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



FEATURES

- Package type: surface mount
- Package form: side view
- Dimensions (L x W x H in mm): 2.3 x 2.55 x 2.3
- Peak wavelength: λ_p = 940 nm
- High reliability
- High radiant power
- High radiant intensity
- Angle of half intensity: φ = ± 25°
- Low forward voltage
- Suitable for high pulse current operation
- Package matches with detector VEMD2023SLX01 and VEMT2023SLX01
- Floor life: 4 weeks, MSL 2a, acc. J-STD-020
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

Pb-free

e3

RoHS COMPLIANT

GREEN (5-2008)

DESCRIPTION

VSMB2948SL 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

- Remote control
- IR touch panels

PRODUCT SUMMARY

COMPONENT	I_e (mW/sr)	φ (deg)	λ_p (nm)	t_r (ns)
VSMB2948SL	20	± 25	940	15

Note

- Test conditions see table “Basic Characteristics“

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VSMB2948SL	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	100	mA
Surge forward current	t_p = 100 µs	I_{FSM}	500	mA
Power dissipation		P_V	160	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 figure 9, J-STD-020	T_{sd}	260	°C
Thermal resistance junction/ambient	J-STD-051, leads 7 mm, soldered on PCB	R_{thJA}	250	K/W

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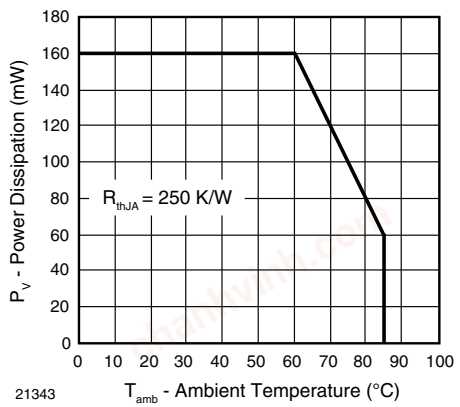


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

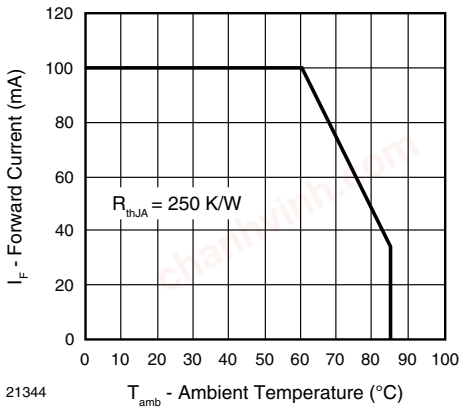


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Forward voltage	I_F = 100 mA, t_p = 20 ms	V_F	1.15	1.35	1.6	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/cm²	C_J		21		pF
Radiant intensity	I_F = 100 mA, t_p = 20 ms	I_e	10	20	30	mW/sr
	I_F = 500 mA, t_p = 100 µs	I_e		90		mW/sr
Radiant power	I_F = 100 mA, t_p = 20 ms	ϕ_e		40		mW
Temperature coefficient of radiant power	I_F = 1 mA	$TK\phi_e$		- 1.1		%/K
Angle of half intensity		φ		± 25		deg
Peak wavelength	I_F = 30 mA	λ_p	920	940	960	nm
Spectral bandwidth	I_F = 30 mA	$\Delta\lambda$		25		nm
Temperature coefficient of λ_p	I_F = 30 mA	$TK\lambda_p$		0.25		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
Cut-off frequency	I_{DC} = 70 mA, I_{AC} = 30 mA pp	f_c		23		MHz

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

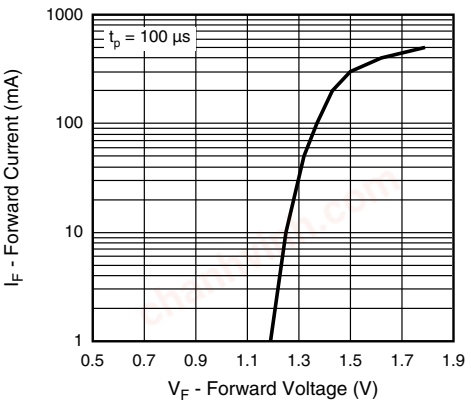


Fig. 3 - Forward Current vs. Forward Voltage

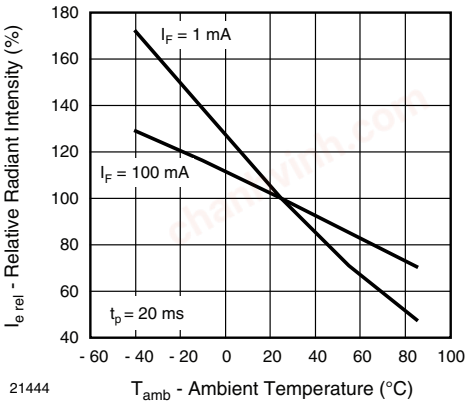


Fig. 6 - Relative Radiant Intensity vs. Ambient Temperature

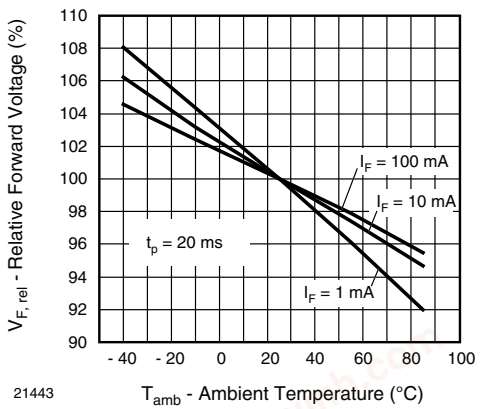


Fig. 4 - Relative Forward Voltage vs. Ambient Temperature

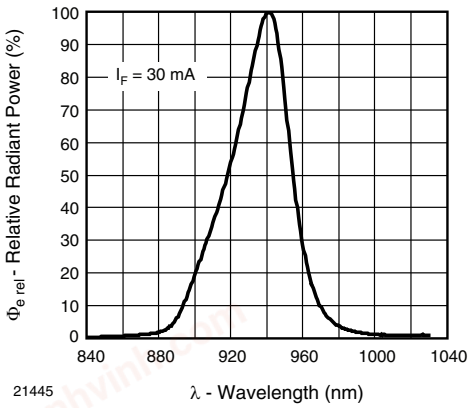


Fig. 7 - Relative Radiant Power vs. Wavelength

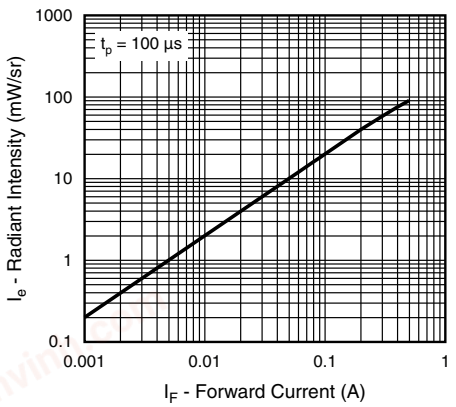


Fig. 5 - Radiant Intensity vs. Forward Current

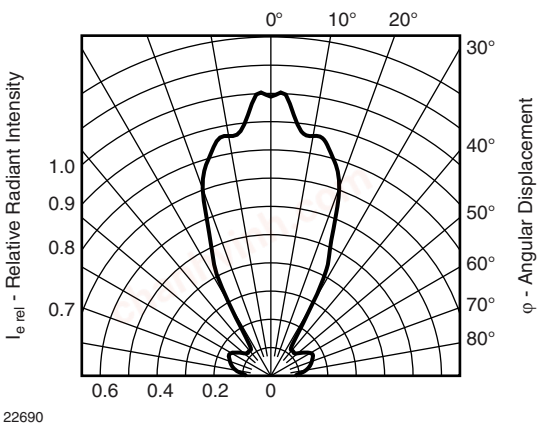


Fig. 8 - Relative Radiant Intensity vs. Angular Displacement

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SOLDER PROFILE

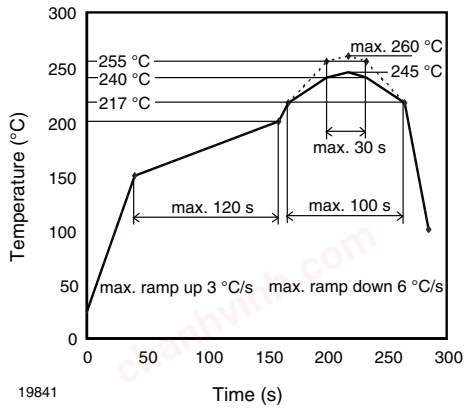


Fig. 9 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020

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.

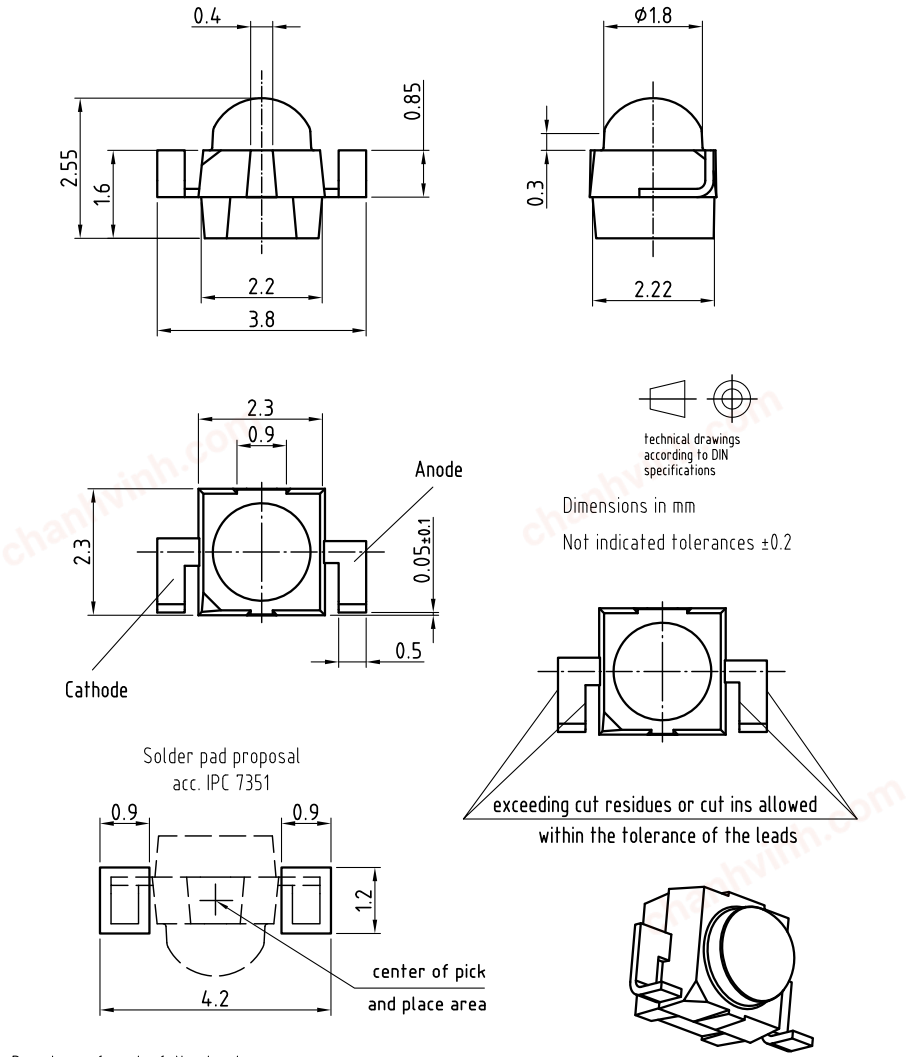
FLOOR LIFE

Floor life (time between soldering and removing from MBB) must not exceed the time indicated on MBB label:
Floor life: 4 weeks
Conditions: T_{amb} < 30 °C, RH < 60 %
Moisture sensitivity level 2a, acc. 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: VSMB2948SL

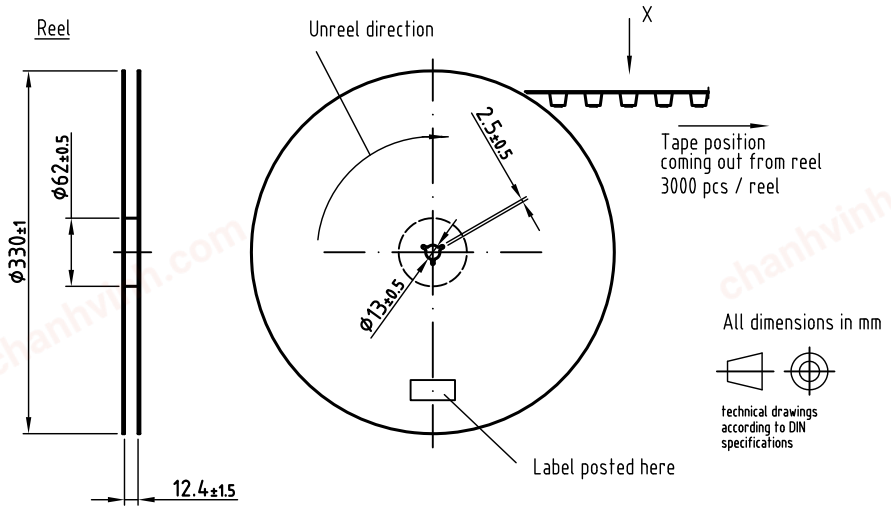


Drawing refers to following types: VSMB2943SLX01
VSMF2893SLX01
Drawing-No.: 6.544-5410.02-4 VSMB2948SL
Issue: prel. 03.08.12 VEMD2x23SLX01

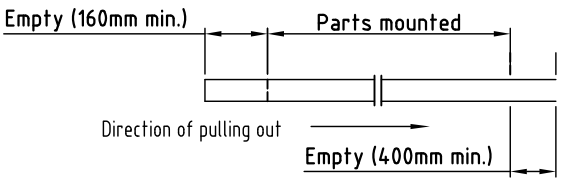
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TAPING AND REEL DIMENSIONS in millimeters: VSMB2948SL

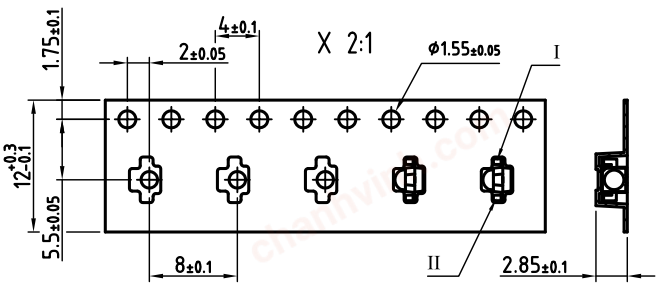


Leader and trailer tape:



Terminal position in tape

Device	Lead I	Lead II
VSMB2943SLX01	Cathode	Anode
VSMF2893SLX01		
VSMB2948SL		
VEMD2023SLX01		
VEMD2523SLX01		
VEMT2023SLX01	Collector	Emitter
VEMT2523SLX01		
VSMY2853SL	Anode	Cathode



Drawing refers to following types: see table
Reel dimensions and tape

Drawing-No.: 9.800-5123.01-4
Issue: prel; 01.02.13

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