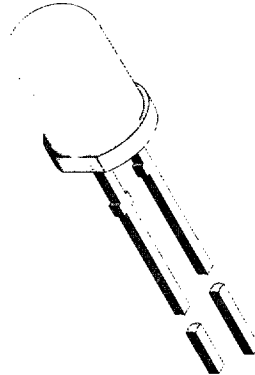


GaAlAs Infrared Emitting Diodes in $\varnothing 5\text{mm}$ (T-1 $\frac{3}{4}$) Package

Description

The TSHA550. series are high efficiency infrared emitting diodes in GaAlAs on GaAlAs technology, molded in a clear, untinted plastic package. In comparison with the standard GaAs on GaAs technology these high intensity emitters feature about 70 % radiant power improvement.



948590

Features

- Extra high radiant power
- Suitable for high pulse current operation
- Standard T-1 $\frac{3}{4}$ ($\varnothing 5\text{ mm}$) package
- Angle of half intensity $\varphi = \pm 24^\circ$
- Peak wavelength $\lambda_p = 875\text{ nm}$
- High reliability
- Good spectral matching to Si photodetectors

Applications

Infrared remote control and free air transmission systems with high power and comfortable radiation angle requirements in combination with PIN photodiodes or phototransistors. Because of the reduced radiance absorption in glass at the wavelength of 875 nm, this emitter series is also suitable for systems with panes in the transmission range between emitter and detector.

Absolute Maximum Ratings

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

Parameter	Test Conditions	Symbol	Value	Unit
Reverse Voltage		V_R	5	V
Forward Current		I_F	100	mA
Peak Forward Current	$t_p/T=0.5, t_p=100\ \mu\text{s}$	I_{FM}	200	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	$t \leq 5\text{sec}, 2\text{ mm from case}$	T_{sd}	260	$^\circ\text{C}$
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		1.5	1.8	V
Temp. Coefficient of V _F	I _F = 100mA	TK _{V_F}		-1.6		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		20		pF
Temp. Coefficient of φ _e	I _F = 20 mA	TK _{φ_e}		-0.7		%/K
Angle of Half Intensity		φ		±24		deg
Peak Wavelength	I _F = 100 mA	λ _p		875		nm
Spectral Bandwidth	I _F = 100 mA	Δλ		80		nm
Temp. Coefficient of λ _p	I _F = 100 mA	TK _{λ_p}		0.2		nm/K
Rise Time	I _F = 100 mA	t _r		600		ns
	I _F = 1.5 A	t _r		300		ns
Fall Time	I _F = 100 mA	t _f		600		ns
	I _F = 1.5 A	t _f		300		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	TSHA5500/5501	V _F		3.2	4.9	V
		TSHA5502/5503	V _F		3.2	4.5	V
Radiant Intensity	I _F = 100mA, t _p = 20ms	TSHA5500	I _e	12	20		mW/sr
		TSHA5501	I _e	16	25		mW/sr
		TSHA5502	I _e	20	30		mW/sr
		TSHA5503	I _e	24	35		mW/sr
Radiant Intensity	I _F = 1.5A, t _p = 100μs	TSHA5500	I _e	150	240		mW/sr
		TSHA5501	I _e	200	300		mW/sr
		TSHA5502	I _e	250	360		mW/sr
		TSHA5503	I _e	300	420		mW/sr
Radiant Power	I _F = 100mA, t _p = 20ms	TSHA5500	φ _e		22		mW
		TSHA5501	φ _e		23		mW
		TSHA5502	φ _e		24		mW
		TSHA5503	φ _e		25		mW

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

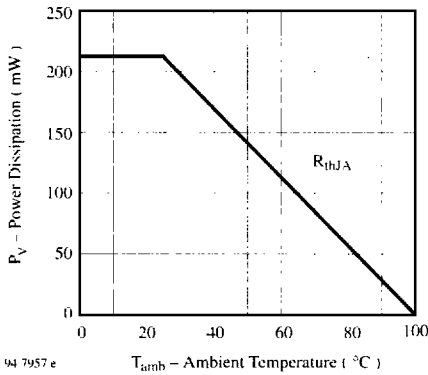


Figure 1. Power Dissipation vs. Ambient Temperature

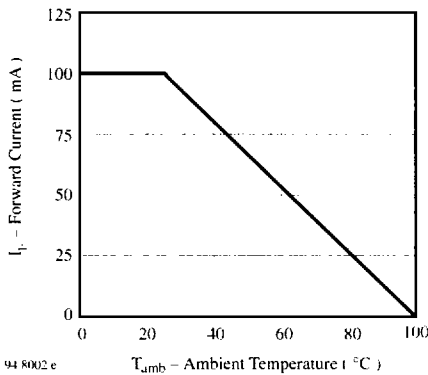


Figure 2. Forward Current vs. Ambient Temperature

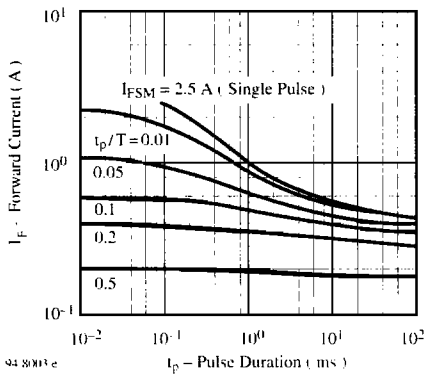


Figure 3. Pulse Forward Current vs. Pulse Duration

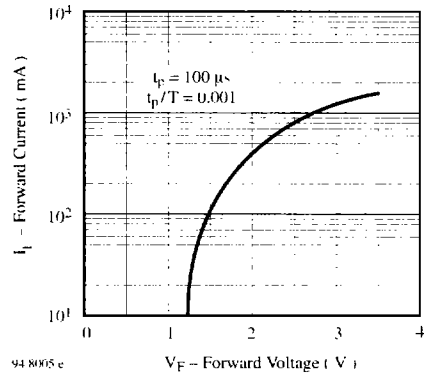


Figure 4. Forward Current vs. Forward Voltage

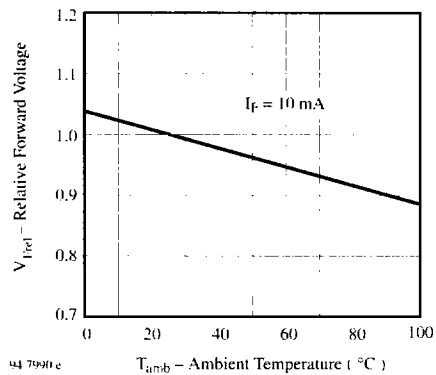


Figure 5. Relative Forward Voltage vs. Ambient Temperature

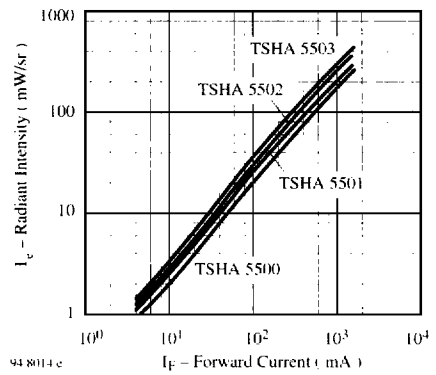


Figure 6. Radiant Intensity vs. Forward Current

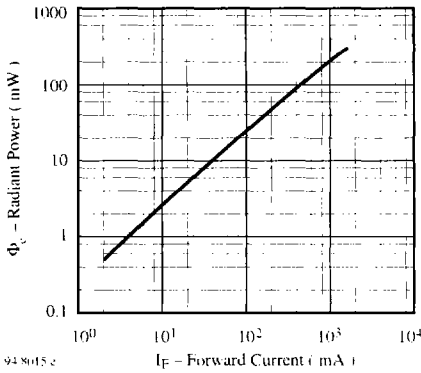


Figure 7. Radiant Power vs. Forward Current

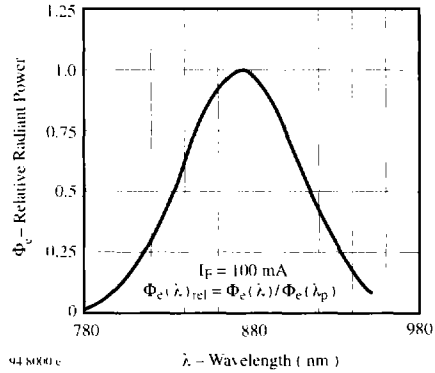


Figure 9. Relative Radiant Power vs. Wavelength

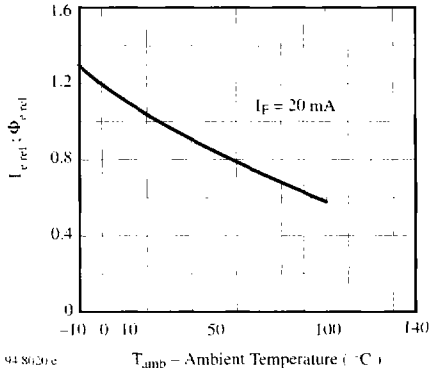


Figure 8. Rel. Radiant Intensity/Power vs. Ambient Temperature

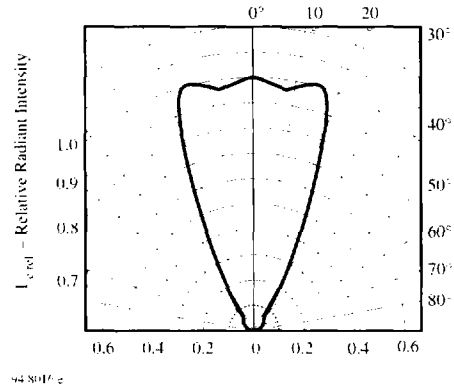


Figure 10. Relative Radiant Intensity vs. Angular Displacement

