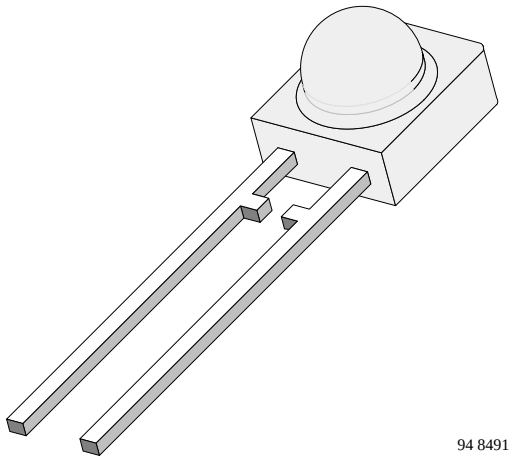
# GaAs/GaAlAs Infrared Emitting Diode in Side View Package

## Description

TSSP 4400 is a high intensity infrared emitting diode in GaAlAs on GaAs – technology, molded in a clear, blue–grey tinted plastic package with spherical side view lens.
The device is spectrally matched to silicon photodiodes and phototransistors.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## Features

- High radiant power and high radiant intensity
- Suitable for DC and high pulse current operation
- Low forward voltage
- Angle of half intensity $\varphi = \pm 22^{\circ}$
- Peak wavelength $\lambda_p = 950$ nm
- High reliability

## Applications

High power infrared emitter in light curtains, light barriers, transmissive or reflective sensors in combination with PIN photodiodes or phototransistors.
Infrared remote control and free air transmission systems for long transmission distance and medium wide angle requirements in combination with PIN photo diodes or photo modules.
Suitable as replacement of CQX 47.

## Absolute Maximum Ratings

$T_{amb}$ = 25°C

| Parameter | Test Conditions | 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 | $I_{FSM}$ | 2.0 | A |
| Power Dissipation | | $P_V$ | 170 | mW |
| Junction Temperature | | $T_j$ | 100 | ˚C |
| Operating Temperature Range | | $T_{amb}$ | –55...+100 | ˚C |
| Storage Temperature Range | | $T_{stg}$ | –55...+100 | ˚C |
| Soldering Temperature | t ≦ 5sec, 2 mm from case | $T_{sd}$ | 260 | ˚C |
| Thermal Resistance Junction/Ambient | | $R_{thJA}$ | 450 | K/W |

## Basic Characteristics

$T_{amb}$ = 25°C

| Parameter | Test Conditions | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Forward Voltage | $I_F$ = 100 mA, $t_p$ = 20 ms | $V_F$ | | 1.3 | 1.8 | V |
| Forward Voltage | $I_F$ = 1.5 A, $t_p$ = 100 µs | $V_F$ | | 2.4 | 3.2 | V |
| Temp. Coefficient of $V_F$ | $I_F$ = 100mA | $TK_{VF}$ | | –1.3 | | mV/K |
| Reverse Current | $V_R$ = 5 V | $I_R$ | | | 100 | 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 | $I_e$ | | 23 | | mW/sr |
| Radiant Intensity | $I_F$ = 1.5 A, $t_p$ = 100 µs | $I_e$ | | 300 | | mW/sr |
| Radiant Power | $I_F$ = 100 mA, $t_p$ = 20 ms | $\phi_e$ | | 18 | | mW |
| Temp. Coefficient of $\phi_e$ | $I_F$ = 100 mA | $TK_{\phi e}$ | | –0.8 | | %/K |
| Angle of Half Intensity | | $\varphi$ | | ±22 | | deg |
| Peak Wavelength | $I_F$ = 100 mA | $\lambda_p$ | | 950 | | nm |
| Spectral Bandwidth | $I_F$ = 100 mA | $\Delta\lambda$ | | 50 | | nm |
| Temp. 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 |
| Rise Time | $I_F$ = 1.5 A | $t_r$ | | 500 | | ns |
| Fall Time | $I_F$ = 100 mA | $t_f$ | | 800 | | ns |
| Fall Time | $I_F$ = 1.5 A | $t_f$ | | 500 | | ns |

## Typical Characteristics ($T_{amb}$ = 25°C unless otherwise specified)

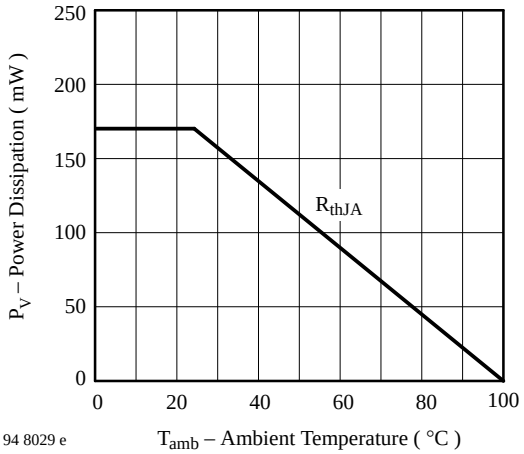



**Figure 1 : Power Dissipation vs. Ambient Temperature**

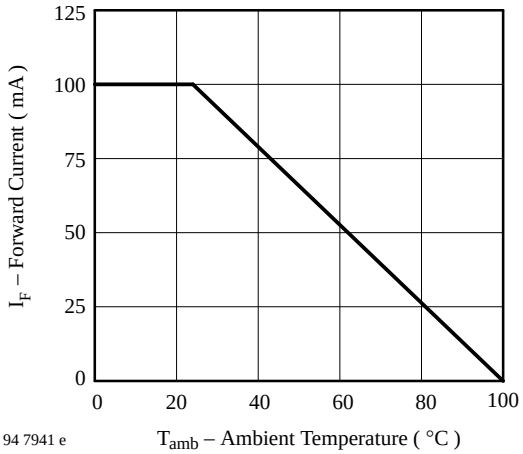



**Figure 2 : Forward Current vs. Ambient Temperature**

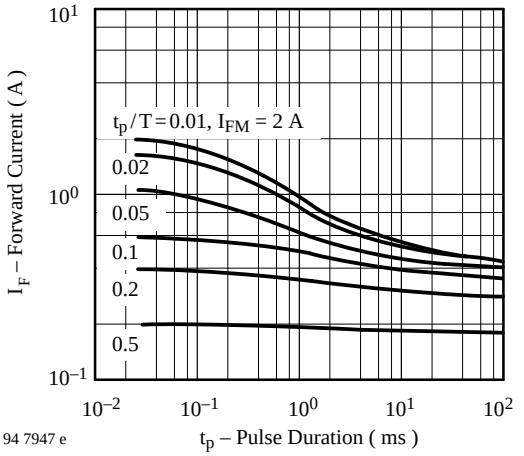



**Figure 3 : Pulse Forward Current vs. Pulse Duration**

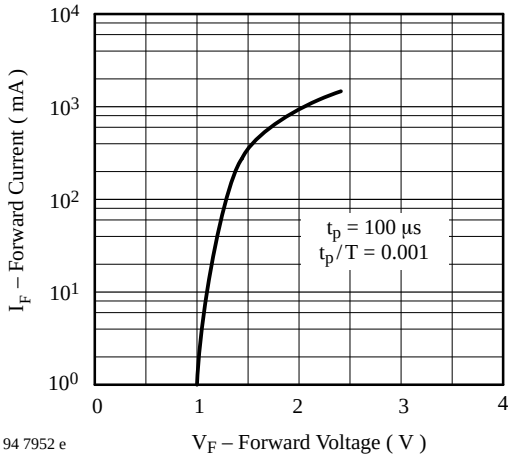



**Figure 4 : Forward Current vs. Forward Voltage**

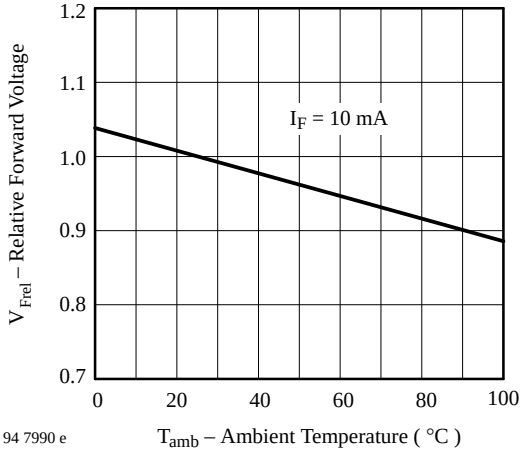



**Figure 5 : Relative Forward Voltage vs. Ambient Temperature**

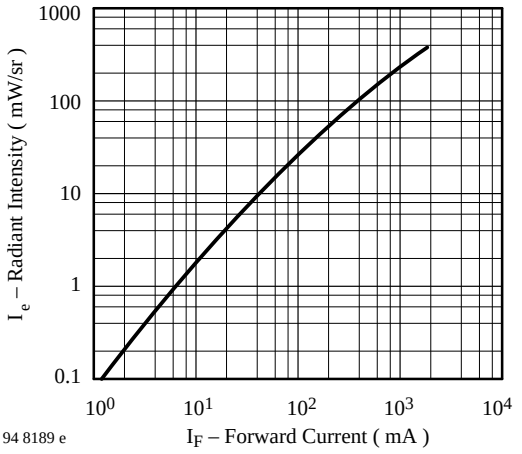



**Figure 6 : Radiant Intensity vs. Forward Current**

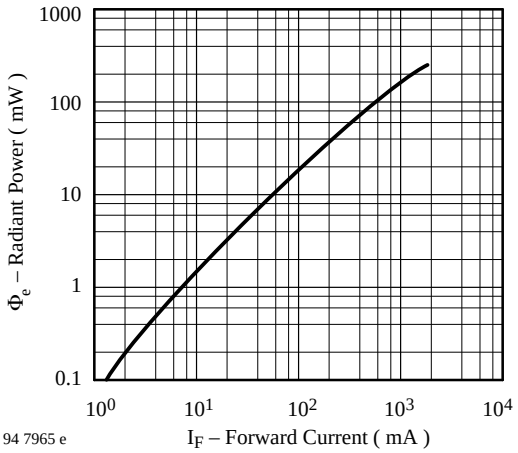



**Figure 7 : Radiant Power vs. Forward Current**

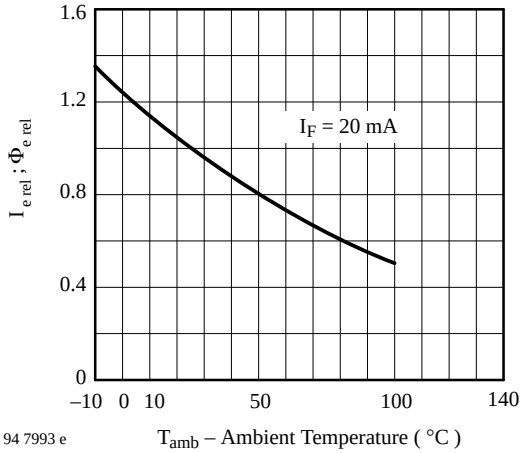



**Figure 8 : Rel. Radiant Intensity\Power vs. Ambient Temperature**

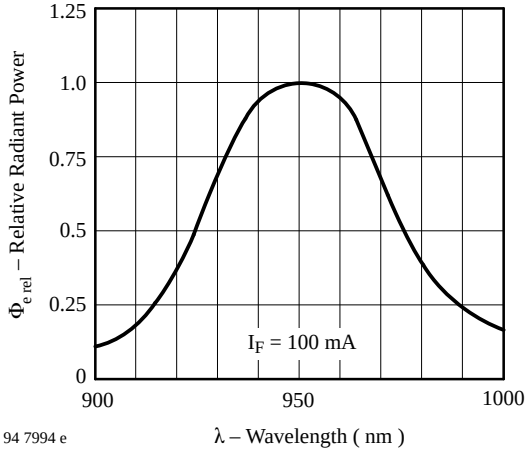



**Figure 9 : Relative Radiant Power vs. Wavelength**

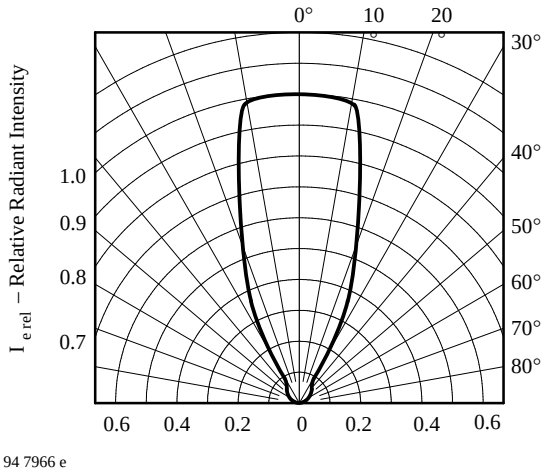
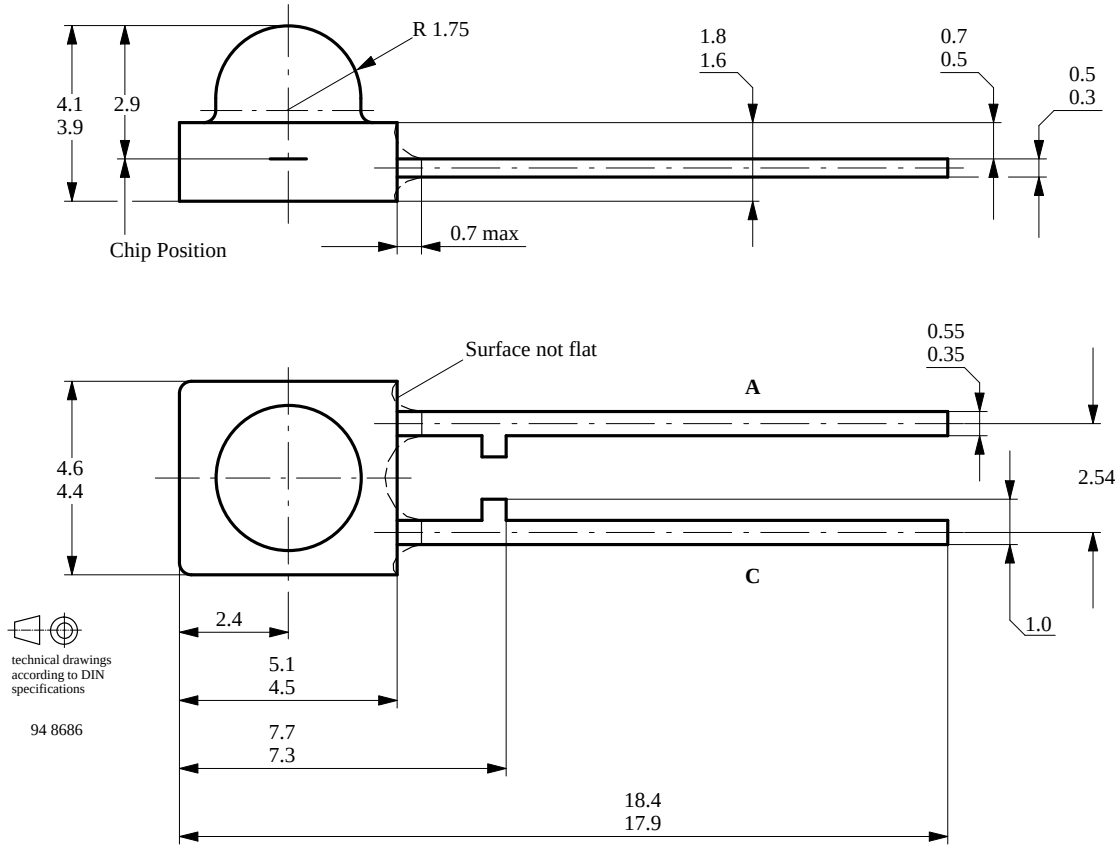



**Figure 10 : Relative Radiant Intensity vs. Angular Displacement**

## Dimensions in mm

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