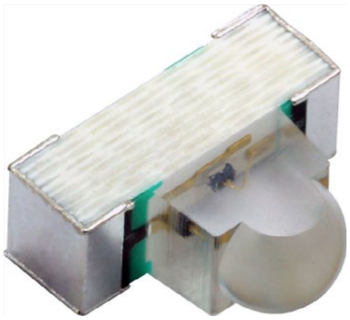
High Speed Infrared Emitting Diodes, 940 nm, GaAlAs, MQW



DESCRIPTION

VSMB14940 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 PCB based package (with lens) for surface mounting (SMD).

APPLICATIONS

- Emitter for remote control
- IR touch panels
- Photointerrupters
- Optical switch

FEATURES

- Package type: surface mount
- Package form: side view
- Dimensions (L x W x H in mm): 3.2 x 2.51 x 1.2
- Peak wavelength: λ_p = 940 nm
- High reliability
- High radiant power
- Very high radiant intensity
- Angle of half intensity: φ = ± 9°
- Suitable for high pulse current operation
- Floor life: 168 h, MSL 3, according to J-STD-020
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free
e3
RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

PRODUCT SUMMARY

COMPONENT	I_e (mW/sr)	φ (deg)	λ_p (nm)	t_r (ns)
VSMB14940	35	± 9	940	15

Note

- Test conditions see table “Basic Characteristics“

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VSMB14940	Tape and reel	MOQ: 1500 pcs, 1500 pcs/reel	Side view

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	70	mA
Surge forward current	t_p = 100 μs	I_{FSM}	500	mA
Power dissipation		P_V	112	mW
Junction temperature		T_j	100	°C
Operating temperature range		T_{amb}	-40 to +85	°C
Storage temperature range		T_{stg}	-40 to +100	°C
Soldering temperature	According fig. 10, J-STD-020	T_{sd}	260	°C
Thermal resistance junction / ambient	J-STD-051, soldered on PCB	R_{thJA}	580	K/W

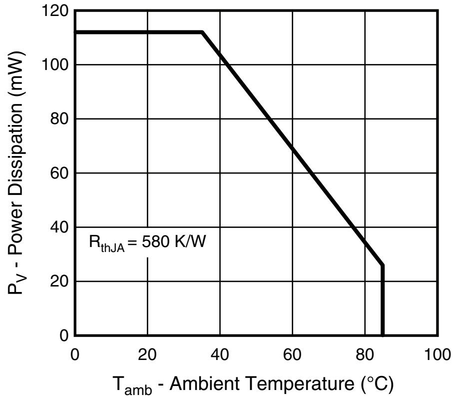


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

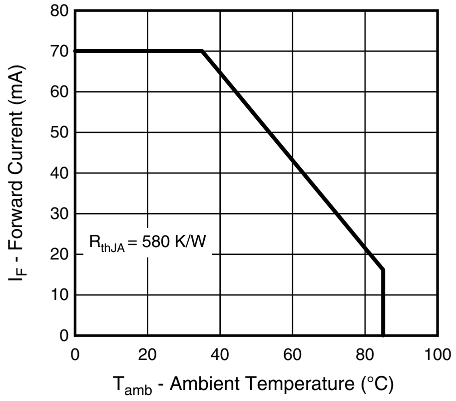


Fig. 2 - Forward Current Limit vs. Ambient Temperature

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

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	I_F = 20 mA, t_p = 20 ms	V_F	1.05	1.24	1.5	V
	I_F = 70 mA, t_p = 20 ms	V_F	-	1.33	1.6	V
	I_F = 500 mA, t_p = 100 μs	V_F	-	1.8	-	V
Temperature coefficient of V_F	I_F = 20 mA	TK_{VF}	-	-1.12	-	mV/K
Reverse current	V_R = 5 V	I_R	-	-	10	μA
Junction capacitance	V_R = 0 V, f = 1 MHz, E = 0 mW/cm^2	C_J	-	38	-	pF
Radiant intensity	I_F = 20 mA, t_p = 20 ms	I_e	6.5	10.5	14.5	mW/sr
	I_F = 70 mA, t_p = 20 ms	I_e	-	35	-	mW/sr
	I_F = 500 mA, t_p = 100 μs	I_e	-	205	-	mW/sr
Radiant power	I_F = 70 mA, t_p = 20 ms	ϕ_e	-	28	-	mW
Temperature coefficient of radiant power	I_F = 20 mA	$TK\phi_e$	-	0.39	-	%/K
Angle of half intensity		φ	-	± 9	-	deg
Peak wavelength	I_F = 70 mA	λ_p	920	940	960	nm
Spectral bandwidth	I_F = 30 mA	$\Delta\lambda$	-	30	-	nm
Temperature coefficient of λ_p	I_F = 30 mA	$TK\lambda_p$	-	0.30	-	nm/K
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

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

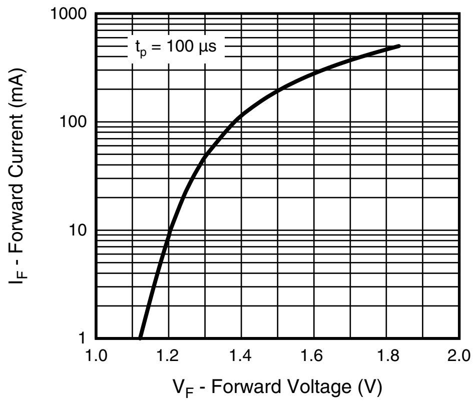


Fig. 3 - Forward Current vs. Forward Voltage

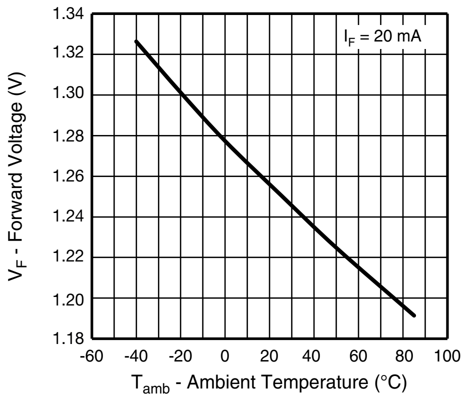


Fig. 4 - Forward Voltage vs. Ambient Temperature

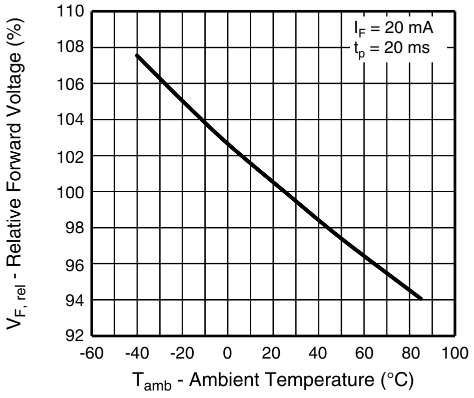


Fig. 5 - Relative Forward Voltage vs. Ambient Temperature

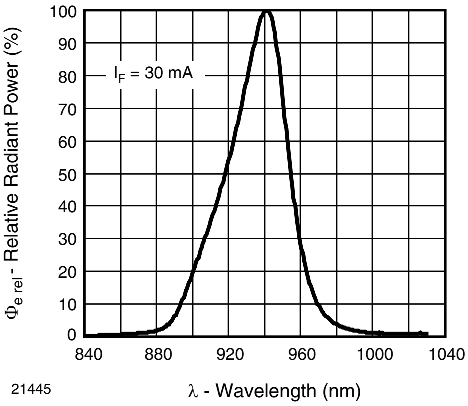


Fig. 8 - Relative Radiant Power vs. Wavelength

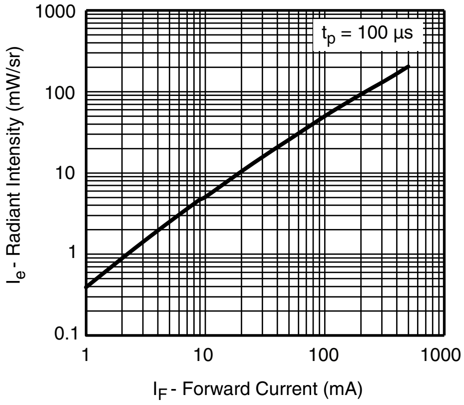


Fig. 6 - Radiant Intensity vs. Forward Current

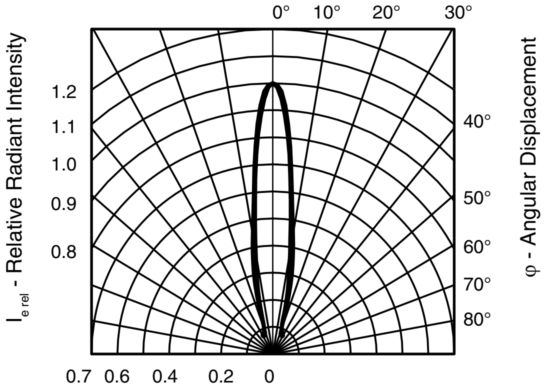


Fig. 9 - Relative Radiant Intensity vs. Angular Displacement

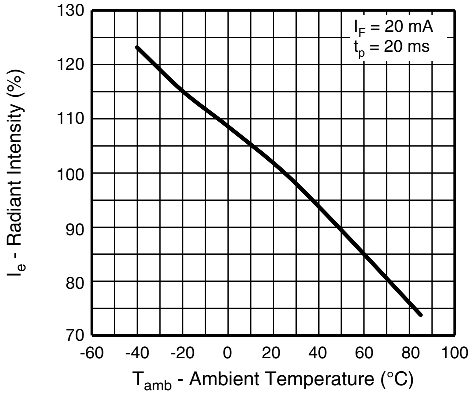


Fig. 7 - Relative Radiant Intensity vs. Ambient Temperature

SOLDER PROFILE

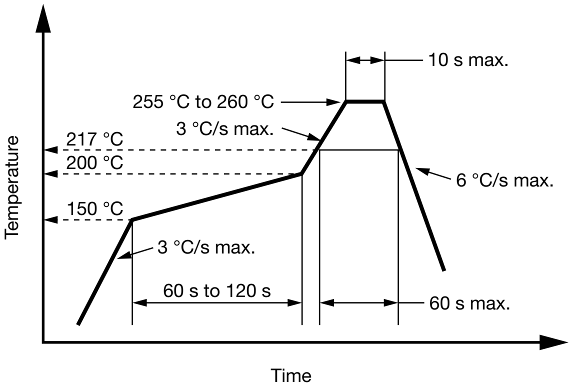


Fig. 10 - Lead (Pb)-free Reflow Solder Profile According to J-STD-020

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

Floor life (time between soldering and removing from MBB) must not exceed the time indicated on MBB label:

Floor life: 168 h

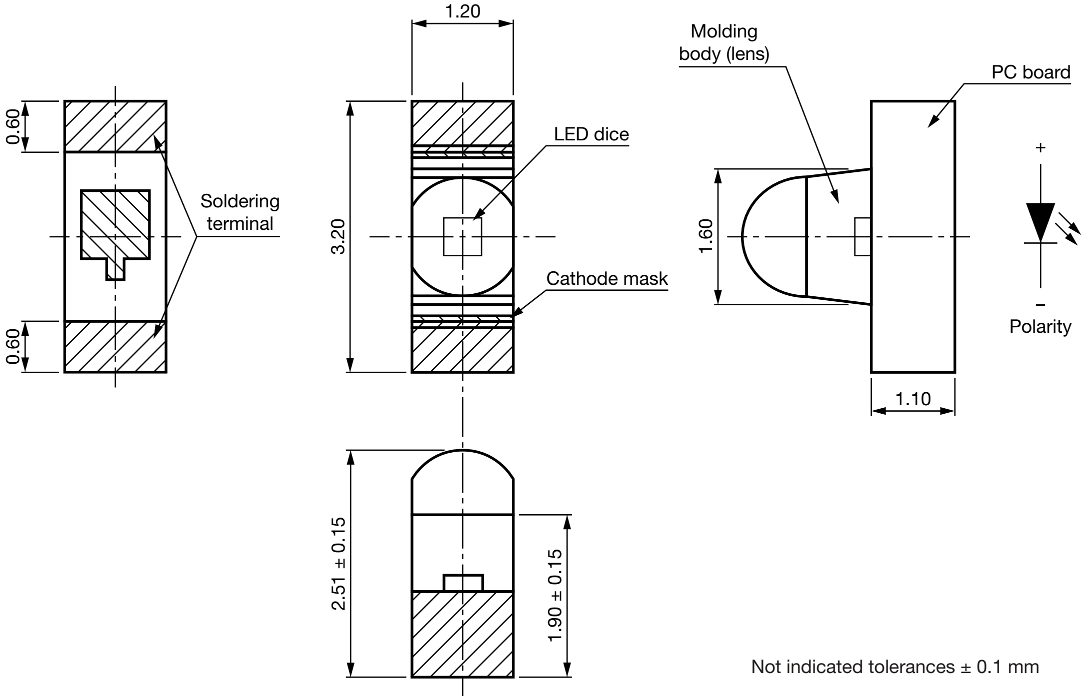
Conditions: $T_{amb} < 30$ °C, RH < 60 %

Moisture sensitivity level 3, according to J-STD-020.

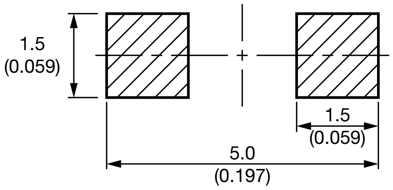
DRYING

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 %.

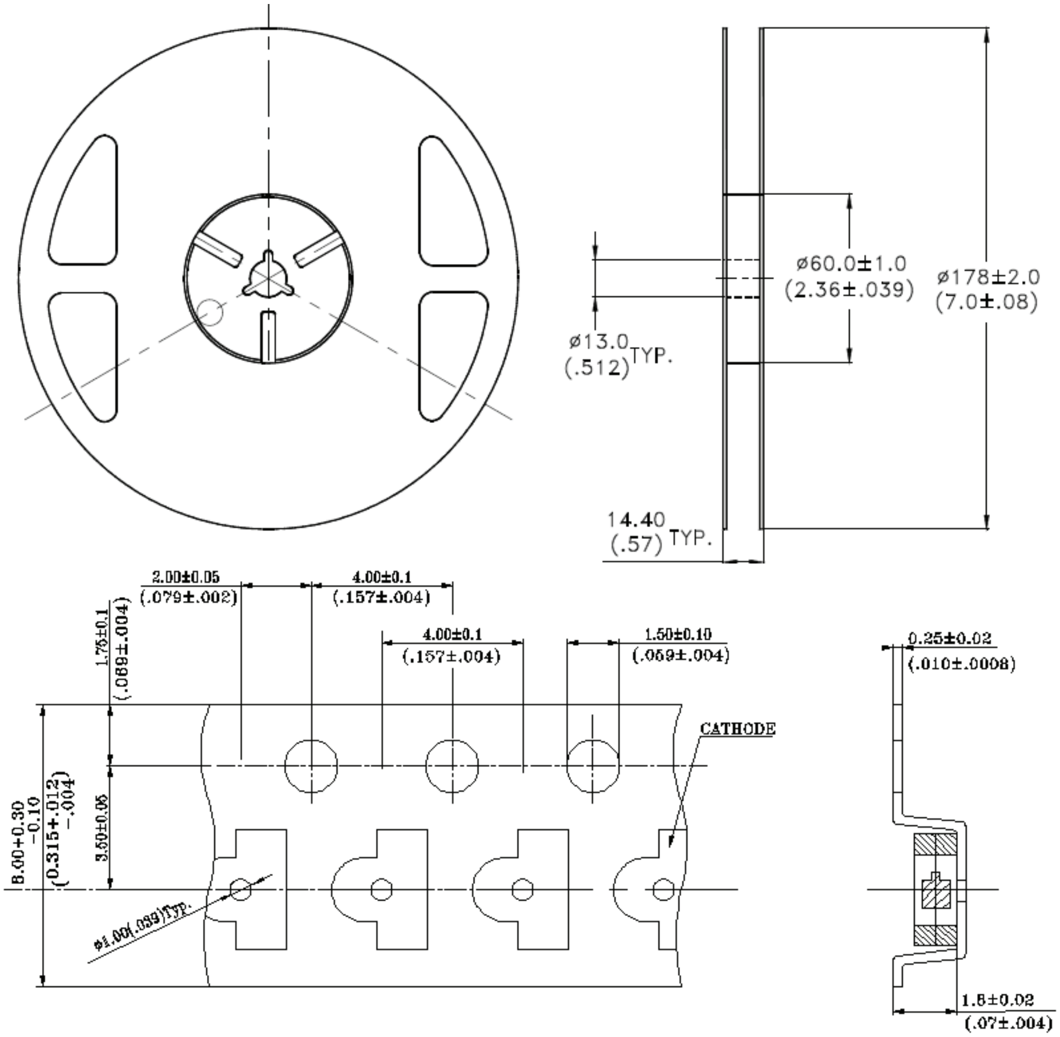
PACKAGE DIMENSIONS in millimeters: VSMB14940



Recommended Solder Pad



TAPING AND REEL DIMENSIONS in millimeters: **VSMB14940**



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