

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



LINKS TO ADDITIONAL RESOURCES



DESCRIPTION

VSMB10941X01 is an infrared, 940 nm side looking emitting diode in GaAlAs multi quantum well (MQW) technology with high radiant power and high speed, molded in clear, untinted plastic package (with lens) for surface mounting (SMD).

FEATURES

- · Package type: surface-mount
- Package form: side view
- Dimensions (L x W x H in mm): 3 x 2 x 1
- AEC-Q101 qualified
- Peak wavelength: $\lambda_p = 940 \text{ nm}$
- High pulse current
- High speed
- Angle of half intensity: $\phi = \pm 75^{\circ}$
- Package matches with detector VEMD10940FX01
- Floor life: 168 h, MSL 3, according to J-STD-020
- · Lead (Pb)-free reflow soldering
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

APPLICATIONS

- IR touch panel
- High performance transmissive or reflective sensors
- Automotive applications
- Head-up displays

PRODUCT SUMMARY						
COMPONENT	l _e (mW/sr), 20 mA	φ (°)	λ _p (nm)	t _r (ns)		
VSMB10941X01	1	± 75	940	15		

Note

Test conditions see table "Basic Characteristics"

ORDERING INFORMATION					
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM		
VSMB10941X01	Tape and reel	MOQ: 3000 pcs, 3000 pcs/reel	Side view		

Note

• MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25 \degree C$, unless otherwise specified)					
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT	
Reverse voltage		V _R	5	V	
Forward current		١ _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 μs	I _{FSM}	1.0	A	
Power dissipation		Pv	160	mW	
Junction temperature		Tj	105	°C	
Operating temperature range		T _{amb}	-55 to +100	°C	
Storage temperature range		T _{stg}	-55 to +105	°C	
Soldering temperature	According to Fig. 9, J-STD-020	T _{sd}	260	°C	
Thermal resistance junction to ambient	J-STD-051	R _{thJA}	450	K/W	

1 For technical questions, contact: <u>SensorsTechSupport@vishay.com</u> Document Number: 84415

AUTOMOTIVE GRADE



COMPLIANT

HALOGEN

FREE GREEN

(5-2008)









Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS ($T_{amb} = 25 \text{ °C}$, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 20 \text{ mA}, t_p = 20 \text{ ms}$	V _F	1.0	1.2	1.5	V
	$I_F = 1.0 \text{ A}, t_p = 100 \ \mu \text{s}$	V _F	-	2.6	-	V
Reverse current	V _R = 5 V	I _R	-	-	5	μA
Junction capacitance	$V_R = 0 V$, f = 1 MHz, E = 0 mW/cm ²	CJ	-	60	-	pF
Radiant intensity	$I_F = 20 \text{ mA}, t_p = 20 \text{ ms}$	le	0.5	1.0	1.5	mW/sr
	$I_F = 1.0 \text{ A}, t_p = 100 \ \mu \text{s}$	l _e	-	45	-	mW/sr
Radiant power	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	φe	-	40	-	mW
Angle of half intensity - horizontal		φ _h	-	± 77.5	-	0
Angle of half intensity - vertical		φν	-	± 72.5	-	0
Peak wavelength	I _F = 30 mA	λ _p	920	940	960	nm
Spectral bandwidth	I _F = 20 mA	Δλ	-	25	-	nm
Rise time	$I_F = 100 \text{ mA}, 20 \% \text{ to } 80 \%$	t _r	-	15	-	ns
Fall time	I _F = 100 mA, 20 % to 80 %	t _f	-	15	-	ns





BASIC CHARACTERISTICS (Tamb = 25 °C, unless otherwise specified)



Fig. 3 - Forward Current vs. Forward Voltage



Fig. 4 - Relative Radiant Intensity vs. Forward Current



Fig. 5 - Relative Radiant Power vs. Wavelength



Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

REFLOW SOLDER PROFILE

www.vishay.com



Fig. 7 - Lead (Pb)-free Reflow Solder Profile According to J-STD-020

PACKAGE DIMENSIONS in millimeters

DRYPACK

Devices are packed in moisture barrier bags (MBB) to prevent the products from moisture absorption during transportation and storage. Each bag contains a desiccant.

FLOOR LIFE

Time between soldering and removing from MBB must not exceed the time indicated in J-STD-020:

Moisture sensitivity: level 3

Floor life: 168 h

Conditions: $T_{amb} < 30$ °C, RH < 60 %

DRYING

In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-020 or label. Devices taped on reel dry using recommended conditions 192 h at 40 °C (+ 5 °C), RH < 5 %.



Recommended Solder Pad Footprint



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BLISTER TAPE DIMENSIONS in millimeters







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