

## High Speed Infrared Emitting Diodes, 940 nm, Surface Emitter Technology

VSMY294310RG

VSMY294310G



### DESCRIPTION

As part of the [SurfLight™](#) portfolio, the VSMY294310 series are infrared, 940 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

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

### FEATURES

- Package type: surface mount
- Package form: GW, RGW
- Dimensions (L x W x H in mm): 2.3 x 2.3 x 2.55
- Peak wavelength:  $\lambda_p = 940$  nm
- High reliability
- High radiant power
- Very high radiant intensity
- Angle of half intensity:  $\phi = \pm 25^\circ$
- Suitable for high pulse current operation
- Terminal configurations: gullwing or reverse gullwing
- Package matches with detector VEMD2503X01 series
- Floor life: 4 weeks, MSL 2a, acc. 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)
VSMY294310RG	25	$\pm 25$	940	10
VSMY294310G	25	$\pm 25$	940	10

#### Note

- Test conditions see table "Basic Characteristics"

### ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VSMY294310RG	Tape and reel	MOQ: 6000 pcs, 6000 pcs/reel	Reverse gullwing
VSMY294310G	Tape and reel	MOQ: 6000 pcs, 6000 pcs/reel	Gullwing

#### Note

- MOQ: minimum order quantity



ABSOLUTE MAXIMUM RATINGS (T <sub>amb</sub> = 25 °C, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V <sub>R</sub>	5	V
Forward current		I <sub>F</sub>	70	mA
Surge forward current	t <sub>p</sub> = 100 μs	I <sub>FSM</sub>	1	A
Power dissipation		P <sub>V</sub>	140	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	Acc. figure 7, J-STD-020	T <sub>sd</sub>	260	°C
Thermal resistance junction/ambient	J-STD-051, soldered on PCB	R <sub>thJA</sub>	250	K/W

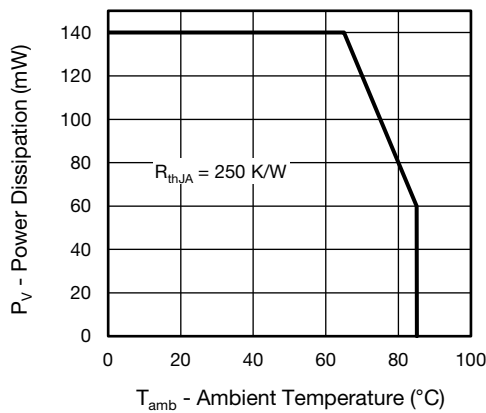


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

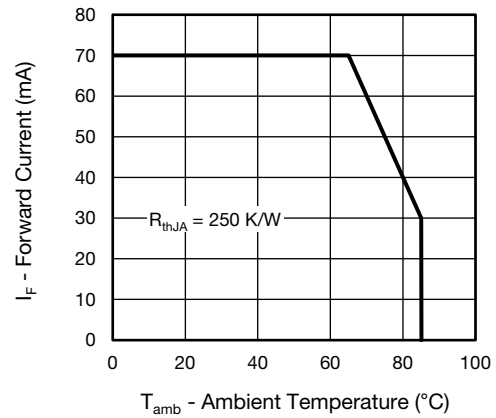


Fig. 2 - Forward Current Limit vs. Ambient Temperature

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> = 70 mA, t <sub>p</sub> = 20 ms	V <sub>F</sub>	-	1.5	2.0	V
	I <sub>F</sub> = 1 A, t <sub>p</sub> = 100 μs	V <sub>F</sub>	-	2.5	-	V
Temperature coefficient of V <sub>F</sub>	I <sub>F</sub> = 20 mA	TK <sub>V<sub>F</sub></sub>	-	-1.7	-	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>	-	5	-	pF
Radiant intensity	I <sub>F</sub> = 70 mA, t <sub>p</sub> = 20 ms	I <sub>e</sub>	12	25	45	mW/sr
	I <sub>F</sub> = 1 A, t <sub>p</sub> = 100 μs	I <sub>e</sub>	-	260	-	mW/sr
Radiant power	I <sub>F</sub> = 70 mA, t <sub>p</sub> = 20 ms	φ <sub>e</sub>	-	40	-	mW
Temperature coefficient of radiant power	I <sub>F</sub> = 70 mA	TK <sub>φ<sub>e</sub></sub>	-	-0.2	-	%/K
Angle of half intensity		φ	-	± 25	-	deg
Peak wavelength	I <sub>F</sub> = 20 mA	λ <sub>p</sub>	920	940	960	nm
Spectral bandwidth	I <sub>F</sub> = 20 mA	Δλ	-	35	-	nm
Temperature coefficient of λ <sub>p</sub>	I <sub>F</sub> = 20 mA	TKλ <sub>p</sub>	-	0.25	-	nm/K
Rise time	I <sub>F</sub> = 70 mA, 20 % to 80 %	t <sub>r</sub>	-	10	-	ns
Fall time	I <sub>F</sub> = 70 mA, 20 % to 80 %	t <sub>f</sub>	-	10	-	ns

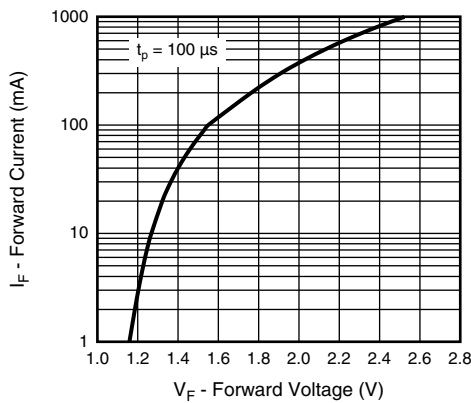
**BASIC CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)


Fig. 3 - Forward Current vs. Forward Voltage

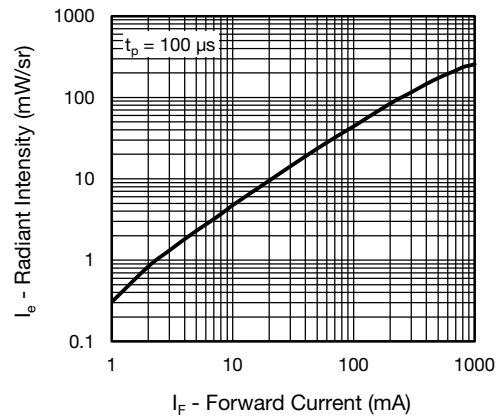


Fig. 6 - Radiant Intensity vs. Forward Current

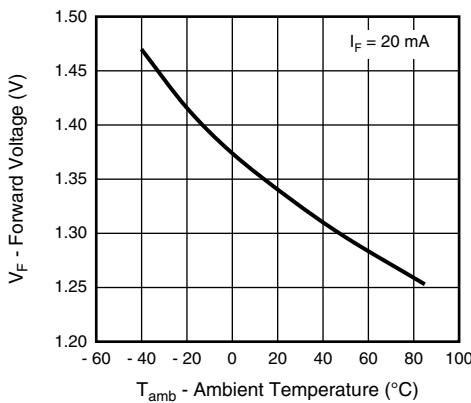


Fig. 4 - Forward Voltage vs. Ambient Temperature

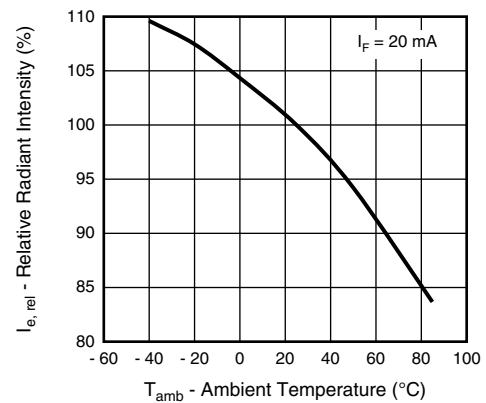


Fig. 7 - Relative Radiant Intensity vs. Ambient Temperature

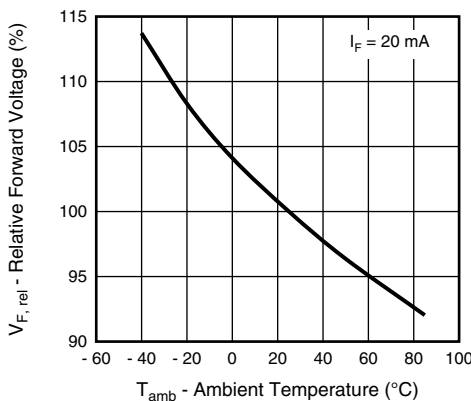


Fig. 5 - Relative Forward Voltage vs. Ambient Temperature

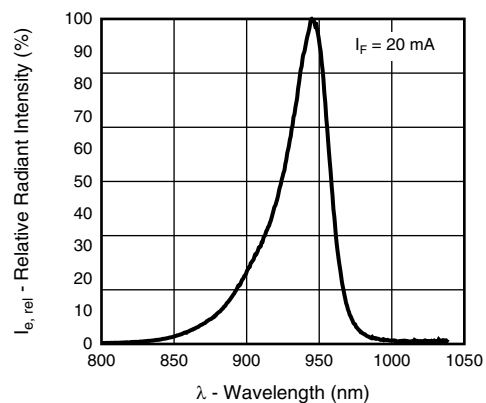


Fig. 8 - Relative Radiant Intensity vs. Wavelength

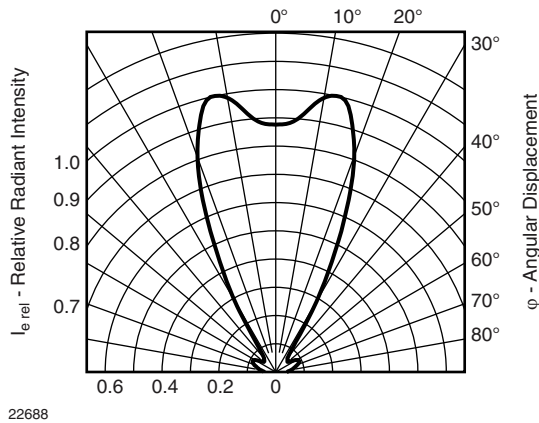


Fig. 9 - Relative Radiant Intensity vs. Angular Displacement

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

**SOLDER PROFILE**

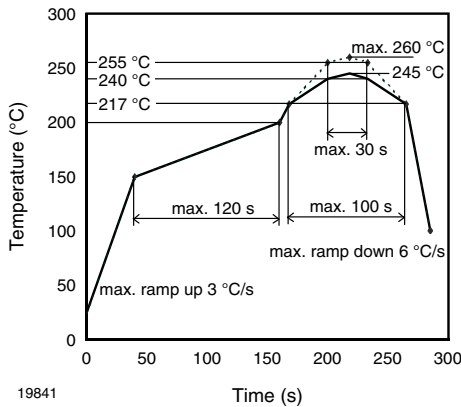
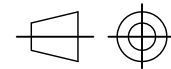
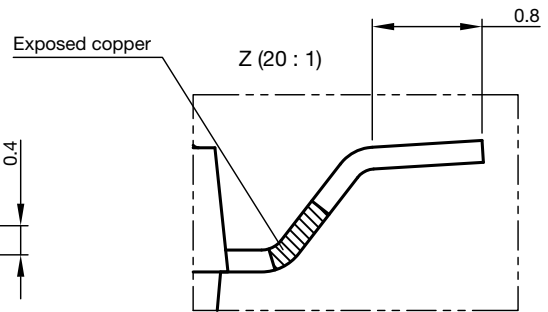
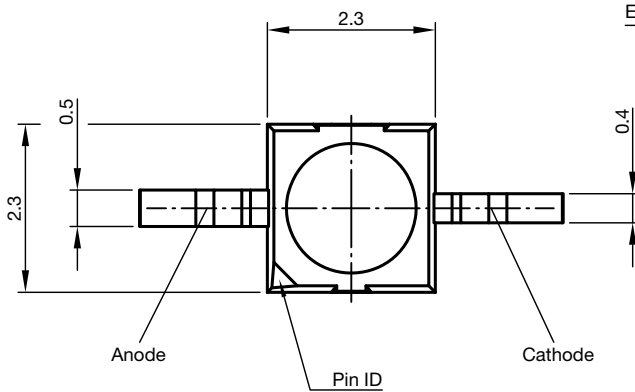
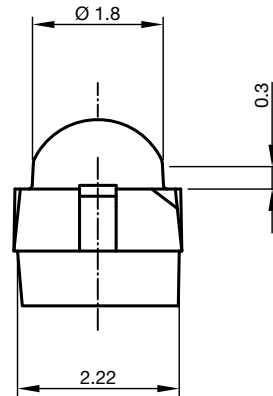
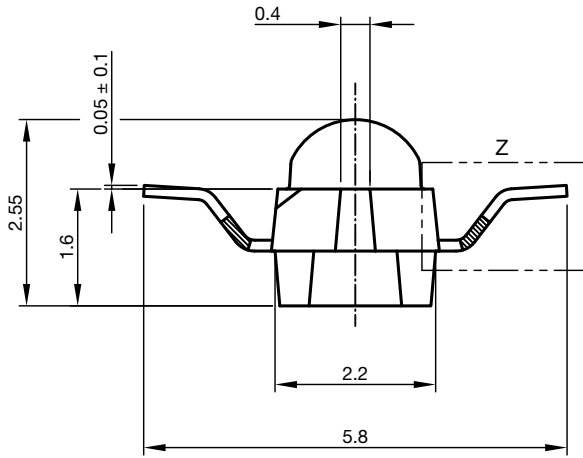


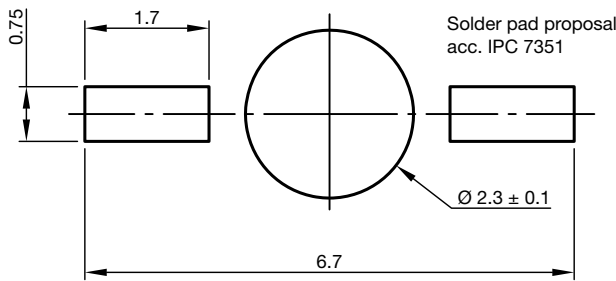
Fig. 10 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020



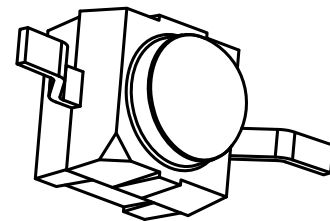
## PACKAGE DIMENSIONS in millimeters: VSMY294310RG



Technical drawings according to DIN specifications



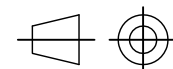
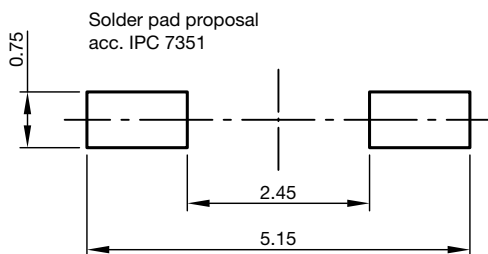
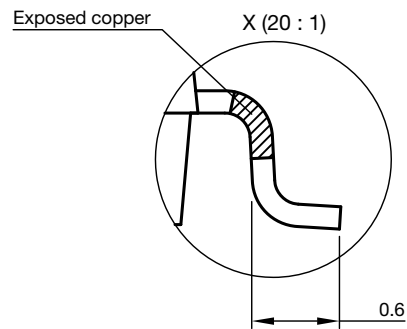
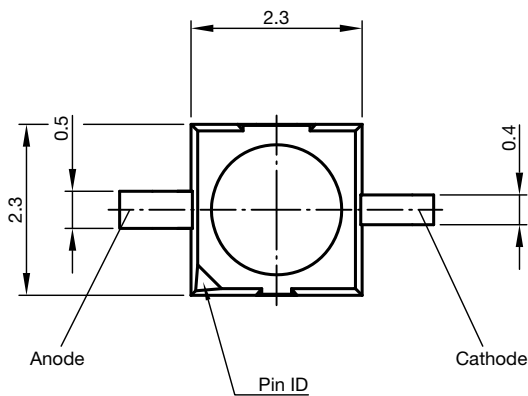
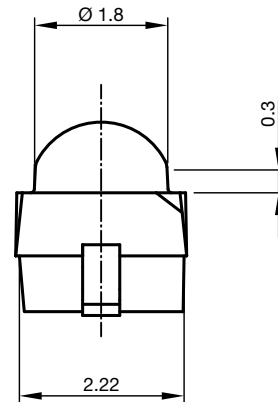
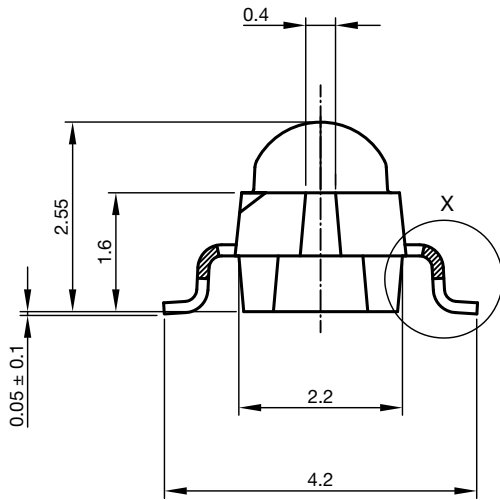
Not indicated tolerances ± 0.2



Drawing-No.: 6.544-5409.03-4  
Issue: 3; 02.10.15

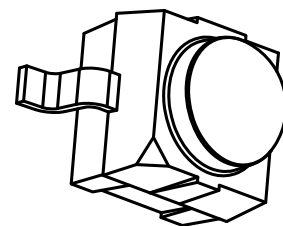


## PACKAGE DIMENSIONS in millimeters: VSMY294310G



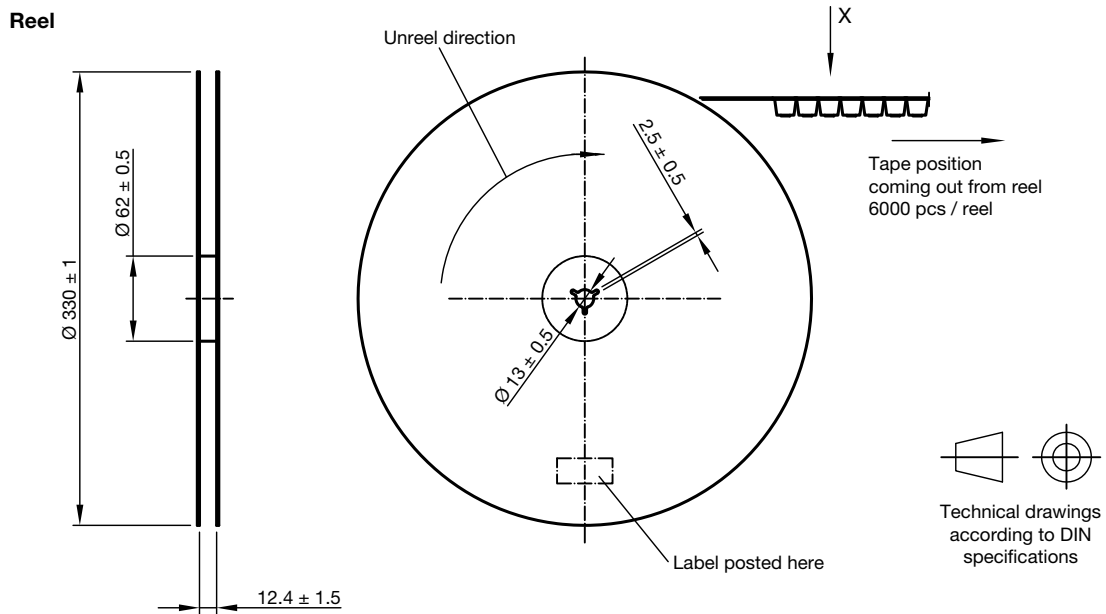
Technical drawings according to DIN specifications

Not indicated tolerances ± 0.2

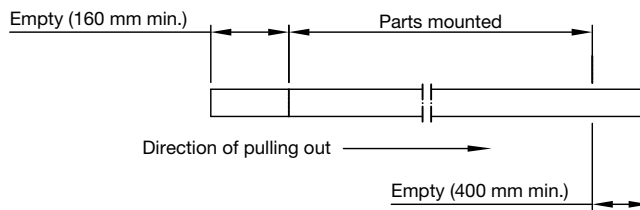


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## TAPING AND REEL DIMENSIONS in millimeters: VSMY294310RG

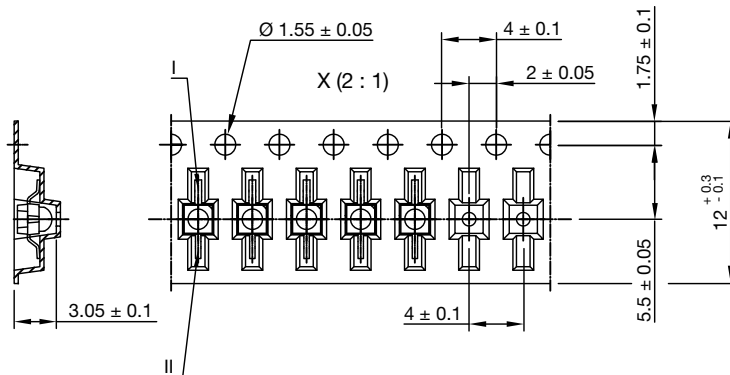


### Leader and trailer tape



### Terminal position in tape

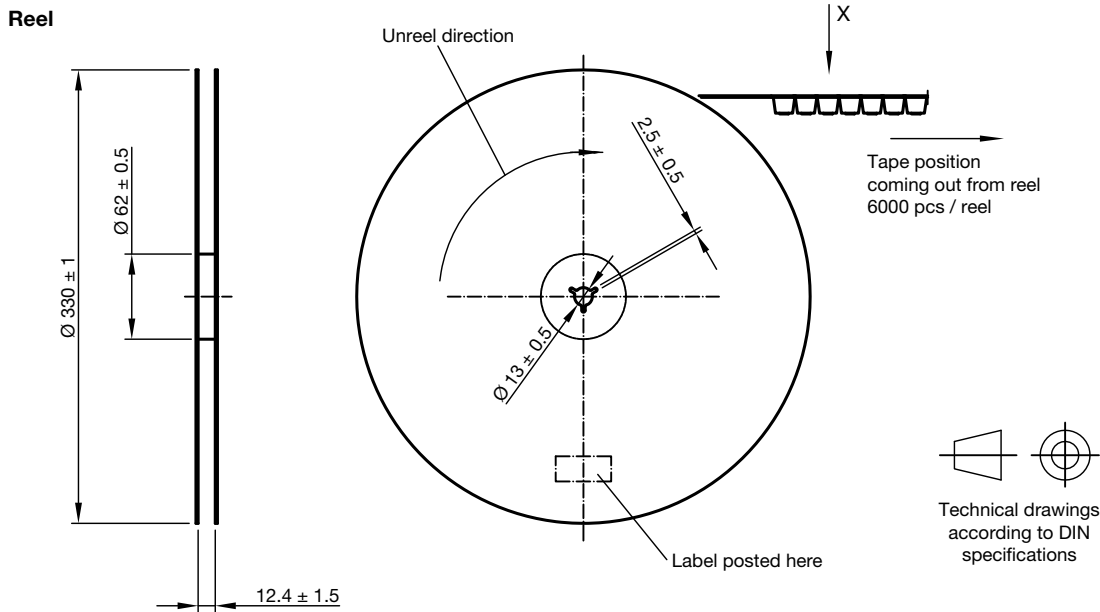
Device	Lead I	Lead II
VSMB2943RGX01	Cathode	Anode
VSMF2893RGX01		
VEMD2x03X01	Collector	Emitter
VEMT2x03X01		
VSMY2853RG	Anode	Cathode
VSMY2943RG		
VSMY294310RG		



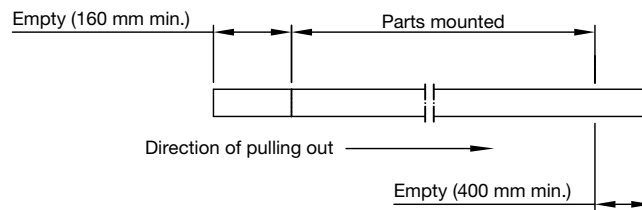
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Issue: 3; 02.10.15

## TAPING AND REEL DIMENSIONS in millimeters: VSMY294310G

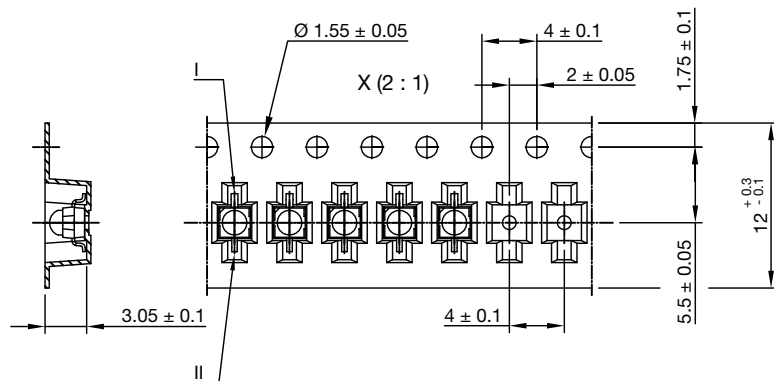


### Leader and trailer tape



### Terminal position in tape

Device	Lead I	Lead II
VSMB2943GX01	Cathode	Anode
VSMF2893GX01		
VEMD2x23X01	Collector	Emitter
VEMT2x23X01		
VSMY2853G	Anode	Cathode
VSMY2943G		
VSMY294310G		



Drawing-No.: 9.800-5091.21-4

Issue: 3; 02.10.15





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