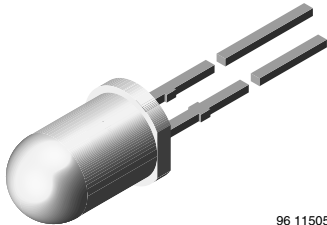


## High Power Infrared Emitting Diode, RoHS Compliant, 940 nm, GaAlAs/GaAs



96 11505

### DESCRIPTION

TSAL5100 is an infrared, 940 nm emitting diode in GaAlAs/GaAs technology with high radiant power, molded in a blue-gray plastic package.

### FEATURES

- Package type: leaded
- Package form: T-1 $\frac{3}{4}$
- Dimensions (in mm):  $\varnothing$  5
- Leads with stand-off
- Peak wavelength:  $\lambda_p = 940$  nm
- High reliability
- High radiant power
- High radiant intensity
- Angle of half intensity:  $\varphi = \pm 10^\circ$
- Low forward voltage
- Suitable for high pulse current operation
- Good spectral matching with Si photodetectors
- Lead (Pb)-free component in accordance with RoHS 2002/95/EC and WEEE 2002/96/EC



RoHS  
COMPLIANT

### 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
- Smoke-automatic fire detectors

### PRODUCT SUMMARY

COMPONENT	$I_e$ (mW/sr)	$\varphi$ (deg)	$\lambda_p$ (nm)	$t_r$ (ns)
TSAL5100	130	$\pm 10$	940	800

#### Note

Test conditions see table "Basic Characteristics"

### ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
TSAL5100	Bulk	MOQ: 4000 pcs, 4000 pcs/bulk	T-1 $\frac{3}{4}$

#### Note

MOQ: minimum order quantity

### ABSOLUTE MAXIMUM RATINGS

PARAMETER	TEST CONDITION	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		$P_V$	160	mW
Junction temperature		$T_j$	100	$^\circ C$
Operating temperature range		$T_{amb}$	- 40 to + 85	$^\circ C$
Storage temperature range		$T_{stg}$	- 40 to + 100	$^\circ C$
Soldering temperature	$t \leq 5$ s, 2 mm from case	$T_{sd}$	260	$^\circ C$
Thermal resistance junction/ambient	J-STD-051, leads 7 mm soldered on PCB	$R_{thJA}$	230	K/W

#### Note

$T_{amb} = 25 \text{ }^\circ C$ , unless otherwise specified

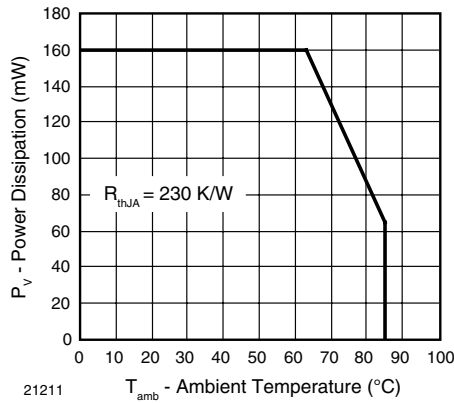


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

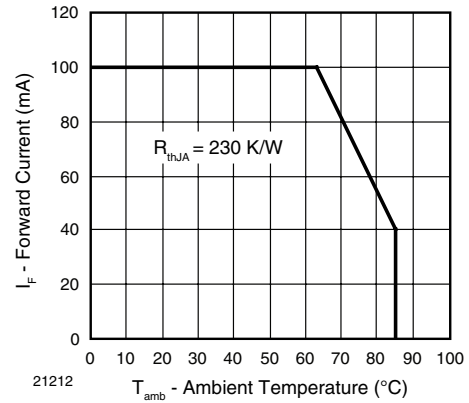


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	I <sub>F</sub> = 100 mA, t <sub>p</sub> = 20 ms	V <sub>F</sub>		1.35	1.6	V
	I <sub>F</sub> = 1 A, t <sub>p</sub> = 100 μs	V <sub>F</sub>		2.6	3	V
Temperature coefficient of V <sub>F</sub>	I <sub>F</sub> = 1 mA	TKV <sub>F</sub>		- 1.8		mV/K
Reverse current	V <sub>R</sub> = 5 V	I <sub>R</sub>			10	μA
Junction capacitance	V <sub>R</sub> = 0 V, f = 1 MHz, E = 0	C <sub>j</sub>		25		pF
Radiant intensity	I <sub>F</sub> = 100 mA, t <sub>p</sub> = 20 ms	I <sub>e</sub>	80	130	400	mW/sr
	I <sub>F</sub> = 1 A, t <sub>p</sub> = 100 μs	I <sub>e</sub>	650	1000		mW/sr
Radiant power	I <sub>F</sub> = 100 mA, t <sub>p</sub> = 20 ms	φ <sub>e</sub>		35		mW
Temperature coefficient of φ <sub>e</sub>	I <sub>F</sub> = 20 mA	TKφ <sub>e</sub>		- 0.6		%/K
Angle of half intensity		φ		± 10		deg
Peak wavelength	I <sub>F</sub> = 100 mA	λ <sub>p</sub>		940		nm
Spectral bandwidth	I <sub>F</sub> = 100 mA	Δλ		50		nm
Temperature coefficient of λ <sub>p</sub>	I <sub>F</sub> = 100 mA	TKλ <sub>p</sub>		0.2		nm/K
Rise time	I <sub>F</sub> = 100 mA	t <sub>r</sub>		800		ns
Fall time	I <sub>F</sub> = 100 mA	t <sub>f</sub>		800		ns
Virtual source diameter	method: 63 % encircled energy	d		3.7		mm

**Note**

T<sub>amb</sub> = 25 °C, unless otherwise specified

**BASIC CHARACTERISTICS**

$T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified

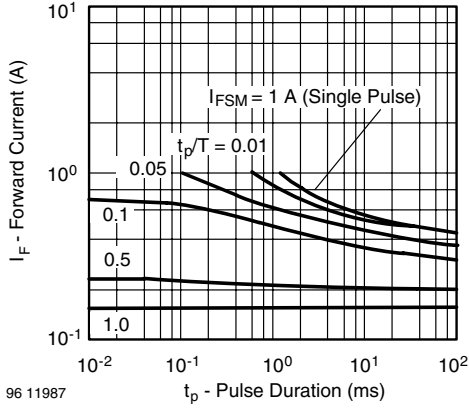


Fig. 3 - Pulse Forward Current vs. Pulse Duration

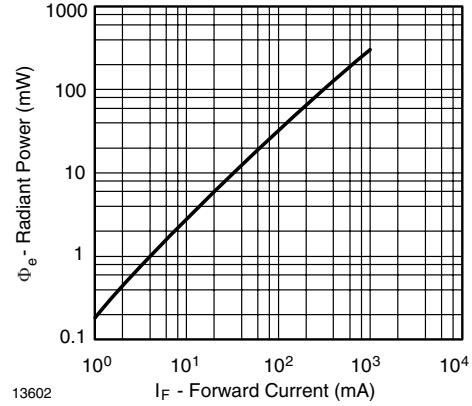


Fig. 6 - Radiant Power vs. Forward Current

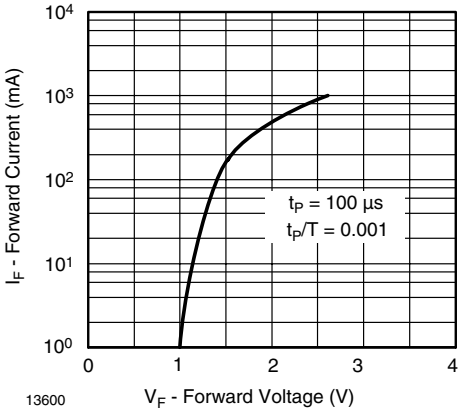


Fig. 4 - Forward Current vs. Forward Voltage

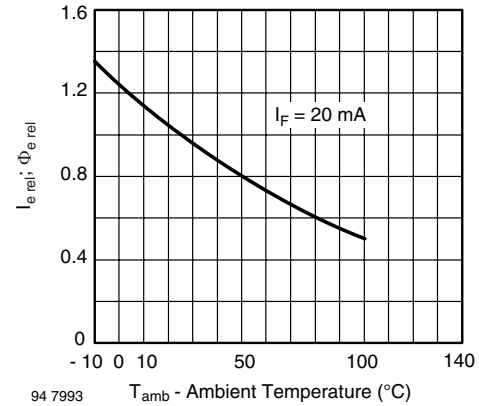


Fig. 7 - Rel. Radiant Intensity/Power vs. Ambient Temperature

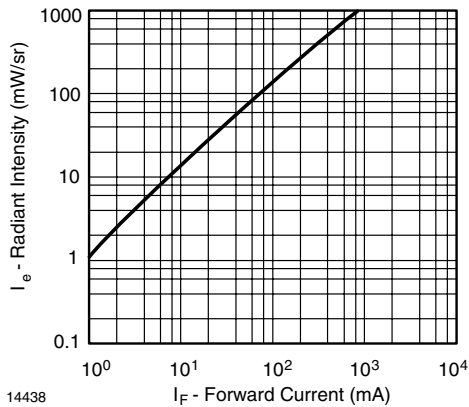


Fig. 5 - Radiant Intensity vs. Forward Current

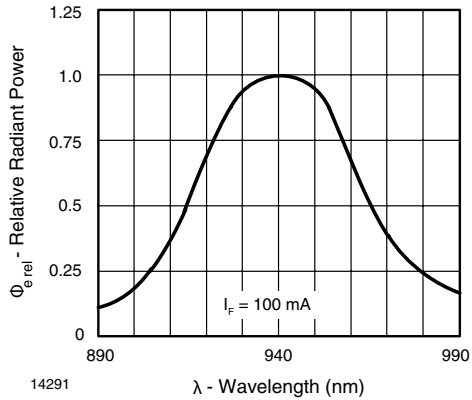


Fig. 8 - Relative Radiant Power vs. Wavelength





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