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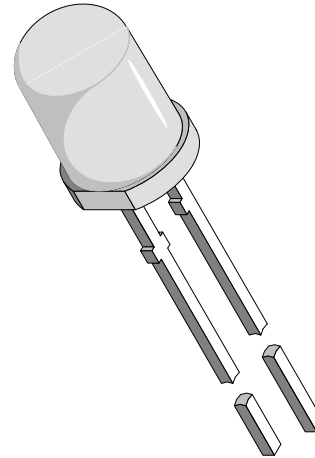
### GaAlAs Infrared Emitting Diode in $\varnothing$ 5 mm (T-1 $\frac{3}{4}$ ) Package

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#### Description

The TSHA 520. 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.



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#### Features

- Extra 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  $\varphi = \pm 12^\circ$
- Peak wavelength  $\lambda_p = 875$  nm
- High reliability
- Good spectral matching to Si photodetectors

#### Applications

Infrared remote control and free air transmission systems with high power and long transmission distance 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

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

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

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

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
Forward Voltage	$I_F = 100\ \text{mA}, t_p = 20\ \text{ms}$	$V_F$		1.5	1.8	V
Temp. Coefficient of $V_F$	$I_F = 100\ \text{mA}$	$TK_{VF}$		-1.6		mV/K
Reverse Current	$V_R = 5\ \text{V}$	$I_R$			100	$\mu\text{A}$
Junction Capacitance	$V_R = 0\ \text{V}, f = 1\ \text{MHz}, E = 0$	$C_j$		20		pF
Temp. Coefficient of $\phi_e$	$I_F = 20\ \text{mA}$	$TK_{\phi_e}$		-0.7		%/K
Angle of Half Intensity		$\phi$		$\pm 12$		deg
Peak Wavelength	$I_F = 100\ \text{mA}$	$\lambda_p$		875		nm
Spectral Bandwidth	$I_F = 100\ \text{mA}$	$\Delta\lambda$		80		nm
Temp. Coefficient of $\lambda_p$	$I_F = 100\ \text{mA}$	$TK_{\lambda_p}$		0.2		nm/K
Rise Time	$I_F = 100\ \text{mA}$	$t_r$		600		ns
Rise Time	$I_F = 1.5\ \text{A}$	$t_r$		300		ns
Fall Time	$I_F = 100\ \text{mA}$	$t_f$		600		ns
Fall Time	$I_F = 1.5\ \text{A}$	$t_f$		300		ns

## Type Dedicated Characteristics

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

Parameter	Type	Test Conditions	Symbol	Min	Typ	Max	Unit
Forward Voltage	TSHA5200/5201	$I_F=1.5\text{A}, t_p=100\mu\text{s}$	$V_F$		3.2	4.9	V
	TSHA5202/5203	$I_F=1.5\text{A}, t_p=100\mu\text{s}$	$V_F$		3.2	4.5	V
Radiant Intensity	TSHA5200	$I_F=100\text{mA}, t_p=20\text{ms}$	$I_e$	25	40		mW/sr
	TSHA5201	$I_F=100\text{mA}, t_p=20\text{ms}$	$I_e$	30	50		mW/sr
	TSHA5202	$I_F=100\text{mA}, t_p=20\text{ms}$	$I_e$	36	60		mW/sr
	TSHA5203	$I_F=100\text{mA}, t_p=20\text{ms}$	$I_e$	50	65		mW/sr
Radiant Intensity	TSHA5200	$I_F=1.5\text{A}, t_p=100\mu\text{s}$	$I_e$	300	500		mW/sr
	TSHA5201	$I_F=1.5\text{A}, t_p=100\mu\text{s}$	$I_e$	400	600		mW/sr
	TSHA5202	$I_F=1.5\text{A}, t_p=100\mu\text{s}$	$I_e$	500	700		mW/sr
	TSHA5203	$I_F=1.5\text{A}, t_p=100\mu\text{s}$	$I_e$	600	800		mW/sr
Radiant Power	TSHA5200	$I_F=100\text{mA}, t_p=20\text{ms}$	$\phi_e$		22		mW
	TSHA5201	$I_F=100\text{mA}, t_p=20\text{ms}$	$\phi_e$		23		mW
	TSHA5202	$I_F=100\text{mA}, t_p=20\text{ms}$	$\phi_e$		24		mW
	TSHA5203	$I_F=100\text{mA}, t_p=20\text{ms}$	$\phi_e$		25		mW

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

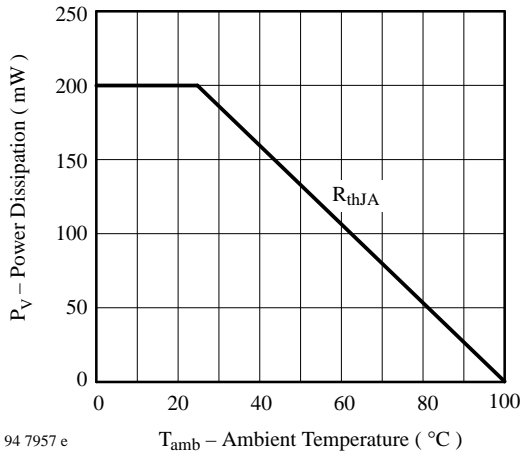


Figure 1 : Power Dissipation vs. Ambient Temperature

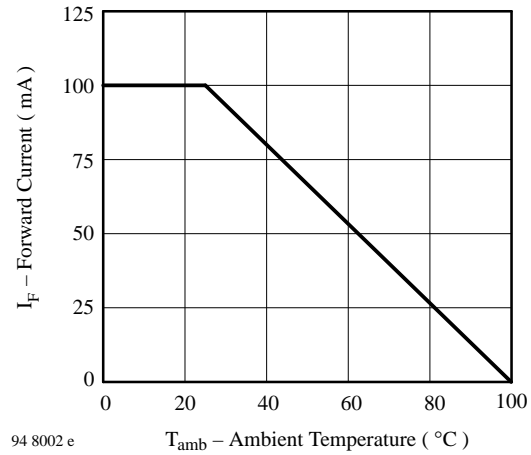


Figure 2 : Forward Current vs. Ambient Temperature

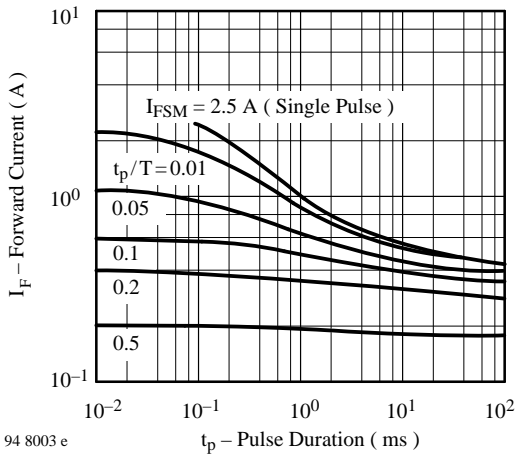


Figure 3 : Pulse Forward Current vs. Pulse Duration

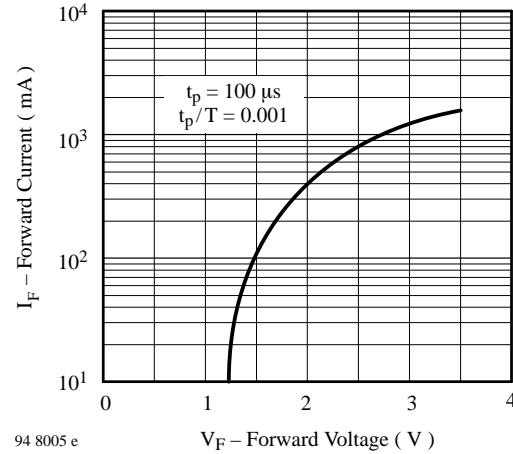


Figure 4 : Forward Current vs. Forward Voltage

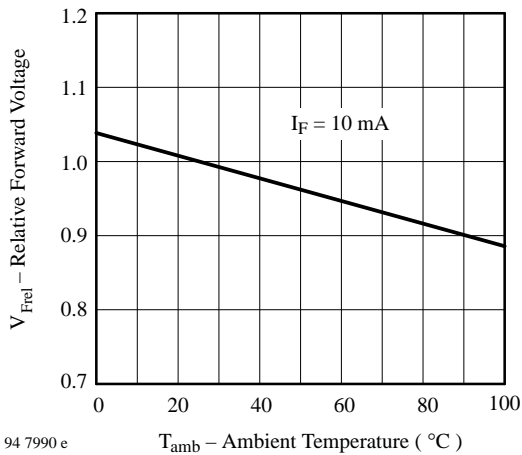


Figure 5 : Relative Forward Voltage vs. Ambient Temperature

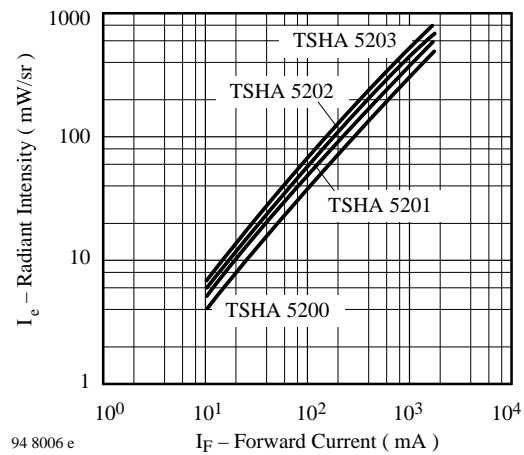


Figure 6 : Radiant Intensity vs. Forward Current

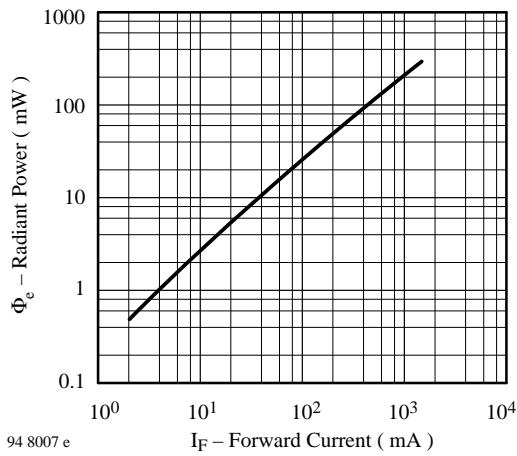


Figure 7 : Radiant Power vs. Forward Current

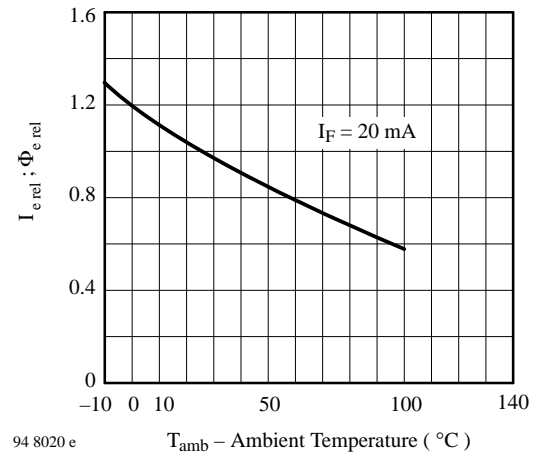


Figure 8 : Rel. Radiant Intensity/Power vs. Ambient Temperature

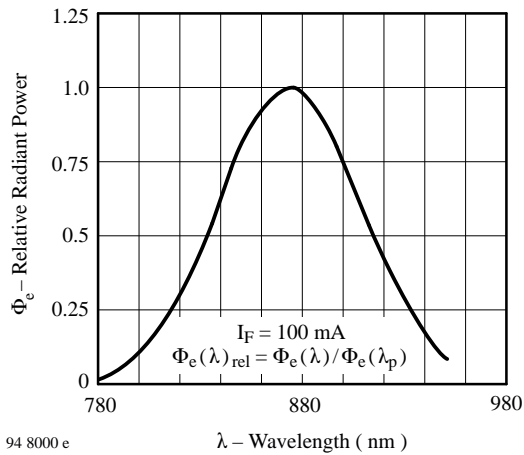


Figure 9 : Relative Radiant Power vs. Wavelength

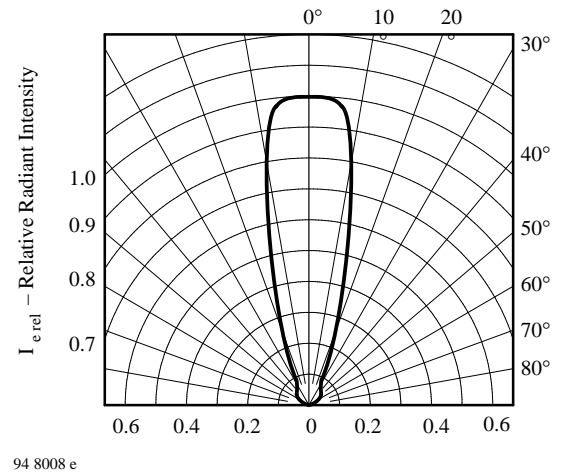
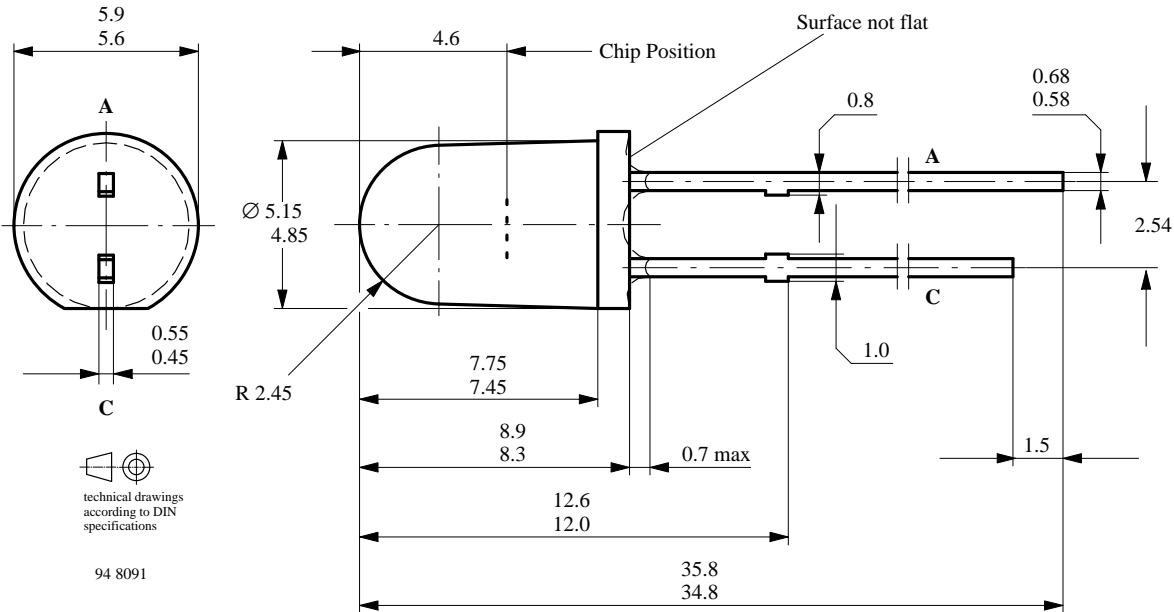


Figure 10 : Relative Radiant Intensity vs. Angular Displacement

## Dimensions in mm



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

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