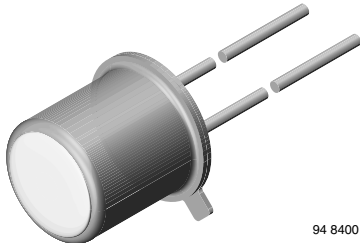


## Infrared Emitting Diode, RoHS Compliant, 950 nm, GaAs



94 8400

### DESCRIPTION

TSTS7500 is an infrared, 950 nm emitting diode in GaAs technology in a hermetically sealed TO-18 package with flat glass window.

### FEATURES

- Package type: leaded
- Package form: TO-18
- Dimensions (in mm):  $\varnothing$  4.7
- Peak wavelength:  $\lambda_p = 950$  nm
- High reliability
- High radiant power
- High radiant intensity
- Angle of half intensity:  $\varphi = \pm 30^\circ$
- Low forward voltage
- Suitable for high pulse current operation
- 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

- Radiation source in near infrared range

### PRODUCT SUMMARY

| COMPONENT | $I_e$ (mW/sr) | $\varphi$ (deg) | $\lambda_p$ (nm) | $t_r$ (ns) |
|-----------|---------------|-----------------|------------------|------------|
| TSTS7500  | 1.6           | $\pm 30$        | 950              | 800        |

#### Note

Test conditions see table "Basic Characteristics"

### ORDERING INFORMATION

| ORDERING CODE | PACKAGING | REMARKS                      | PACKAGE FORM |
|---------------|-----------|------------------------------|--------------|
| TSTS7500      | Bulk      | MOQ: 1000 pcs, 1000 pcs/bulk | TO-18        |

#### Note

MOQ: minimum order quantity

### ABSOLUTE MAXIMUM RATINGS

| PARAMETER                           | TEST CONDITION                                                                | SYMBOL     | VALUE         | UNIT             |
|-------------------------------------|-------------------------------------------------------------------------------|------------|---------------|------------------|
| Reverse voltage                     |                                                                               | $V_R$      | 5             | V                |
| Forward current                     | $T_{case} \leq 25^\circ\text{C}$                                              | $I_F$      | 250           | mA               |
| Peak forward current                | $t_p/T = 0.5$ , $t_p \leq 100 \mu\text{s}$ , $T_{case} \leq 25^\circ\text{C}$ | $I_{FM}$   | 500           | mA               |
| Surge forward current               | $t_p \leq 100 \mu\text{s}$                                                    | $I_{FSM}$  | 2.5           | A                |
| Power dissipation                   |                                                                               | $P_V$      | 170           | mW               |
|                                     | $T_{case} \leq 25^\circ\text{C}$                                              | $P_V$      | 500           | mW               |
| Junction temperature                |                                                                               | $T_j$      | 100           | $^\circ\text{C}$ |
| Storage temperature range           |                                                                               | $T_{stg}$  | - 55 to + 100 | $^\circ\text{C}$ |
| Thermal resistance junction/ambient | leads not soldered                                                            | $R_{thJA}$ | 450           | K/W              |
| Thermal resistance junction/case    | leads not soldered                                                            | $R_{thJC}$ | 150           | K/W              |

#### Note

$T_{amb} = 25^\circ\text{C}$ , unless otherwise specified

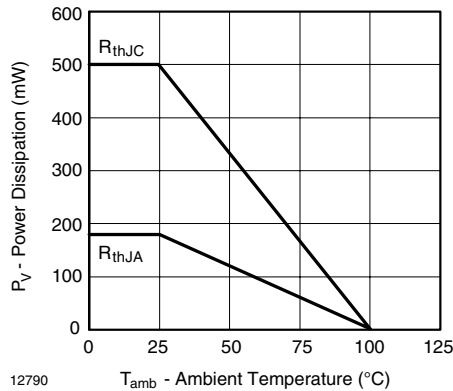


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

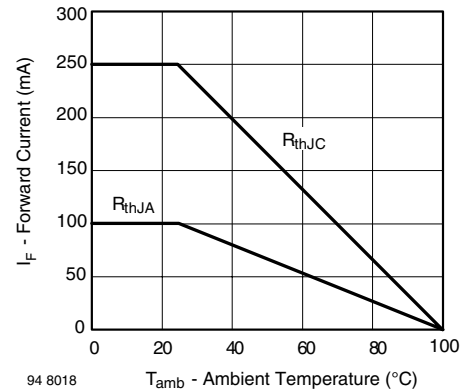


Fig. 2 - Forward Current Limit vs. Ambient Temperature

| BASIC CHARACTERISTICS               |                                                                             |                 |      |          |      |       |
|-------------------------------------|-----------------------------------------------------------------------------|-----------------|------|----------|------|-------|
| PARAMETER                           | TEST CONDITION                                                              | SYMBOL          | MIN. | TYP.     | MAX. | UNIT  |
| Forward voltage                     | $I_F = 100 \text{ mA}$ , $t_p \leq 20 \text{ ms}$                           | $V_F$           |      | 1.3      | 1.7  | V     |
| Temperature coefficient of $V_F$    | $I_F = 100 \text{ mA}$                                                      | $TK_{V_F}$      |      | - 1.3    |      | mV/K  |
| Breakdown voltage                   | $I_R = 100 \text{ } \mu\text{A}$                                            | $V_{(BR)}$      | 5    |          |      | V     |
| Junction capacitance                | $V_R = 0 \text{ V}$ , $f = 1 \text{ MHz}$ , $E = 0$                         | $C_j$           |      | 30       |      | pF    |
| Radiant intensity                   | $I_F = 100 \text{ mA}$ , $t_p = 20 \text{ ms}$                              | $I_e$           | 1.25 | 1.6      | 8    | mW/sr |
| Radiant power                       | $I_F = 100 \text{ mA}$ , $t_p \leq 20 \text{ ms}$                           | $\phi_e$        |      | 7        |      | mW    |
| Temperature coefficient of $\phi_e$ | $I_F = 100 \text{ mA}$                                                      | $TK_{\phi_e}$   |      | - 0.8    |      | %/K   |
| Angle of half intensity             |                                                                             | $\varphi$       |      | $\pm 30$ |      | deg   |
| Peak wavelength                     | $I_F = 100 \text{ mA}$                                                      | $\lambda_p$     |      | 950      |      | nm    |
| Spectral bandwidth                  | $I_F = 100 \text{ mA}$                                                      | $\Delta\lambda$ |      | 50       |      | nm    |
| Rise time                           | $I_F = 100 \text{ mA}$                                                      | $t_r$           |      | 800      |      | ns    |
|                                     | $I_F = 1.5 \text{ A}$ , $t_p/T = 0.01$ , $t_p \leq 10 \text{ } \mu\text{s}$ | $t_r$           |      | 400      |      | ns    |
| Virtual source diameter             |                                                                             | $d$             |      | 0.5      |      | mm    |

#### Note

$T_{amb} = 25 \text{ } ^\circ\text{C}$ , unless otherwise specified

#### BASIC CHARACTERISTICS

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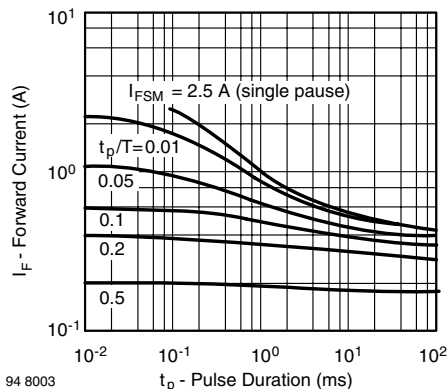


Fig. 3 - Pulse Forward Current vs. Pulse Duration

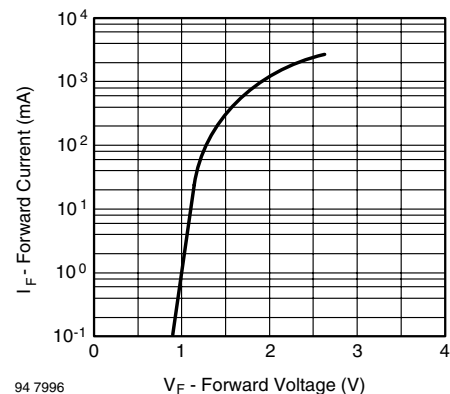


Fig. 4 - Forward Current vs. Forward Voltage

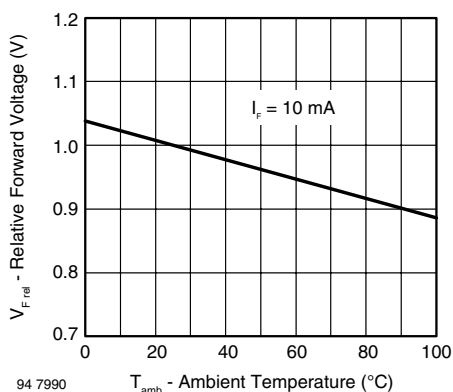


Fig. 5 - Relative Forward Voltage vs. Ambient Temperature

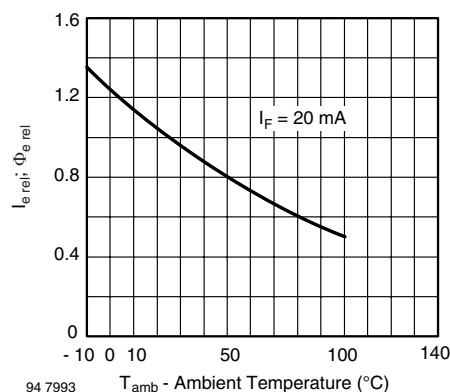


Fig. 8 - Relative Radiant Intensity/Power vs. Ambient Temperature

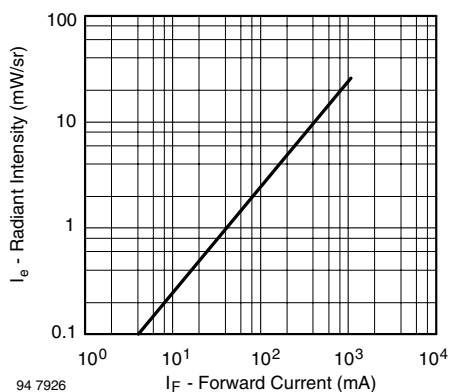


Fig. 6 - Radiant Intensity vs. Forward Current

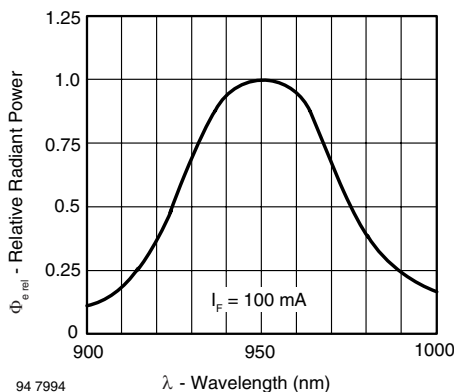


Fig. 9 - Relative Radiant Power vs. Wavelength

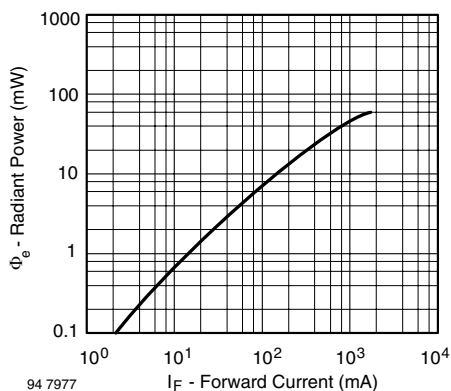


Fig. 7 - Radiant Power vs. Forward Current

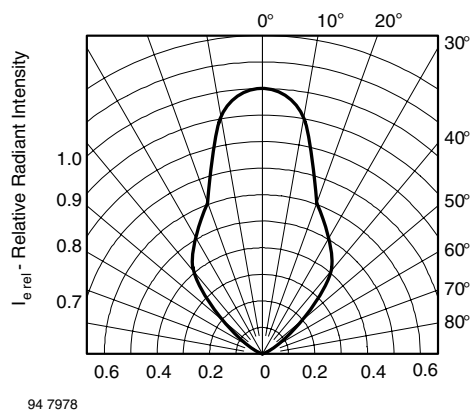
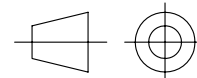
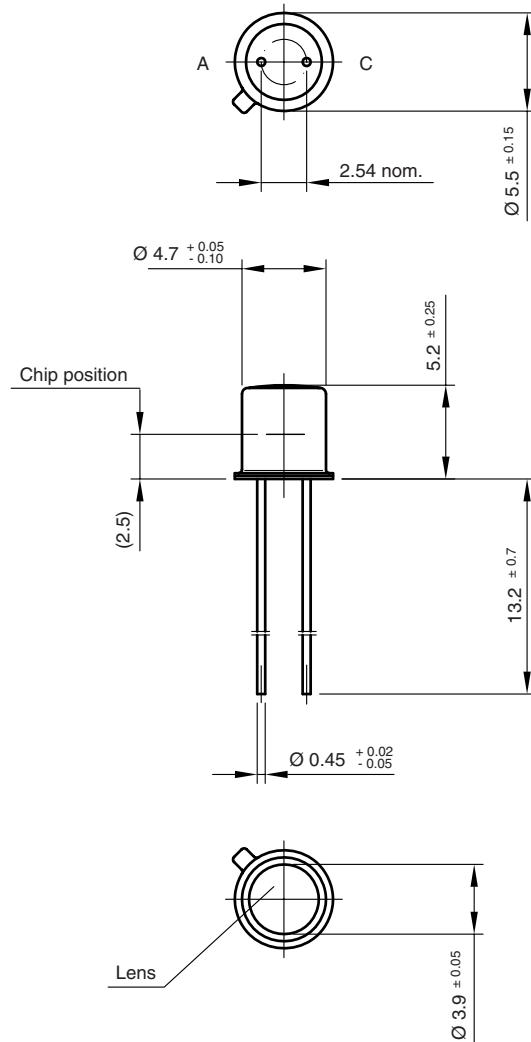


Fig. 10 - Relative Radiant Intensity vs. Angular Displacement

**PACKAGE DIMENSIONS** in millimeters

technical drawings  
according to DIN  
specifications

Drawing-No.: 6.503-5001.02-4

Issue: 1; 24.08.98

14485



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