RoHS

**HALOGEN** 

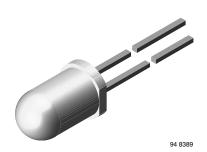
**FREE** 

GREEN (5-2008)



## Vishay Semiconductors

# High Power Infrared Emitting Diode, 940 nm, GaAlAs, MQW



#### **DESCRIPTION**

TSAL6100 is an infrared, 940 nm emitting diode in GaAlAs multi quantum well (MQW) technology with high radiant power and high speed molded in a blue-gray plastic package.

#### **FEATURES**

Package type: leaded
Package form: T-1¾
Dimensions (in mm): Ø 5

• Dimensions (in mim): Ø 5

• Peak wavelength:  $\lambda_p = 940 \text{ nm}$ 

· High reliability

• High radiant power

· High radiant intensity

• Angle of half intensity:  $\phi = \pm 10^{\circ}$ 

Low forward voltage

· Suitable for high pulse current operation

Good spectral matching with Si photodetectors

 Material categorization: For definitions of compliance please see <a href="https://www.vishay.com/doc?99912"><u>www.vishay.com/doc?99912</u></a>

#### **APPLICATIONS**

- Infrared remote control units with high power regirements
- Free air transmission systems
- · Infrared source for optical counters and card readers
- IR source for smoke detectors

PRODUCT SUMMARY					
COMPONENT	I <sub>e</sub> (mW/sr)	φ (deg)	λ <sub>p</sub> (nm)	t <sub>r</sub> (ns)	
TSAL6100	170	± 10	940	15	

#### Note

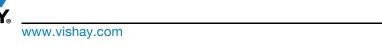
· Test conditions see table "Basic Characteristics"

ORDERING INFORMATION				
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM	
TSAL6100	Bulk	MOQ: 4000 pcs, 4000 pcs/bulk	T-1¾	

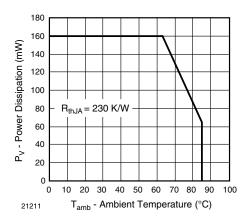
#### Note

• MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS (T <sub>amb</sub> = 25 °C, unless otherwise specified)					
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT	
Reverse voltage		V <sub>R</sub>	5	V	
Forward current		l <sub>F</sub>	100	mA	
Peak forward current	$t_p/T = 0.5$ , $t_p = 100 \mu s$	I <sub>FM</sub>	200	mA	
Surge forward current	t <sub>p</sub> = 100 μs	I <sub>FSM</sub>	1.5	Α	
Power dissipation		P <sub>V</sub>	160	mW	
Junction temperature		Tj	100	°C	
Operating temperature range		T <sub>amb</sub>	-40 to +85	°C	
Storage temperature range		T <sub>stg</sub>	-40 to +100	°C	
Soldering temperature	t ≤ 5 s, 2 mm from case	T <sub>sd</sub>	260	°C	
Thermal resistance junction/ambient	J-STD-051, leads 7 mm soldered on PCB	R <sub>thJA</sub>	230	K/W	



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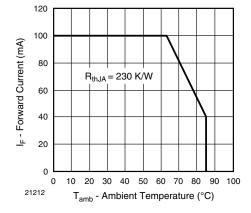


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

Fig. 2 - Forward Current Limit vs. Ambient Temperature

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	V <sub>F</sub>		1.35	1.6	V
	$I_F = 1 \text{ A}, t_p = 100 \mu \text{s}$	V <sub>F</sub>		2.2	3	V
Temperature coefficient of V <sub>F</sub>	I <sub>F</sub> = 1 mA	TK <sub>VF</sub>		-1.8		mV/K
Reverse current	V <sub>R</sub> = 5 V	I <sub>R</sub>			10	μΑ
Junction capacitance	$V_R = 0 \text{ V, f} = 1 \text{ MHz, E} = 0$	Cj		40		pF
Radiant intensity	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	l <sub>e</sub>	80	170	400	mW/sr
	$I_F = 1 \text{ A}, t_p = 100 \mu \text{s}$	l <sub>e</sub>	650	1450		mW/sr
Radiant power	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	фe		40		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	λρ		940		nm
Spectral bandwidth	I <sub>F</sub> = 100 mA	Δλ		30		nm
Temperature coefficient of $\lambda_p$	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>		15		ns
Fall time	I <sub>F</sub> = 100 mA	t <sub>f</sub>		15		ns



### **BASIC CHARACTERISTICS** (T<sub>amb</sub> = 25 °C, unless otherwise specified)

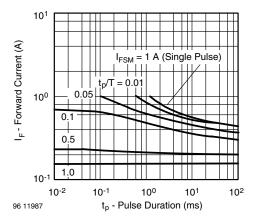


Fig. 3 - Pulse Forward Current vs. Pulse Duration

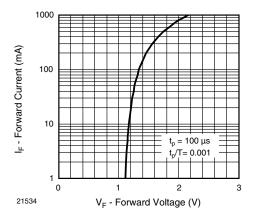


Fig. 4 - Forward Current vs. Forward Voltage

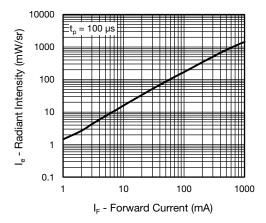


Fig. 5 - Radiant Intensity vs. Forward Current

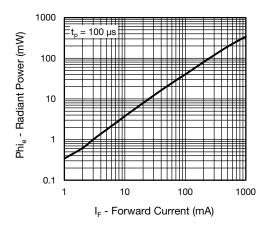


Fig. 6 - Radiant Power vs. Forward Current

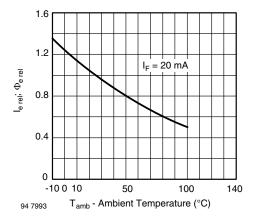


Fig. 7 - Rel. Radiant Intensity/Power vs. Ambient Temperature

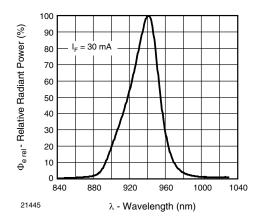


Fig. 8 - Relative Radiant Power vs. Wavelength



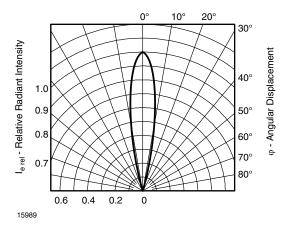
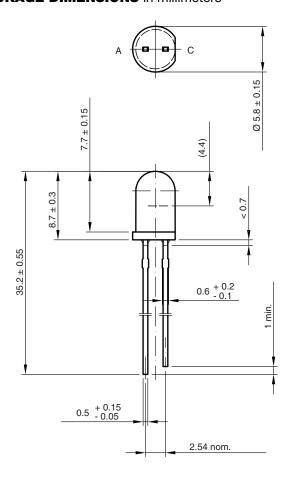
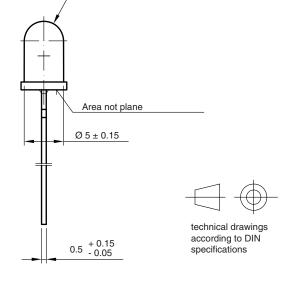


Fig. 9 - Relative Radiant Intensity vs. Angular Displacement

### **PACKAGE DIMENSIONS** in millimeters





R2.49 (sphere)

6.544-5259.08-4 Issue: 3; 19.05.09 14436



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