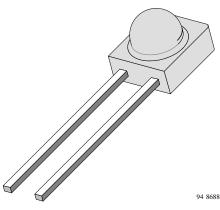


# High Speed Infrared Emitting Diode in Side View Package

#### Description

TSSF4500 is a high speed infrared emitting diode in GaAlAs on GaAlAs double hetero (DH) technology, molded in a clear, untinted plastic package with spherical side view lens.

The new technology combines the high speed of DH-GaAlAs with the efficiency of standard GaAlAs and the low forward voltage of the standard GaAs technology.



#### **Features**

- High modulation bandwidth (10 MHz)
- Extra high radiant power and high radiant intensity
- Low forward voltage
- Suitable for high pulse current operation
- Angle of half intensity  $\varphi = \pm 22^{\circ}$
- Peak wavelength  $\lambda_p = 870 \text{ nm}$
- High reliability
- Good spectral matching to Si photodetectors
- Lead (PB)-free component
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

#### **Absolute Maximum Ratings**

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



#### 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).

| Parameter                            | Test condition                                   | Symbol            | Value     | Unit |  |
|--------------------------------------|--|-------------------|-----------|------|--|
| Reverse voltage                      |  | V <sub>R</sub>    | 5         | V    |  |
| Forward current                      |  | ١ <sub>F</sub>    | 100       | mA   |  |
| Peak forward current                 | t <sub>p</sub> /T = 0.5, t <sub>p</sub> = 100 μs | I <sub>FM</sub>   | 200       | mA   |  |
| Surge forward current                | t <sub>p</sub> = 100 μs                          | I <sub>FSM</sub>  | 1.5       | A    |  |
| Power dissipation                    |  | Pv                | 170       | mW   |  |
| Junction temperature                 |  | Тj                | 100       | °C   |  |
| Operating temperature range          |  | T <sub>amb</sub>  | - 40+ 100 | °C   |  |
| Storage temperature range            |  | T <sub>stg</sub>  | - 40+ 100 | °C   |  |
| Soldering temperature                | $t \leq$ 5sec, 2 mm from case                    | T <sub>sd</sub>   | 260       | °C   |  |
| Thermal resistance junction/ ambient |  | R <sub>thJA</sub> | 450       | K/W  |  |



#### **Vishay Semiconductors**

#### **Electrical Characteristics**

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

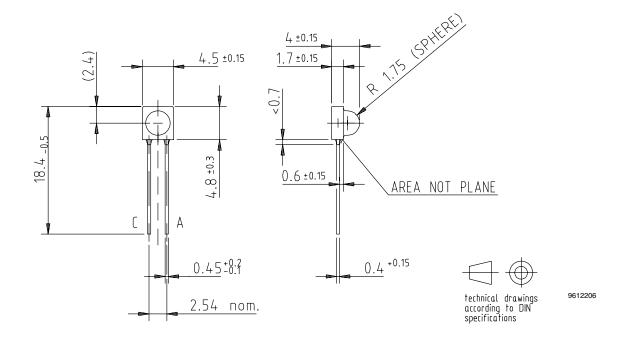
| Parameter                           | Test condition                                  | Symbol           | Min | Тур.  | Max | Unit |
|-------------------------------------|---|------------------|-----|-------|-----|------|
| Forward voltage                     | I <sub>F</sub> = 100 mA, t <sub>p</sub> = 20 ms | V <sub>F</sub>   |     | 1.35  | 1.6 | V    |
|                                     | I <sub>F</sub> = 1.5 A, t <sub>p</sub> = 100 μs | V <sub>F</sub>   |     | 2.4   |     | V    |
| Temp. coefficient of V <sub>F</sub> | I <sub>F</sub> = 100 mA                         | TK <sub>VF</sub> |     | - 1.7 |     | mV/K |
| Reverse current                     | V <sub>R</sub> = 5 V                            | I <sub>R</sub>   |     |       | 10  | μA   |
| Junction capacitance                | $V_{R} = 0 V, f = 1 MHz, E = 0$                 | Cj               |     | 160   |     | pF   |

### **Optical Characteristics**

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

| Parameter                        | Test condition                                | Symbol           | Min | Тур.  | Max | Unit  |
|----------------------------------|---|------------------|-----|-------|-----|-------|
| Radiant intensity                | $I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$   | Ι <sub>e</sub>   | 10  | 20    |     | mW/sr |
|                                  | $I_F = 1 \text{ A}, t_p = 100 \ \mu \text{s}$ | Ι <sub>e</sub>   |     | 200   |     | mW/sr |
| Radiant power                    | $I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$   | φ <sub>e</sub>   |     | 35    |     | mW    |
| Temp. coefficient of $\phi_{e}$  | 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                       | λ <sub>p</sub>   |     | 870   |     | nm    |
| Spectral bandwidth               | I <sub>F</sub> = 100 mA                       | Δλ               |     | 40    |     | nm    |
| Temp. coefficient of $\lambda_p$ | I <sub>F</sub> = 100 mA                       | ΤΚλ <sub>ρ</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    |

## Package Dimensions in mm





## **Ozone Depleting Substances Policy Statement**

It is the policy of Vishay Semiconductor GmbH to

- 1. Meet all present and future national and international statutory requirements.
- 2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

Vishay Semiconductor GmbH has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

- 1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
- 2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
- 3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

Vishay Semiconductor GmbH can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

We reserve the right to make changes to improve technical design and may do so without further notice.

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Vishay

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