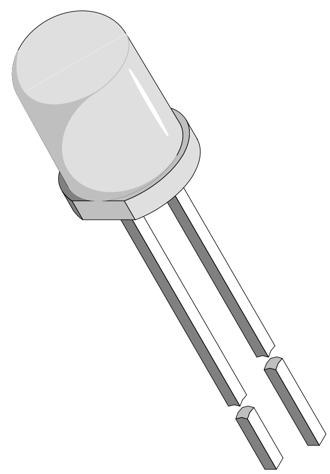
TSHA 650.

GaAlAs Infrared Emitting Diode in ø 5 mm (T–1¾) Package

Description

The TSHA 650. 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.
In contrast to the TSHA550. series lead stand–offs are omitted.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Features

- Extra high radiant power
- Suitable for DC and high pulse current operation
- Standard T–1¾ (ø 5 mm) package
- Leads formed without stand–off
- Angle of half intensity $\varphi = \pm 24^\circ$
- Peak wavelength λ_p = 875 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_{amb} = 25°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 μs	I_{FM}	200	mA
Surge Forward Current	t_p=100 μs	I_{FSM}	2.5	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		1.5	1.8	V
Temp. Coefficient of V_F	I_F = 100mA	TK_{VF}		–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	$TK_{\phi e}$		–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	$TK_{\lambda p}$		0.2		nm/K
Rise Time	I_F = 100 mA	t_r		600		ns
Rise Time	I_F = 1.5 A	t_r		300		ns
Fall Time	I_F = 100 mA	t_f		600		ns
Fall Time	I_F = 1.5 A	t_f		300		ns

Type Dedicated Characteristics

T_{amb} = 25°C

Parameter	Type	Test Conditions	Symbol	Min	Typ	Max	Unit
Forward Voltage	TSHA6500/6501	I_F=1.5A, t_p=100µs	V_F		3.2	4.9	V
	TSHA6502/6503	I_F=1.5A, t_p=100µs	V_F		3.2	4.5	V
Radiant Intensity	TSHA6500	I_F=100mA, t_p=20ms	I_e	12	20		mW/sr
	TSHA6501	I_F=100mA, t_p=20ms	I_e	16	25		mW/sr
	TSHA6502	I_F=100mA, t_p=20ms	I_e	20	30		mW/sr
	TSHA6503	I_F=100mA, t_p=20ms	I_e	24	35		mW/sr
Radiant Intensity	TSHA6500	I_F=1.5A, t_p=100µs	I_e	150	240		mW/sr
	TSHA6501	I_F=1.5A, t_p=100µs	I_e	200	300		mW/sr
	TSHA6502	I_F=1.5A, t_p=100µs	I_e	250	360		mW/sr
	TSHA6503	I_F=1.5A, t_p=100µs	I_e	300	420		mW/sr
Radiant Power	TSHA6500	I_F=100mA, t_p=20ms	ϕ_e		22		mW
	TSHA6501	I_F=100mA, t_p=20ms	ϕ_e		23		mW
	TSHA6502	I_F=100mA, t_p=20ms	ϕ_e		24		mW
	TSHA6503	I_F=100mA, t_p=20ms	ϕ_e		25		mW

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

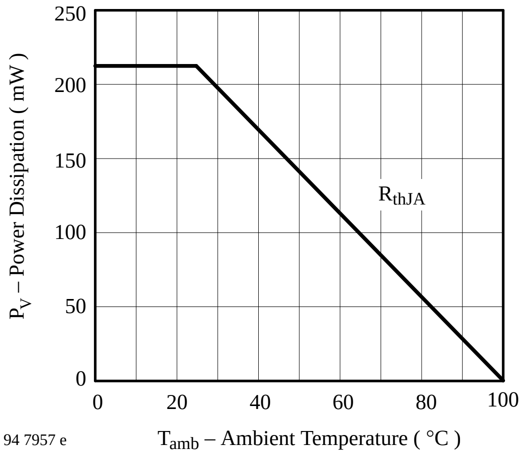


Figure 1 : Power Dissipation vs. Ambient Temperature

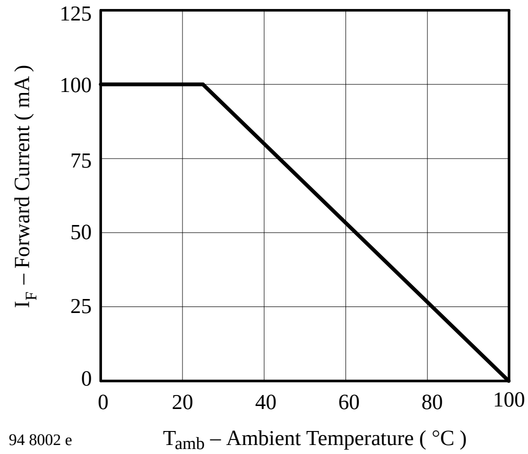


Figure 2 : Forward Current vs. Ambient Temperature

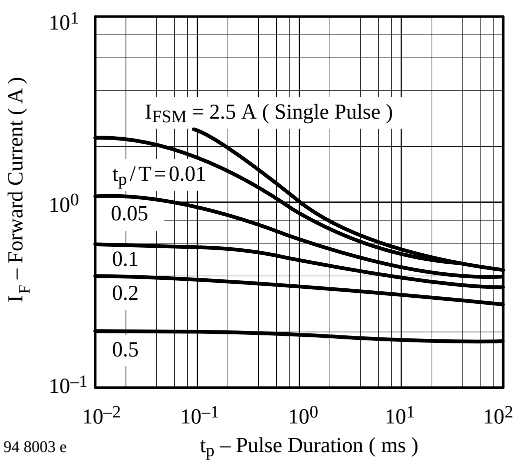


Figure 3 : Pulse Forward Current vs. Pulse Duration

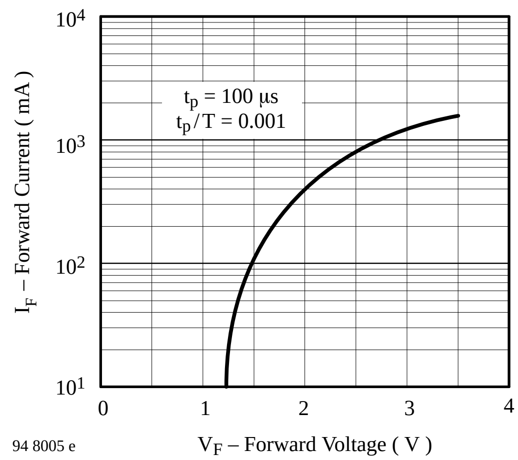


Figure 4 : Forward Current vs. Forward Voltage

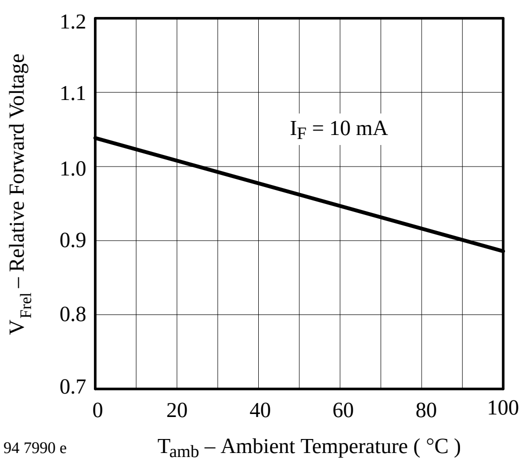


Figure 5 : Relative Forward Voltage vs. Ambient Temperature

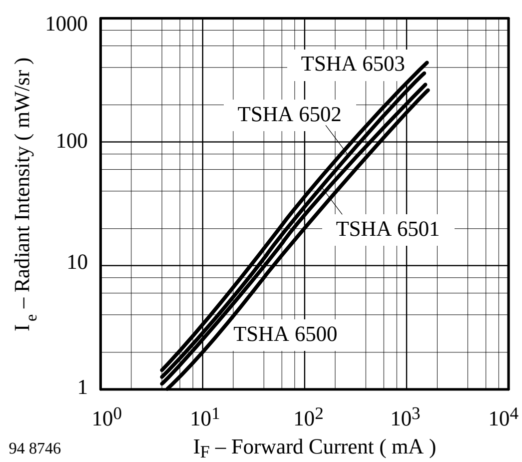


Figure 6 : Radiant Intensity vs. Forward Current

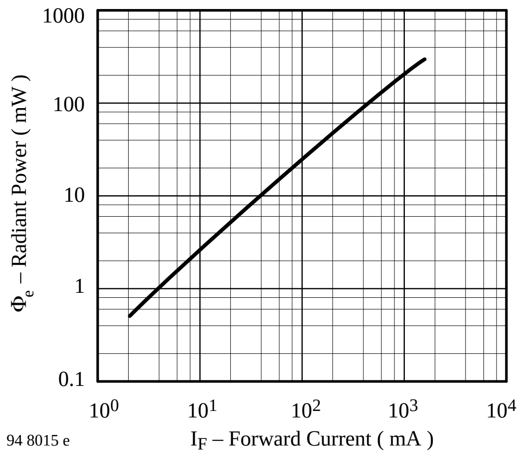


Figure 7 : Radiant Power vs. Forward Current

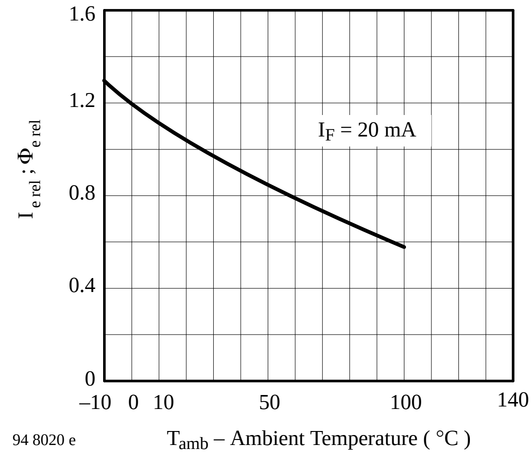


Figure 8 : Rel. Radiant Intensity\Power vs. Ambient Temperature

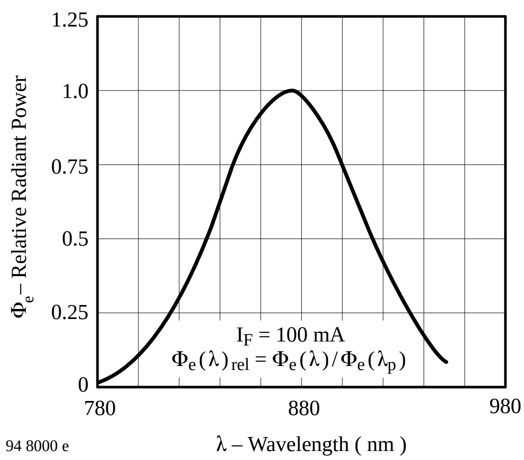


Figure 9 : Relative Radiant Power vs. Wavelength

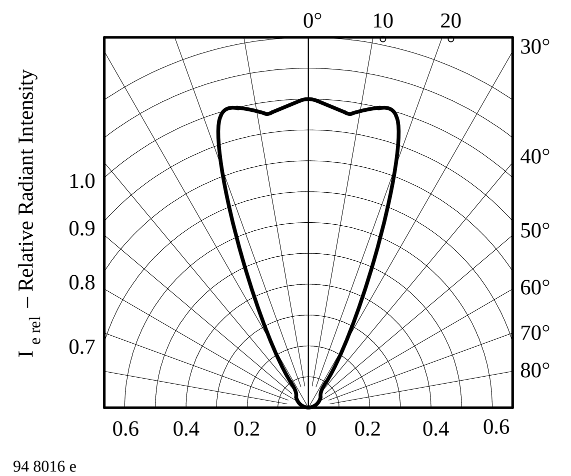
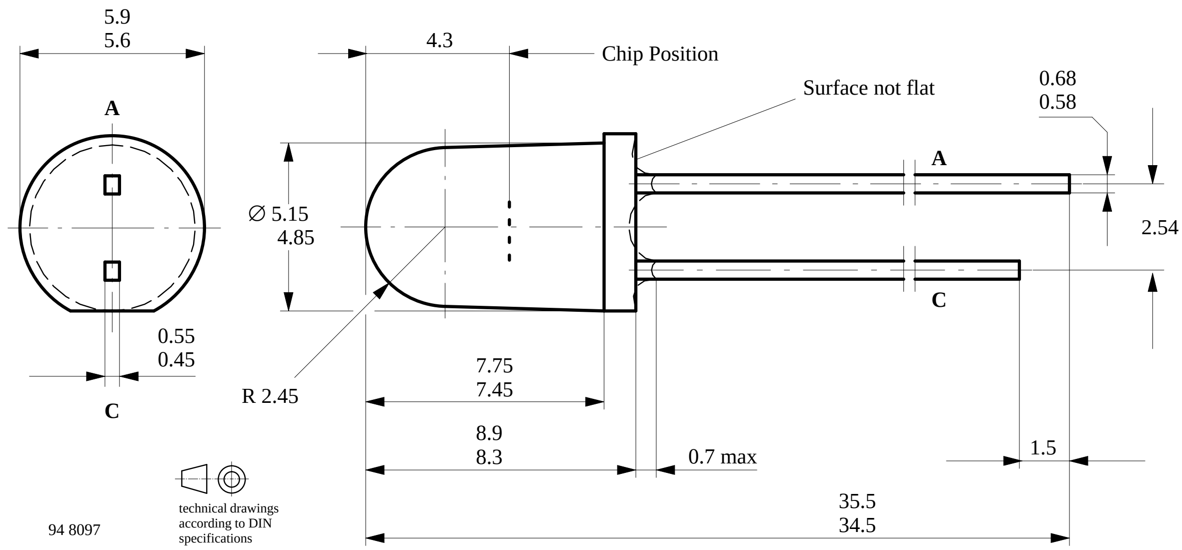


Figure 10 : Relative Radiant Intensity vs. Angular Displacement

Dimensions in mm



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