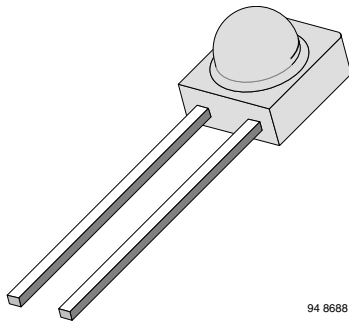


## High Speed Infrared Emitting Diode, 890 nm, GaAlAs Double Hetero



### 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:  $\lambda_p = 890$  nm
- High reliability
- High radiant power
- High radiant intensity
- Angle of half intensity:  $\phi = \pm 22^\circ$
- Low forward voltage
- Suitable for high pulse current operation
- High modulation bandwidth:  $f_c = 12$  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](http://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	$I_e$ (mW/sr)	$\phi$ (deg)	$\lambda_p$ (nm)	$t_r$ (ns)
TSSF4500	20	$\pm 22$	890	30

### Note

- Test conditions see table "Basic Characteristics"

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

### 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



ABSOLUTE MAXIMUM RATINGS ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Junction temperature		$T_j$	100	$^{\circ}\text{C}$
Operating temperature range		$T_{amb}$	- 40 to + 100	$^{\circ}\text{C}$
Storage temperature range		$T_{stg}$	- 40 to + 100	$^{\circ}\text{C}$
Soldering temperature	$t \leq 5\text{ s}$ , 2 mm from case	$T_{sd}$	260	$^{\circ}\text{C}$
Thermal resistance junction/ambient	Leads not soldered	$R_{thJA}$	450	K/W

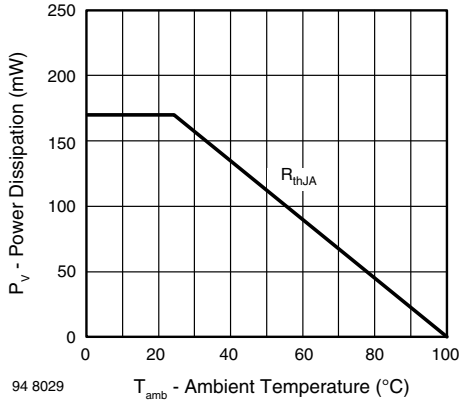


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

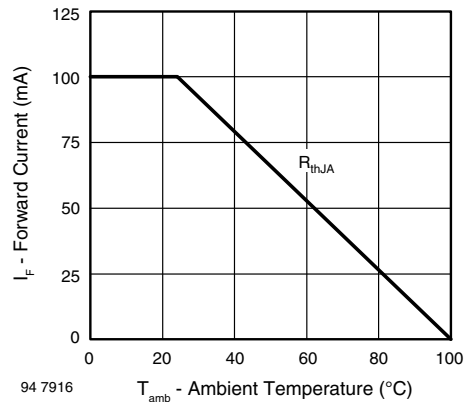


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$V_F$		1.35	1.6	V
	$I_F = 1.5\text{ A}$ , $t_p = 100\text{ }\mu\text{s}$	$V_F$		2.4		V
Temperature coefficient of $V_F$	$I_F = 1\text{ mA}$	$TK_{V_F}$		- 1.8		mV/K
Reverse current	$V_R = 5\text{ V}$	$I_R$			10	$\mu\text{A}$
Junction capacitance	$V_R = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$	$C_j$		160		pF
Radiant intensity	$I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$I_e$	10	20	50	mW/sr
	$I_F = 1\text{ A}$ , $t_p = 100\text{ }\mu\text{s}$	$I_e$		200		mW/sr
Radiant power	$I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$\phi_e$		35		mW
Temperature coefficient of $\phi_e$	$I_F = 100\text{ mA}$	$TK_{\phi_e}$		- 0.7		%/K
Angle of half intensity		$\phi$		$\pm 22$		deg
Peak wavelength	$I_F = 100\text{ mA}$	$\lambda_p$		890		nm
Spectral bandwidth	$I_F = 100\text{ mA}$	$\Delta\lambda$		40		nm
Temperature coefficient of $\lambda_p$	$I_F = 100\text{ mA}$	$TK_{\lambda_p}$		0.2		nm/K
Rise time	$I_F = 100\text{ mA}$	$t_r$		30		ns
Fall time	$I_F = 100\text{ mA}$	$t_f$		30		ns
Cut-off frequency	$I_{DC} = 70\text{ mA}$ , $I_{AC} = 30\text{ mA pp}$	$f_c$		12		MHz
Virtual source diameter		$d$		2.1		mm

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

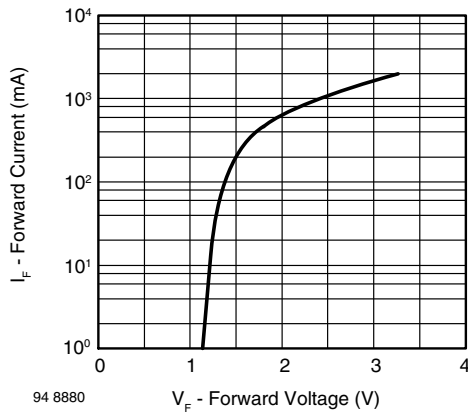


Fig. 3 - Forward Current vs. Forward Voltage

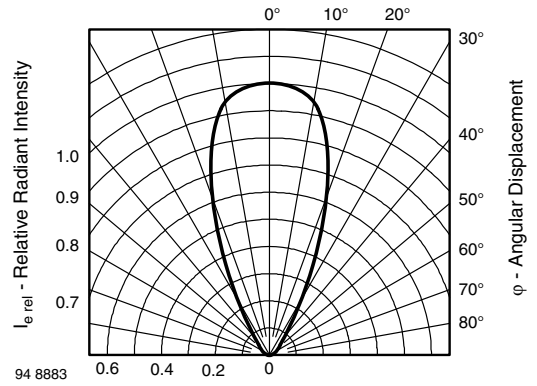


Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

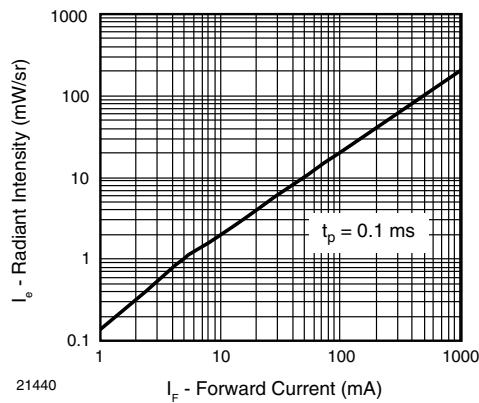


Fig. 4 - Radiant Intensity vs. Forward Current

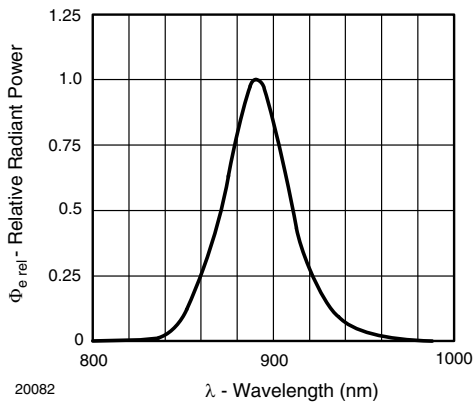
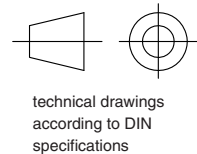
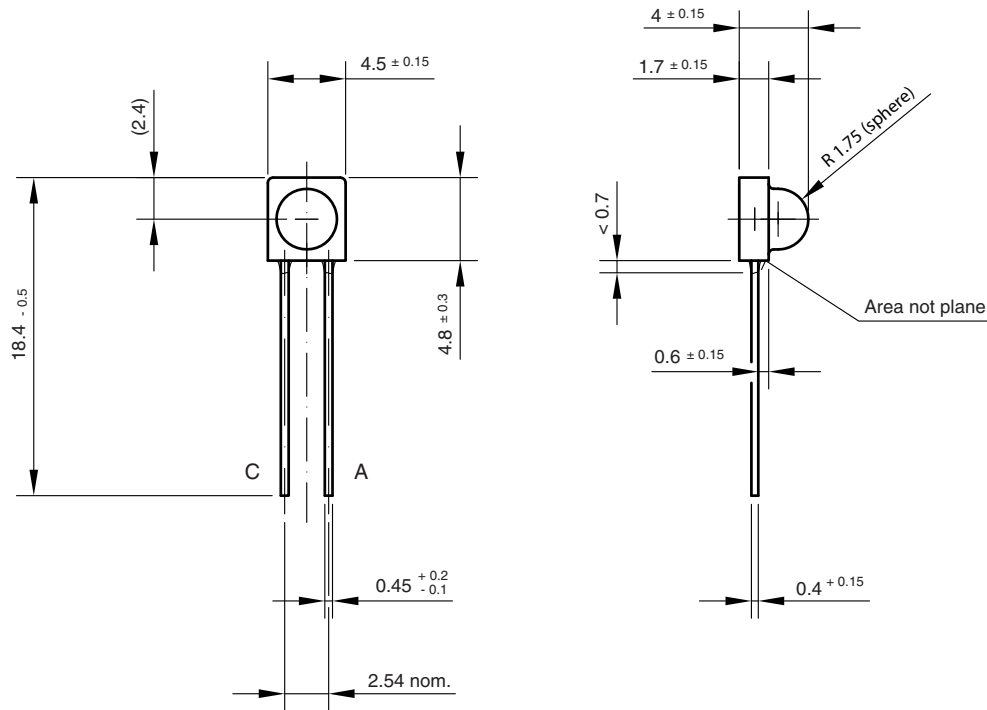


Fig. 5 - Relative Radiant Power vs. Wavelength



**PACKAGE DIMENSIONS** in millimeters



Drawing-No.: 6.544-5253.01-4

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