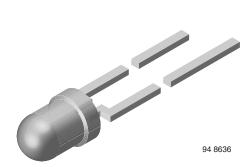
HALOGEN FREE

GREEN



## Vishay Semiconductors

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



### **DESCRIPTION**

TSAL4400 is an infrared, 940 nm emitting diode in GaAlAs, MQW technology with high radiant power molded in a blue-gray plastic package.

#### **FEATURES**

Package type: leadedPackage form: T-1

• Dimensions (in mm): Ø 3

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

· High reliability

• High radiant power

· High radiant intensity

• Angle of half intensity:  $\varphi = \pm 25^{\circ}$ 

· Low forward voltage

· Suitable for high pulse current operation

· Good spectral matching with Si photodetectors

• Package matches with detector TEFT4300

 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
- Free air transmission systems
- Infrared source for optical counters and card readers

PRODUCT SUMMARY				
COMPONENT	I <sub>e</sub> (mW/sr)	φ (deg)	λ <sub>p</sub> (nm)	t <sub>r</sub> (ns)
TSAL4400	36	± 25	940	15

#### Note

• Test conditions see table "Basic Characteristics"

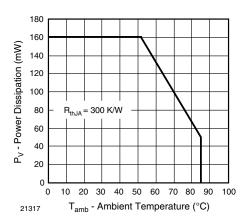
ORDERING INFORMATION				
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM	
TSAL4400	Bulk	MOQ: 5000 pcs, 5000 pcs/bulk	T-1	
TSAL4400-RSZ	Ammopack	MOQ: 8000 pcs, 2000 pcs/box	T-1	

#### Note

MOQ: minimum order quantity

<b>ABSOLUTE MAXIMUM RATINGS</b> (T <sub>amb</sub> = 25 °C, unless otherwise specified)					
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT	
Reverse voltage		$V_R$	5	V	
Forward current		I <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>	300	K/W	

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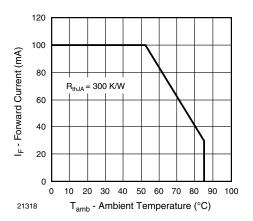


Fig. 2 - Forward Current Limit vs. Ambient Temperature

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
	$I_F = 1 \text{ A}, t_D = 100 \mu\text{s}$	V <sub>F</sub>	-	2.6	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	μA
Junction capacitance	$V_R = 0 \text{ V, } f = 1 \text{ MHz, } E = 0$	C <sub>i</sub>	-	60	-	pF
Radiant intensity	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	I <sub>e</sub>	16	36	80	mW/sr
	$I_F = 1 \text{ A}, t_p = 100 \mu\text{s}$	I <sub>e</sub>	135	290	-	mW/sr
Radiant power	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	φ <sub>e</sub>	-	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	-	± 25	-	deg
Peak wavelength	I <sub>F</sub> = 100 mA	λρ	-	940	-	nm
Spectral bandwidth	I <sub>F</sub> = 100 mA	Δλ	-	25	-	nm
Temperature coefficient of $\lambda_p$	I <sub>F</sub> = 100 mA	TKλ <sub>p</sub>	-	0.25	-	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)

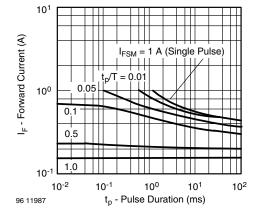


Fig. 3 - Pulse Forward Current vs. Pulse Duration

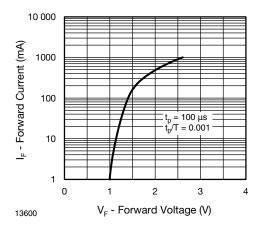


Fig. 4 - Forward Current vs. Forward Voltage

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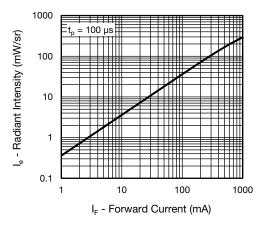


Fig. 5 - Radiant Intensity vs. Forward Current

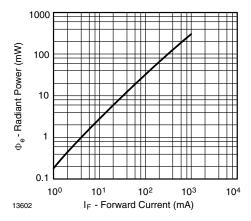


Fig. 6 - Radiant Power vs. Forward Current

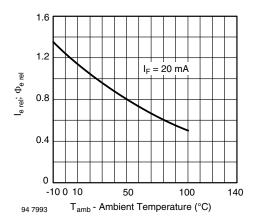


Fig. 7 - Rel. Radiant Intensity/Power vs. Ambient Temperature

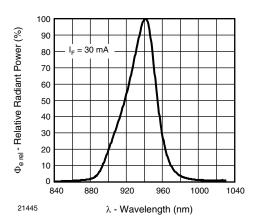


Fig. 8 - Relative Radiant Power vs. Wavelength

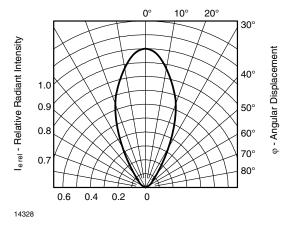
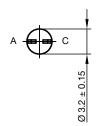
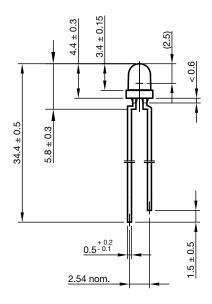


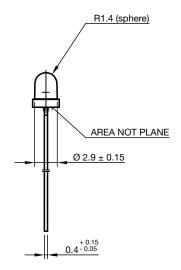
Fig. 9 - Relative Radiant Intensity vs. Angular Displacement

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### **PACKAGE DIMENSIONS** in millimeters









Drawing-No.: 6.544-5255.01-4

Issue: 9; 28.07.14



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