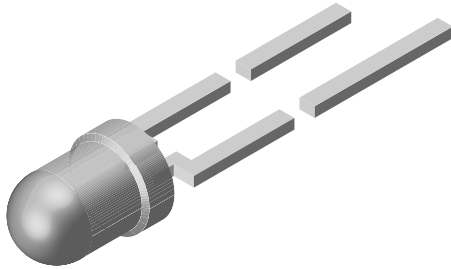


# High Speed Infrared Emitting Diode, 940 nm, GaAlAs, MQW



## 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:  $\varnothing$  3 mm
- Peak wavelength:  $\lambda_p = 940$  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 [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



## APPLICATIONS

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

## PRODUCT SUMMARY

COMPONENT	$I_e$ (mW/sr)	$\varphi$ (°)	$\lambda_p$ (nm)	$t_r$ (ns)
VSLB3940	65	$\pm 22$	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

## ABSOLUTE MAXIMUM RATINGS ( $T_{amb} = 25^\circ\text{C}$ , unless otherwise specified)

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		$V_R$	5	V
Forward current		$I_F$	100	mA
Peak forward current	$t_p/T = 0.1, t_p = 100 \mu\text{s}$	$I_{FM}$	1	A
Surge forward current	$t_p = 100 \mu\text{s}$	$I_{FSM}$	1.5	A
Power dissipation		$P_V$	160	mW
Junction temperature		$T_j$	100	$^\circ\text{C}$
Operating temperature range		$T_{amb}$	-40 to +85	$^\circ\text{C}$
Storage temperature range		$T_{stg}$	-40 to +100	$^\circ\text{C}$
Soldering temperature	$t \leq 5$ s, 2 mm from case	$T_{sd}$	260	$^\circ\text{C}$
Thermal resistance junction / ambient	J-STD-051, leads 7 mm, soldered on PCB	$R_{thJA}$	300	K/W

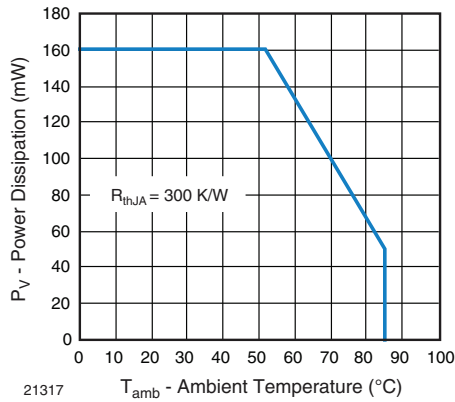


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

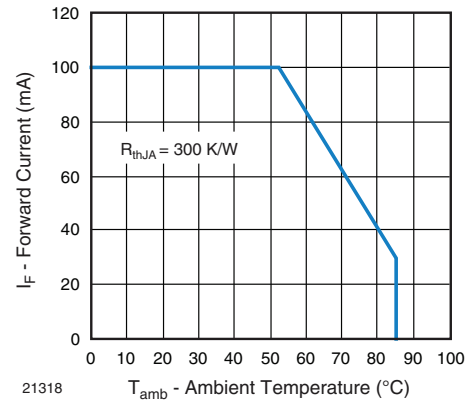


Fig. 2 - Forward Current Limit vs. Ambient Temperature

<b>BASIC CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$V_F$	1.15	1.35	1.6	V
	$I_F = 1\text{ A}$ , $t_p = 100\text{ }\mu\text{s}$	$V_F$	-	2.2	-	V
Temperature coefficient of $V_F$	$I_F = 1\text{ mA}$	$TK_{V_F}$	-	-1.5	-	mV/K
	$I_F = 100\text{ mA}$	$TK_{V_F}$	-	-1.1	-	mV/K
Reverse current	$V_R = 5\text{ V}$	$I_R$	-	-	10	$\mu\text{A}$
Junction capacitance	$V_R = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0\text{ mW/cm}^2$	$C_J$	-	70	-	pF
Radiant intensity	$I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$I_e$	32	65	110	mW/sr
	$I_F = 1\text{ A}$ , $t_p = 100\text{ }\mu\text{s}$	$I_e$	-	650	-	mW/sr
Radiant power	$I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$\phi_e$	-	40	-	mW
Temperature coefficient of radiant power	$I_F = 1\text{ mA}$	$TK_{\phi_e}$	-	-1.1	-	%/K
	$I_F = 100\text{ mA}$	$TK_{\phi_e}$	-	-0.51	-	%/K
Angle of half intensity		$\phi$	-	$\pm 22$	-	$^{\circ}$
Peak wavelength	$I_F = 30\text{ mA}$	$\lambda_p$	-	940	-	nm
Spectral bandwidth	$I_F = 30\text{ mA}$	$\Delta\lambda$	-	25	-	nm
Temperature coefficient of $I_p$	$I_F = 30\text{ mA}$	$TK_{\lambda_p}$	-	0.25	-	nm
Rise time	$I_F = 100\text{ mA}$ , 20 % to 80 %	$t_r$	-	15	-	ns
Fall time	$I_F = 100\text{ mA}$ , 20 % to 80 %	$t_f$	-	15	-	ns
Virtual source diameter		$d$	-	2	-	mm

**BASIC CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

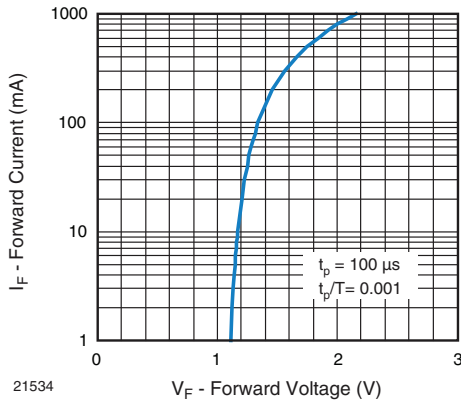


Fig. 3 - Forward Current vs. Forward Voltage

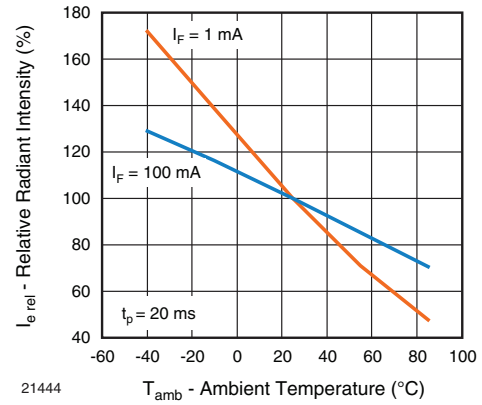


Fig. 6 - Relative Radiant Intensity vs. Ambient Temperature

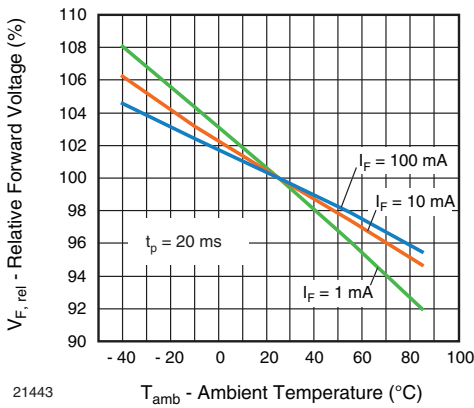


Fig. 4 - Relative Forward Voltage vs. Ambient Temperature

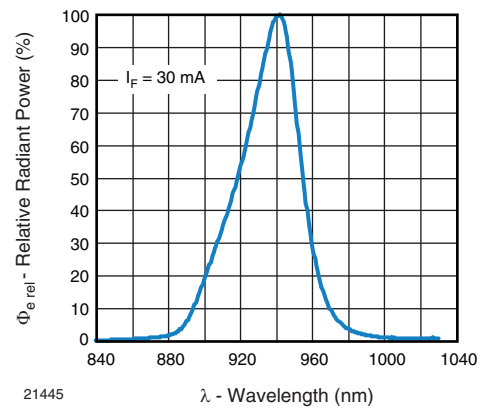


Fig. 7 - Relative Radiant Power vs. Wavelength

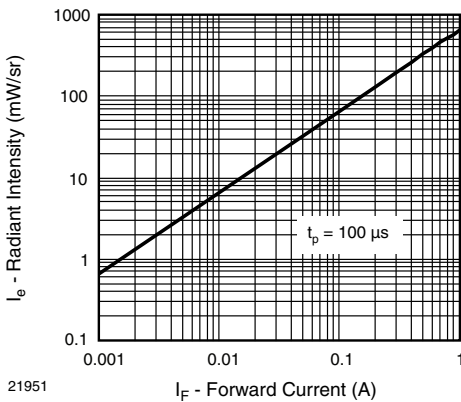


Fig. 5 - Radiant Intensity vs. Forward Current

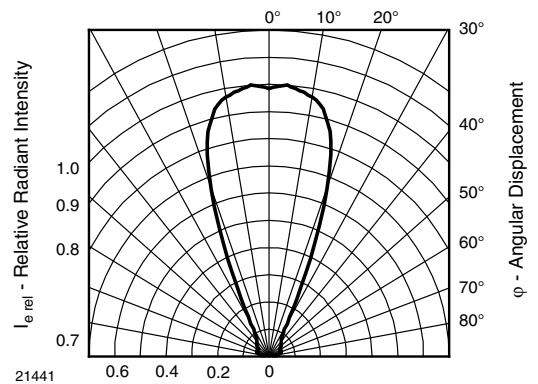
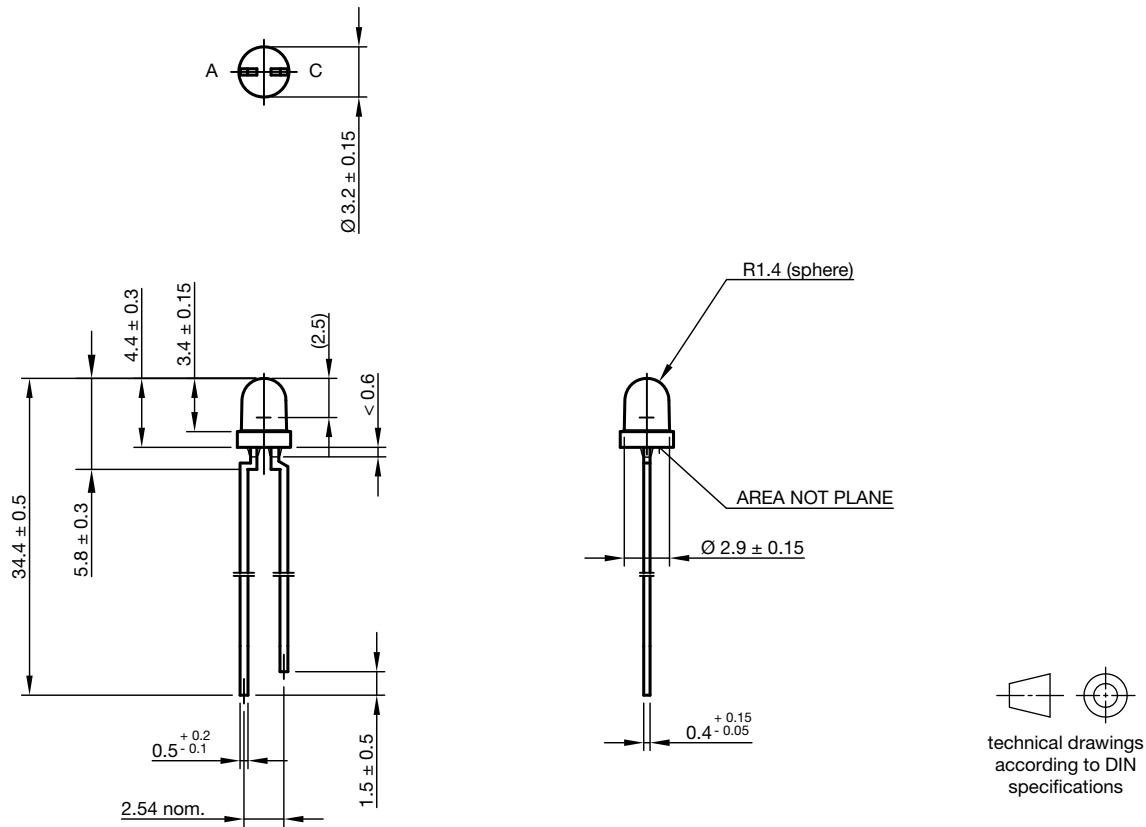


Fig. 8 - Relative Radiant Intensity vs. Angular Displacement



**PACKAGE DIMENSIONS** in millimeters



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