

## High Speed Infrared Emitting Diodes, 890 nm, Surface Emitter Technology

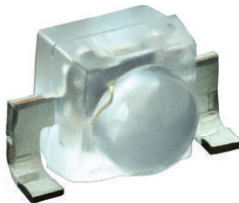
VSMY2893RGX01



VSMY2893GX01



VSMY2893SLX01



### FEATURES

- Package type: surface-mount
- Package form: GW, RGW, side view
- Dimensions (L x W x H in mm): 2.3 x 2.3 x 2.55
- AEC-Q101 qualified
- Peak wavelength:  $\lambda_p = 890$  nm
- Angle of half intensity:  $\phi = \pm 28^\circ$
- Suitable for high pulse current operation
- Terminal configurations: gullwing or reverse gullwing
- Package matches with detector VEMD2503X01 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)

 AUTOMOTIVE  
GRADE

**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)

### LINKS TO ADDITIONAL RESOURCES



### DESCRIPTION

As part of the [SurfLight™](#) portfolio, the VSMY2893 series are infrared, 890 nm emitting diodes 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

- Automotive sensors
- Optical switch
- Emitter source for proximity sensors
- IR illumination
- [Head-up displays](#)

### PRODUCT SUMMARY

COMPONENT	$I_e$ (mW/sr) at $I_F = 100$ mA	$\phi$ (°)	$\lambda_p$ (nm)	$t_r$ (ns)
VSMY2893RGX01	50	$\pm 28$	890	15
VSMY2893GX01	50	$\pm 28$	890	15
VSMY2893SLX01	50	$\pm 28$	890	15

#### Note

- Test conditions see table “Basic Characteristics“

### ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VSMY2893RGX01	Tape and reel	MOQ: 6000 pcs, 6000 pcs/reel	Reverse gullwing
VSMY2893GX01	Tape and reel	MOQ: 6000 pcs, 6000 pcs/reel	Gullwing
VSMY2893SLX01	Tape and reel	MOQ: 6000 pcs, 3000 pcs/reel	Side view

#### Note

- MOQ: minimum order quantity



ABSOLUTE MAXIMUM RATINGS (T <sub>amb</sub> = 25 °C, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Forward current		I <sub>F</sub>	100	mA
Peak forward current	t <sub>p</sub> /T = 0.5, t <sub>p</sub> = 100 μs	I <sub>FM</sub>	200	mA
Surge forward current	t <sub>p</sub> = 100 μs	I <sub>FSM</sub>	1	A
Power dissipation		P <sub>V</sub>	190	mW
Junction temperature		T <sub>J</sub>	100	°C
Operating temperature range		T <sub>amb</sub>	-40 to +85	°C
Storage temperature range		T <sub>stg</sub>	-40 to +100	°C
Soldering temperature	According to Fig. 9, J-STD-020	T <sub>sd</sub>	260	°C
Thermal resistance junction-to-ambient	JESD51	R <sub>thJA</sub>	250	K/W

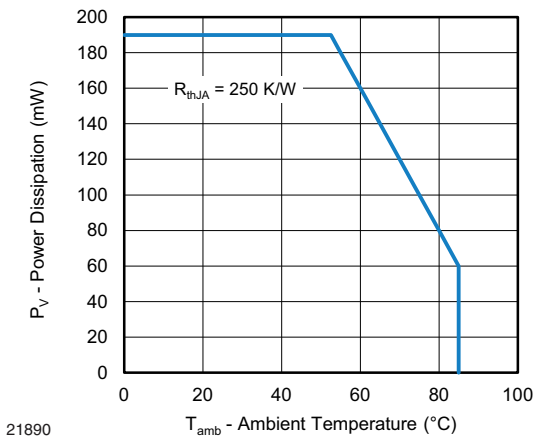


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

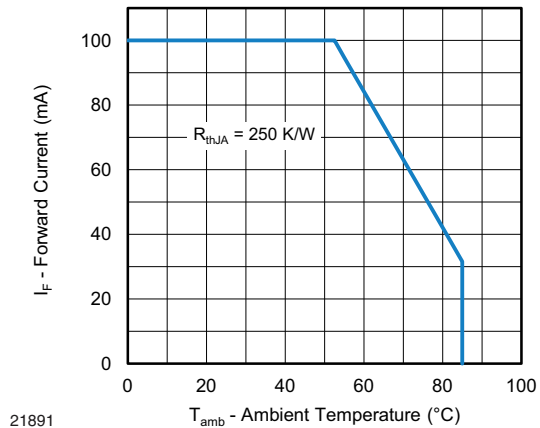


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS (T <sub>amb</sub> = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	I <sub>F</sub> = 100 mA, t <sub>p</sub> = 20 ms	V <sub>F</sub>	-	1.6	1.9	V
	I <sub>F</sub> = 1 A, t <sub>p</sub> = 100 μs	V <sub>F</sub>	-	2.8	-	V
Temperature coefficient of V <sub>F</sub>	I <sub>F</sub> = 100 mA	TK <sub>V<sub>F</sub></sub>	-	-2.0	-	mV/K
Reverse current		I <sub>R</sub>	Not designed for reverse operation			μA
Junction capacitance	V <sub>R</sub> = 0 V, f = 1 MHz, E = 0 mW/cm <sup>2</sup>	C <sub>J</sub>	-	60	-	pF
Radiant intensity	I <sub>F</sub> = 100 mA, t <sub>p</sub> = 20 ms	I <sub>e</sub>	27	50	75	mW/sr
	I <sub>F</sub> = 1 A, t <sub>p</sub> = 100 μs	I <sub>e</sub>	-	350	-	mW/sr
Radiant power	I <sub>F</sub> = 100 mA, t <sub>p</sub> = 20 ms	φ <sub>e</sub>	-	55	-	mW
Temperature coefficient of radiant power	I <sub>F</sub> = 100 mA	TK <sub>φ<sub>e</sub></sub>	-	-0.15	-	%/K
Angle of half intensity		φ	-	± 28	-	°
Peak wavelength	I <sub>F</sub> = 100 mA	λ <sub>p</sub>	870	890	910	nm
Spectral bandwidth	I <sub>F</sub> = 100 mA	Δλ	-	35	-	nm
Temperature coefficient of λ <sub>p</sub>	I <sub>F</sub> = 100 mA	TK <sub>λ<sub>p</sub></sub>	-	0.3	-	nm/K
Rise time	I <sub>F</sub> = 100 mA, 10 % to 90 %	t <sub>r</sub>	-	15	-	ns
Fall time	I <sub>F</sub> = 100 mA, 10 % to 90 %	t <sub>f</sub>	-	15	-	ns



## BASIC CHARACTERISTICS (T<sub>amb</sub> = 25 °C, unless otherwise specified)

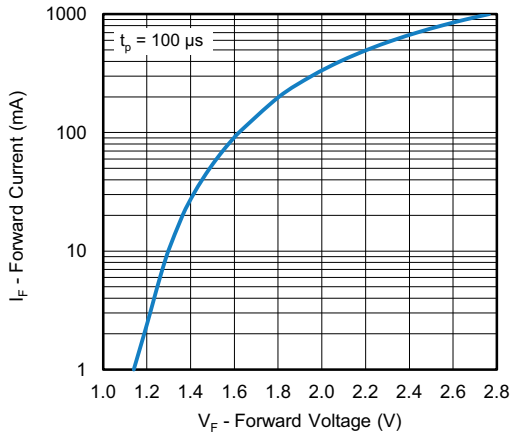


Fig. 3 - Forward Current vs. Forward Voltage

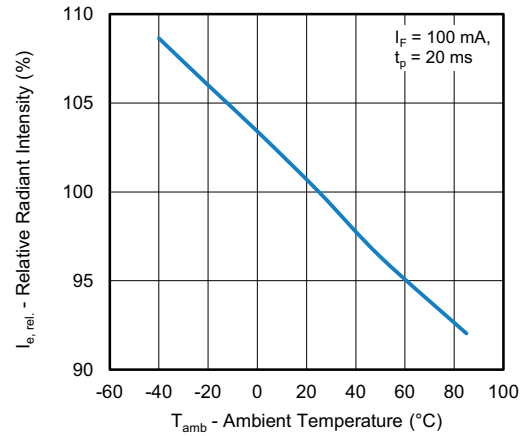


Fig. 6 - Relative Radiant Intensity vs. Ambient Temperature

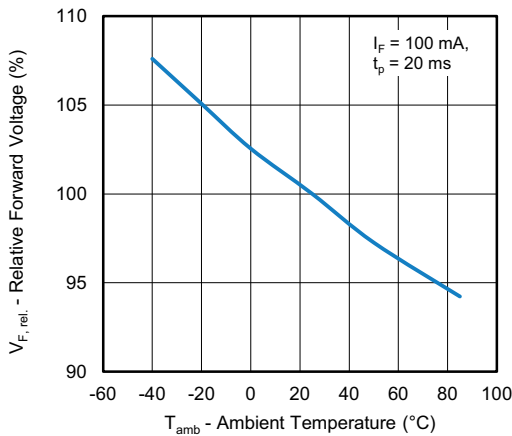


Fig. 4 - Relative Forward Voltage vs. Ambient Temperature

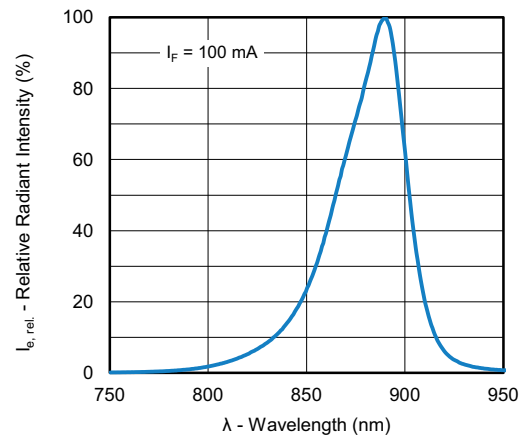


Fig. 7 - Relative Radiant Intensity vs. Wavelength

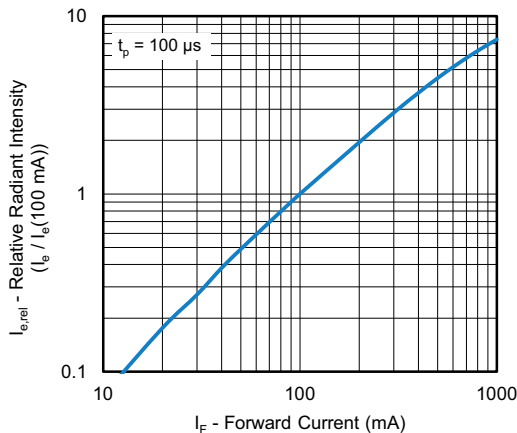


Fig. 5 - Relative Radiant Intensity vs. Forward Current

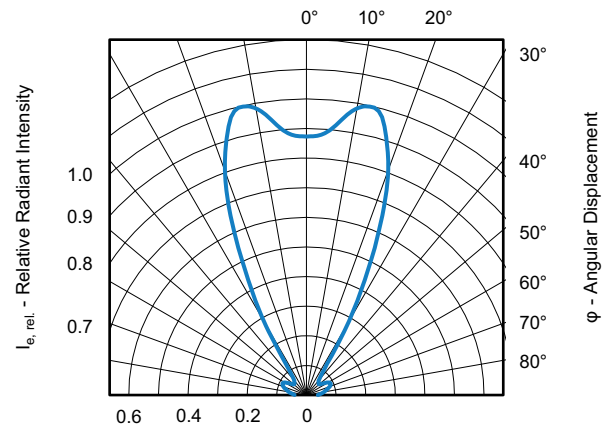
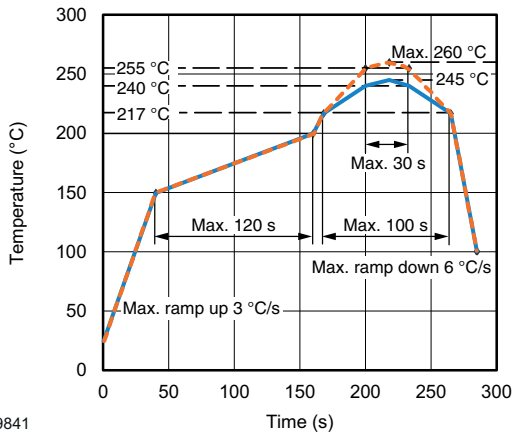


Fig. 8 - Relative Radiant Intensity vs. Angular Displacement



### SOLDER PROFILE



19841

Fig. 9 - 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:  $T_{amb} < 30\text{ °C}$ ,  $RH < 60\%$

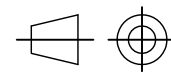
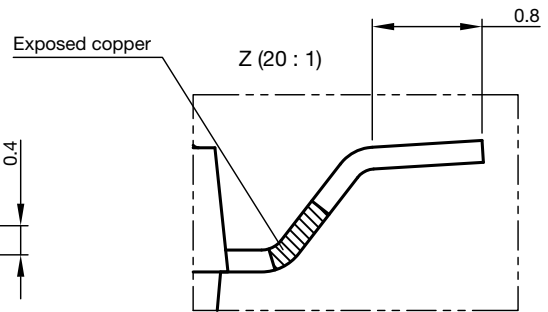
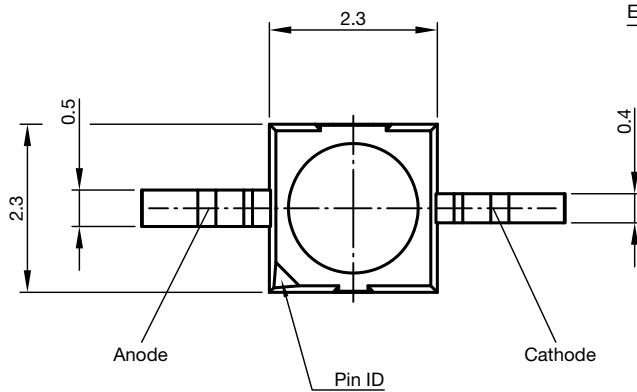
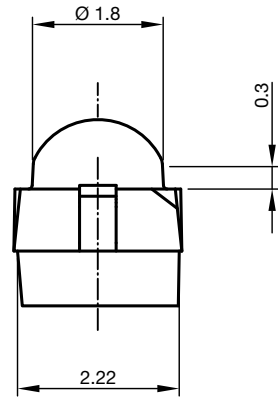
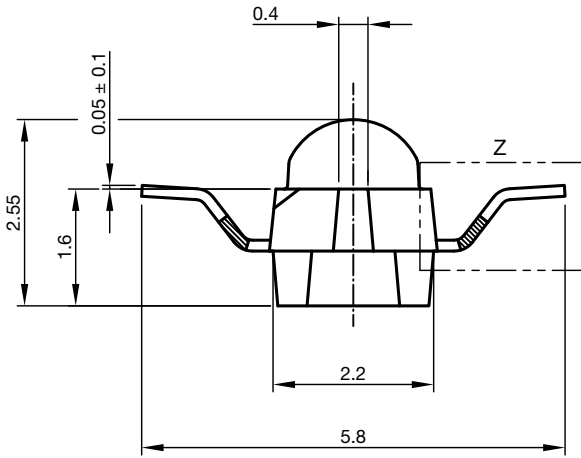
Moisture sensitivity level 2a, according to J-STD-020.

### DRYING

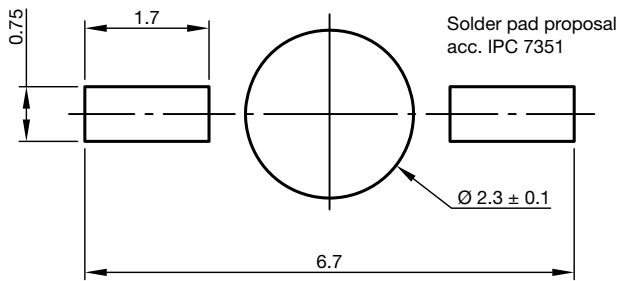
In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-033D or label. Devices taped on reel dry using recommended conditions 192 h at 40 °C (+ 5 °C),  $RH < 5\%$ .



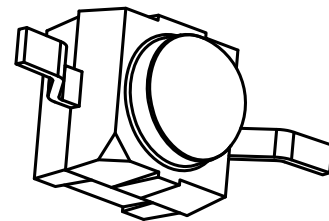
## PACKAGE DIMENSIONS in millimeters: VSMY2893RGX01



Technical drawings according to DIN specifications



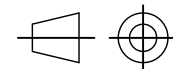
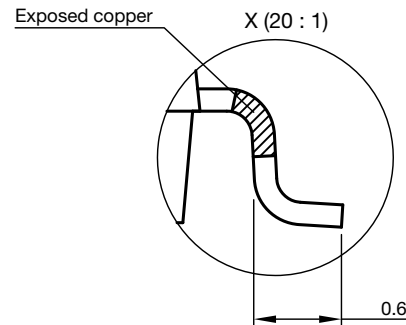
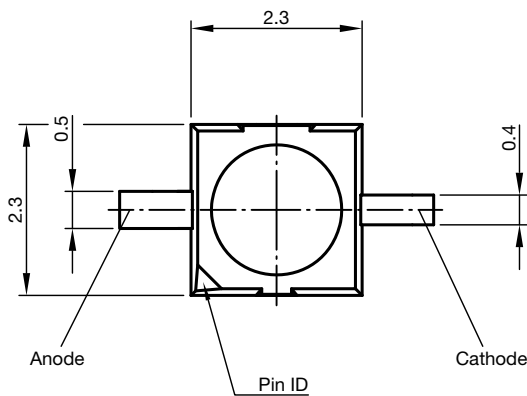
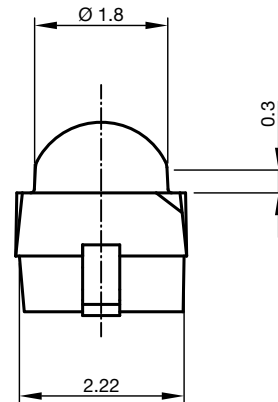
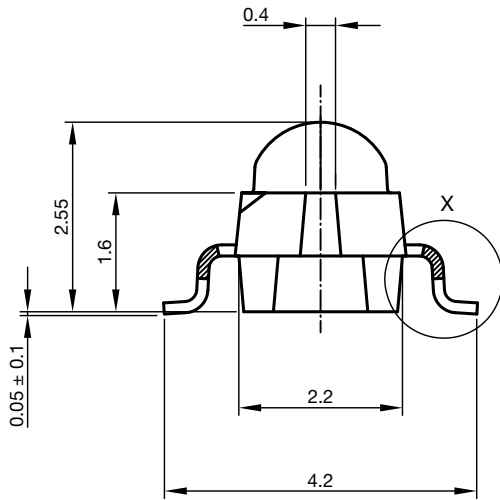
Not indicated tolerances ± 0.2



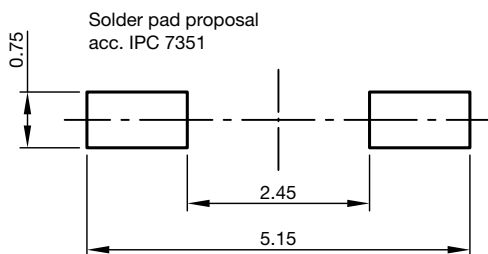
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Issue: 3; 02.10.15



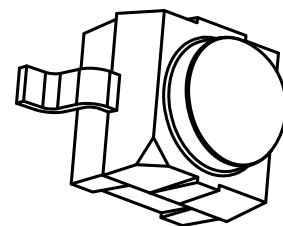
PACKAGE DIMENSIONS in millimeters: VSMY2893GX01



Technical drawings according to DIN specifications



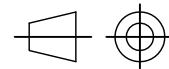
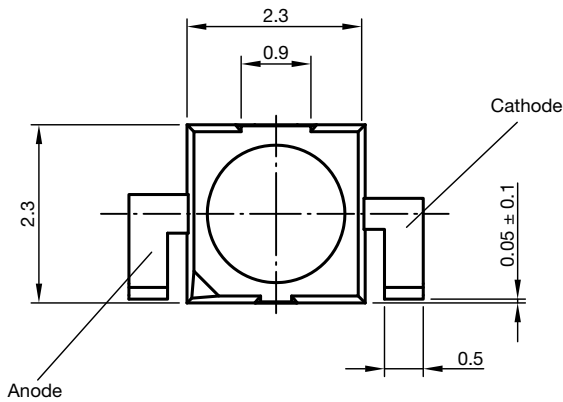
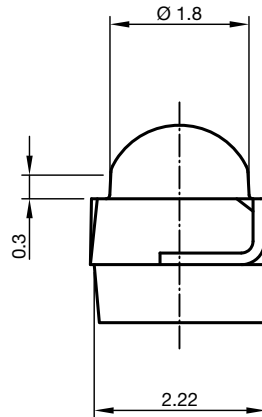
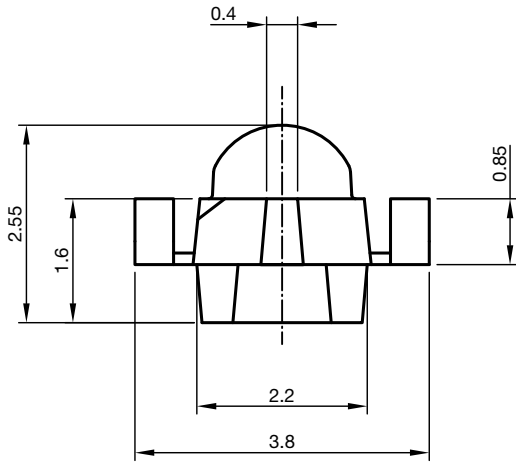
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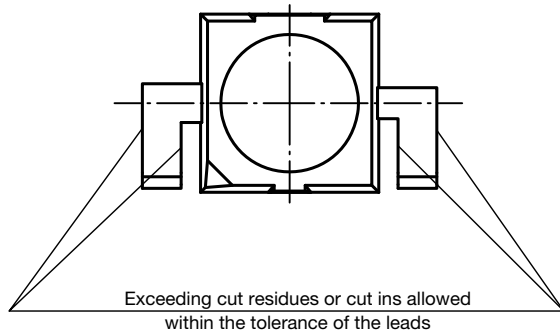


PACKAGE DIMENSIONS in millimeters: VSMY2893SLX01

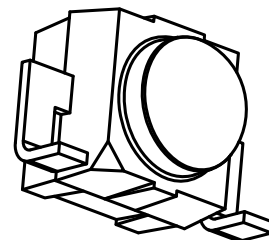
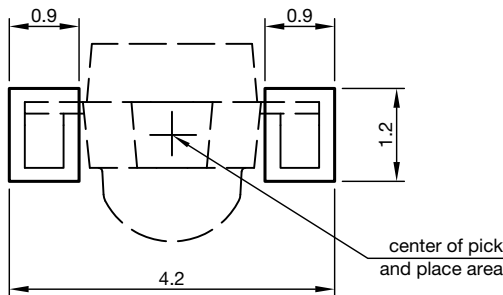


Technical drawings according to DIN specifications

Not indicated tolerances ± 0.2



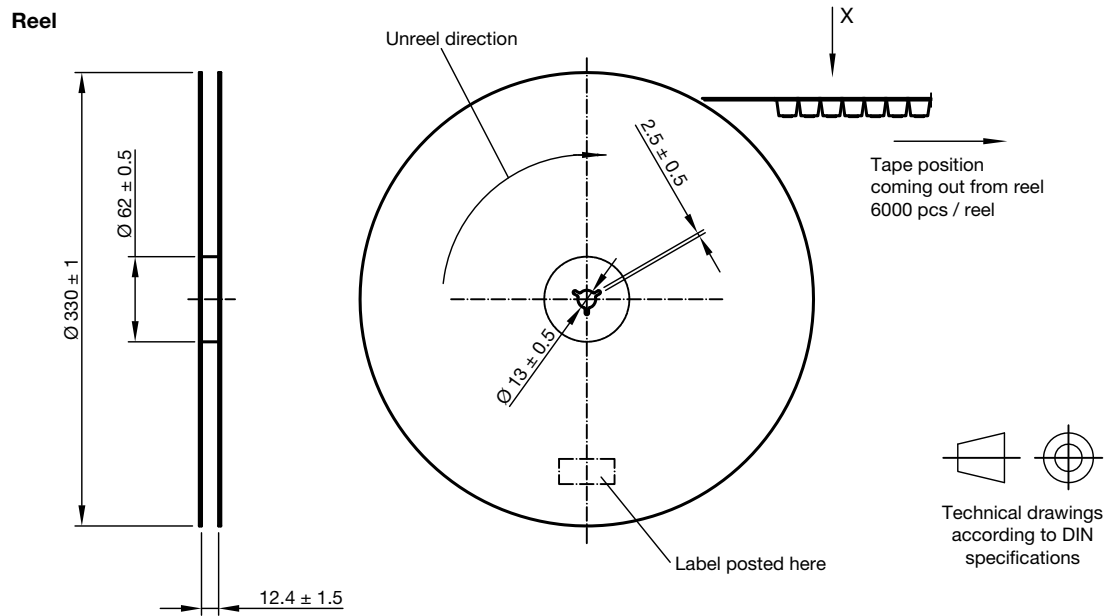
Solder pad proposal acc. IPC 7351



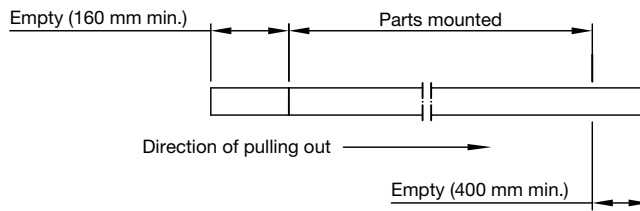
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Issue: 3; 02.10.15



**TAPING AND REEL DIMENSIONS** in millimeters: **VSMY2893RGX01**

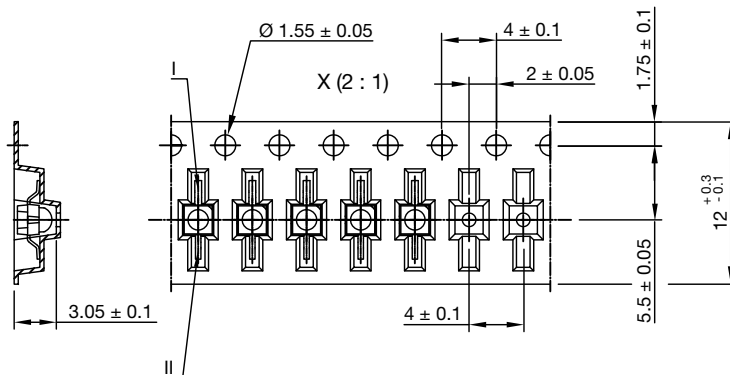


**Leader and trailer tape**



**Terminal position in tape**

Device	Lead I	Lead II
VSMB2943RGX01	Cathode	Anode
VSMF2893RGX01		
VEMD2x03X01	Collector	Emitter
VENT2x03X01		
VSMY2xxx	Anode	Cathode

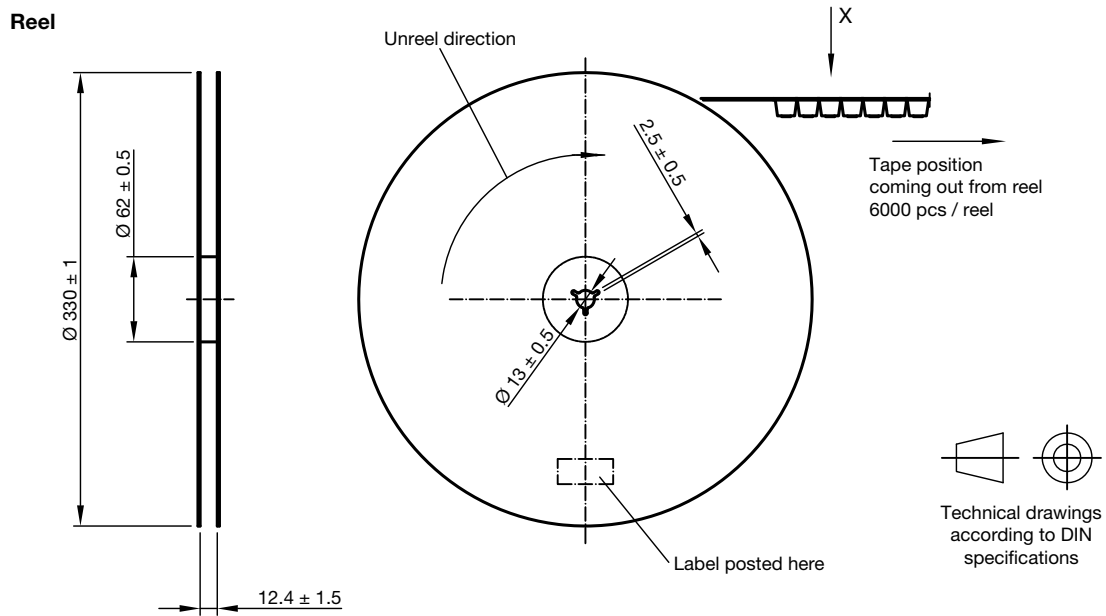


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Issue: prel.; 11.07.19

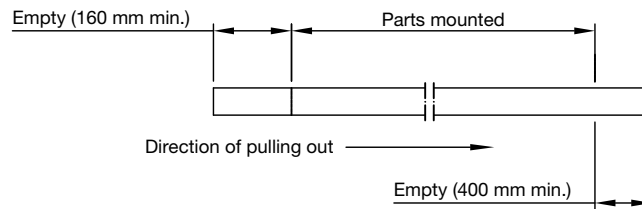




**TAPING AND REEL DIMENSIONS** in millimeters: **VSMY2893GX01**

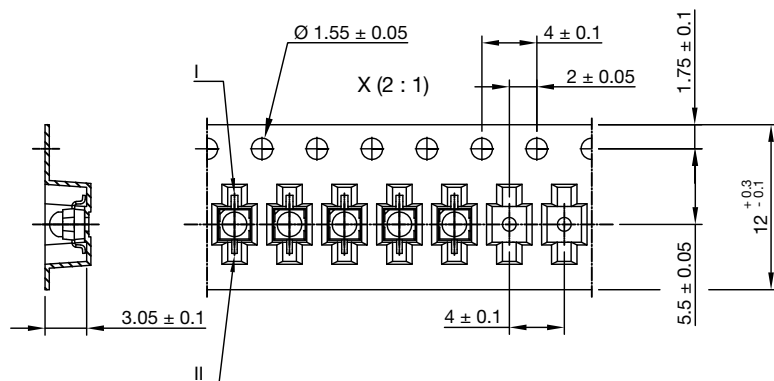


**Leader and trailer tape**



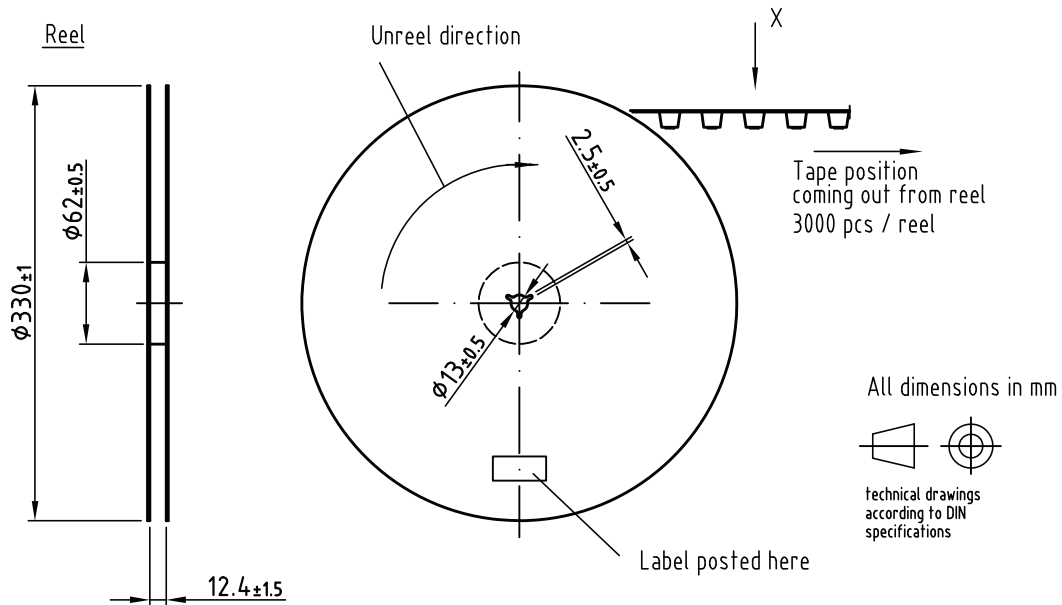
**Terminal position in tape**

Device	Lead I	Lead II
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VSMF2893GX01	Cathode	Anode
VEMD2x23X01		
VEMT2x23X01	Collector	Emitter
VSMY2xxx	Anode	Cathode

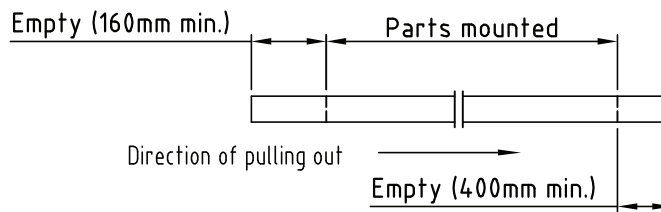


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Issue: prel.; 11.07.19

## TAPING AND REEL DIMENSIONS in millimeters: VSMY2893SLX01

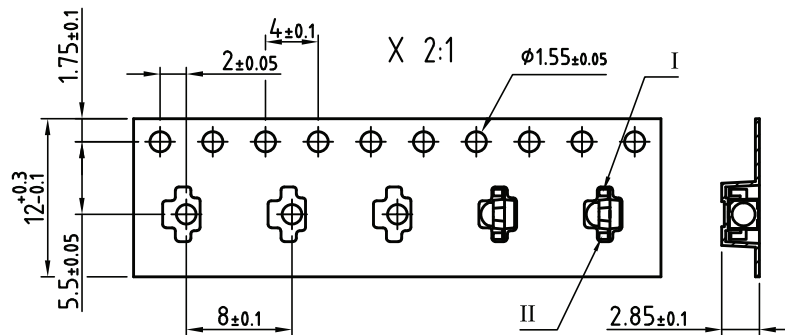


Leader and trailer tape:



Terminal position in tape

Device	Lead I	Lead II
VSMB2943SLX01	Cathode	Anode
VSMF2893SLX01		
V SMB2948SL		
VEMD2023SLX01		
VEMD2523SLX01	Collector	Emitter
VEMT2023SLX01		
VEMT2523SLX01	Anode	Cathode
VSMY2xxx		



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

Drawing-No.: 9.800-5123.01-4  
Issue: preliminary, 11.07.19



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