COMPLIANT HALOGEN

FREE

GREEN



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Vishay Semiconductors

High Speed Infrared Emitting Diode, 940 nm, GaAlAs Double Hetero



DESCRIPTION

VSMB1940X01 is an infrared, 940 nm emitting diode in GaAlAs Double Hetero technology with high radiant power and high speed, molded in clear, untinted 0805 plastic package for surface mounting (SMD).

FEATURES

· Package type: surface mount

• Package form: 0805

• Dimensions (L x W x H in mm): 2 x 1.25 x 0.85

AEC-Q101 qualified

Peak wavelength: λ_p = 940 nm

· High reliability

- High radiant power
- · High radiant intensity
- High speed
- Angle of half sensitivity: $\varphi = \pm 60^{\circ}$
- Low forward voltage
- · Suitable for high pulse current operation
- 0805 standard surface-mountable package
- 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.vishav.com/doc?99912</u>

APPLICATIONS

- High speed IR data transmission
- High power emitter for low space applications
- High performance transmissive or reflective sensors

PRODUCT SUMMARY					
COMPONENT	I _e (mW/sr)	φ (deg)	λ _p (nm)	t _r (ns)	
VSMB1940X01	6	± 60	940	15	

Note

• Test conditions see table "Basic Characteristics"

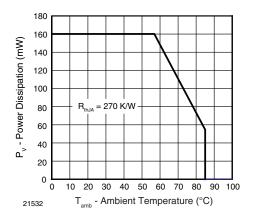
ORDERING INFORMATION						
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM			
VSMB1940X01	Tape and reel	MOQ: 3000 pcs, 3000 pcs/reel	0805			

Note

· MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS (T _{amb} = 25 °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	$t_p/T = 0.5, t_p = 100 \mu s$	I _{FM}	200	mA	
Surge forward current	t _p = 100 μs	I _{FSM}	1	Α	
Power dissipation		P _V	160	mW	
Junction temperature		Tj	100	°C	
Operating temperature range		T _{amb}	-40 to +85	°C	
Storage temperature range		T _{stg}	-40 to +100	°C	
Soldering temperature	According to Fig. 9, J-STD-020	T _{sd}	260	°C	
Thermal resistance junction / ambient	JESD 51	R _{thJA}	270	K/W	





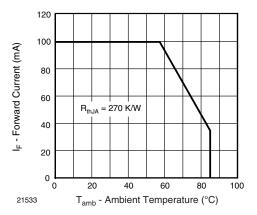


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

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 _F	1.15	1.35	1.6	V
	$I_F = 1 \text{ A}, t_p = 100 \mu \text{s}$	V _F	=	2.2	-	V
Temperature coefficient of V _F	I _F = 1 mA	TK _{VF}	-	-1.5	-	mV/K
	I _F = 100 mA	TK _{VF}	-	-1.1	-	mV/K
Reverse current	V _R = 5 V	I _R	=	-	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 _e	3	6	12	mW/sr
	$I_F = 1 \text{ A}, t_p = 100 \mu \text{s}$	I _e	=	60	-	mW/sr
Radiant power	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	фе	-	40	-	mW
Temperature coefficient of radiant power	I _F = 1 mA	TKφ _e	-	-1.1	-	%/K
	I _F = 100 mA	TKφ _e	=	-0.51	-	%/K
Angle of half intensity		φ	-	± 60	-	deg
Peak wavelength	I _F = 30 mA	λ_{p}	-	940	-	nm
Spectral bandwidth	I _F = 30 mA	Δλ	-	25	-	nm
Temperature coefficient of λ_p	I _F = 30 mA	TK _{λp}	-	0.25	-	nm
Rise time	I _F = 100 mA, 20 % to 80 %	t _r	-	15	-	ns
Fall time	I _F = 100 mA, 20 % to 80 %	t _f	-	15	-	ns
Virtual source diameter		d	-	0.5	-	mm

BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

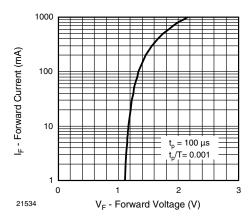


Fig. 3 - Forward Current vs. Forward Voltage

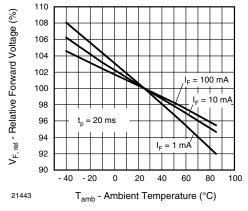


Fig. 4 - Relative Forward Voltage vs. Ambient Temperature

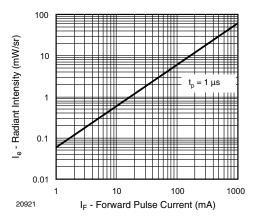


Fig. 5 - Radiant Intensity vs. Forward Current

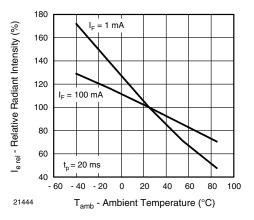


Fig. 6 - Relative Radiant Intensity vs. Ambient Temperature

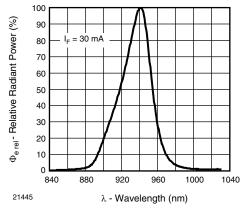


Fig. 7 - Relative Radiant Power vs. Wavelength

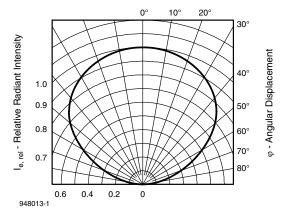


Fig. 8 - Relative Radiant Intensity vs. Angular Displacement



REFLOW SOLDER PROFILE

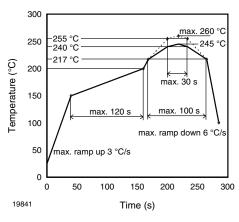


Fig. 9 - Lead (Pb)-free Reflow Solder Profile According to J-STD-020

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

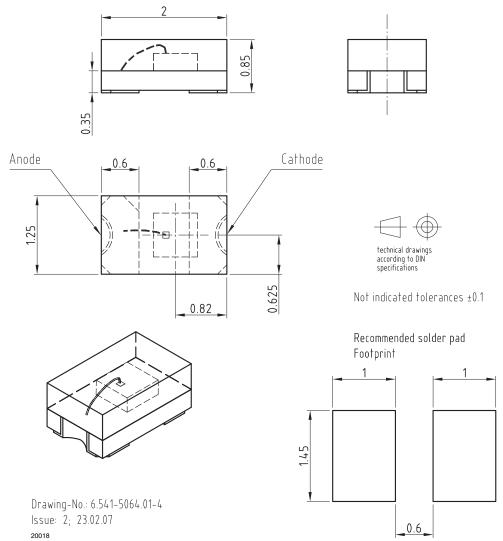
Floor life: 168 h

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

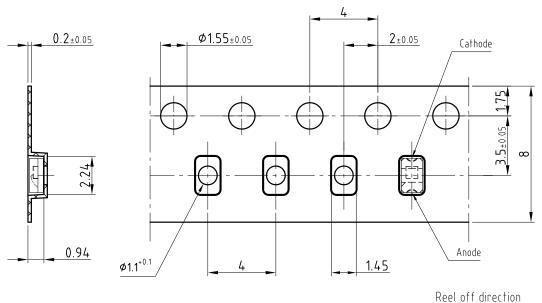
DRYING

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 $^{\circ}$ C (+ 5 $^{\circ}$ C), RH < 5 $^{\circ}$ M.

PACKAGE DIMENSIONS in millimeters



BLISTER TAPE DIMENSIONS in millimeters



Reet off direction

technical drawings

technical drawings according to DIN specifications

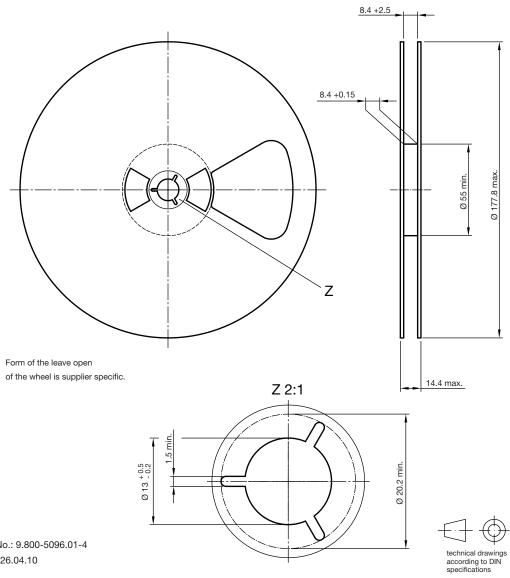
Drawing-No.: 9.700-5311.01-4

Issue: 1; 23.02.07

21501

Not indicated tolerances ±0.1

REEL DIMENSIONS in millimeters



Drawing-No.: 9.800-5096.01-4

Issue: 2; 26.04.10

20875



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