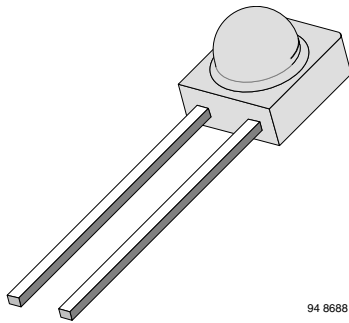


High Speed Infrared Emitting Diode, 890 nm, GaAlAs Double Hetero



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

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) | ϕ (deg) | λ_p (nm) | t_r (ns) |
| TSSF4500 | 20 | ± 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 |

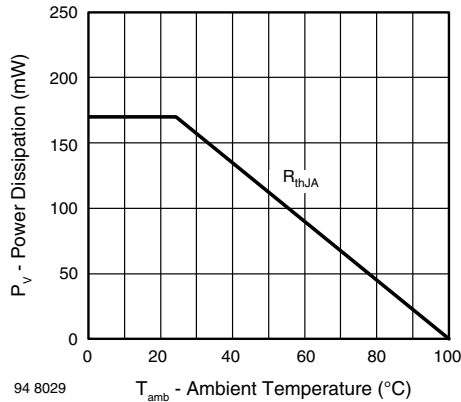


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

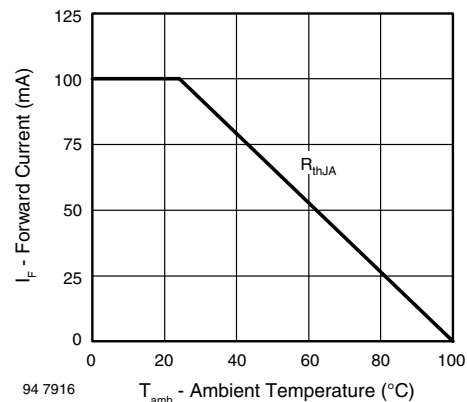


Fig. 2 - Forward Current Limit vs. Ambient Temperature

| 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 | μA |
| 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 | $I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$ | ϕ_e | | 35 | | mW |
| Temperature coefficient of ϕ_e | $I_F = 100\text{ mA}$ | TK_{ϕ_e} | | - 0.7 | | %/K |
| Angle of half intensity | | ϕ | | ± 22 | | deg |
| Peak wavelength | $I_F = 100\text{ mA}$ | λ_p | | 890 | | nm |
| Spectral bandwidth | $I_F = 100\text{ mA}$ | $\Delta\lambda$ | | 40 | | nm |
| Temperature coefficient of λ_p | $I_F = 100\text{ mA}$ | TK_{λ_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)

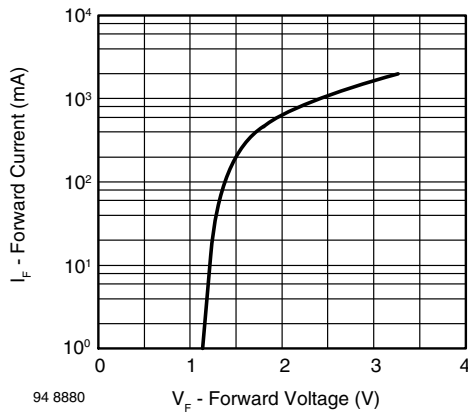


Fig. 3 - Forward Current vs. Forward Voltage

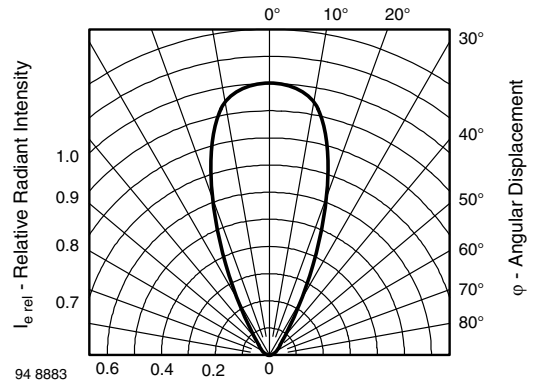


Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

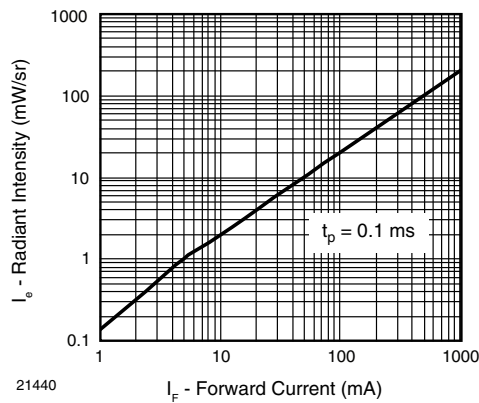


Fig. 4 - Radiant Intensity vs. Forward Current

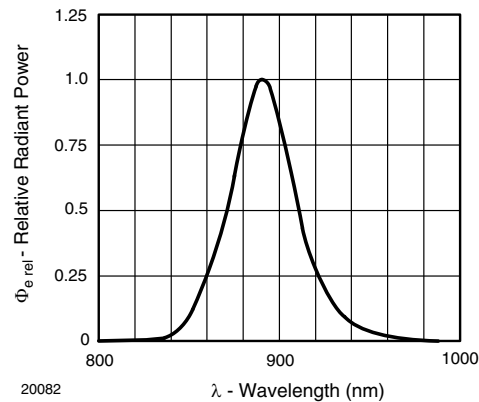
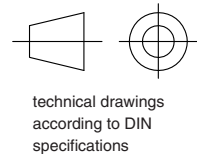
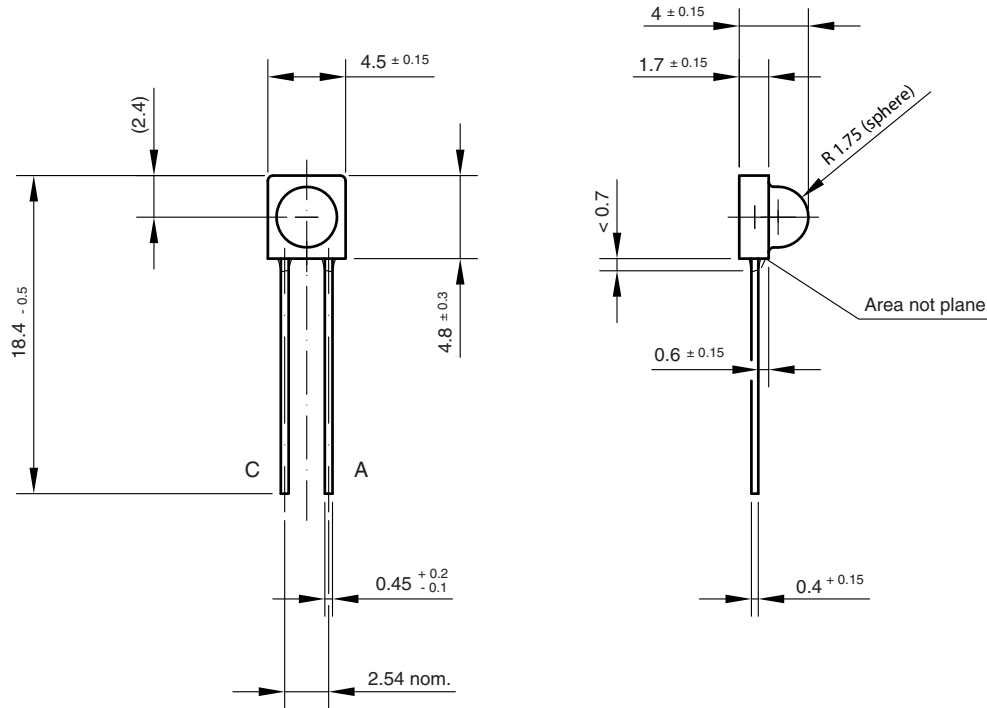


Fig. 5 - Relative Radiant Power vs. Wavelength



PACKAGE DIMENSIONS in millimeters



Drawing-No.: 6.544-5253.01-4

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