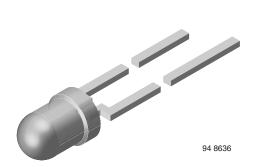
HALOGEN FREE

<u>GREEN</u>



## Vishay Semiconductors

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



### **DESCRIPTION**

VSLB3940 is a high speed infrared emitting diode in GaAlAs, MQW technology, molded in a clear plastic package.

#### **FEATURES**

Package type: leaded

• Package form: T-1, clear epoxy

• Dimensions: Ø 3 mm

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

· High speed

· High radiant power

· High radiant intensity

• Angle of half intensity:  $\varphi = \pm 22^{\circ}$ 

· Low forward voltage

· Suitable for high pulse current operation

· Good spectral matching to 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>



- · 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)	
VSLB3940	65	± 22	940	15	

#### Note

• Test conditions see table "Basic Characteristics"

ORDERING INFORMATION					
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM		
VSLB3940	Bulk	MOQ: 5000 pcs, 5000 pcs/bulk	T-1		
VSLB3940-MSZ	Ammopack	MOQ: 10 000 pcs, 2000 pcs/box	T-1		
VSLB3940-QS21	Tape and reel	MOQ: 10 000 pcs, 2000 pcs/reel	T-1		

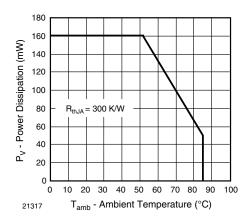
#### Note

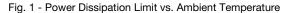
· MOQ: minimum order quantity

<b>ABSOLUTE MAXIMUM RATINGS</b> (T <sub>amb</sub> = 25 °C, unless otherwise specified)					
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT	
Reverse voltage		V <sub>R</sub>	5	V	
Forward current		I <sub>F</sub>	100	mA	
Peak forward current	$t_p/T = 0.1, t_p = 100 \mu s$	I <sub>FM</sub>	1	А	
Surge forward current	t <sub>p</sub> = 100 μs	I <sub>FSM</sub>	1.5	А	
Power dissipation		$P_V$	160	mW	
Junction temperature		T <sub>j</sub>	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	$t \le 5$ 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	



# Vishay Semiconductors





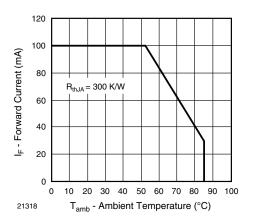


Fig. 2 - Forward Current Limit vs. Ambient Temperature

PARAMETER PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	V <sub>F</sub>	1.15	1.35	1.6	V
	$I_F = 1 \text{ A, } t_D = 100  \mu\text{s}$	V <sub>F</sub>	-	2.2	-	V
Temperature coefficient of V <sub>F</sub>	I <sub>F</sub> = 1 mA	TK <sub>VF</sub>	-	-1.5	-	mV/K
	I <sub>F</sub> = 100 mA	TK <sub>VF</sub>	-	-1.1	-	mV/K
Reverse current	V <sub>R</sub> = 5 V	I <sub>R</sub>	-	-	10	μA
Junction capacitance	$V_R = 0 \text{ V, f} = 1 \text{ MHz,}$ $E = 0 \text{ mW/cm}^2$	CJ	-	70	-	pF
Radiant intensity	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	I <sub>e</sub>	32	65	110	mW/sr
	I <sub>F</sub> = 1 A, t <sub>p</sub> = 100 μs	I <sub>e</sub>	-	650	-	mW/sr
Radiant power	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	фе	-	40	-	mW
Temperature coefficient of radiant power	I <sub>F</sub> = 1 mA	TK <sub>φe</sub>	-	-1.1	-	%/K
	I <sub>F</sub> = 100 mA	TK <sub>φe</sub>	-	-0.51	-	%/K
Angle of half intensity		φ	-	± 22	-	deg
Peak wavelength	I <sub>F</sub> = 30 mA	$\lambda_{p}$	-	940	-	nm
Spectral bandwidth	I <sub>F</sub> = 30 mA	Δλ	-	25	-	nm
Temperature coefficient of Ip	I <sub>F</sub> = 30 mA	$TK_{\lambdap}$	-	0.25	-	nm
Rise time	I <sub>F</sub> = 100 mA, 20 % to 80 %	t <sub>r</sub>	-	15	-	ns
Fall time	I <sub>F</sub> = 100 mA, 20 % to 80 %	t <sub>f</sub>	-	15	-	ns
Virtual source diameter		d	-	2	-	mm

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

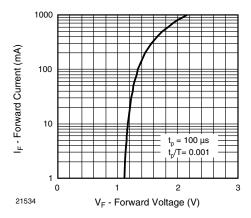


Fig. 3 - Forward Current vs. Forward Voltage

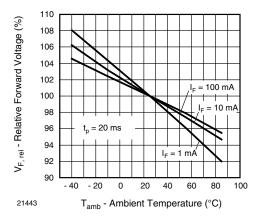


Fig. 4 - Relative Forward Voltage vs. Ambient Temperature

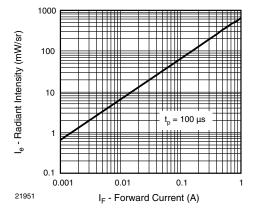


Fig. 5 - Radiant Intensity vs. Forward Current

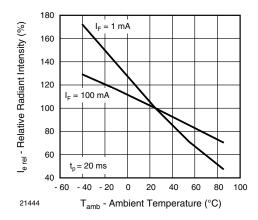


Fig. 6 - Relative Radiant Intensity vs. Ambient Temperature

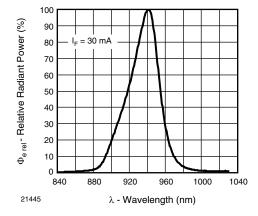


Fig. 7 - Relative Radiant Power vs. Wavelength

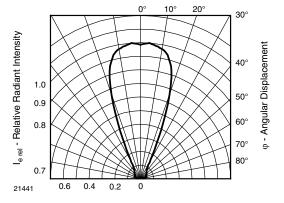
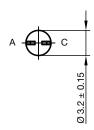
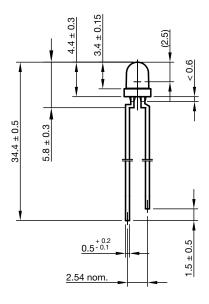


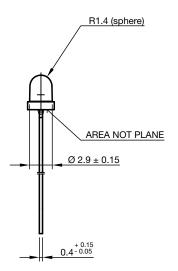
Fig. 8 - Relative Radiant Intensity vs. Angular Displacement

# Vishay Semiconductors

### **PACKAGE DIMENSIONS** in millimeters







technical drawings according to DIN specifications

Drawing-No.: 6.544-5255.01-4

Issue: 9; 28.07.14

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