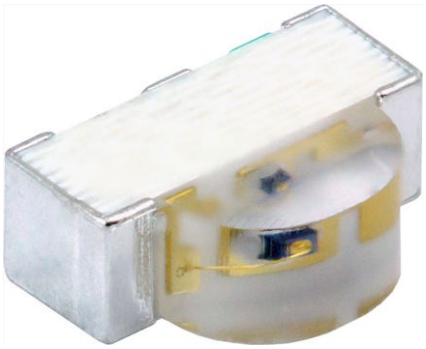
High Speed Infrared Emitting Diode, 940 nm, GaAlAs, MQW



FEATURES

- Package type: Surface mount
- Package form: Side view
- Dimensions (L x W x H in mm): 3 x 2 x 1
- Peak wavelength: λ_p = 940 nm
- High reliability
- High radiant power
- High radiant intensity
- High speed
- Angle of half sensitivity: φ = ± 75°
- Low forward voltage
- Package matches with detector VEMD10940F
- Floor life: 168 h, MSL 3, acc. J-STD-020
- Lead (Pb)-free reflow soldering
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

Pb-free

e3

RoHS COMPLIANT

HALOGEN FREE

GREEN (5-2008)

DESCRIPTION

VSMB10940 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).

APPLICATIONS

- IR touch panel
- High power emitter for low space applications
- High performance transmissive or reflective sensors

PRODUCT SUMMARY

COMPONENT	I_e (mW/sr), 20 mA	φ (deg)	λ_p (nm)	t_r (ns)
VSMB10940	1	± 75	940	15

Note

- Test conditions see table “Basic Characteristics“

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VSMB10940	Tape and reel	MOQ: 3000 pcs, 3000 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	65	mA
Peak forward current	t_p/T = 0.5, t_p = 100 µs	I_{FM}	130	mA
Surge forward current	t_p = 100 µs	I_{FSM}	500	mA
Power dissipation		P_V	104	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 to fig. 9, J-STD-020	T_{sd}	260	°C
Thermal resistance junction/ambient	J-STD-051, leads 7 mm, soldered on PCB	R_{thJA}	450	K/W

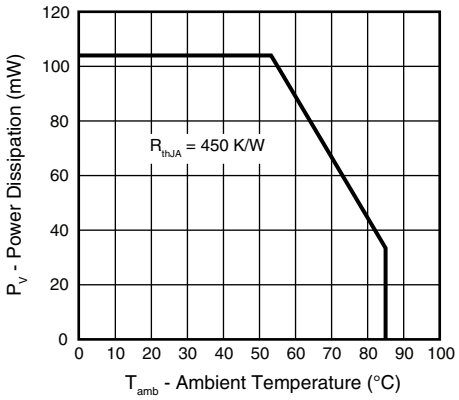


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

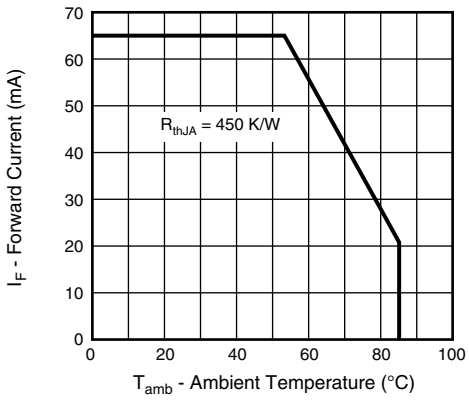


Fig. 2 - Forward Current Limit vs. Ambient Temperature

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	1.1	1.3	1.5	V
	I_F = 65 mA, t_p = 20 ms	V_F		1.35		V
	I_F = 500 mA, t_p = 100 µs	V_F		1.8		V
Temperature coefficient of V_F	I_F = 1 mA	TK_{VF}		- 1.5		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		21		pF
Radiant intensity	I_F = 20 mA, t_p = 20 ms	I_e	0.5	1	1.5	mW/sr
	I_F = 65 mA, t_p = 20 ms	I_e		3.05		mW/sr
	I_F = 500 mA, t_p = 100 µs	I_e		13		mW/sr
Radiant power	I_F = 100 mA, t_p = 20 ms	ϕe		35		mW
Temperature coefficient of radiant power	I_F = 100 mA	$TK\phi_e$		- 0.47		%/K
Angle of half intensity - horizontal		φ_h		± 77.5		deg
Angle of half intensity - vertical		φ_v		± 72.5		deg
Peak wavelength	I_F = 30 mA	λ_p		940		nm
Spectral bandwidth	I_F = 30 mA	$\Delta\lambda$		25		nm
Temperature coefficient of λ_p	I_F = 30 mA	$TK_{\lambda p}$		0.3		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

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

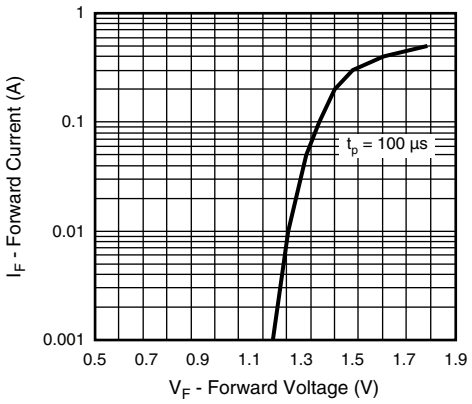


Fig. 3 - Forward Current vs. Forward Voltage

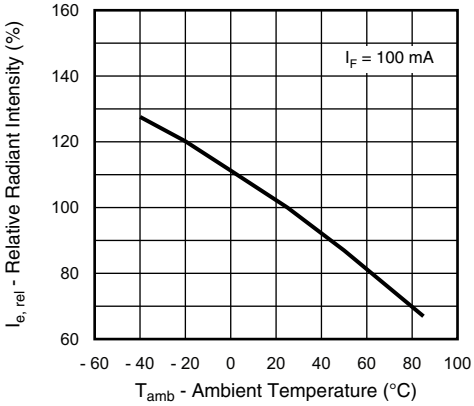


Fig. 6 - Relative Radiant Intensity vs. Ambient Temperature

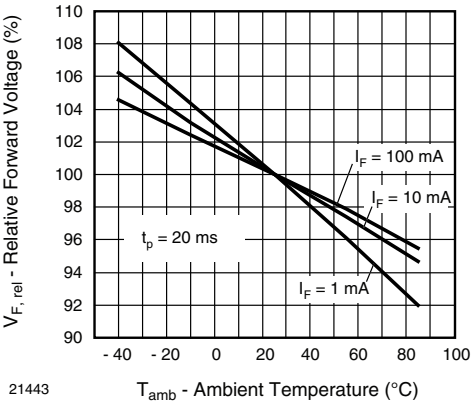


Fig. 4 - Relative Forward Voltage vs. Ambient Temperature

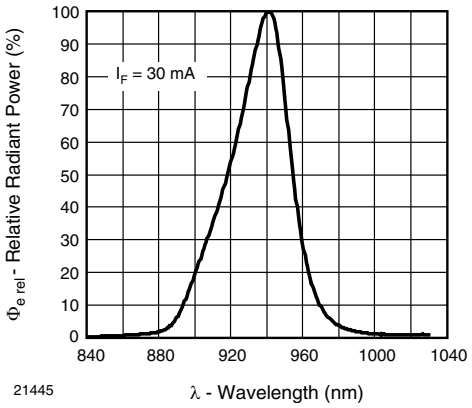


Fig. 7 - Relative Radiant Power vs. Wavelength

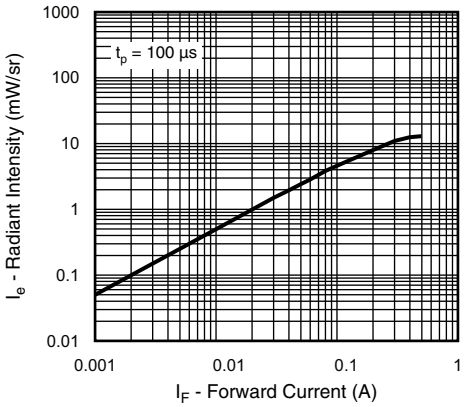


Fig. 5 - Radiant Intensity vs. Forward Current

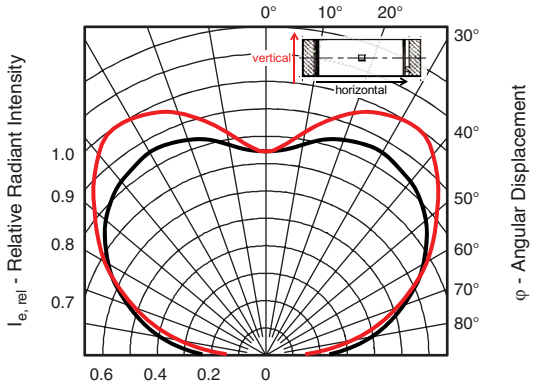


Fig. 8 - Relative Radiant Intensity vs. Angular Displacement

REFLOW SOLDER PROFILE

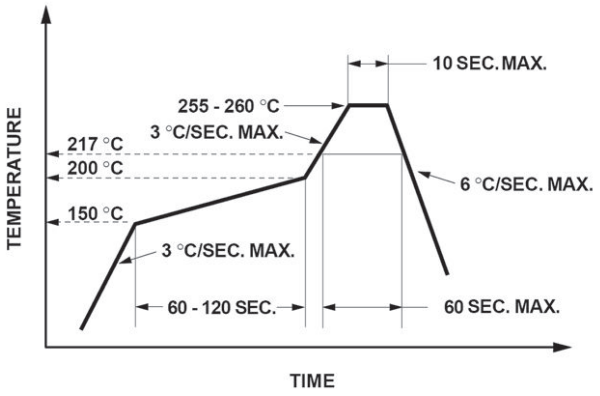


Fig. 9 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020

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

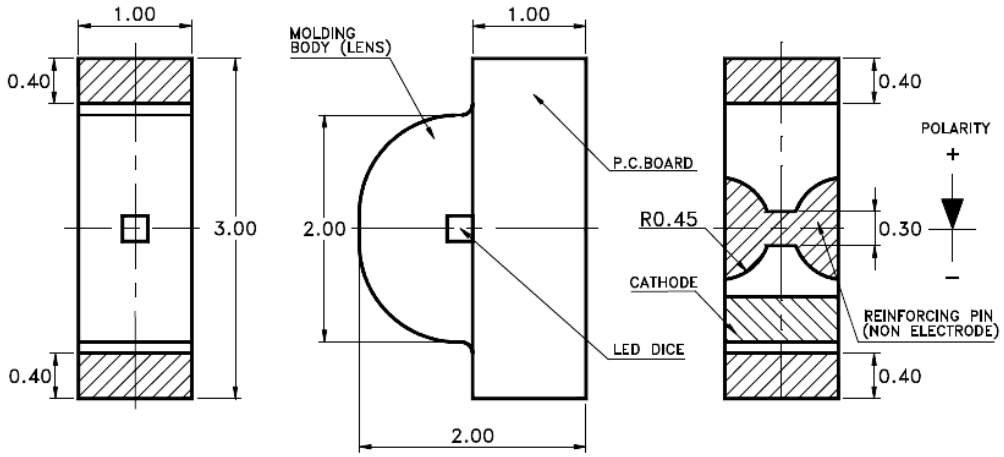
Floor life: 168 h

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

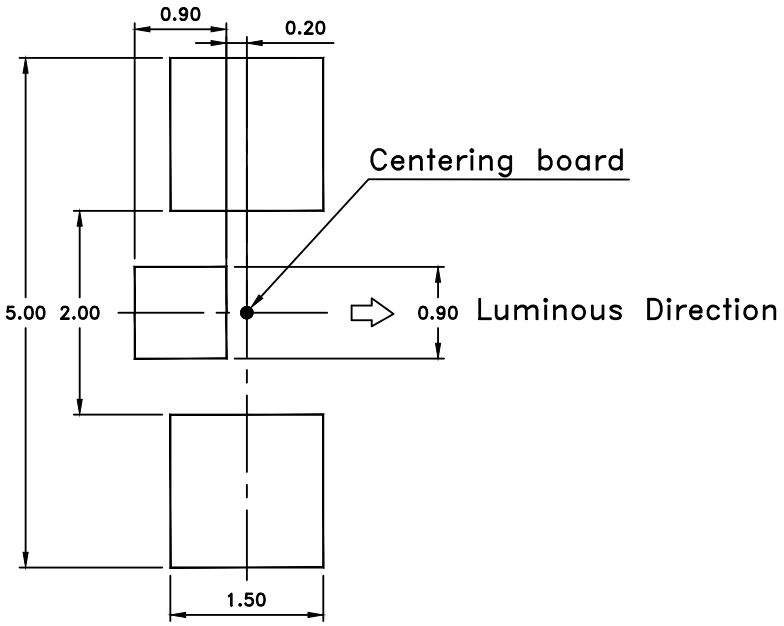
DRYING

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 °C (+ 5 °C), RH < 5 %.

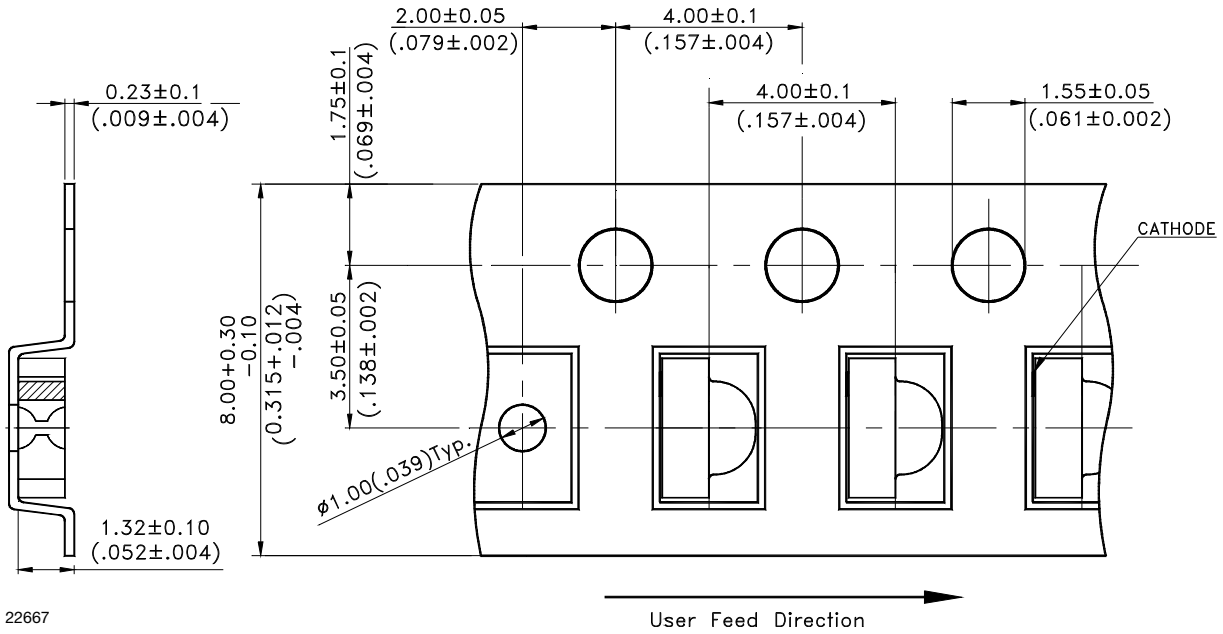
PACKAGE DIMENSIONS in millimeters



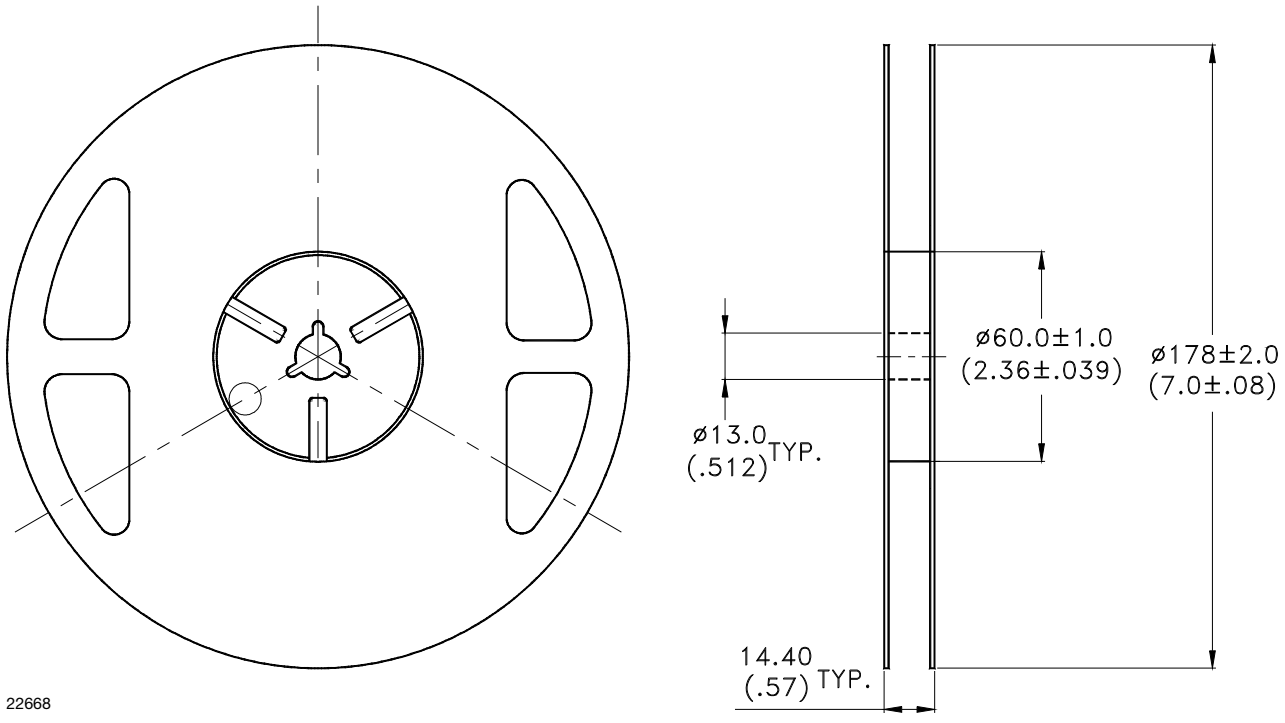
Recommended Solder Pad Footprint



BLISTER TAPE DIMENSIONS in millimeters



REEL DIMENSIONS in millimeters



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