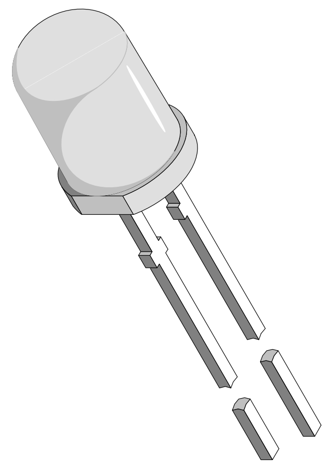
GaAs/GaAlAs IR Emitting Diodes in ø 5 mm (T–1¾) Package

Description



TSIP 52..–series are high efficiency infrared emitting diodes in GaAlAs on GaAs technology, molded in clear, bluegrey 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.

Features

- Extra high radiant power and radiant intensity
- Low forward voltage
- Suitable for DC and high pulse current operation
- Standard T–1¾ (ø 5 mm) package
- Angle of half intensity $\varphi = \pm 17^\circ$
- Peak wavelength λ_p = 950 nm
- High reliability
- Good spectral matching to Si photodetectors

Applications

Infrared remote control units with high power requirements
Free air transmission systems
Infrared source for optical counters and card readers
IR source for smoke detectors

Absolute Maximum Ratings

T_{amb} = 25°C

Parameter	Test Conditions	Symbol	Value	Unit
Reverse Voltage		V_R	7	V
Forward Current		I_F	150	mA
Peak Forward Current	$t_p/T=0.5$, $t_p=100$ µs	I_{FM}	300	mA
Surge Forward Current	$t_p=100$ µs	I_{FSM}	3	A
Power Dissipation		P_V	210	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}	350	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
Temp. Coefficient of ϕ_e	I_F = 20 mA	$TK_{\phi e}$		–0.8		%/K
Angle of Half Intensity		φ		±17		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		500		ns
Fall Time	I_F = 100 mA	t_f		800		ns
Fall Time	I_F = 1.5 A	t_f		500		ns

Type Dedicated Characteristics

T_{amb} = 25°C

Parameter	Type	Test Conditions	Symbol	Min	Typ	Max	Unit
Radiant Intensity	TSIP5200	I_F=100mA, t_p=20ms	I_e	20	40		mW/sr
	TSIP5201	I_F=100mA, t_p=20ms	I_e	30	50		mW/sr
Radiant Intensity	TSIP5200	I_F=1.5A, t_p=100µs	I_e	240	520		mW/sr
	TSIP5201	I_F=1.5A, t_p=100µs	I_e	360	650		mW/sr
Radiant Power	TSIP5200	I_F=100mA, t_p=20ms	ϕ_e		22		mW
	TSIP5201	I_F=100mA, t_p=20ms	ϕ_e		25		mW

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

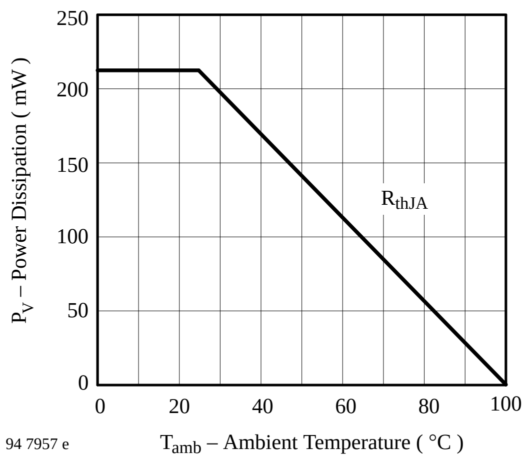


Figure 1 : Power Dissipation vs. Ambient Temperature

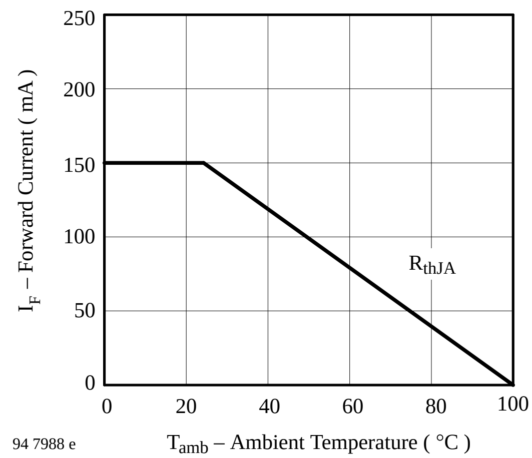


Figure 2 : Forward Current vs. Ambient Temperature

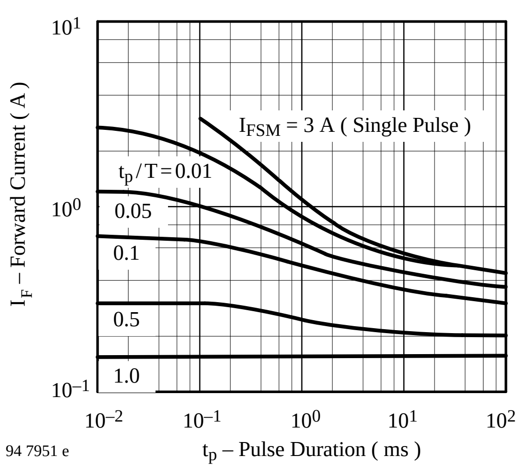


Figure 3 : Pulse Forward Current vs. Pulse Duration

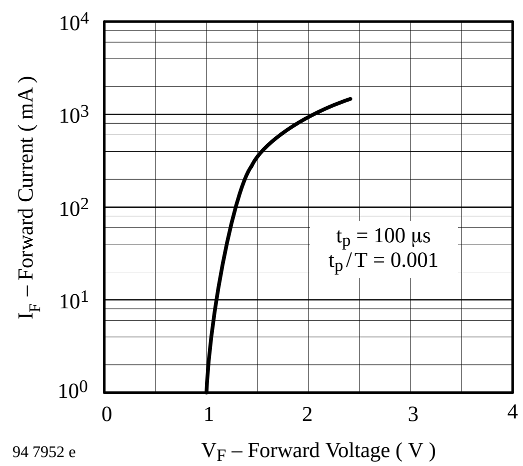


Figure 4 : Forward Current vs. Forward Voltage

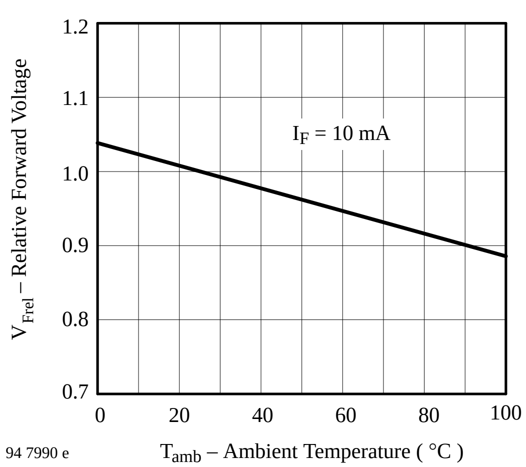


Figure 5 : Relative Forward Voltage vs. Ambient Temperature

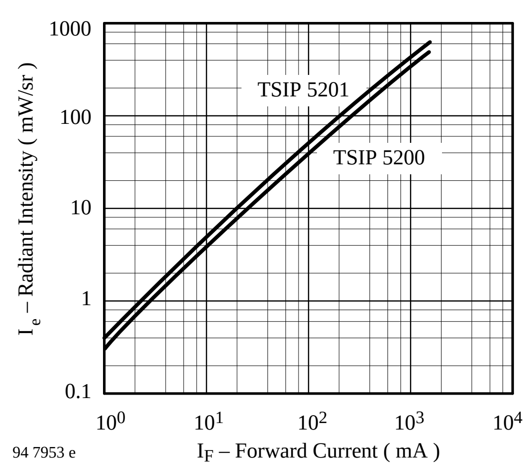


Figure 6 : Radiant Intensity vs. Forward Current

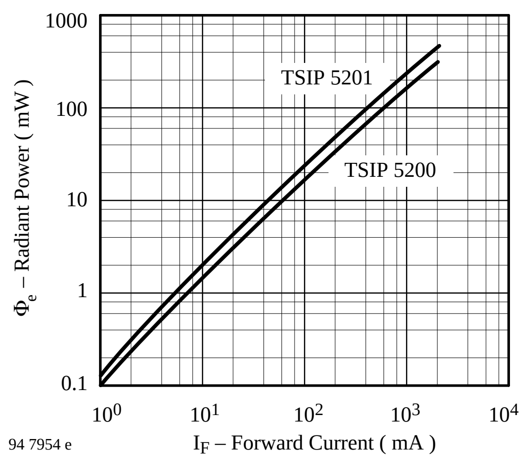


Figure 7 : Radiant Power vs. Forward Current

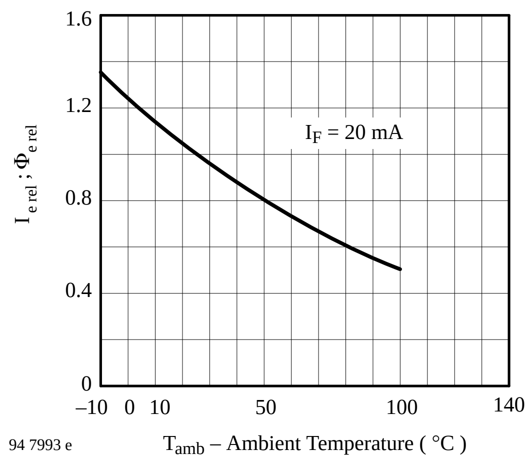


Figure 8 : Rel. Radiant Intensity\Power vs. Ambient Temperature

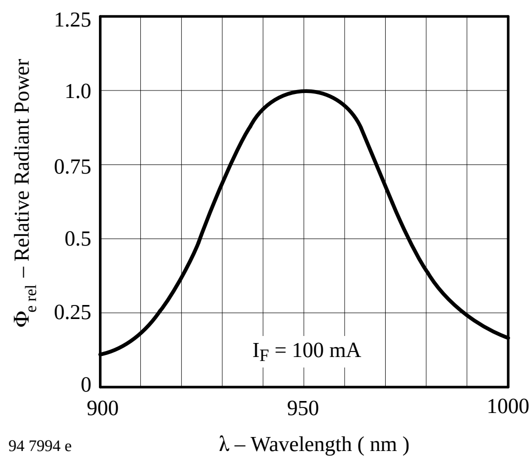


Figure 9 : Relative Radiant Power vs. Wavelength

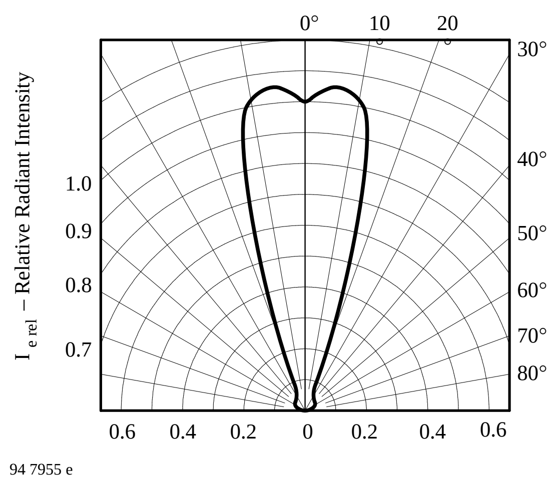
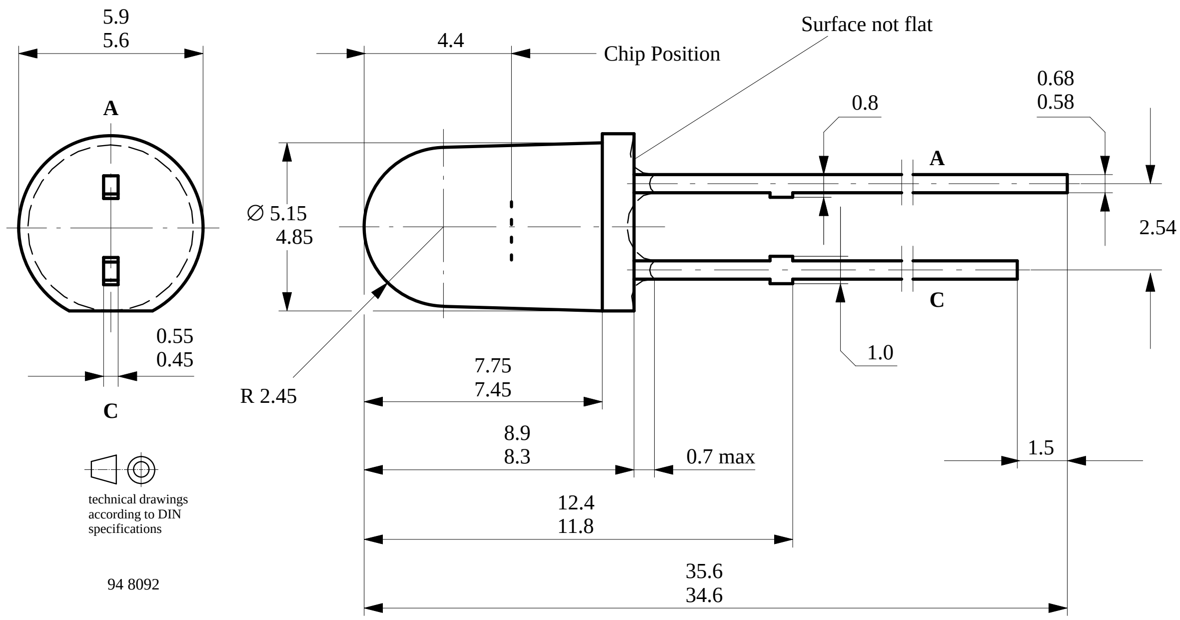


Figure 10 : Relative Radiant Intensity vs. Angular Displacement

Dimensions in mm



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