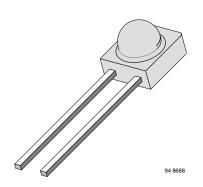
RoHS

GREEN



## Vishay Semiconductors

# High Speed Infrared Emitting Diode, 890 nm, GaAlAs Double Hetero



#### **DESCRIPTION**

TSSF4500 is an infrared, 890 nm emitting diode in GaAlAs double hetero (DH) technology with high radiant power and high speed, molded in a clear, untinted plastic package.

#### **FEATURES**

• Package type: leaded

Package form: side view

• Dimensions (L x W x H in mm): 4.5 x 4 x 4.8

Peak wavelength: λ<sub>p</sub> = 890 nm

· High reliability

· High radiant power

High radiant intensity

• Angle of half intensity:  $\varphi = \pm 22^{\circ}$ 

• Low forward voltage

· Suitable for high pulse current operation

• High modulation bandwidth: f<sub>c</sub> = 12 MHz

· Good spectral matching with Si photodetectors

 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

#### **APPLICATIONS**

- Infrared high speed remote control and free air data transmission systems with high modulation frequencies or high data transmission rate requirements
- TSSF4500 is ideal for the design of transmission systems according to IrDA requirements and for carrier frequency based systems (e.g. ASK/FSK - coded, 450 kHz or 1.3 MHz)

PRODUCT SUMMARY					
COMPONENT	I <sub>e</sub> (mW/sr)	φ (deg)	λ <sub>p</sub> (nm)	t <sub>r</sub> (ns)	
TSSF4500	20	± 22	890	30	

#### Note

• Test conditions see table "Basic Characteristics"

ORDERING INFORMATION					
ORDERING CODE	CODE PACKAGING		PACKAGE FORM		
TSSF4500	Bulk	MOQ: 4000 pcs, 4000 pcs/bulk	Side view		

#### Note

· MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS (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>	1.5	Α	
Power dissipation		P <sub>V</sub>	160	mW	



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ABSOLUTE MAXIMUM RATINGS (T <sub>amb</sub> = 25 °C, unless otherwise specified)					
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT	
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 ≤ 5 s, 2 mm from case	T <sub>sd</sub>	260	°C	
Thermal resistance junction/ambient	Leads not soldered	R <sub>thJA</sub>	450	K/W	

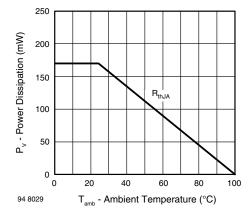


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

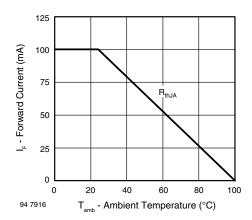


Fig. 2 - Forward Current Limit vs. Ambient Temperature

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Famusard valtage	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	V <sub>F</sub>		1.35	1.6	V
Forward voltage	$I_F = 1.5 \text{ A}, t_p = 100 \mu \text{s}$	V <sub>F</sub>		2.4		V
Temperature coefficient of V <sub>F</sub>	I <sub>F</sub> = 1 mA	TK <sub>VF</sub>		- 1.8		mV/K
Reverse current	V <sub>R</sub> = 5 V	I <sub>R</sub>			10	μΑ
Junction capacitance	$V_R = 0 \text{ V, } f = 1 \text{ MHz, } E = 0$	Cj		160		pF
Radiant intensity	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	l <sub>e</sub>	10	20	50	mW/sr
	$I_F = 1 \text{ A}, t_p = 100 \ \mu\text{s}$	l <sub>e</sub>		200		mW/sr
Radiant power	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	фe		35		mW
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		± 22		deg
Peak wavelength	I <sub>F</sub> = 100 mA	$\lambda_{p}$		890		nm
Spectral bandwidth	I <sub>F</sub> = 100 mA	Δλ		40		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>		30		ns
Fall time	I <sub>F</sub> = 100 mA	t <sub>f</sub>		30		ns
Cut-off frequency	I <sub>DC</sub> = 70 mA, I <sub>AC</sub> = 30 mA pp	f <sub>c</sub>		12		MHz
Virtual source diameter		d		2.1		mm

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

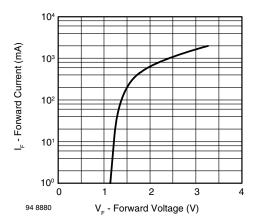


Fig. 3 - Forward Current vs. Forward Voltage

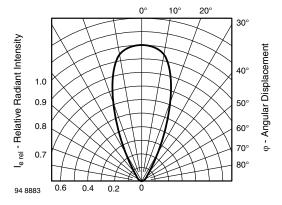


Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

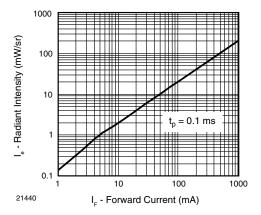


Fig. 4 - Radiant Intensity vs. Forward Current

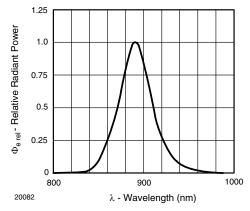
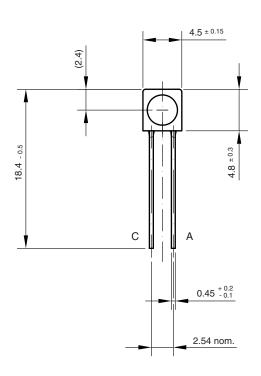


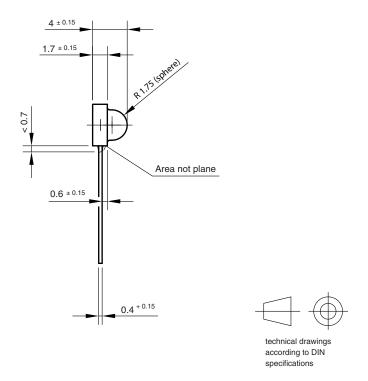
Fig. 5 - Relative Radiant Power vs. Wavelength

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#### **PACKAGE DIMENSIONS** in millimeters





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