

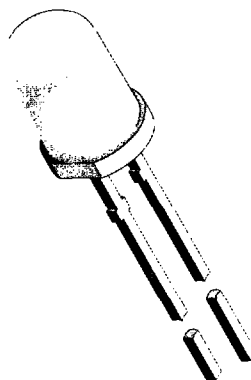
GaAs Infrared Emitting Diodes in $\varnothing 5$ mm (T-1 $\frac{3}{4}$) Package

Description

TSUS520. series are infrared emitting diodes in standard GaAs on GaAs technology, molded in a clear, blue-grey tinted plastic package. The devices are spectrally matched to silicon photodiodes and phototransistors.

Features

- Low cost emitter
- Low forward voltage
- High radiant power and radiant intensity
- Suitable for DC and high pulse current operation
- Standard T-1 $\frac{3}{4}$ ($\varnothing 5$ mm) package
- Angle of half intensity $\varphi = \pm 15^\circ$
- Peak wavelength $\lambda_p = 950$ nm
- High reliability
- Good spectral matching to Si photodetectors



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Applications

Infrared remote control and free air transmission systems with low forward voltage and low cost requirements in combination with PIN photodiodes or phototransistors.

Absolute Maximum Ratings

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

Parameter	Test Conditions	Symbol	Value	Unit
Reverse Voltage		V_R	5	V
Forward Current		I_F	150	mA
Peak Forward Current	$t_p/T=0.5$, $t_p=100\ \mu\text{s}$	I_{FM}	300	mA
Surge Forward Current	$t_p=100\ \mu\text{s}$	I_{FSM}	2.5	A
Power Dissipation		P_V	210	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 mm from case	T_{sd}	260	$^\circ\text{C}$
Thermal Resistance Junction/Ambient		R_{thJA}	375	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
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 _c	I _F = 20 mA	TK _{φc}		-0.8		%/K
Angle of Half Intensity		φ		±15		deg
Peak Wavelength	I _F = 100 mA	λ _p		950		nm
Spectral Bandwidth	I _F = 100 mA	Δλ		50		nm
Temp. Coefficient of λ _p	I _F = 100 mA	TK _{λp}		0.2		nm/K
Rise Time	I _F = 100 mA	t _r		800		ns
	I _F = 1.5 A	t _r		400		ns
Fall Time	I _F = 100 mA	t _f		800		ns
	I _F = 1.5 A	t _f		400		ns

Type Dedicated Characteristics

T_{amb} = 25°C

Parameter	Test Conditions	Type	Symbol	Min	Typ	Max	Unit
Forward Voltage	I _F =1.5A, t _p =100μs	TSUS5200/5201	V _F		2.2	3.4	V
		TSUS5202	V _F		2.2	2.7	V
Radiant Intensity	I _F =100mA, t _p =20ms	TSUS5200	I _e	10	20		mW/sr
		TSUS5201	I _e	15	25		mW/sr
		TSUS5202	I _e	20	30		mW/sr
Radiant Intensity	I _F =1.5A, t _p =100μs	TSUS5200	I _e	95	180		mW/sr
		TSUS5201	I _e	120	230		mW/sr
		TSUS5202	I _e	170	280		mW/sr
Radiant Power	I _F =100mA, t _p =20ms	TSUS5200	φ _e		13		mW
		TSUS5201	φ _e		14		mW
		TSUS5202	φ _e		15		mW

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

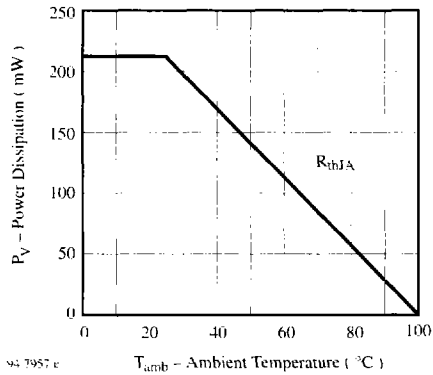


Figure 1. Power Dissipation vs. Ambient Temperature

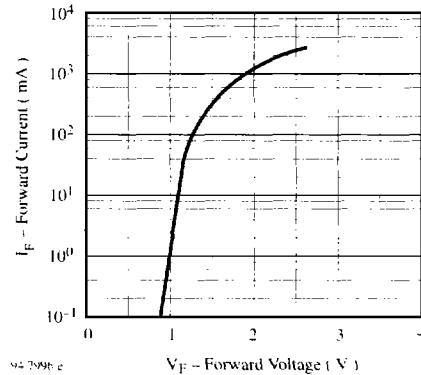


Figure 4. Forward Current vs. Forward Voltage

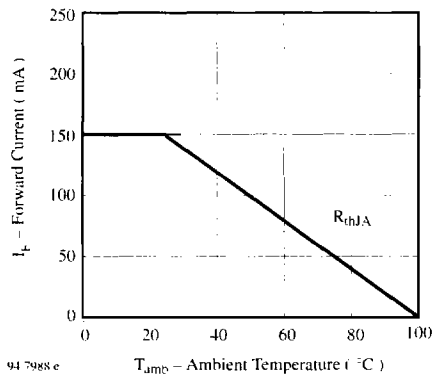


Figure 2. Forward Current vs. Ambient Temperature

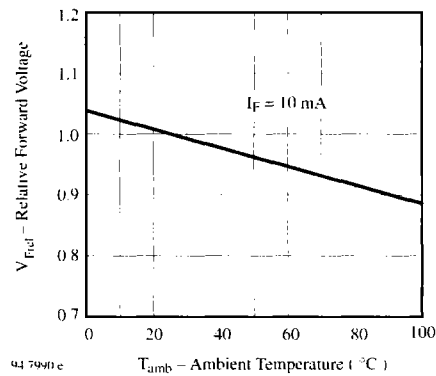


Figure 5. Relative Forward Voltage vs. Ambient Temperature

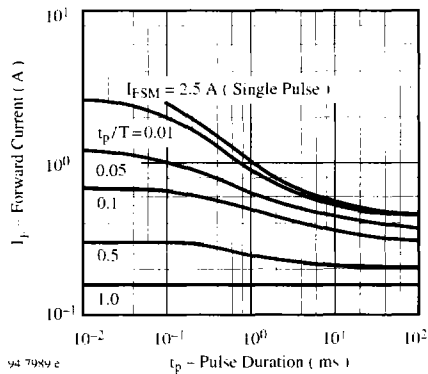


Figure 3. Pulse Forward Current vs. Pulse Duration

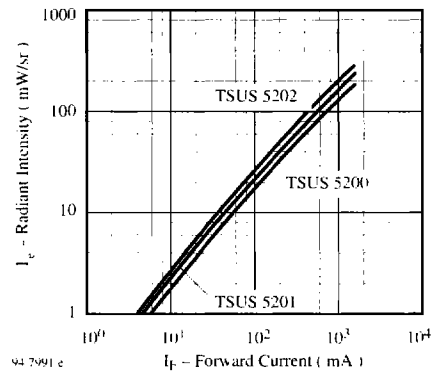


Figure 6. Radiant Intensity vs. Forward Current

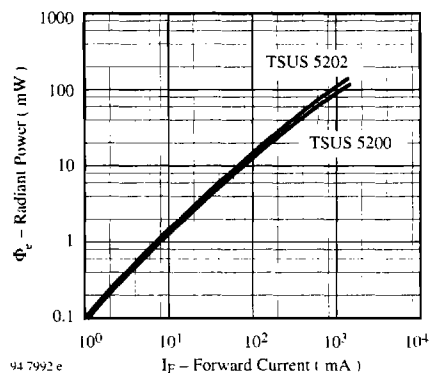


Figure 7. Radiant Power vs. Forward Current

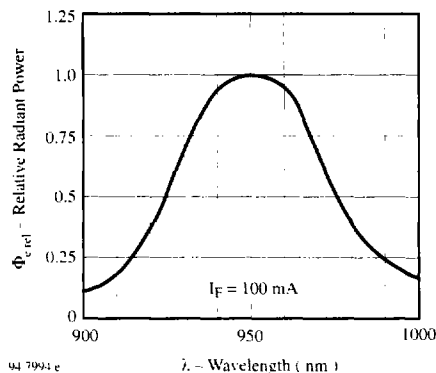


Figure 9. Relative Radiant Power vs. Wavelength

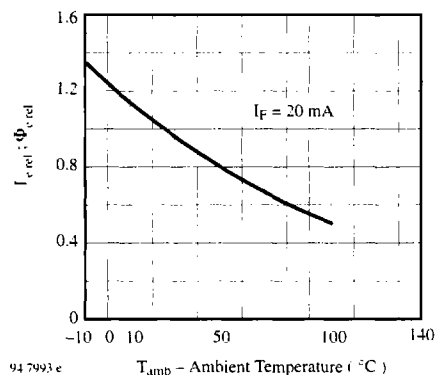


Figure 8. Rel. Radiant Intensity/Power vs. Ambient Temperature

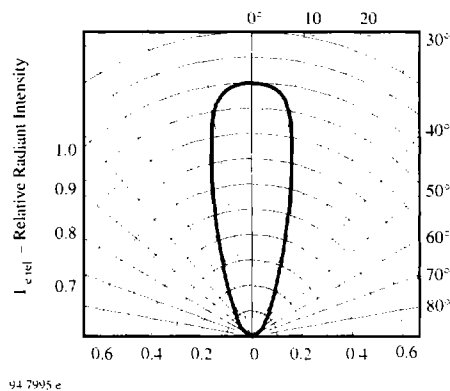
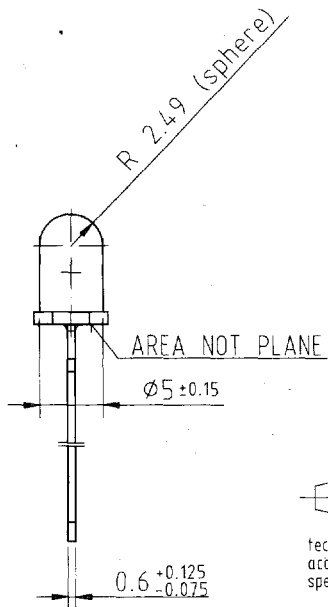
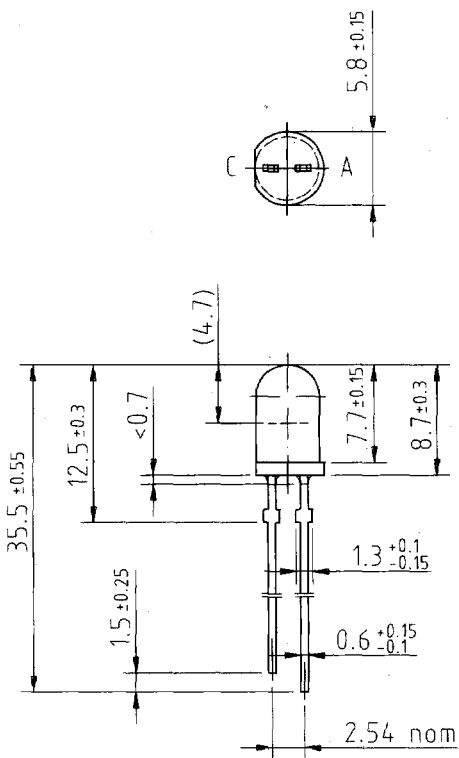


Figure 10. Relative Radiant Intensity vs. Angular Displacement

Dimensions in mm



technical drawings
according to DIN
specifications