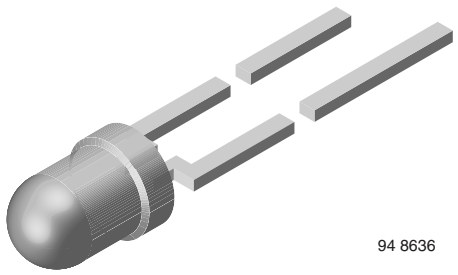
# Infrared Emitting Diode, 950 nm, GaAs



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## FEATURES

- Package type: leaded
- Package form: T-1
- Dimensions (in mm): ∅ 3
- Peak wavelength: $\lambda_p$ = 950 nm
- High reliability
- Angle of half intensity: φ = ± 18°
- Low forward voltage
- Suitable for high pulse current operation
- Good spectral matching with Si photodetectors
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

e2

RoHS COMPLIANT

HALOGEN FREE GREEN (5-2008)

## DESCRIPTION

TSUS4400 is an infrared, 950 nm emitting diode in GaAs technology molded in a blue tinted plastic package.

## APPLICATIONS

- Infrared remote control and free air transmission systems with low forward voltage and small package requirements
- Emitter in transmissive sensors
- Emitter in reflective sensors

| PRODUCT SUMMARY | | | | |
|---|---|---|---|---|
| COMPONENT | $I_e$ (mW/sr) | φ (deg) | $\lambda_p$ (nm) | $t_r$ (ns) |
| TSUS4400 | 15 | ± 18 | 950 | 800 |

**Note**

- Test conditions see table “Basic Characteristics”

| ORDERING INFORMATION | | | |
|---|---|---|---|
| ORDERING CODE | PACKAGING | REMARKS | PACKAGE FORM |
| TSUS4400 | Bulk | MOQ: 5000 pcs, 5000 pcs/bulk | T-1 |

**Note**

- MOQ: minimum order quantity

| ABSOLUTE MAXIMUM RATINGS ($T_{amb}$ = 25 °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 µs | $I_{FM}$ | 200 | mA |
| Surge forward current | $t_p$ = 100 µs | $I_{FSM}$ | 2 | A |
| Power dissipation | | $P_V$ | 170 | mW |
| Junction temperature | | $T_j$ | 100 | °C |
| Operating temperature range | | $T_{amb}$ | -40 to + 85 | °C |
| Storage temperature range | | $T_{stg}$ | -40 to +100 | °C |
| Soldering temperature | t ≤ 5 s, 2 mm from case | $T_{sd}$ | 260 | °C |
| Thermal resistance junction/ambient | J-STD-051, leads 7 mm, soldered on PCB | $R_{thJA}$ | 300 | K/W |

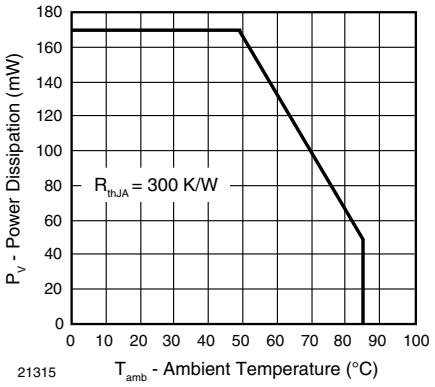



Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

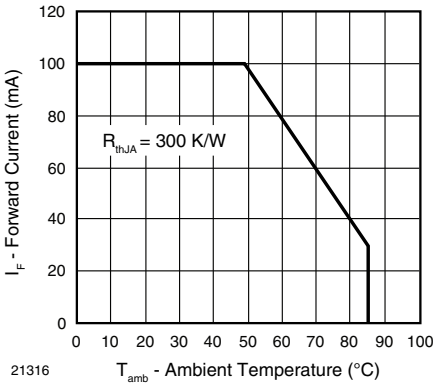



Fig. 2 - Forward Current Limit vs. Ambient Temperature

| **BASIC CHARACTERISTICS** ($T_{amb}$ = 25 °C, unless otherwise specified) | | | | | | |
|---|---|---|---|---|---|---|
| **PARAMETER** | **TEST CONDITION** | **SYMBOL** | **MIN.** | **TYP.** | **MAX.** | **UNIT** |
| Forward voltage | $I_F$ = 100 mA, $t_p$ = 20 ms | $V_F$ | | 1.3 | 1.7 | V |
| | $I_F$ = 1.5 A, $t_p$ = 100 µs | $V_F$ | | 2.2 | | V |
| Temperature coefficient of $V_F$ | $I_F$ = 100 mA | $TK_{VF}$ | | -1.3 | | mV/K |
| Reverse current | $V_R$ = 5 V | $I_R$ | | | 100 | µA |
| Breakdown voltage | $I_R$ = 100 µA | $V_{(BR)}$ | 5 | 40 | | µA |
| Junction capacitance | $V_R$ = 0 V, f = 1 MHz, E = 0 | $C_j$ | | 30 | | pF |
| Radiant intensity | $I_F$ = 100 mA, $t_p$ = 20 ms | $I_e$ | 7 | 15 | 35 | mW/sr |
| | $I_F$ = 1.5 A, $t_p$ = 100 µs | $I_e$ | | 140 | | mW/sr |
| Radiant power | $I_F$ = 100 mA, $t_p$ = 20 ms | $\phi_e$ | | 20 | | mW |
| Temperature coefficient of $\phi_e$ | $I_F$ = 20 mA | $TK\phi_e$ | | -0.8 | | %/K |
| Angle of half intensity | | $\varphi$ | | ± 18 | | deg |
| Peak wavelength | $I_F$ = 100 mA | $\lambda_p$ | | 950 | | nm |
| Spectral bandwidth | $I_F$ = 100 mA | $\Delta\lambda$ | | 50 | | nm |
| Temperature coefficient of $\lambda_p$ | $I_F$ = 100 mA | $TK\lambda_p$ | | 0.2 | | nm/K |
| Rise time | $I_F$ = 100 mA | $t_r$ | | 800 | | ns |
| | $I_F$ = 1.5 A | $t_r$ | | 400 | | ns |
| Fall time | $I_F$ = 100 mA | $t_f$ | | 800 | | ns |
| | $I_F$ = 1.5 A | $t_f$ | | 400 | | ns |
| Virtual source diameter | | d | | 2.1 | | mm |

**BASIC CHARACTERISTICS** ($T_{amb}$ = 25 °C, unless otherwise specified)

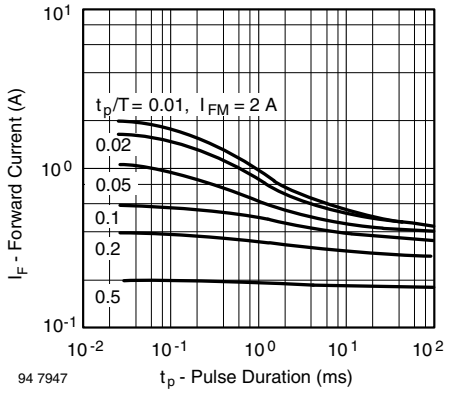



Fig. 3 - Pulse Forward Current vs. Pulse Duration

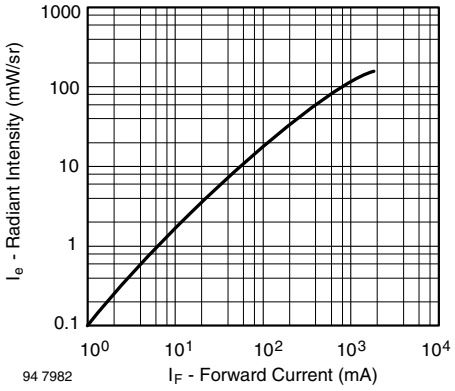



Fig. 6 - Radiant Intensity vs. Forward Current

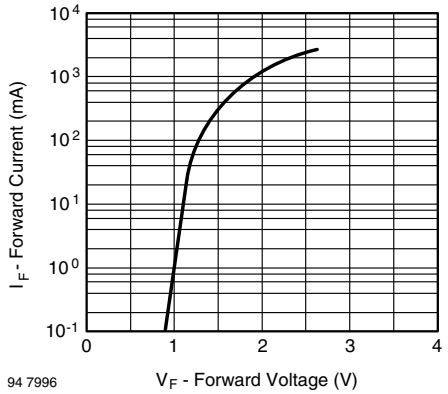



Fig. 4 - Forward Current vs. Forward Voltage

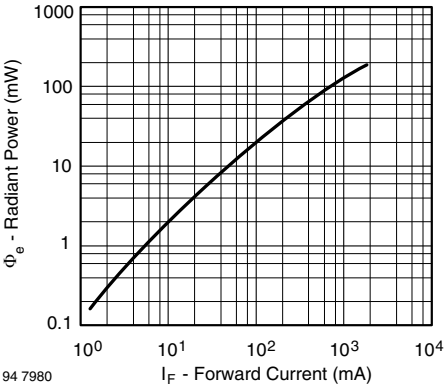



Fig. 7 - Radiant Power vs. Forward Current

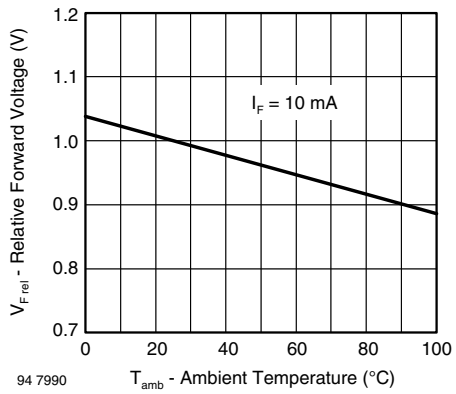



Fig. 5 - Relative Forward Voltage vs. Ambient Temperature

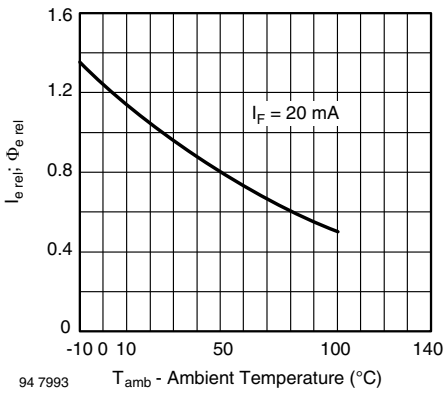



Fig. 8 - Relative Radiant Intensity/Power vs. Ambient Temperature

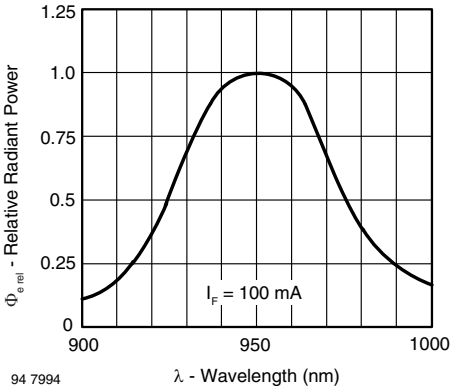



Fig. 9 - Relative Radiant Power vs. Wavelength

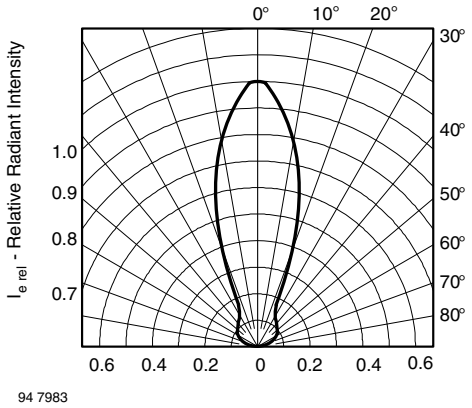
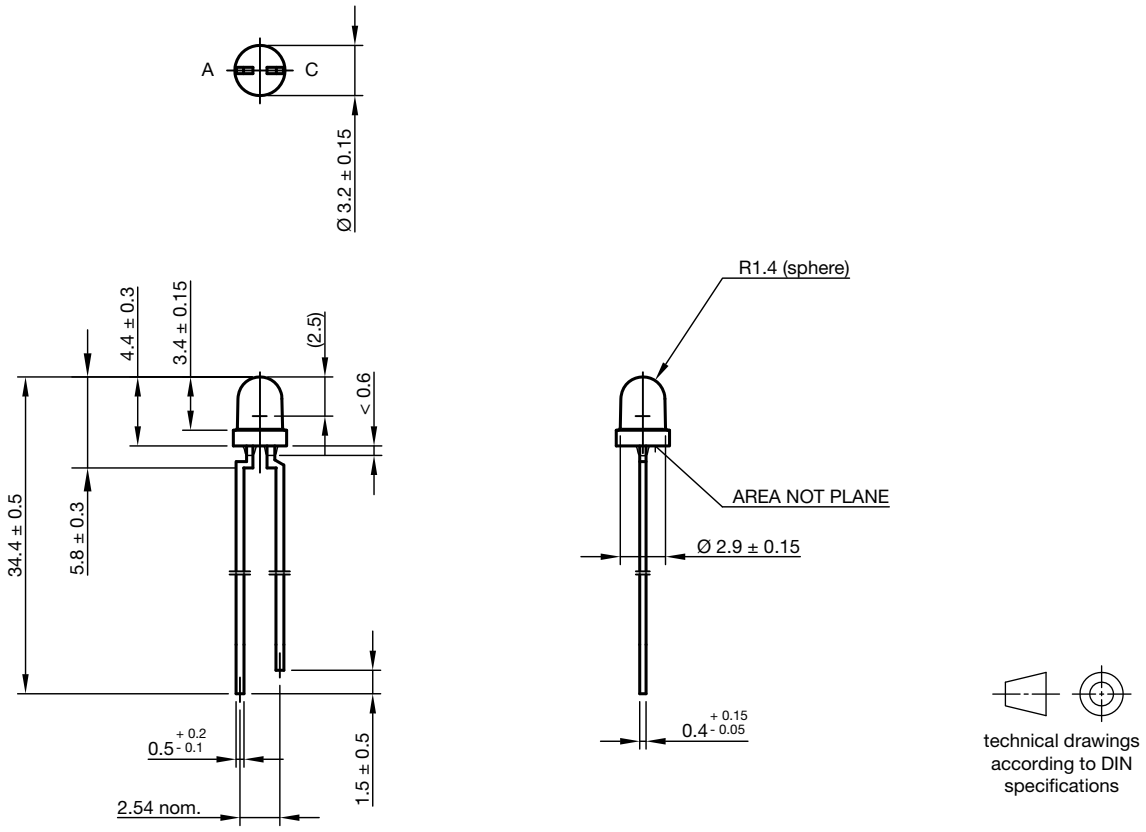



Fig. 10 - Relative Radiant Intensity vs. Angular Displacement

## **PACKAGE DIMENSIONS** in millimeters

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