

## High Speed Infrared Emitting Diode, 850 nm, Surface Emitter Technology



### DESCRIPTION

As part of the [SurfLight™](#) portfolio, the VSMY2853SL is an infrared, 850 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 touch panels
- IR illumination

### 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:  $\lambda_p = 850$  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](http://www.vishay.com/doc?99912)



### PRODUCT SUMMARY

COMPONENT	$I_e$ (mW/sr)	$\phi$ (deg)	$\lambda_p$ (nm)	$t_r$ (ns)
VSMY2853SL	50	$\pm 28$	850	10

#### Note

- Test conditions see table "Basic Characteristics"

### ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VSMY2853SL	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	$t_p/T = 0.5$ , $t_p = 100\text{ }\mu\text{s}$	$I_{FM}$	200	mA
Surge forward current	$t_p = 100\text{ }\mu\text{s}$	$I_{FSM}$	1	A
Power dissipation		$P_V$	190	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	EIA / JESD51	$R_{thJA}$	250	K/W

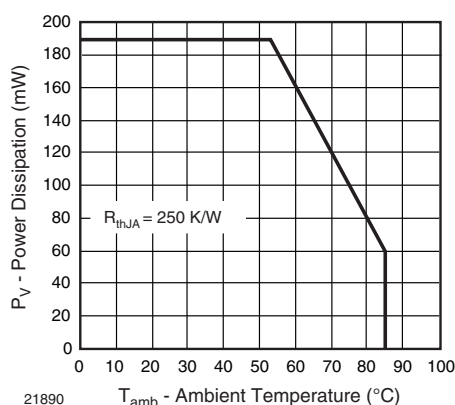


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

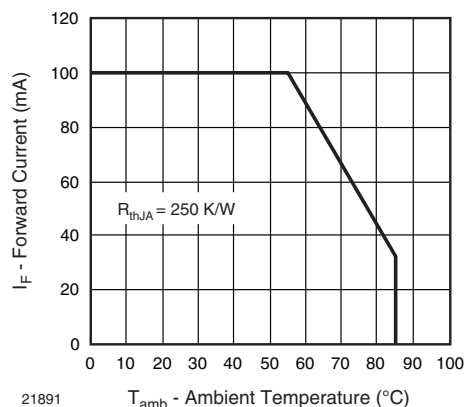


Fig. 2 - Forward Current Limit vs. Ambient Temperature

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

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$V_F$	-	1.6	1.9	V
	$I_F = 1\text{ A}$ , $t_p = 100\text{ }\mu\text{s}$	$V_F$	-	2.8	-	V
Temperature coefficient of $V_F$	$I_F = 100\text{ mA}$	$TK_{VF}$	-	-1.5	-	mV/K
Reverse current		$I_R$	Not designed for reverse operation			$\mu\text{A}$
Junction capacitance	$V_R = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0\text{ mW/cm}^2$	$C_J$	-	50	-	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	$I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$\phi_e$	-	55	-	mW
Temperature coefficient of radiant power	$I_F = 100\text{ mA}$	$TK_{\phi_e}$	-	-0.12	-	%/K
Angle of half intensity		$\phi$	-	$\pm 28$	-	deg
Peak wavelength	$I_F = 100\text{ mA}$	$\lambda_p$	840	850	870	nm
Spectral bandwidth	$I_F = 30\text{ mA}$	$\Delta\lambda$	-	30	-	nm
Temperature coefficient of $\lambda_p$	$I_F = 30\text{ mA}$	$TK_{\lambda_p}$	-	0.25	-	nm/K
Rise time	$I_F = 100\text{ mA}$ , 10 % to 90 %	$t_r$	-	10	-	ns
Fall time	$I_F = 100\text{ mA}$ , 10 % to 90 %	$t_f$	-	10	-	ns

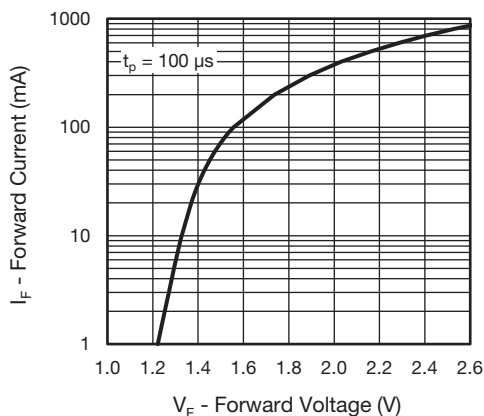
**BASIC CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)


Fig. 3 - Forward Current vs. Forward Voltage

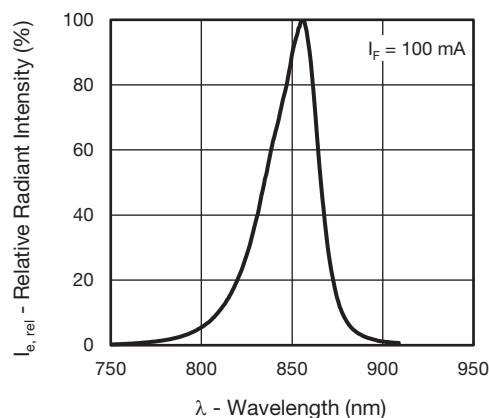


Fig. 5 - Relative Radiant Power vs. Wavelength

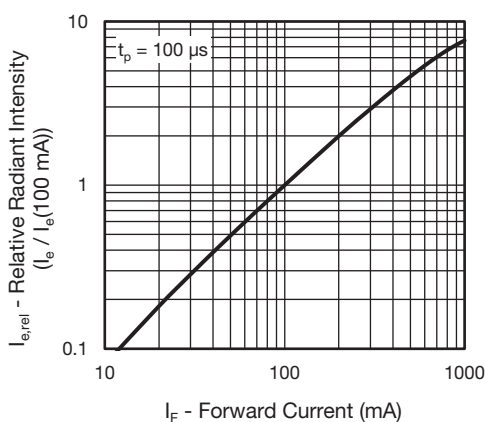


Fig. 4 - Relative Radiant Intensity vs. Forward Current

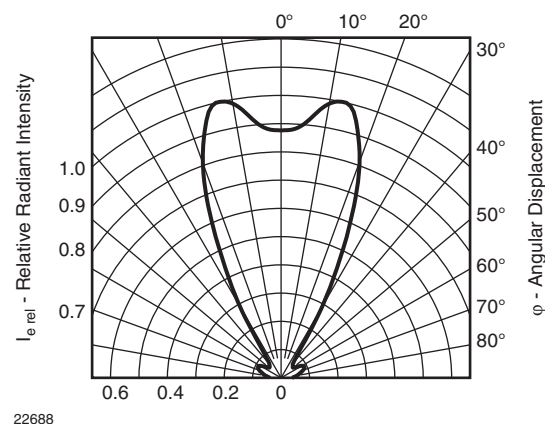


Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

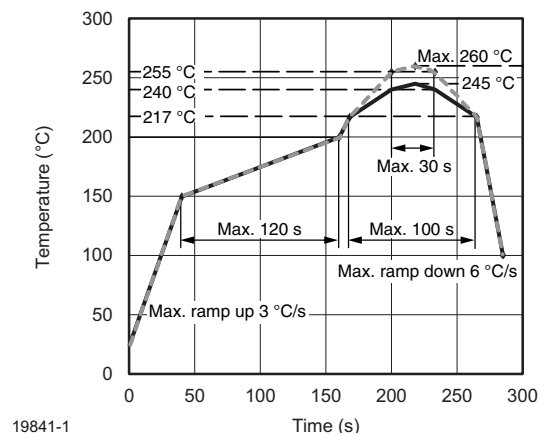
**SOLDER PROFILE**


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:

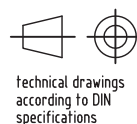
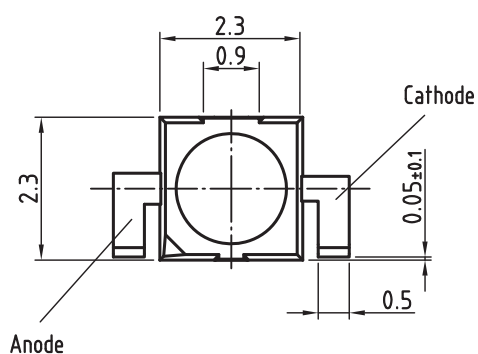
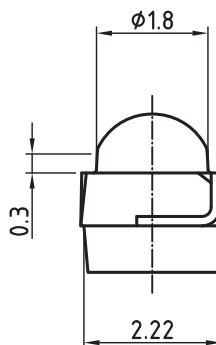
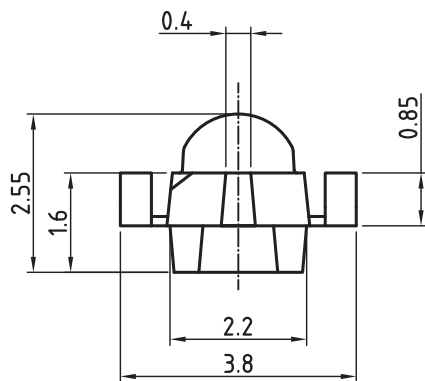
Floor life: 4 weeks

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

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

**DRYING**

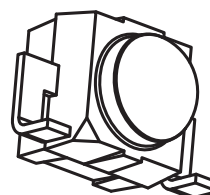
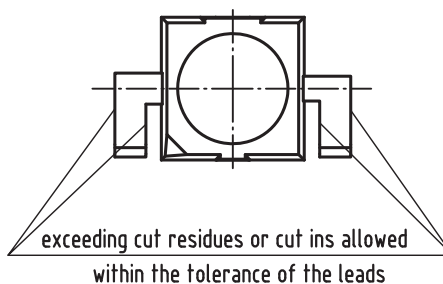
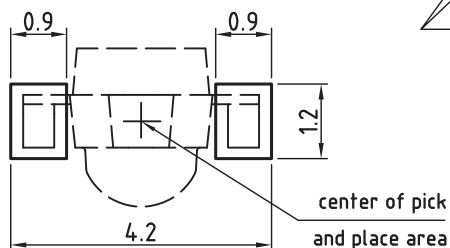
In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-020 or label. Devices taped on reel dry using recommended conditions 192 h at  $40\text{ }^{\circ}\text{C}$  (+ 5 °C), RH < 5 %.

**PACKAGE DIMENSIONS** in millimeters: **VSMY2853SL**


Dimensions in mm

Not indicated tolerances ±0.2

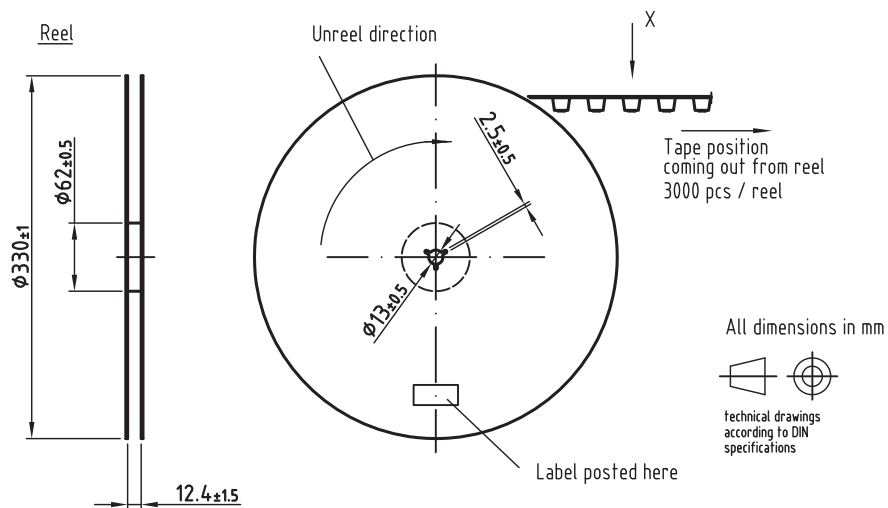
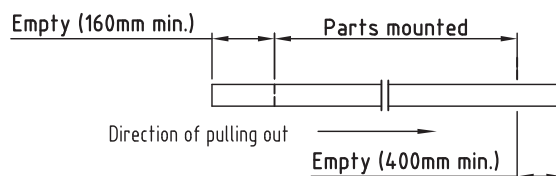
Solder pad proposal  
acc. IPC 7351



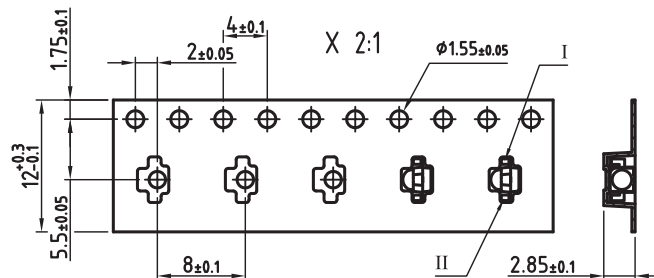
Drawing refers to following types: VSMY2853SL

Drawing-No.: 6.544-5410.03-4

Issue: prel. 03.08.12

**TAPING AND REEL DIMENSIONS** in millimeters: **VSMY2853SL**

Leader and trailer tape:

Terminal position in tape

Device	Lead I	Lead II
V SMB294.3SLX01	Cathode	Anode
V SMF2893SLX01		
V SMB294.8SL		
V EMD2023SLX01	Collector	Emitter
V EMD2523SLX01		
V EMT2023SLX01		
V EMT2523SLX01	Anode	Cathode
V SMY2853SL		



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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