



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

VSMY2890RGX01



VSMY2890GX01



### DESCRIPTION

As part of the [SurfLight™](#) portfolio, the VSMY2890 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
- Photointerrupters
- 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 2.8
- AEC-Q101 qualified
- Peak wavelength:  $\lambda_p = 890 \text{ nm}$
- Angle of half intensity:  $\phi = \pm 10^\circ$
- Suitable for high pulse current operation
- Terminal configurations: gullwing or reverse gullwing
- Package matches with detector VEMD2500X01 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)

PRODUCT SUMMARY				
COMPONENT	$I_e$ (mW/sr) at $I_F = 100 \text{ mA}$	$\phi$ (°)	$\lambda_p$ (nm)	$t_r$ (ns)
VSMY2890RGX01	135	$\pm 10$	890	15
VSMY2890GX01	135	$\pm 10$	890	15

#### Note

- Test conditions see table "Basic Characteristics"

ORDERING INFORMATION			
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VSMY2890RGX01	Tape and reel	MOQ: 6000 pcs, 6000 pcs/reel	Reverse gullwing
VSMY2890GX01	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
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

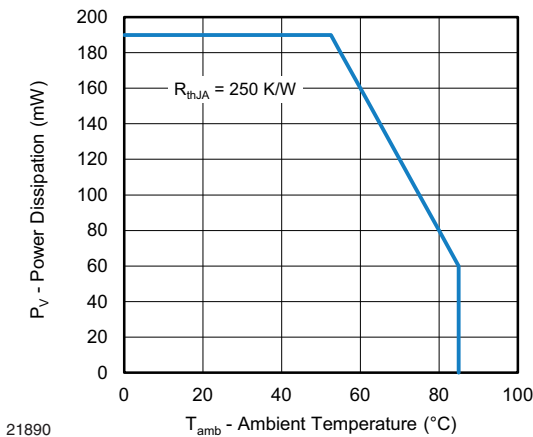


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

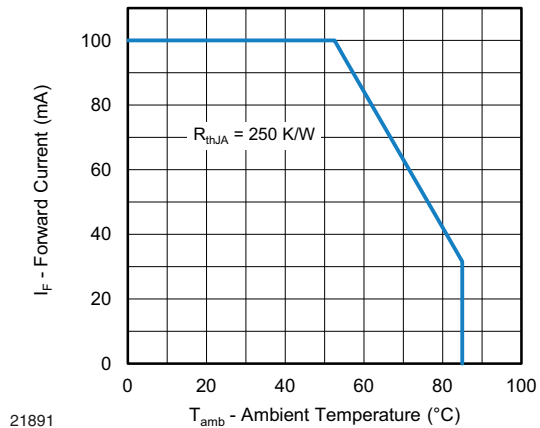


Fig. 2 - Forward Current Limit vs. Ambient Temperature

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>	-	1.7	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>	50	135	175	mW/sr
	I <sub>F</sub> = 1 A, t <sub>p</sub> = 100 μs	I <sub>e</sub>	-	1000	-	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>	-	-0.12	-	%/K
Angle of half intensity		φ	-	± 10	-	°
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)

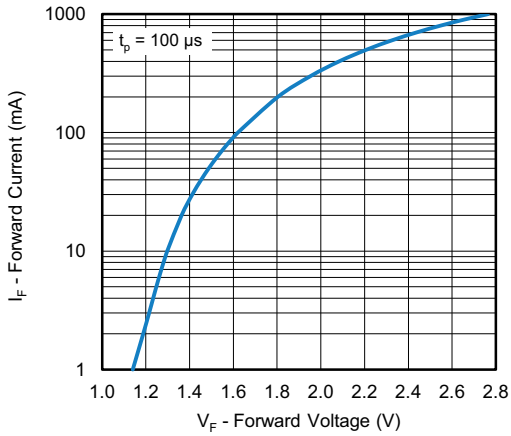


Fig. 3 - Forward Current vs. Forward Voltage

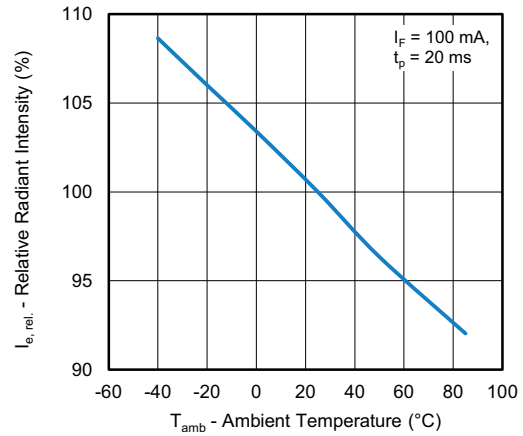


Fig. 6 - Relative Radiant Intensity vs. Ambient Temperature

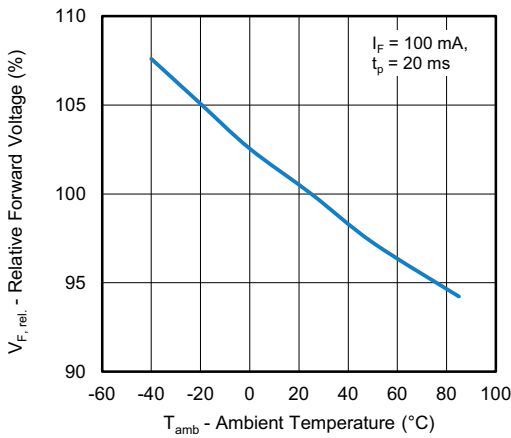


Fig. 4 - Relative Forward Voltage vs. Ambient Temperature

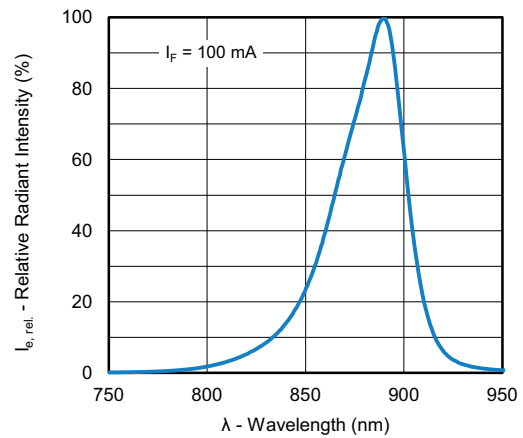


Fig. 7 - Relative Radiant Intensity vs. Wavelength

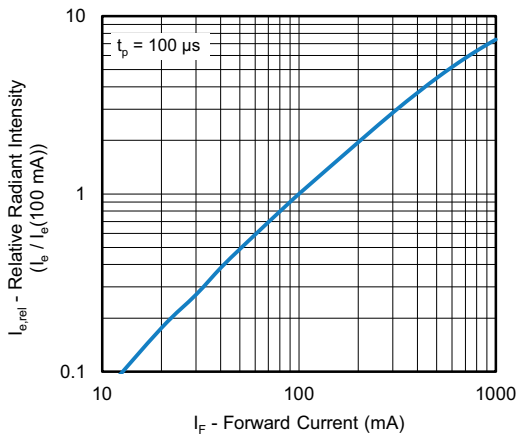


Fig. 5 - Relative Radiant Intensity vs. Forward Current

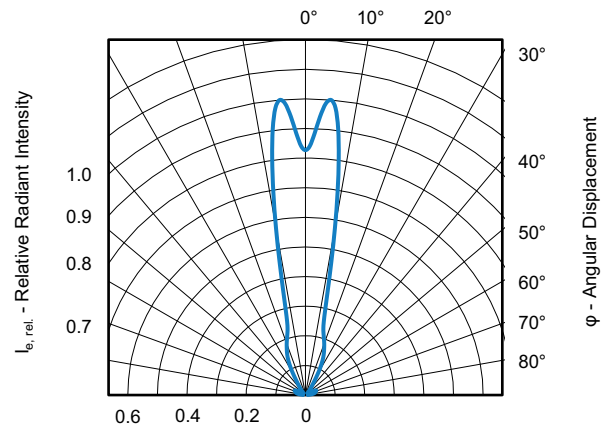
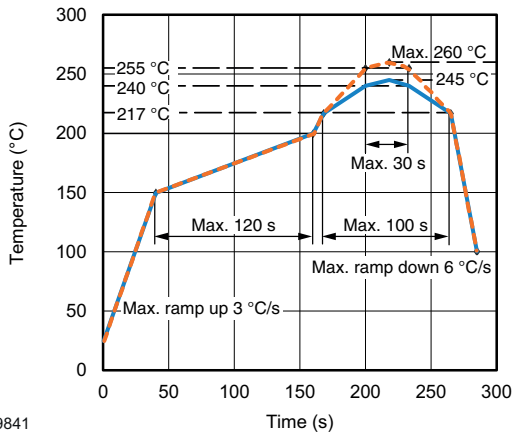


Fig. 8 - Relative Radiant Intensity vs. Angular Displacement



## 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:  $T_{amb} < 30\text{ °C}$ ,  $RH < 60\%$

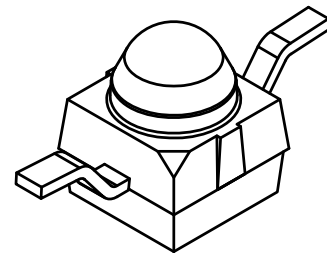
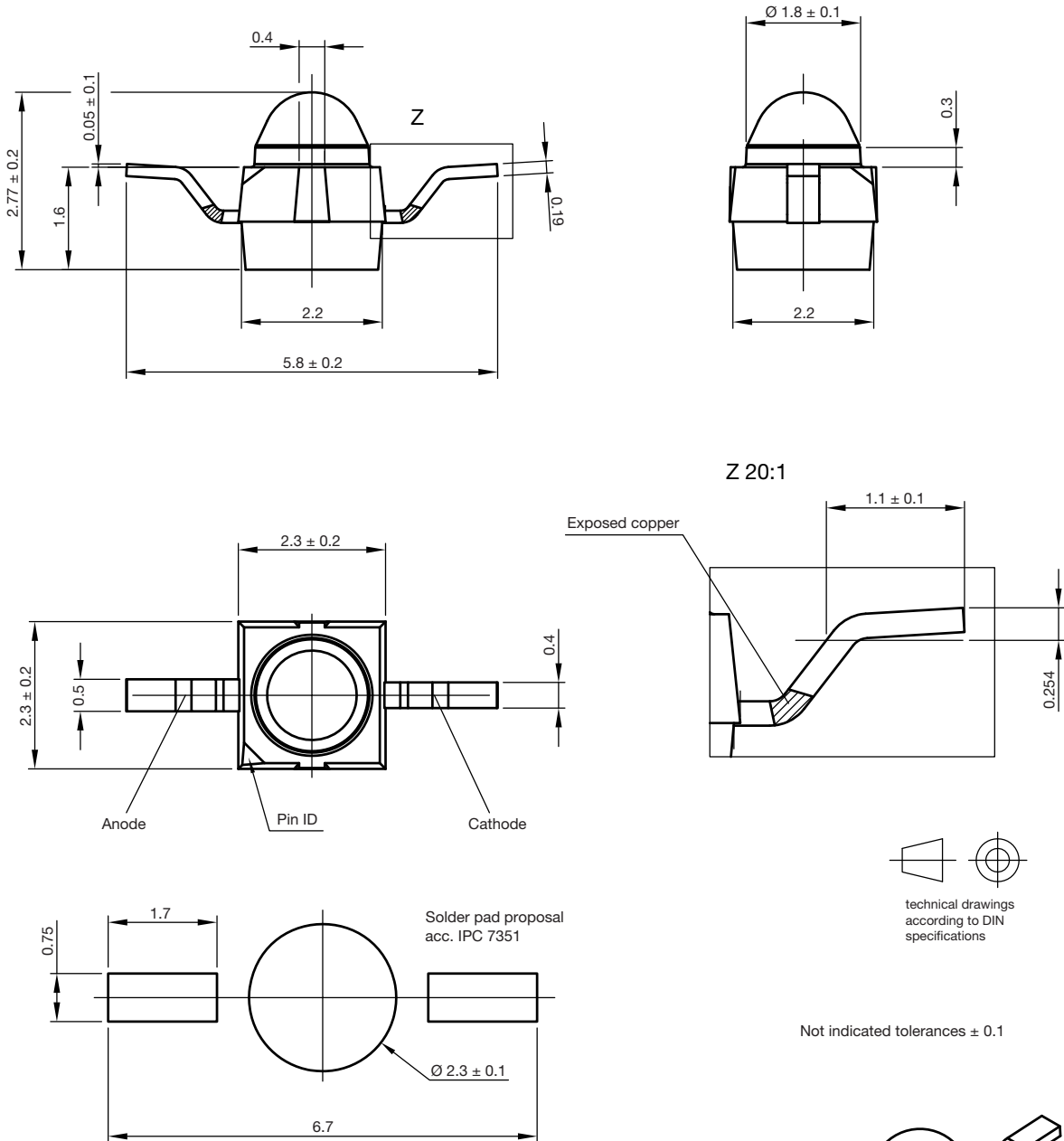
Moisture sensitivity level 2a, according to J-STD-020.

## 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: VSMY2890RGX01



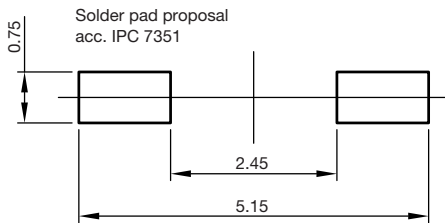
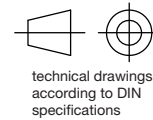
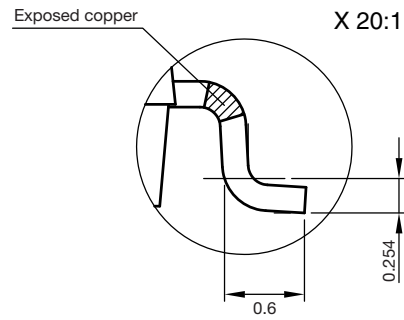
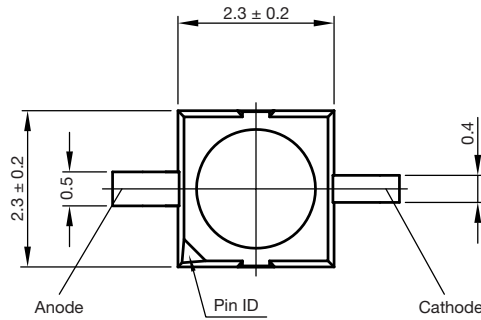
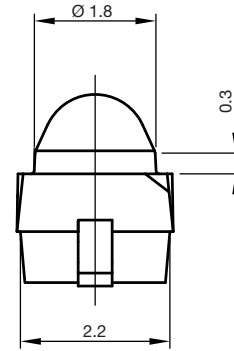
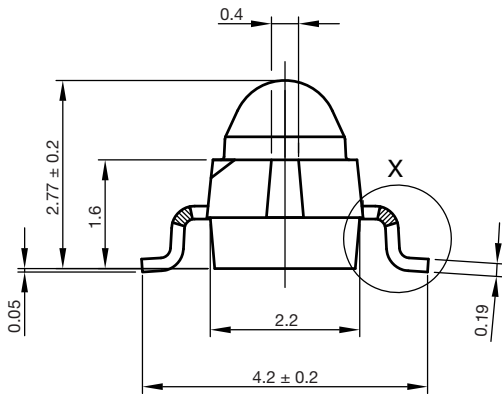
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Issue: 1; 18.03.10

22100

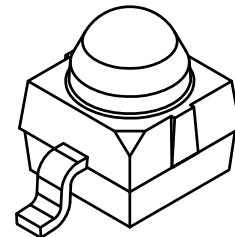


## PACKAGE DIMENSIONS in millimeters: VSMY2890GX01

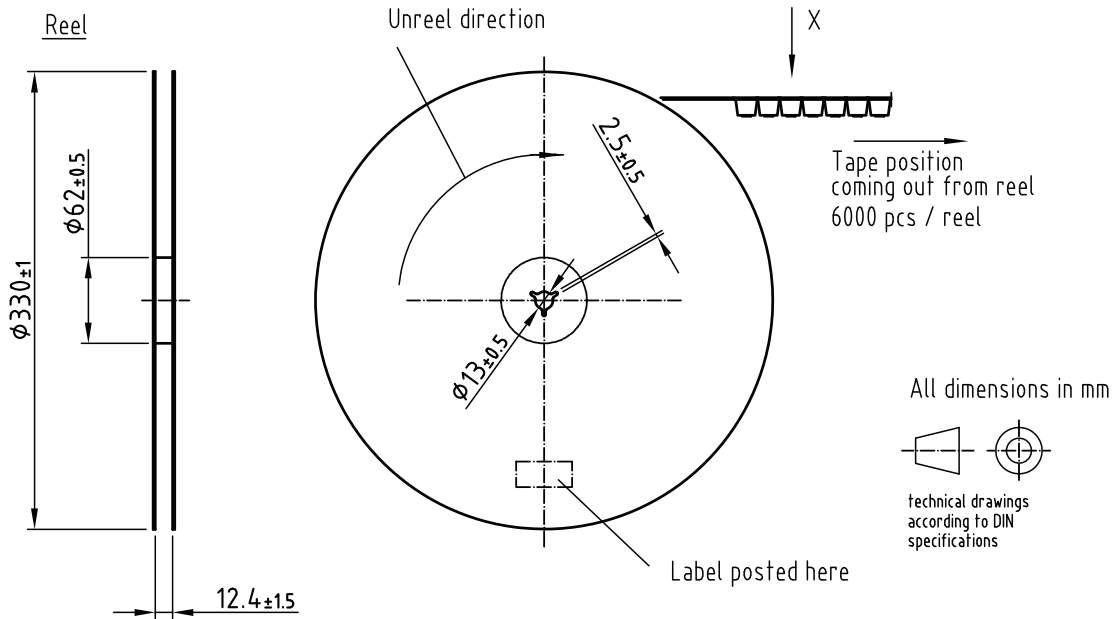


Not indicated tolerances ± 0.1

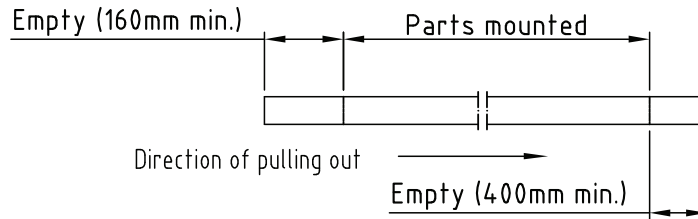
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Issue: 1; 18.03.10  
22099



## TAPING AND REEL DIMENSIONS in millimeters: VSMY2890RGX01

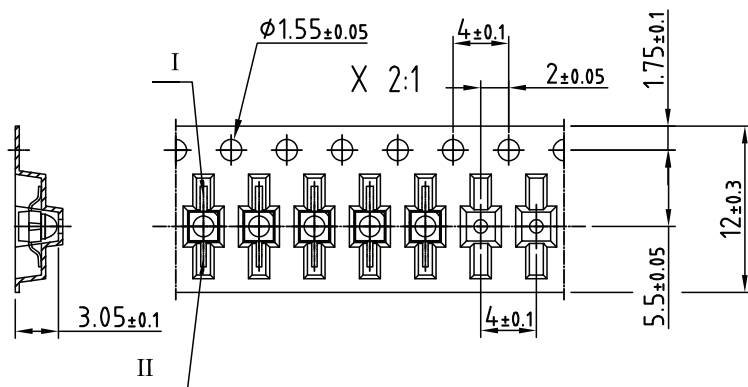


### Leader and trailer tape:



### Terminal position in tape

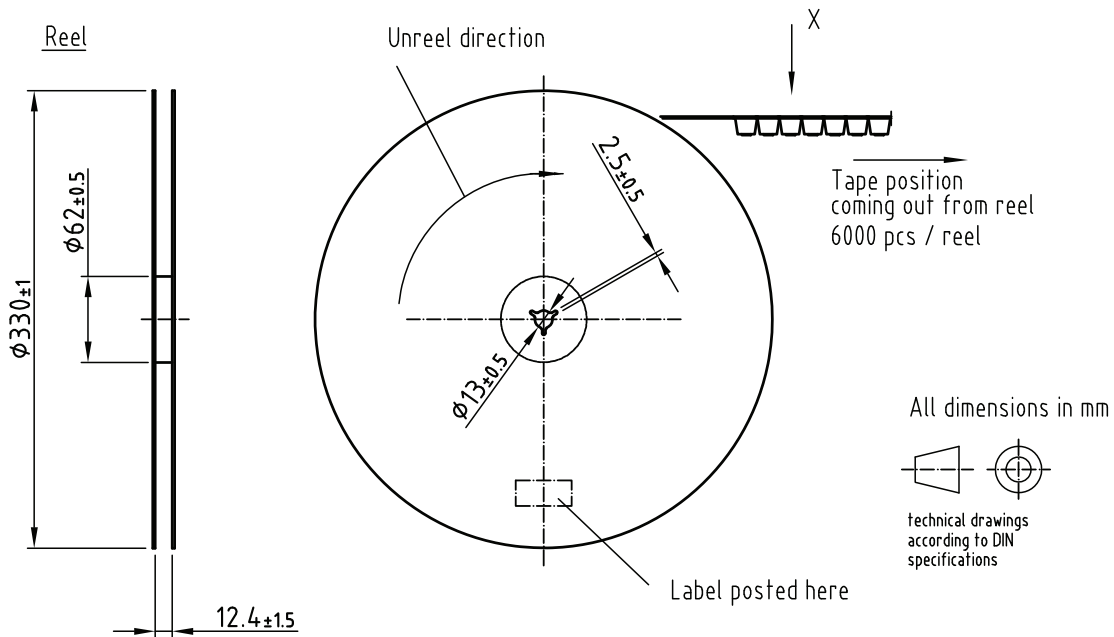
Device	Lead I	Lead II
VEMT 2000	Collector	Emitter
VEMT 2500		
VEMD 2000	Cathode	Anode
VEMD 2500		
VSMB 2000		
VSMG 2000		
VSMF 2890 RG	Anode	Cathode
VSMB 294008 RG		
VSMY 2xxx		
VSMF 288011 RG		



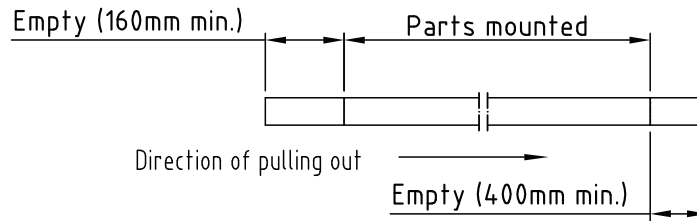
Drawing refers to following types: see table  
Reel dimensions and tape

Drawing-No.: 9.800-5100.01-4  
Issue: preliminary, 11.07.19

## TAPING AND REEL DIMENSIONS in millimeters: VSMY2890GX01

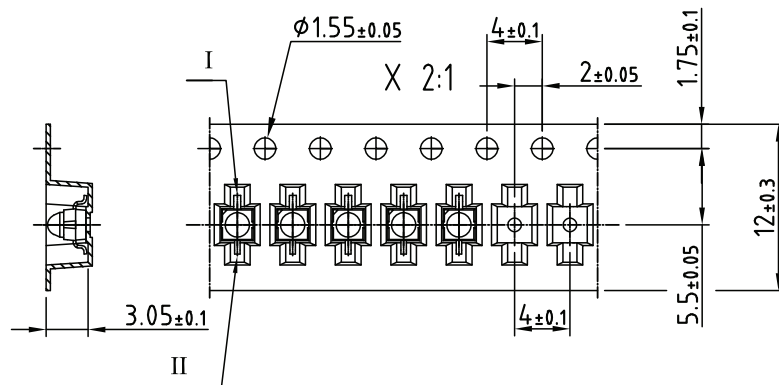


### Leader and trailer tape:



### Terminal position in tape

Device	Lead I	Lead II
VSMB 2020	Cathode	Anode
VSMG 2020		
VEMD 2020		
VEMD 2520		
VSMF 2890 G	Collector	Emitter
VSMB 294008 G		
VEMT 2020	Anode	Cathode
VEMT 2520		
VSMY 2xxx		
VSMF 288011 G		



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

Drawing-No.: 9.800-5091.01-4  
Issue: preliminary, 11.07.19





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