

High Speed Infrared Emitting Diode, 940 nm, Surface Emitter Technology



DESCRIPTION

As part of the [SurfLight™](#) portfolio, the VSMY2943SL is an infrared, 940 nm, side looking emitting diode based on GaAlAs surface emitter chip technology with extreme high radiant intensities, high optical power and high speed, molded in clear, untinted plastic packages (with lens) for surface mounting (SMD).

APPLICATIONS

- Miniature light barrier
- Photointerrupters
- Optical switch
- Emitter source for proximity sensors
- IR illumination
- Remote control

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: $\lambda_p = 940$ nm
- High reliability
- High radiant power
- Very high radiant intensity
- Angle of half intensity: $\phi = \pm 28^\circ$
- Suitable for high pulse current operation
- Package matches with detector VEMD2xx3SLX01 and VEMT2xx3SLX01 series
- Floor life: 4 weeks, MSL 2a, according to J-STD-020
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



PRODUCT SUMMARY

COMPONENT	I_e (mW/sr)	ϕ (deg)	λ_p (nm)	t_r (ns)
VSMY2943SL	50	± 28	940	10

Note

- Test conditions see table "Basic Characteristics"

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VSMY2943SL	Tape and reel	MOQ: 3000 pcs, 3000 pcs/reel	Side view

Note

- MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V_R	5	V
Forward current		I_F	100	mA
Peak forward current	$t_p/T = 0.5$, $t_p = 100\text{ }\mu\text{s}$	I_{FM}	180	mA
Surge forward current	$t_p = 100\text{ }\mu\text{s}$	I_{FSM}	1	A
Power dissipation		P_V	200	mW
Junction temperature		T_j	100	$^{\circ}\text{C}$
Operating temperature range		T_{amb}	-40 to +85	$^{\circ}\text{C}$
Storage temperature range		T_{stg}	-40 to +100	$^{\circ}\text{C}$
Soldering temperature	According to Fig. 7, J-STD-020	T_{sd}	260	$^{\circ}\text{C}$
Thermal resistance junction-to-ambient	J-STD-051, soldered on PCB	R_{thJA}	250	K/W

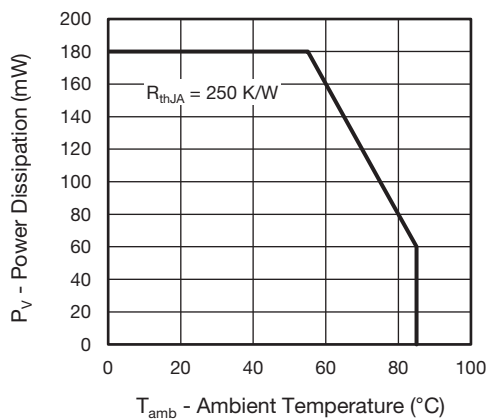


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

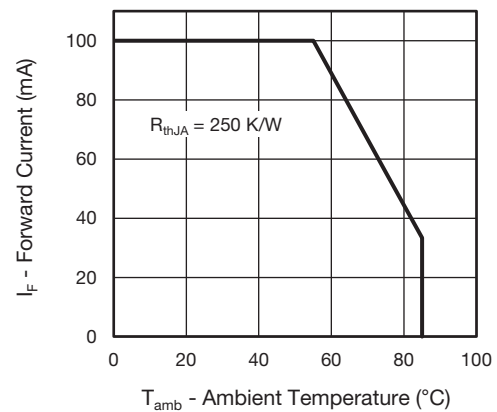


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$	V_F	-	1.4	1.8	V
	$I_F = 1\text{ A}$, $t_p = 100\text{ }\mu\text{s}$	V_F	-	2.5	-	V
Temperature coefficient of V_F	$I_F = 100\text{ mA}$	TK_{V_F}	-	-0.7	-	mV/K
Reverse current		I_R	Not designed for reverse operation			μA
Junction capacitance	$V_R = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0\text{ mW/cm}^2$	C_J	-	55	-	pF
Radiant intensity	$I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$	I_e	27	50	75	mW/sr
	$I_F = 1\text{ A}$, $t_p = 100\text{ }\mu\text{s}$	I_e	-	350	-	mW/sr
Radiant power	$I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$	ϕ_e	-	55	-	mW
Temperature coefficient of radiant power	$I_F = 100\text{ mA}$	TK_{ϕ_e}	-	-0.2	-	%/K
Angle of half intensity		ϕ	-	± 28	-	deg
Peak wavelength	$I_F = 100\text{ mA}$	λ_p	920	940	960	nm
Spectral bandwidth	$I_F = 30\text{ mA}$	$\Delta\lambda$	-	50	-	nm
Temperature coefficient of λ_p	$I_F = 30\text{ mA}$	TK_{λ_p}	-	0.25	-	nm/K
Rise time	$I_F = 100\text{ mA}$, 20 % to 80 %	t_r	-	10	-	ns
Fall time	$I_F = 100\text{ mA}$, 20 % to 80 %	t_f	-	10	-	ns

BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

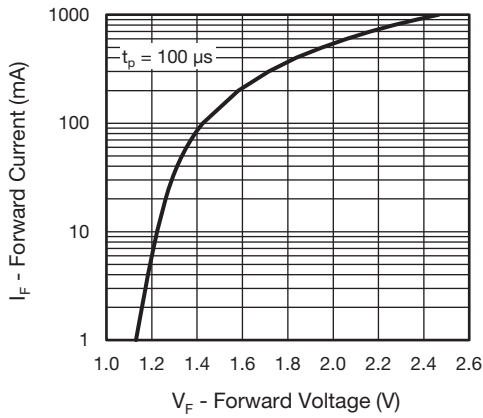


Fig. 3 - Forward Current vs. Forward Voltage

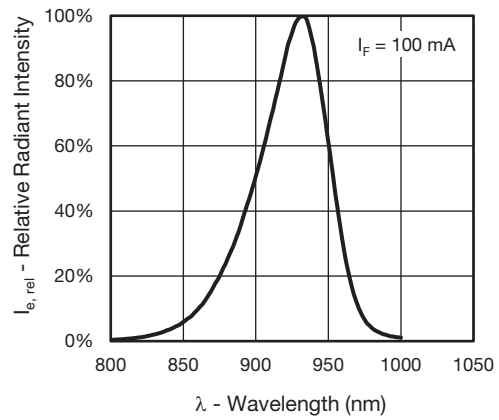


Fig. 5 - Relative Radiant Power vs. Wavelength

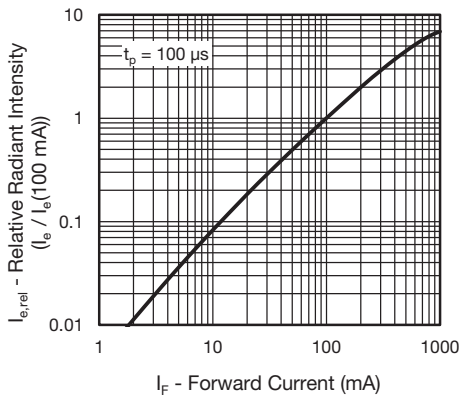


Fig. 4 - Radiant Intensity vs. Forward Current

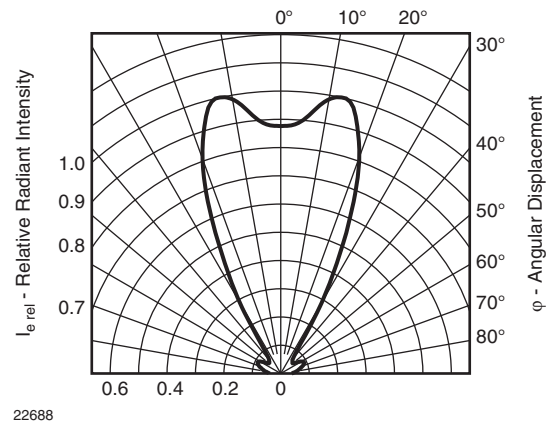


Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

SOLDER PROFILE

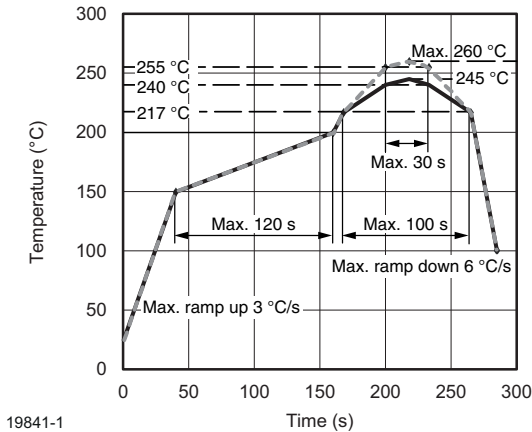


Fig. 7 - Lead (Pb)-free Reflow Solder Profile According to J-STD-020

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: 4 weeks

Conditions: $T_{amb} < 30\text{ }^{\circ}\text{C}$, $\text{RH} < 60\%$

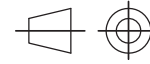
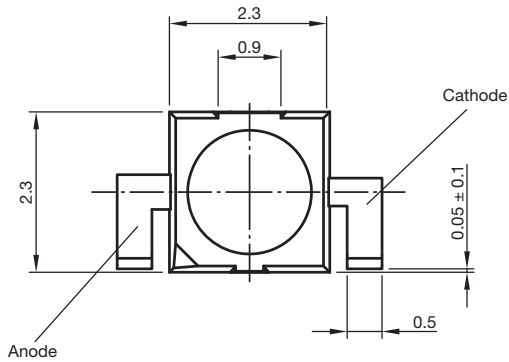
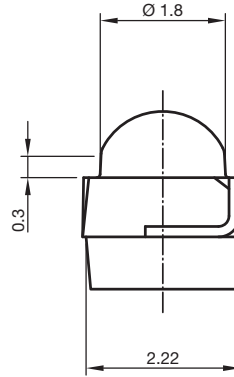
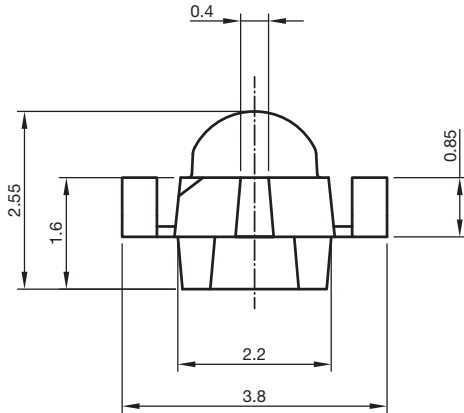
Moisture sensitivity level 2a, according to J-STD-020.

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 $40\text{ }^{\circ}\text{C}$ ($+ 5\text{ }^{\circ}\text{C}$), $\text{RH} < 5\%$.

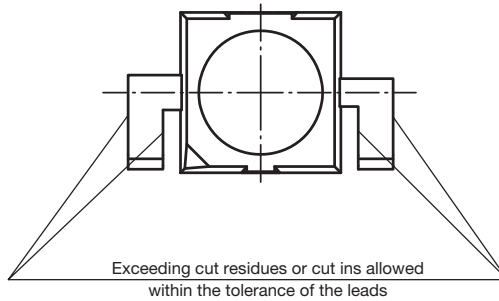


PACKAGE DIMENSIONS in millimeters: VSMY2943SL

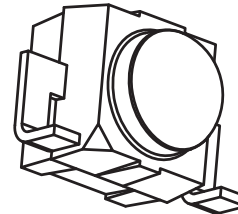
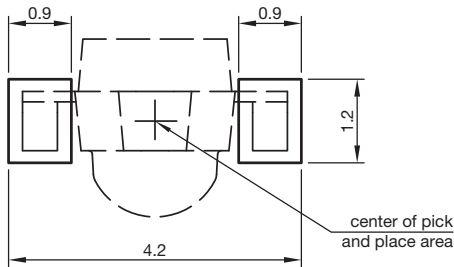


Technical drawings according to DIN specifications

Not indicated tolerances ± 0.2

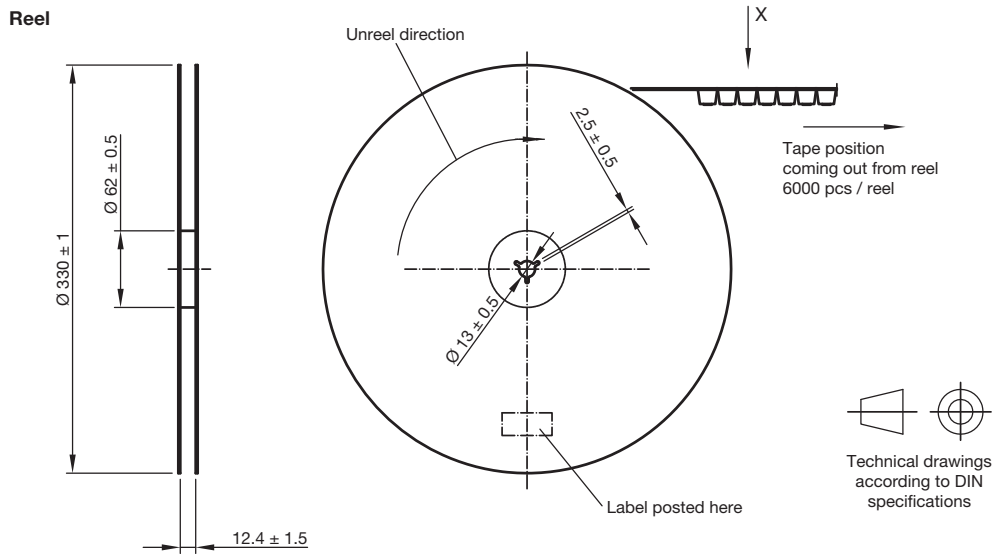


Solder pad proposal acc. IPC 7351

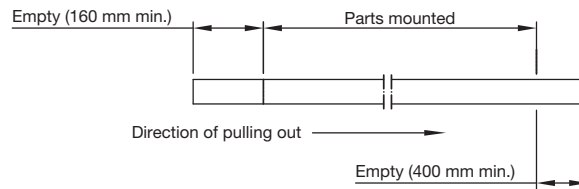


Drawing-No.: 6.544-5410.03-4
Issue: 3; 02.10.15

TAPING AND REEL DIMENSIONS in millimeters: **VSMY2943SL**

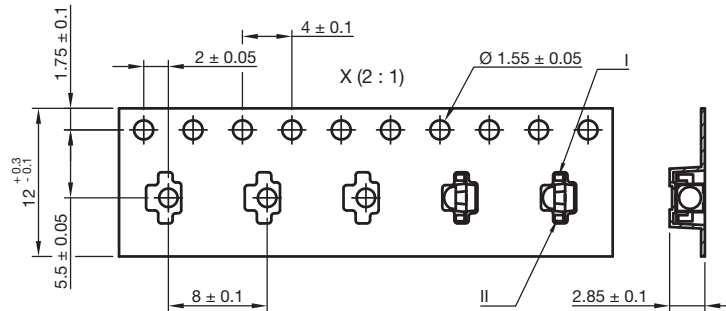


Leader and trailer tape



Terminal position in tape

Device	Lead I	Lead II
V SMB2943SLX01	Cathode	Anode
V SMF2893SLX01		
V SMB2948SL		
V EMD2023SLX01		
V EMD2523SLX01		
V EMT2023SLX01	Collector	Emitter
V EMT2523SLX01	Anode	Cathode
V SMY2853SL		
V SMY2943SL		
V SMY2943T0SL		



Drawing-No.: 9.800-5123.01-4
Issue: 4; 02.10.15



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