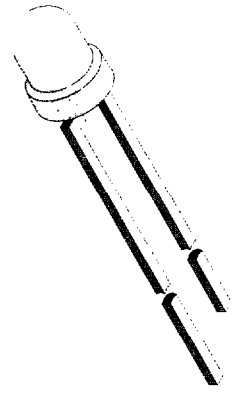
GaAs/GaAlAs IR Emitting Diodes in ø 3 mm (T–1) Package

Description

TSIP44..–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 a similar 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.



Features

- Extra high radiant power
- Low forward voltage
- Suitable for high pulse current operation
- Standard T–1 (ø 3 mm) package
- Angle of half intensity $\varphi = \pm 20°$
- Peak wavelength $\lambda_p = 925$ 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°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 µs	I_{FM}	200	mA
Surge Forward Current	t_p=100 µs	I_{FSM}	2	A
Power Dissipation		P_V	180	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
	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
Temp. Coefficient of ϕ_e	I_F = 100 mA	$TK_{\phi e}$		–0.8		%/K
Angle of Half Intensity		φ		±20		deg
Peak Wavelength	I_F = 100 mA	λ_p		925		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
	I_F = 1.5 A	t_r		500		ns
Fall Time	I_F = 100 mA	t_f		800		ns
	I_F = 1.5 A	t_f		500		ns

Type Dedicated Characteristics

T_{amb} = 25°C

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

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

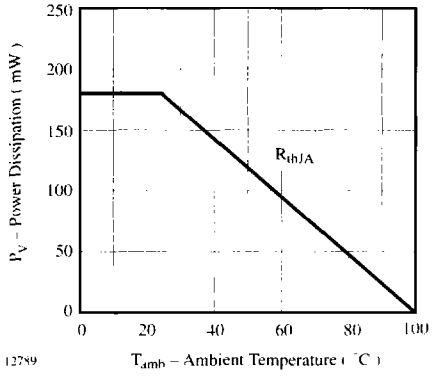


Figure 1. Power Dissipation vs. Ambient Temperature

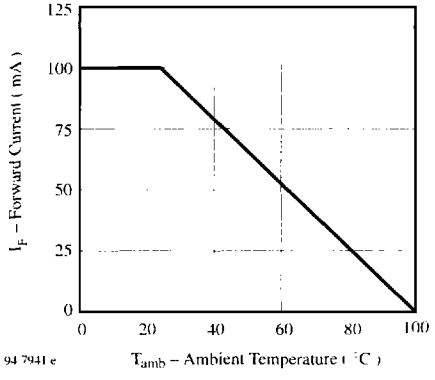


Figure 2. Forward Current vs. Ambient Temperature

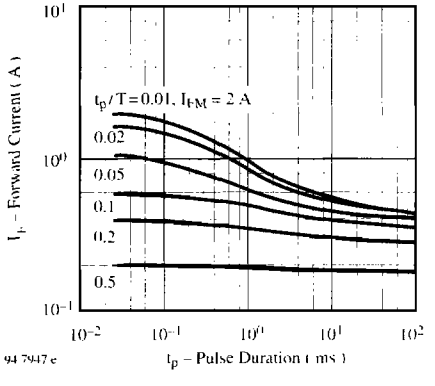


Figure 3. Pulse Forward Current vs. Pulse Duration

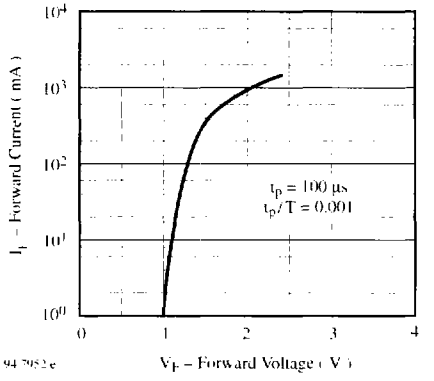


Figure 4. Forward Current vs. Forward Voltage

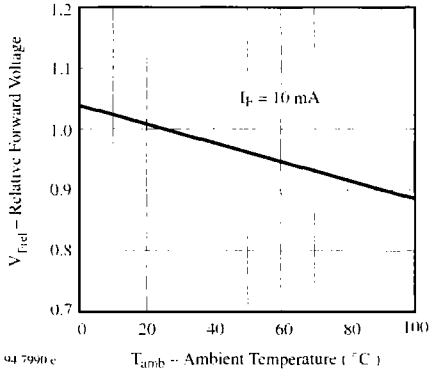


Figure 5. Relative Forward Voltage vs. Ambient Temperature

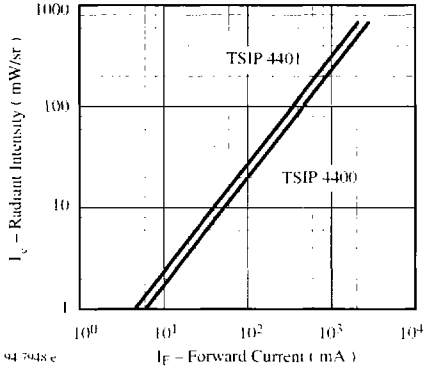


Figure 6. Radiant Intensity vs. Forward Current

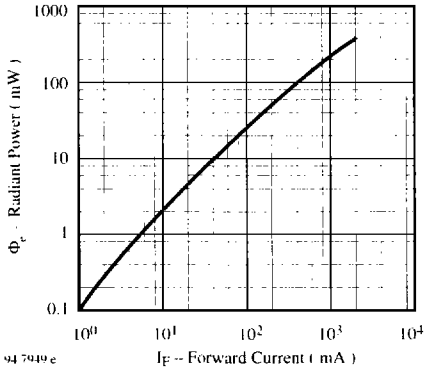


Figure 7. Radiant Power vs. Forward Current

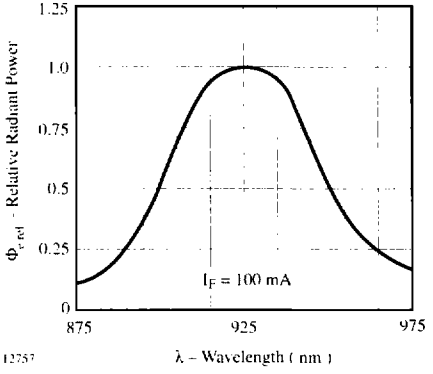


Figure 9. Relative Radiant Power vs. Wavelength

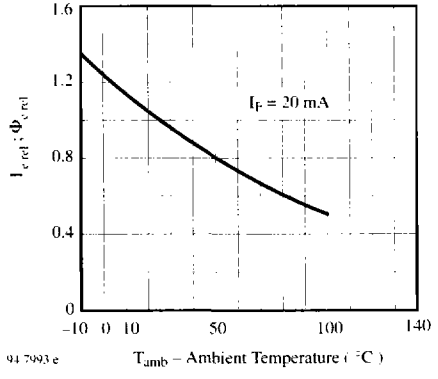


Figure 8. Rel. Radiant Intensity\Power vs. Ambient Temperature

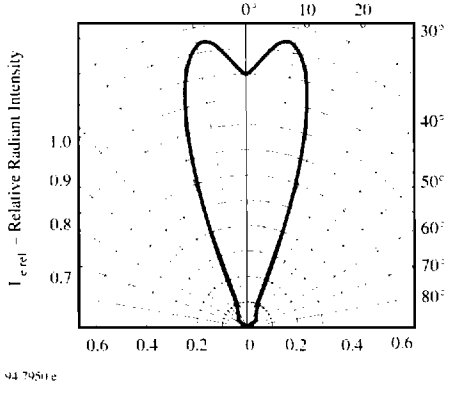


Figure 10. Relative Radiant Intensity vs. Angular Displacement

Dimensions in mm