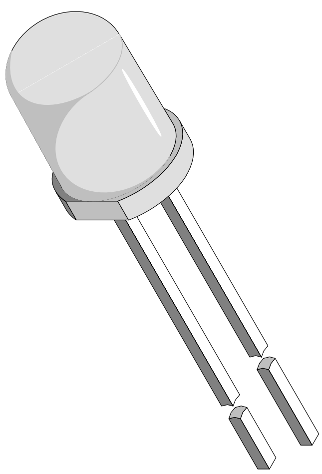
GaAs/GaAlAs IR Emitting Diode in ø 5 mm (T–1¾) Package

Description



TSAL6400 is a high efficiency infrared emitting diode in GaAlAs on GaAs technology, molded in clear, blue-grey tinted plastic packages.
In comparison with the standard GaAs on GaAs technology these emitters achieve more than 100 % radiant power improvement at a similar 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.

Features

- Extra high radiant power and radiant intensity
- High reliability
- Low forward voltage
- Suitable for high pulse current operation
- Standard T–1¾ (ø 5 mm) package
- Angle of half intensity $\varphi = \pm 25°$
- Peak wavelength λ_p = 940 nm
- 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	5	V
Forward Current		I_F	100	mA
Peak Forward Current	$t_p/T = 0.5$, $t_p = 100\ \mu s$	I_{FM}	200	mA
Surge Forward Current	$t_p = 100\ \mu s$	I_{FSM}	1.5	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	$t \leqq 5$sec, 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		1.35	1.6	V
	I_F = 1 A, t_p = 100 μs	V_F		2.6	3	V
Temp. Coefficient of V_F	I_F = 100 mA	TK_{VF}		–1.3		mV/K
Reverse Current	V_R = 5 V	I_R			10	μA
Junction Capacitance	V_R = 0 V, f = 1 MHz, E = 0	C_j		25		pF
Radiant Intensity	I_F = 100 mA, t_p = 20 ms	I_e	25	40		mW/sr
	I_F = 1.0 A, t_p = 100 μs	I_e	220	310		mW/sr
Radiant Power	I_F = 100 mA, t_p = 20 ms	ϕ_e		35		mW
Temp. Coefficient of ϕ_e	I_F = 20 mA	$TK_{\phi e}$		–0.6		%/K
Angle of Half Intensity		φ		±25		deg
Peak Wavelength	I_F = 100 mA	λ_p		940		nm
Spectral Bandwidth	I_F = 100 mA	Δλ		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
Fall Time	I_F = 100 mA	t_f		800		ns
Virtual Source Diameter	method: 63% encircled energy	ø		2.8		mm

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

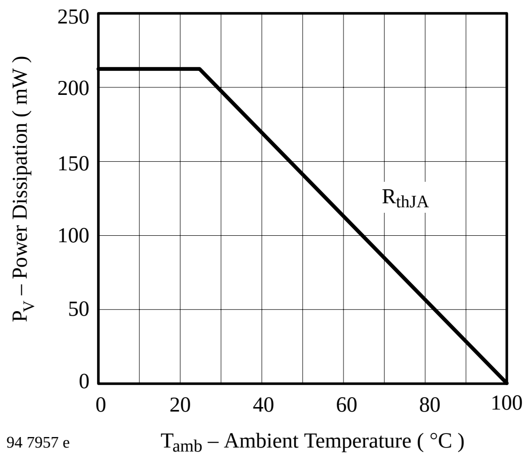


Figure 1. Power Dissipation vs. Ambient Temperature

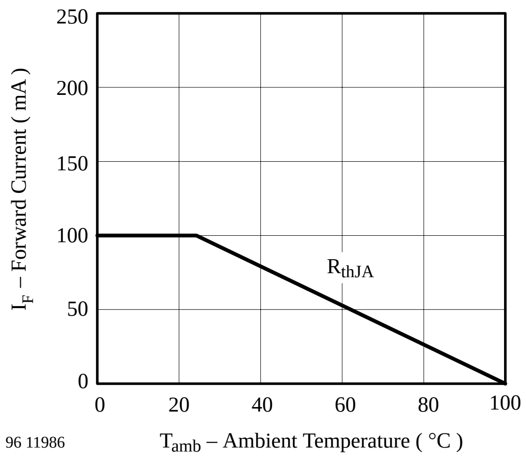


Figure 2. Forward Current vs. Ambient Temperature

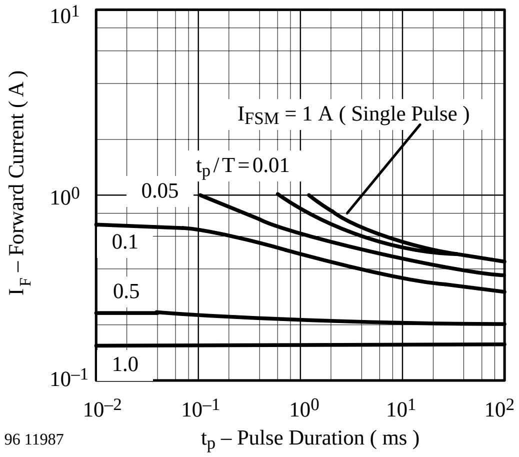


Figure 3. Pulse Forward Current vs. Pulse Duration

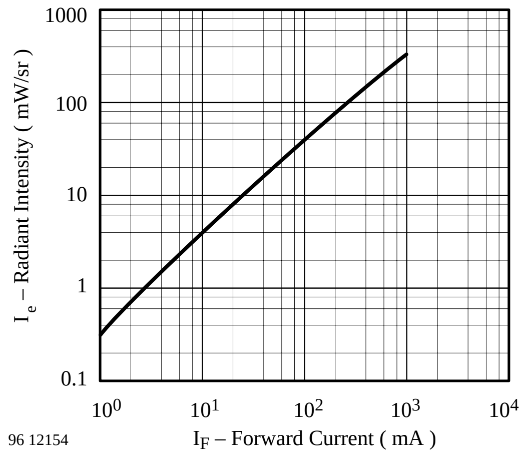


Figure 6. Radiant Intensity vs. Forward Current

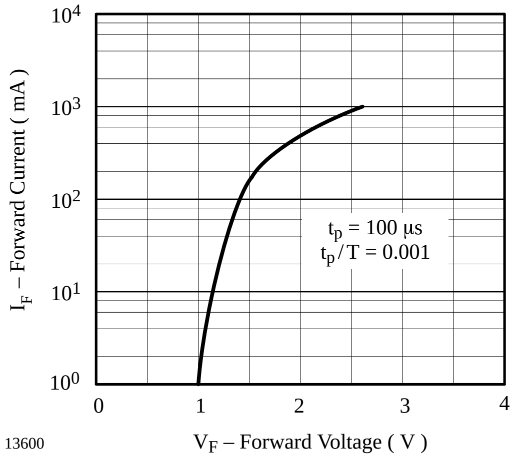


Figure 4. Forward Current vs. Forward Voltage

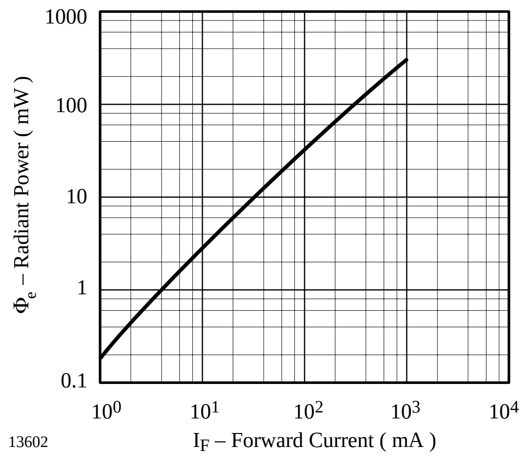


Figure 7. Radiant Power vs. Forward Current

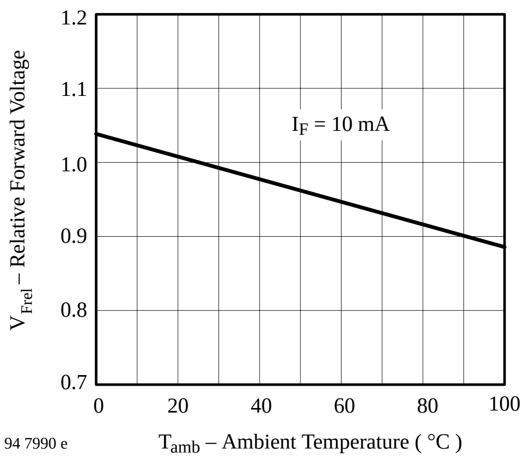


Figure 5. Relative Forward Voltage vs. Ambient Temperature

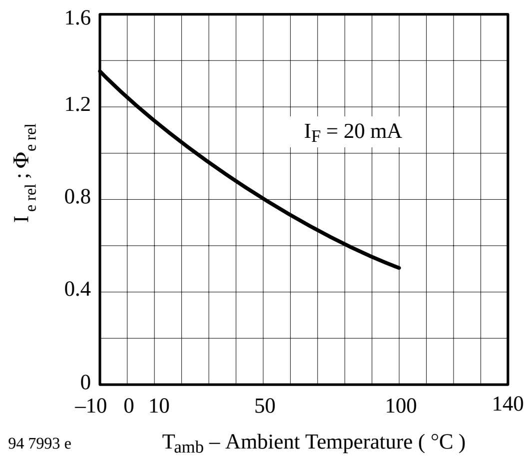


Figure 8. Rel. Radiant Intensity\Power vs. Ambient Temperature

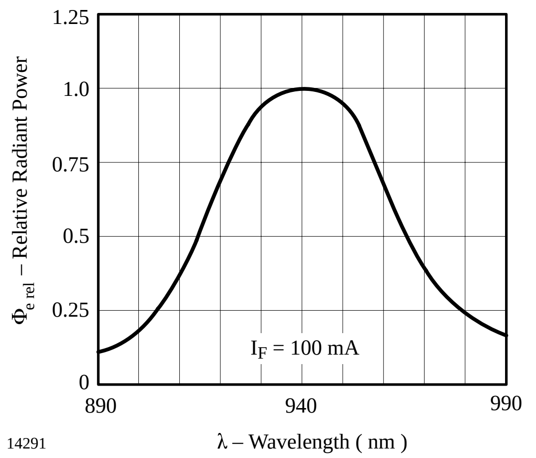


Figure 9. Relative Radiant Power vs. Wavelength

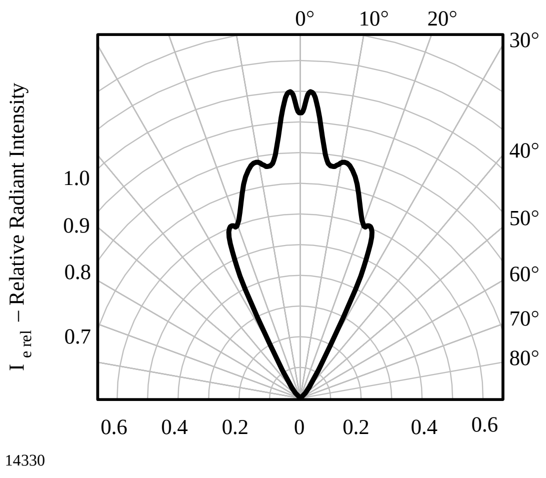


Figure 10. Relative Radiant Intensity vs. Angular Displacement

Dimensions in mm