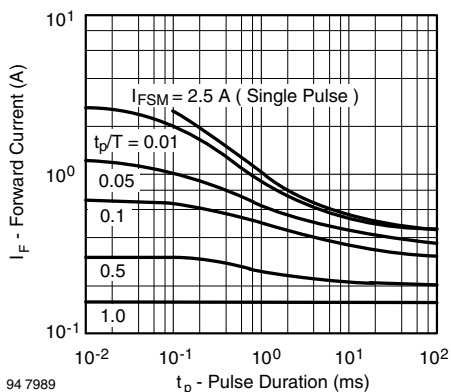


Fig. 3 - Pulse Forward Current vs. Pulse Duration

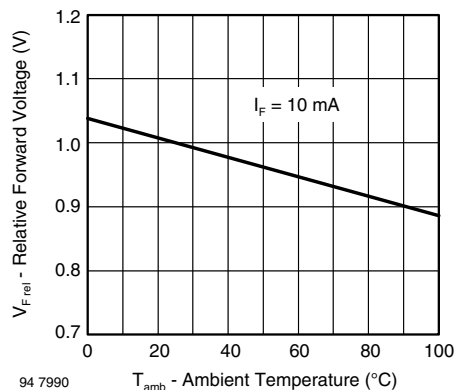


Fig. 5 - Relative Forward Voltage vs. Ambient Temperature

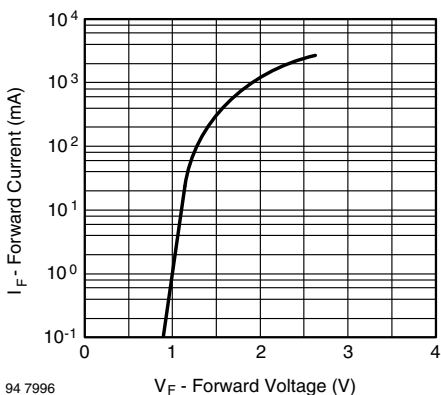


Fig. 4 - Forward Current vs. Forward Voltage

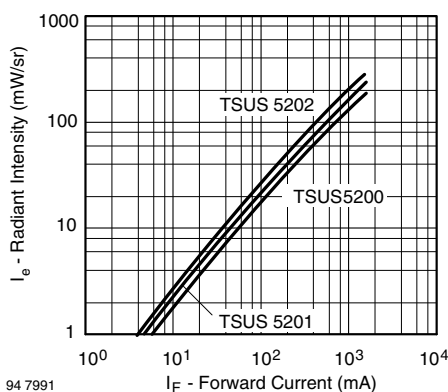


Fig. 6 - Radiant Intensity vs. Forward Current

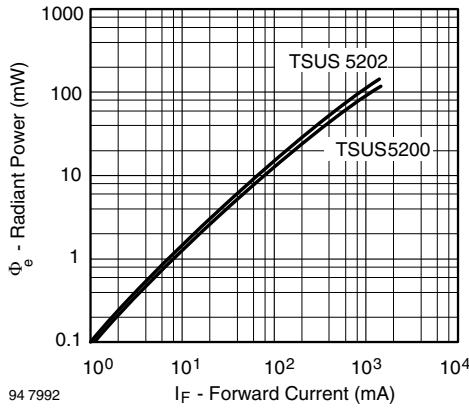


Fig. 7 - Radiant Power vs. Forward Current

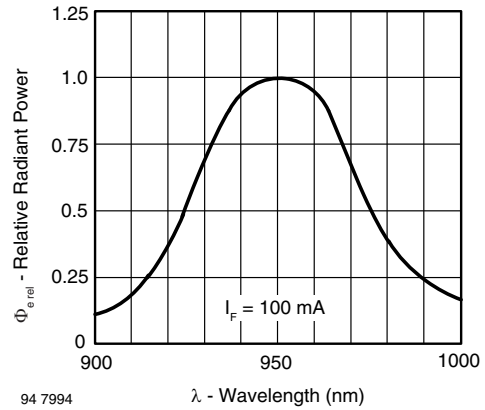


Fig. 9 - Relative Radiant Power vs. Wavelength

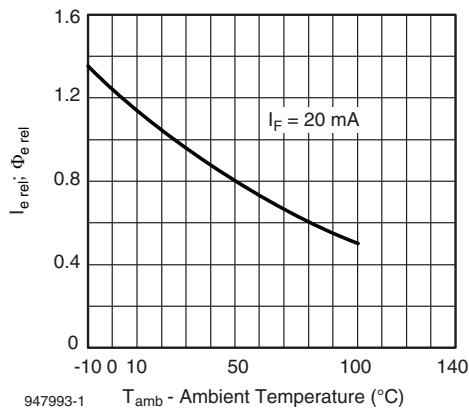


Fig. 8 - Relative Radiant Intensity/Power vs. Ambient Temperature

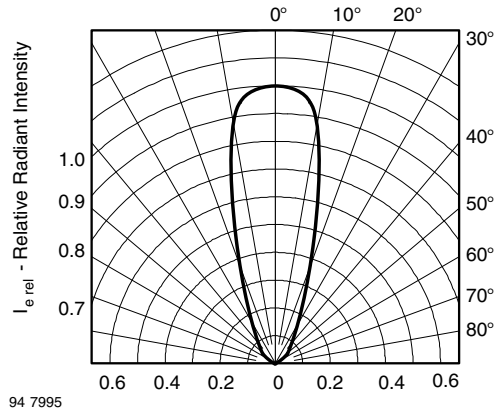


Fig. 10 - Relative Radiant Intensity vs. Angular Displacement





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