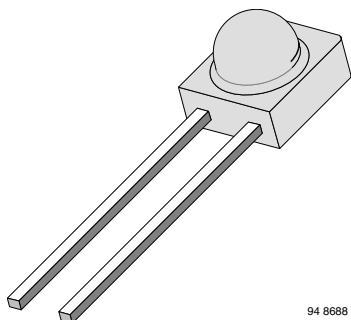


## High Speed Infrared Emitting Diode, RoHS Compliant, 890 nm, GaAIAs Double Hetero



94 8688

### DESCRIPTION

TSSF4500 is an infrared, 890 nm emitting diode in GaAIAs 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:  $\varphi = \pm 22^\circ$
- Low forward voltage
- Suitable for high pulse current operation
- High modulation bandwidth:  $f_c = 12$  MHz
- Good spectral matching with Si photodetectors
- Lead (Pb)-free component in accordance with RoHS 2002/95/EC and WEEE 2002/96/EC



**RoHS**  
COMPLIANT

### 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)	$\varphi$ (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

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		$V_R$	5	V
Forward current		$I_F$	100	mA
Peak forward current	$t_p/T = 0.5, t_p = 100 \mu s$	$I_{FM}$	200	mA
Surge forward current	$t_p = 100 \mu s$	$I_{FSM}$	1.5	A
Power dissipation		$P_V$	160	mW



<b>ABSOLUTE MAXIMUM RATINGS</b>				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Junction temperature		$T_j$	100	°C
Operating temperature range		$T_{amb}$	- 40 to + 100	°C
Storage temperature range		$T_{stg}$	- 40 to + 100	°C
Soldering temperature	$t \leq 5$ s, 2 mm from case	$T_{sd}$	260	°C
Thermal resistance junction/ambient	Leads not soldered	$R_{thJA}$	450	K/W

**Note**

$T_{amb} = 25$  °C, unless otherwise specified

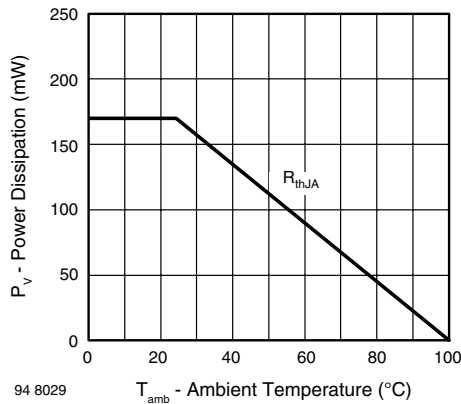


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

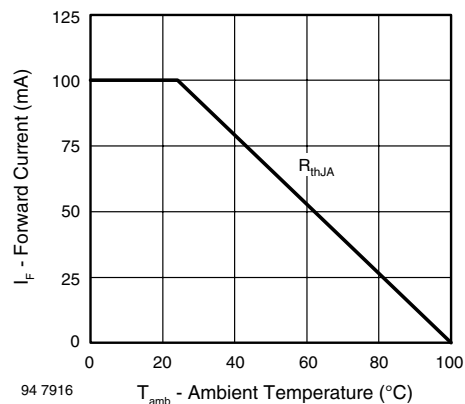


Fig. 2 - Forward Current Limit vs. Ambient Temperature

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

**Note**

$T_{amb} = 25$  °C, unless otherwise specified

**BASIC CHARACTERISTICS**

T<sub>amb</sub> = 25 °C, unless otherwise specified

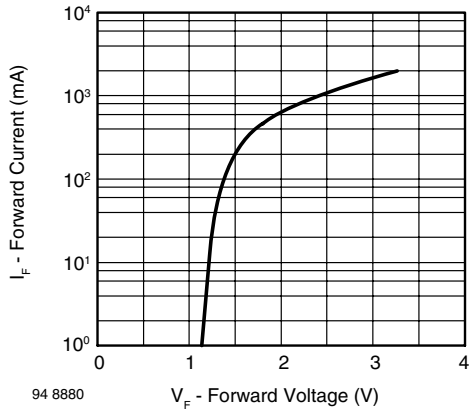


Fig. 3 - Forward Current vs. Forward Voltage

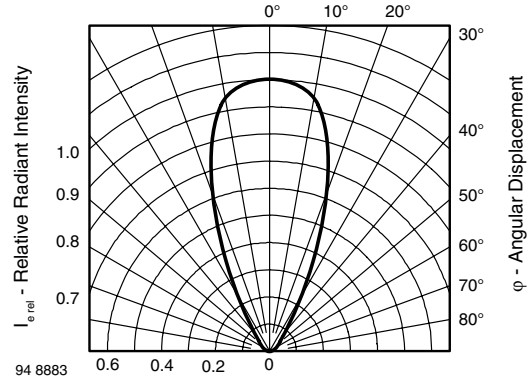


Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

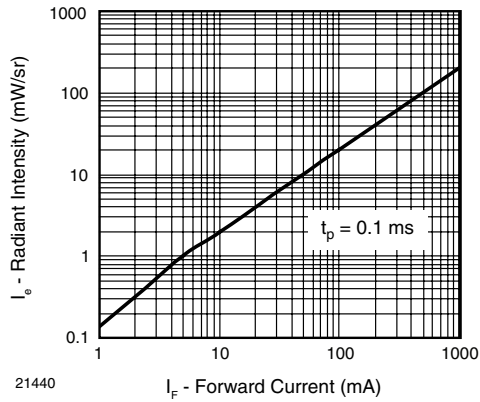


Fig. 4 - Radiant Intensity vs. Forward Current

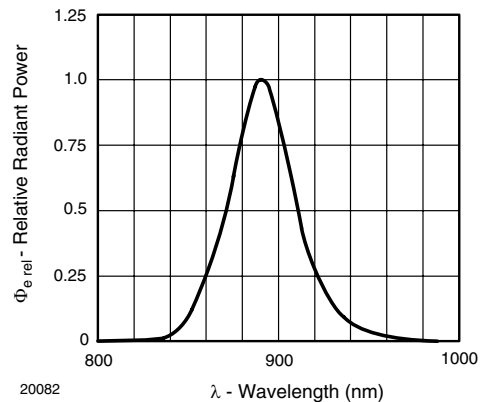
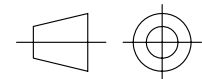
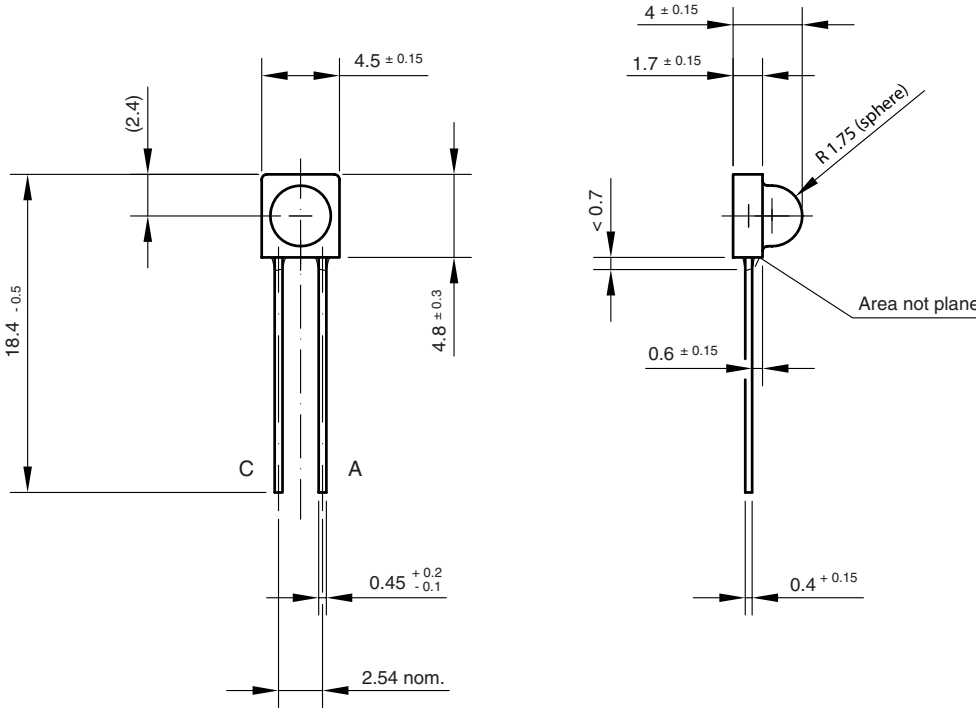


Fig. 5 - Relative Radiant Power vs. Wavelength



**PACKAGE DIMENSIONS** in millimeters



technical drawings according to DIN specifications

Drawing-No.: 6.544-5253.01-4  
Issue:1; 01.07.96  
96 12206



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