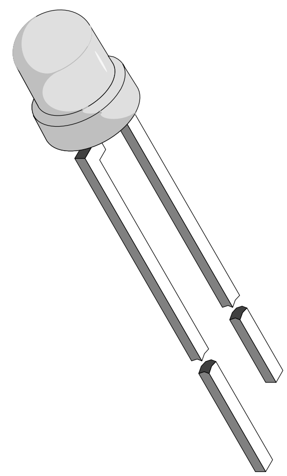
GaAs Infrared Emitting Diode in ø 3 mm (T–1) Package

Description

TSUS 4400 is an infrared emitting diode in standard GaAs on GaAs technology, molded in a clear, blue tinted plastic package. The device is spectrally matched to silicon photodetectors.



Features

- Low cost emitter
- Low forward voltage
- High radiant power and radiant intensity
- Suitable for DC and high pulse current operation
- Standard T–1(ø 3 mm) package
- Angle of half intensity $\varphi = \pm 18^\circ$
- Peak wavelength λ_p = 950 nm
- High reliability
- Good spectral matching to Si photodetectors

Applications

Infrared remote control systems with small package and low cost requirements in combination with silicon photo detectors.
Infrared source in reflective sensors, tape end detection.

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	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	1.7	V
Forward Voltage	I_F = 1.5 A, t_p = 100 μs	V_F		2.2		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
Breakdown Voltage	I_R = 100 μA	$V_{(BR)}$	5	40		
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		mW/sr
Radiant Intensity	I_F = 1.5 A, t_p = 100 μs	I_e		140		mW/sr
Radiant Power	I_F = 100 mA, t_p = 20 ms	ϕ_e		13		mW
Temp. Coefficient of ϕ_e	I_F = 20 mA	$TK_{\phi e}$		–0.8		%/K
Angle of Half Intensity		φ		±18		deg
Peak Wavelength	I_F = 100 mA	λ_p		950		nm
Spectral Bandwidth	I_F = 100 mA	$\Delta\lambda$		50		nm
Temp. Coefficient of λ_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		400		ns
Fall Time	I_F = 100 mA	t_f		800		ns
Fall Time	I_F = 1.5 A	t_f		400		ns

Typical Characteristics (T$_{amb}$ = 25°C unless otherwise specified)

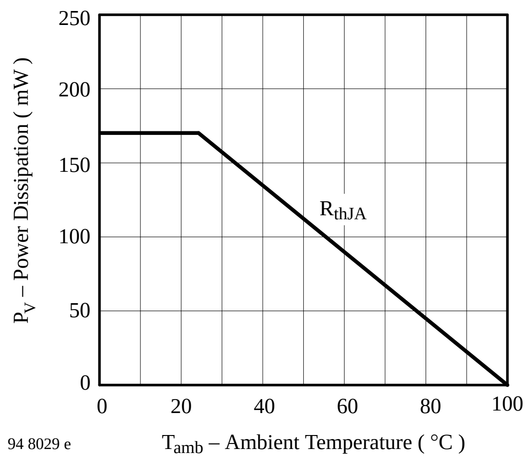


Figure 1 : Power Dissipation vs. Ambient Temperature

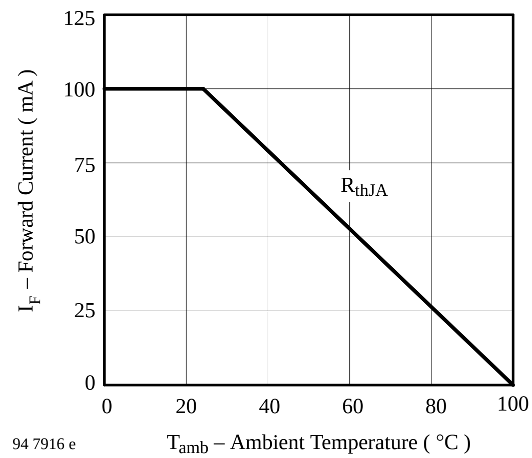


Figure 2 : Forward Current vs. Ambient Temperature

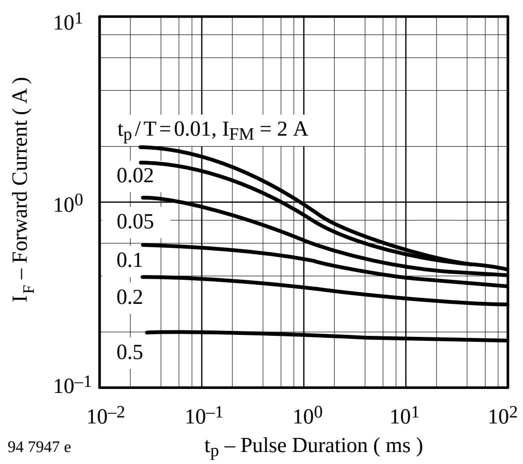


Figure 3 : Pulse Forward Current vs. Pulse Duration

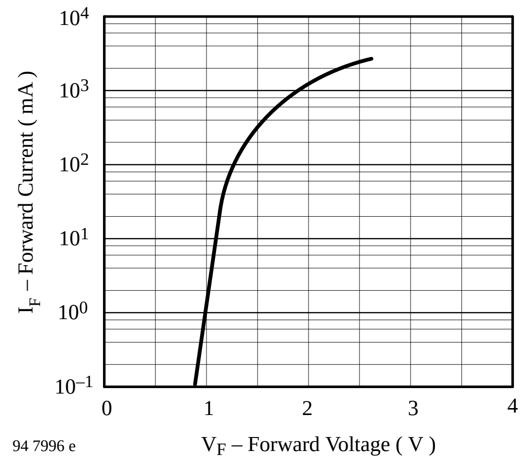


Figure 4 : Forward Current vs. Forward Voltage

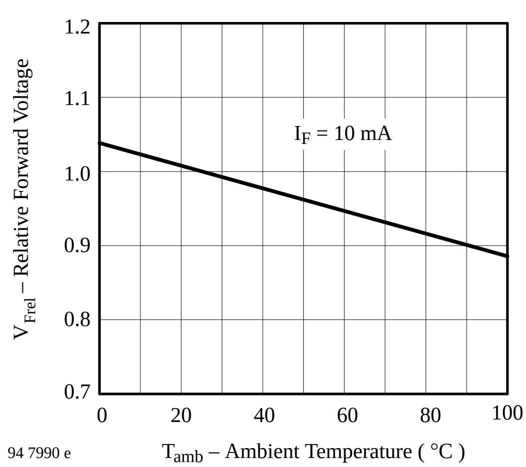


Figure 5 : Relative Forward Voltage vs. Ambient Temperature

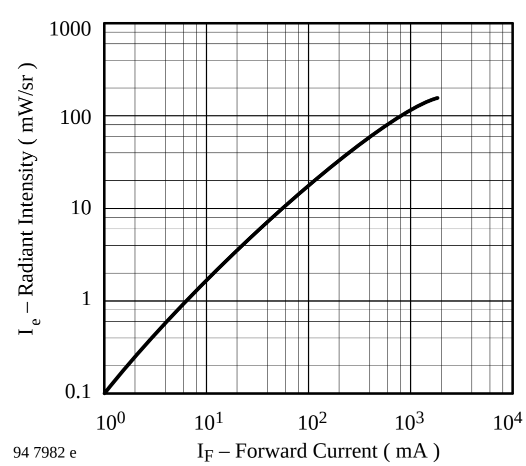


Figure 6 : Radiant Intensity vs. Forward Current

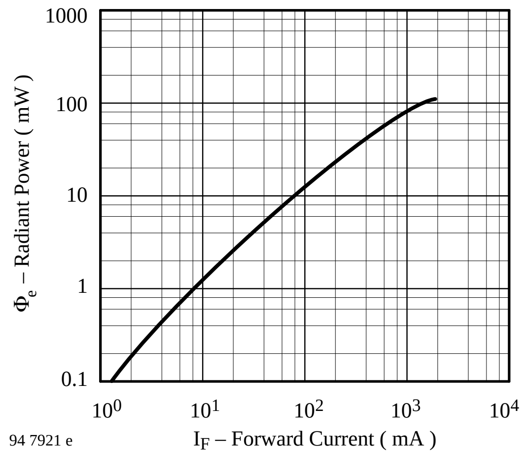


Figure 7 : Radiant Power vs. Forward Current

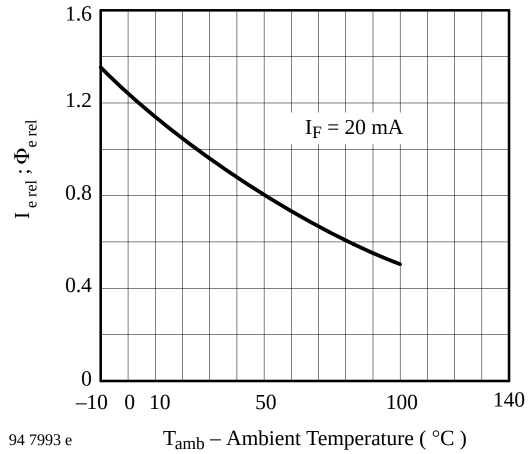


Figure 8 : Rel. Radiant Intensity\Power vs. Ambient Temperature

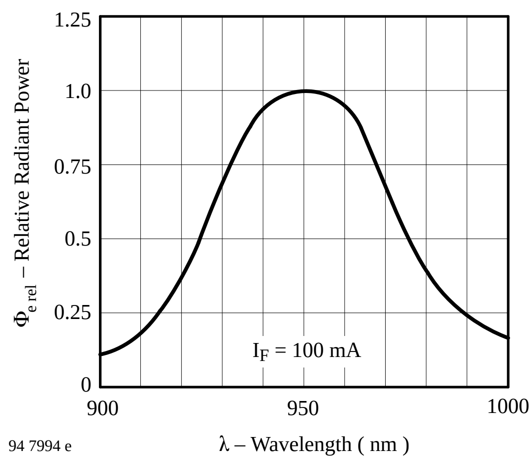


Figure 9 : Relative Radiant Power vs. Wavelength

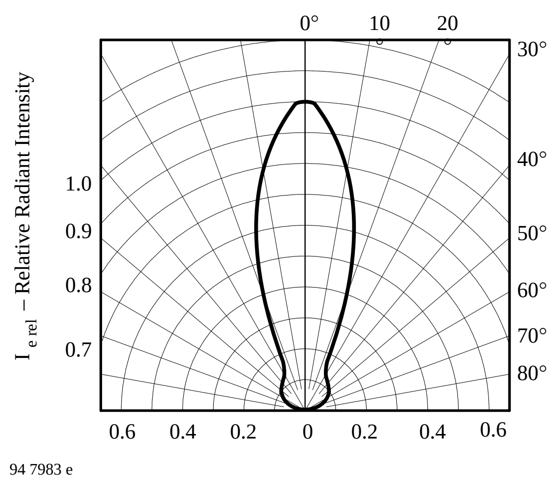
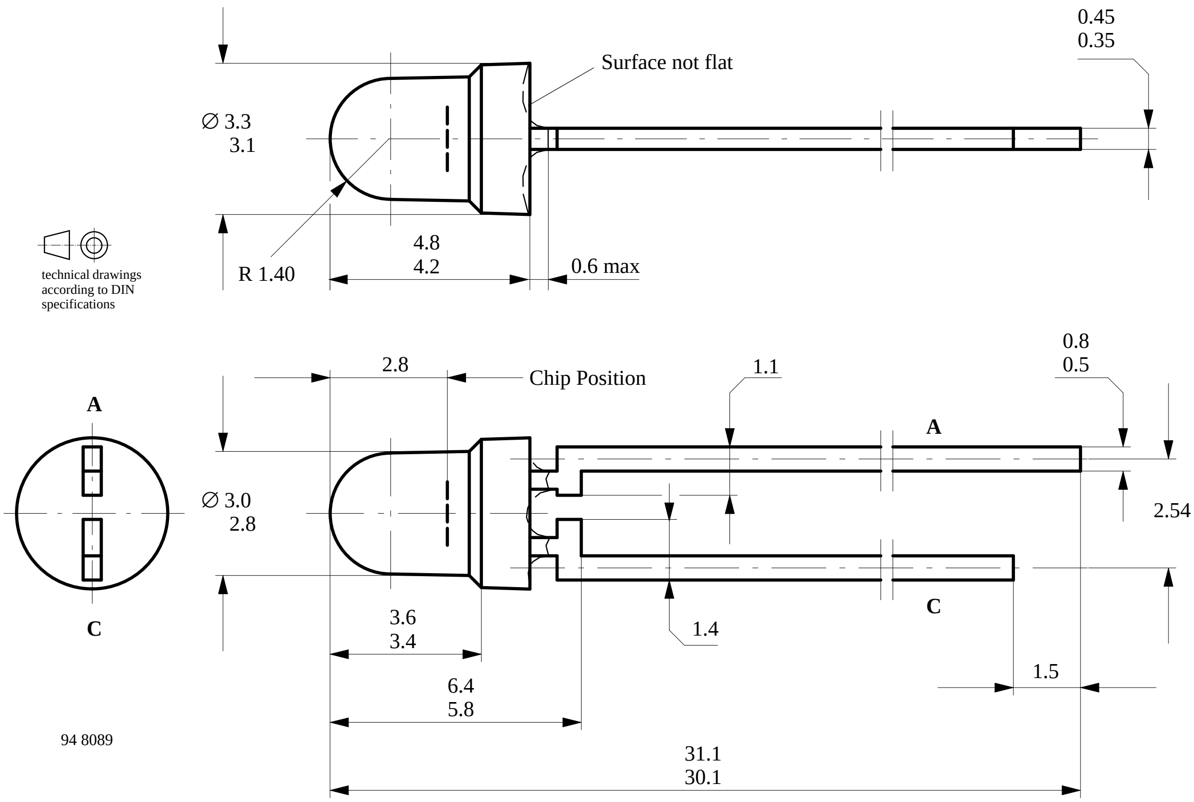


Figure 10 : Relative Radiant Intensity vs. Angular Displacement

Dimensions in mm



We reserve the right to make changes to improve technical design without further notice. Parameters can vary in different applications. All operating parameters must be validated for each customer application by the customer. Should the buyer use TEMIC products for any unintended or unauthorized application, the buyer shall indemnify TEMIC against all claims, costs, damages, and expenses, arising out of, directly or indirectly, any claim of personal damage, injury or death associated with such unintended or unauthorized use.

TEMIC TELEFUNKEN microelectronic GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany
Telephone: 49 (0)7131 67 2831, Fax Number: 49 (0)7131 67 2423