
GaAs/GaAlAs IR Emitting Diodes in \varnothing 3 mm (T-1) Package

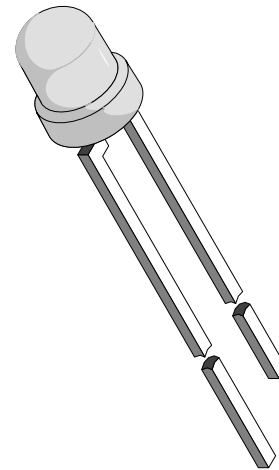
Description

TSIP 44..-series are high efficiency infrared emitting diodes in GaAlAs on GaAs technology, molded in clear, grey tinted plastic packages.

In comparison with the standard GaAs on GaAs technology these emitters achieve about 70 % radiant power improvement at the same wavelength.

The forward voltages at low current and at high pulse current roughly correspond to the low values of the standard technology. Therefore these emitters are ideally suitable as high performance replacements of standard emitters.

It is not necessary to modify the filter characteristics of the detector, the cover plates of transmitter and receiver or the supply voltage.



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Features

- Extra high radiant power
- Low forward voltage
- Suitable for DC and high pulse current operation
- Standard T-1 (\varnothing 3 mm) package
- Angle of half intensity $\varphi = \pm 20^\circ$
- Peak wavelength $\lambda_p = 950$ nm
- High reliability
- Good spectral matching to Si photodetectors

Applications

Infrared remote control units

Free air transmission systems

Infrared source for optical counters and card readers

Absolute Maximum Ratings

 $T_{amb} = 25^{\circ}\text{C}$

Parameter	Test Conditions	Symbol	Value	Unit
Reverse Voltage		V_R	7	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}	2	A
Power Dissipation		P_V	170	mW
Junction Temperature		T_j	100	$^{\circ}\text{C}$
Operating Temperature Range		T_{amb}	-55...+100	$^{\circ}\text{C}$
Storage Temperature Range		T_{stg}	-55...+100	$^{\circ}\text{C}$
Soldering Temperature	$t \leq 5\text{sec}, 2\ \text{mm from case}$	T_{sd}	260	$^{\circ}\text{C}$
Thermal Resistance Junction/Ambient		R_{thJA}	450	K/W

Basic Characteristics

 $T_{amb} = 25^{\circ}\text{C}$

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
Forward Voltage	$I_F = 100\ \text{mA}, t_p = 20\ \text{ms}$	V_F		1.3	1.8	V
Forward Voltage	$I_F = 1.5\ \text{A}, t_p = 100\ \mu\text{s}$	V_F		2.4	3.2	V
Temp. Coefficient of V_F	$I_F = 100\text{mA}$	TK_{VF}		-1.3		mV/K
Reverse Current	$V_R = 5\ \text{V}$	I_R			100	μA
Junction Capacitance	$V_R = 0\ \text{V}, f = 1\ \text{MHz}, E = 0$	C_j		30		pF
Temp. Coefficient of ϕ_e	$I_F = 100\ \text{mA}$	TK_{ϕ_e}		-0.8		%/K
Angle of Half Intensity		ϕ		± 20		deg
Peak Wavelength	$I_F = 100\ \text{mA}$	λ_p		950		nm
Spectral Bandwidth	$I_F = 100\ \text{mA}$	$\Delta\lambda$		50		nm
Temp. 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		800		ns
Rise Time	$I_F = 1.5\ \text{A}$	t_r		500		ns
Fall Time	$I_F = 100\ \text{mA}$	t_f		800		ns
Fall Time	$I_F = 1.5\ \text{A}$	t_f		500		ns

Type Dedicated Characteristics

 $T_{amb} = 25^{\circ}\text{C}$

Parameter	Type	Test Conditions	Symbol	Min	Typ	Max	Unit
Radiant Intensity	TSIP4400	$I_F=100\text{mA}, t_p=20\text{ms}$	I_e	12	20		mW/sr
	TSIP4401	$I_F=100\text{mA}, t_p=20\text{ms}$	I_e	16	25		mW/sr
Radiant Intensity	TSIP4400	$I_F=1.5\text{A}, t_p=100\mu\text{s}$	I_e	140	240		mW/sr
	TSIP4401	$I_F=1.5\text{A}, t_p=100\mu\text{s}$	I_e	190	300		mW/sr
Radiant Power	TSIP4400	$I_F=100\text{mA}, t_p=20\text{ms}$	ϕ_e		22		mW
	TSIP4401	$I_F=100\text{mA}, t_p=20\text{ms}$	ϕ_e		25		mW

Typical Characteristics ($T_{amb} = 25^{\circ}\text{C}$ unless otherwise specified)

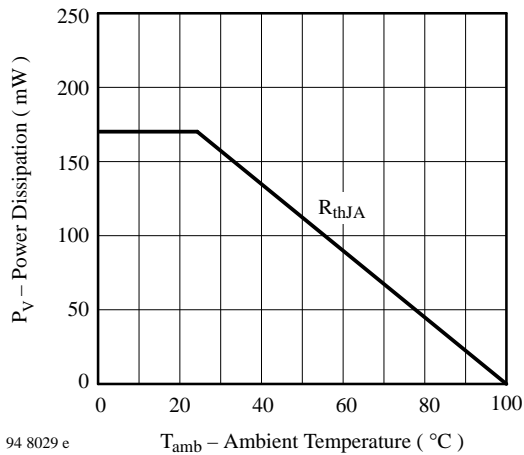


Figure 1 : Power Dissipation vs. Ambient Temperature

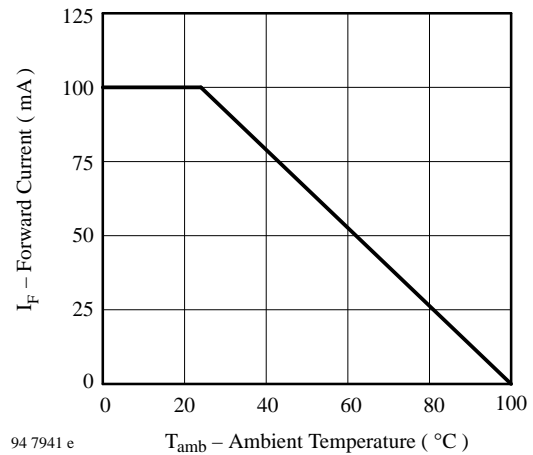


Figure 2 : Forward Current vs. Ambient Temperature

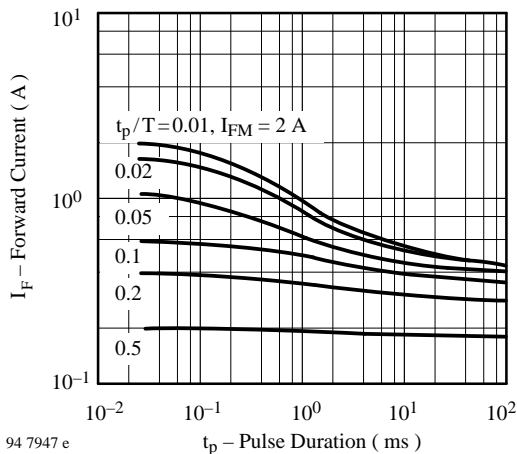


Figure 3 : Pulse Forward Current vs. Pulse Duration

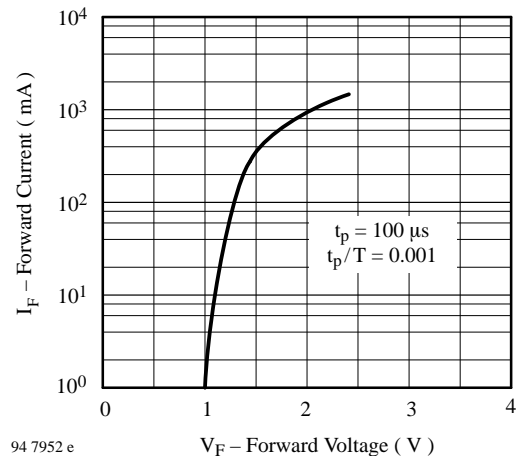


Figure 4 : Forward Current vs. Forward Voltage

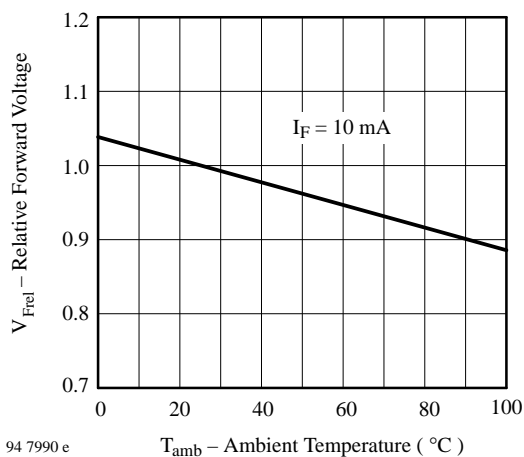


Figure 5 : Relative Forward Voltage vs. Ambient Temperature

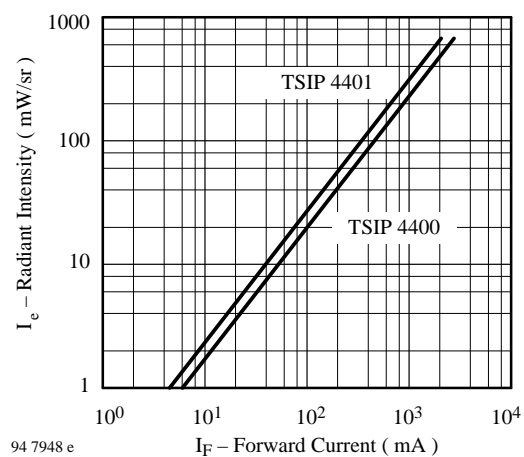


Figure 6 : Radiant Intensity vs. Forward Current

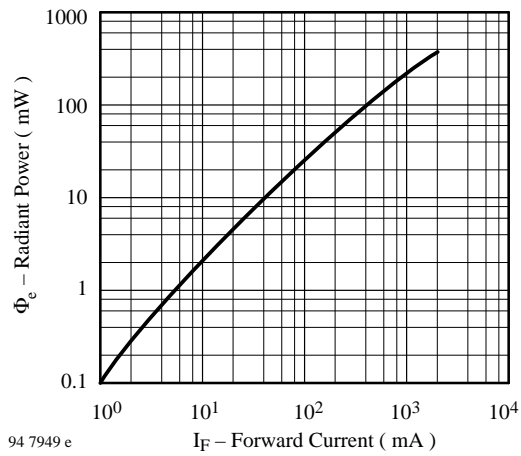


Figure 7 : Radiant Power vs. Forward Current

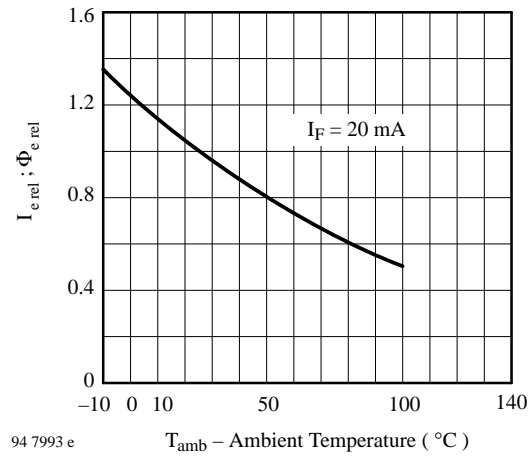


Figure 8 : Rel. Radiant Intensity/Power vs. Ambient Temperature

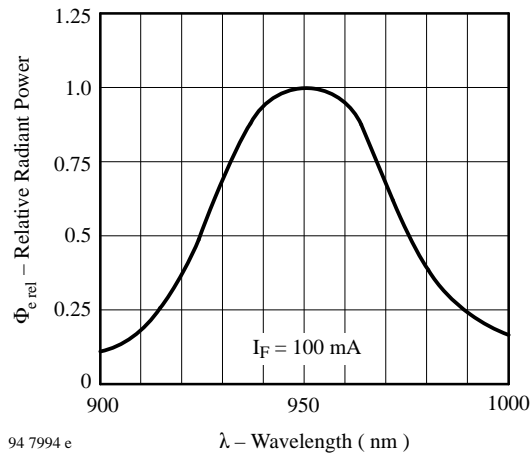


Figure 9 : Relative Radiant Power vs. Wavelength

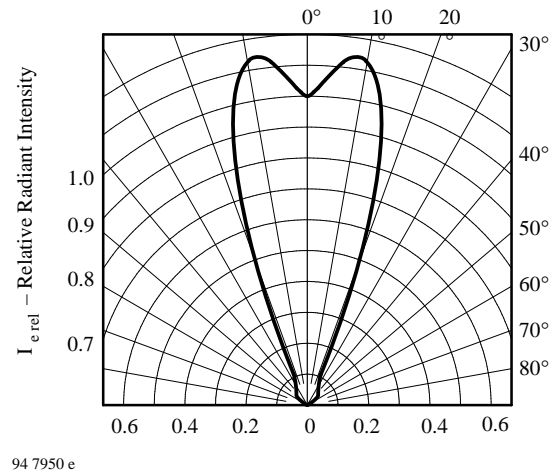
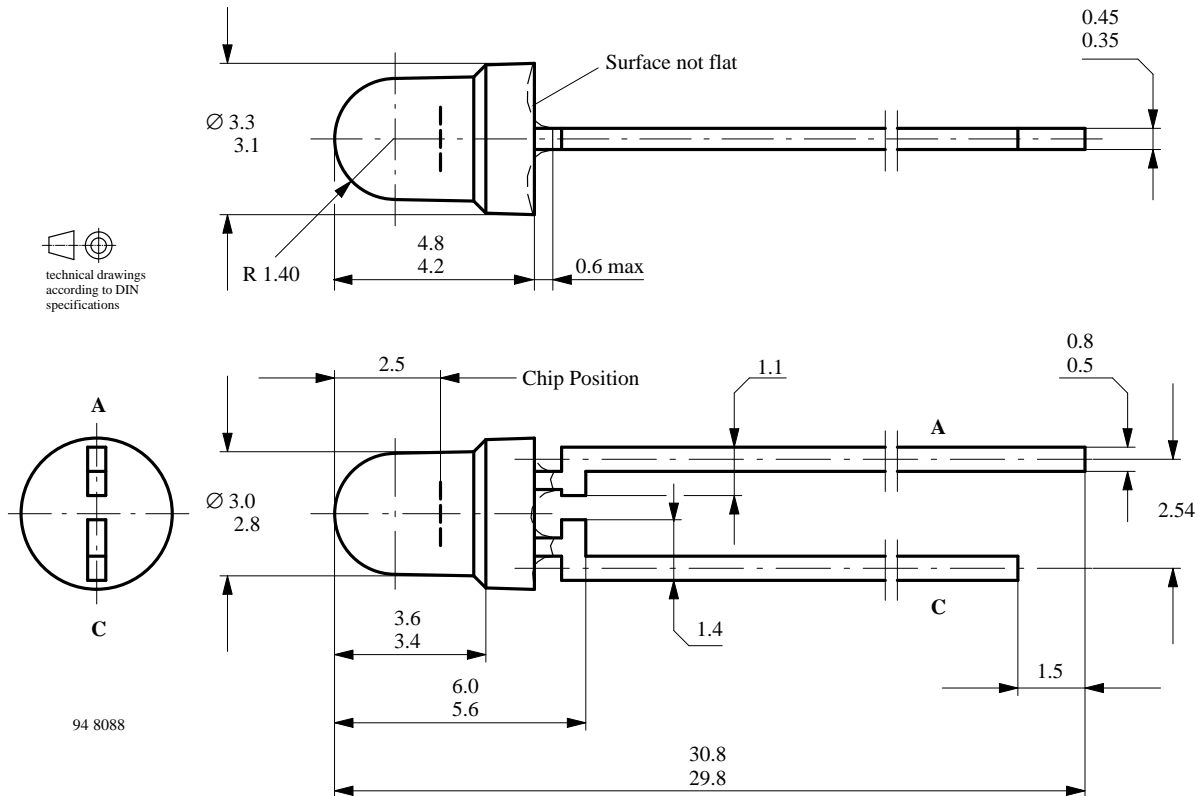


Figure 10 : Relative Radiant Intensity vs. Angular Displacement

Dimensions in mm



We reserve the right to make changes to improve technical design without further notice.

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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