

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

VSMY2890RGX01



VSMY2890GX01



### LINKS TO ADDITIONAL RESOURCES



### 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).

### 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:  $\lambda_p = 890$  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)

### APPLICATIONS

- Automotive sensors
- Photointerrupters
- 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)
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** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
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. 9, J-STD-020	$T_{sd}$	260	$^{\circ}\text{C}$
Thermal resistance junction-to-ambient	JESD51	$R_{thJA}$	250	K/W

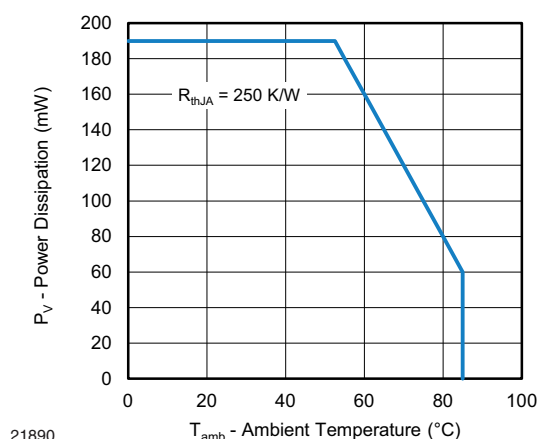


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

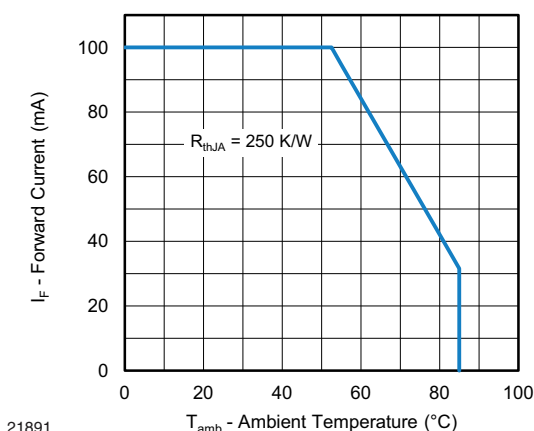


Fig. 2 - Forward Current Limit vs. Ambient Temperature

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

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$V_F$	-	1.7	1.9	V
	$I_F = 1\text{ A}$ , $t_p = 100\text{ }\mu\text{s}$	$V_F$	-	2.8	-	V
Temperature coefficient of $V_F$	$I_F = 100\text{ mA}$	$TK_{VF}$	-	-2.0	-	mV/K
Reverse current		$I_R$	Not designed for reverse operation			$\mu\text{A}$
Junction capacitance	$V_R = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0\text{ mW/cm}^2$	$C_J$	-	60	-	pF
Radiant intensity	$I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$I_e$	50	135	175	mW/sr
	$I_F = 1\text{ A}$ , $t_p = 100\text{ }\mu\text{s}$	$I_e$	-	1000	-	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		$\varphi$	-	$\pm 10$	-	$^{\circ}$
Peak wavelength	$I_F = 100\text{ mA}$	$\lambda_p$	870	890	910	nm
Spectral bandwidth	$I_F = 100\text{ mA}$	$\Delta\lambda$	-	35	-	nm
Temperature coefficient of $\lambda_p$	$I_F = 100\text{ mA}$	$TK_{\lambda_p}$	-	0.3	-	nm/K
Rise time	$I_F = 100\text{ mA}$ , 10 % to 90 %	$t_r$	-	15	-	ns
Fall time	$I_F = 100\text{ mA}$ , 10 % to 90 %	$t_f$	-	15	-	ns



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

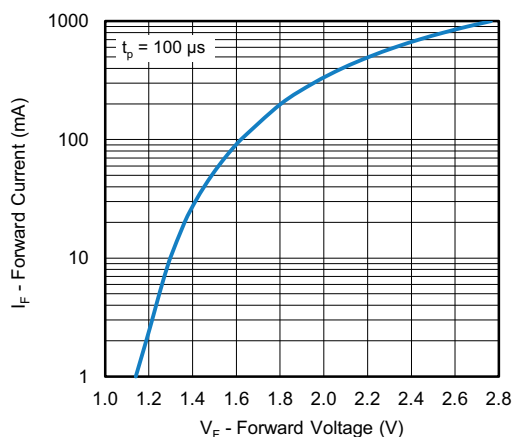


Fig. 3 - Forward Current vs. Forward Voltage

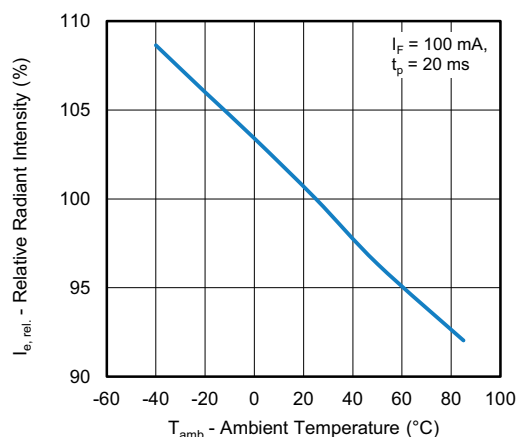


Fig. 6 - Relative Radiant Intensity vs. Ambient Temperature

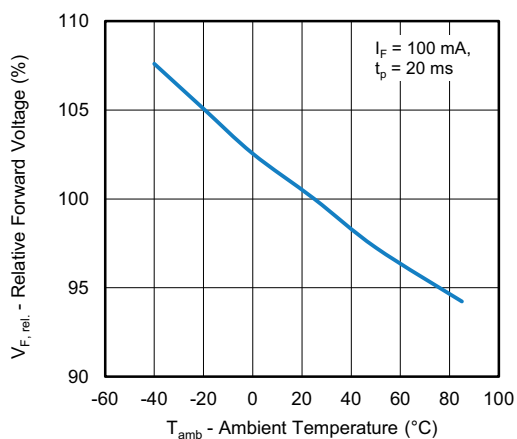


Fig. 4 - Relative Forward Voltage vs. Ambient Temperature

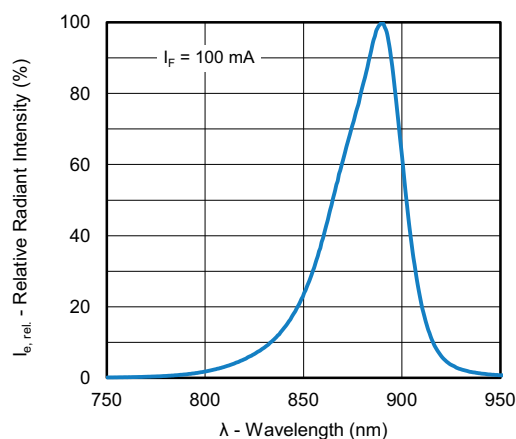


Fig. 7 - Relative Radiant Intensity vs. Wavelength

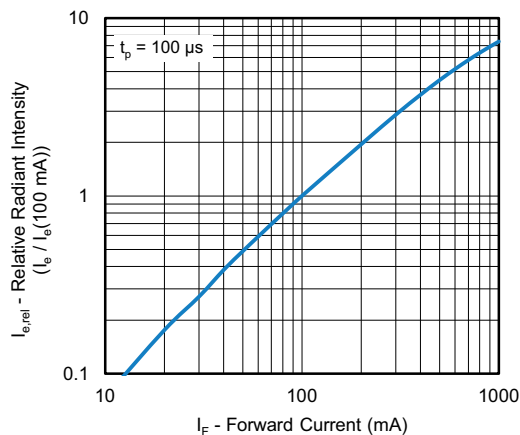


Fig. 5 - Relative Radiant Intensity vs. Forward Current

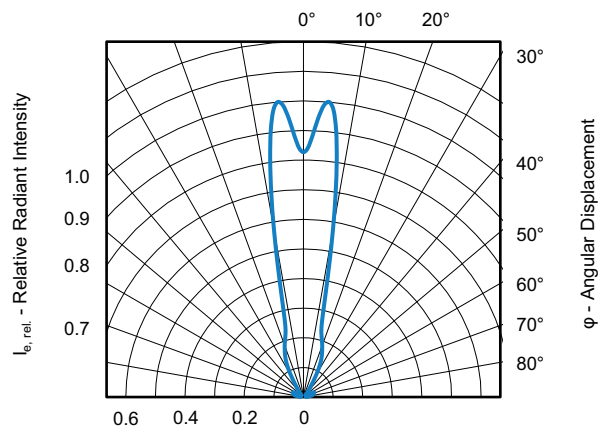


Fig. 8 - Relative Radiant Intensity vs. Angular Displacement



## SOLDER PROFILE

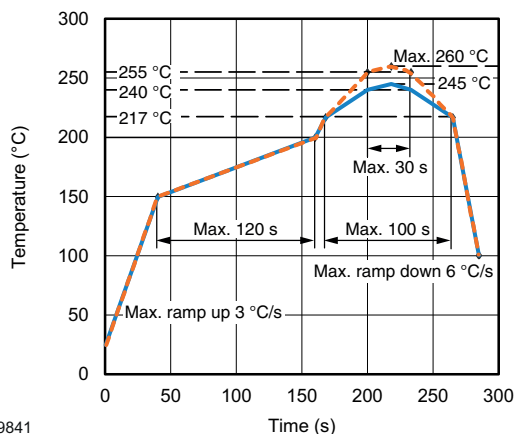


Fig. 9 - Lead (Pb)-free Reflow Solder Profile  
According to J-STD-020

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

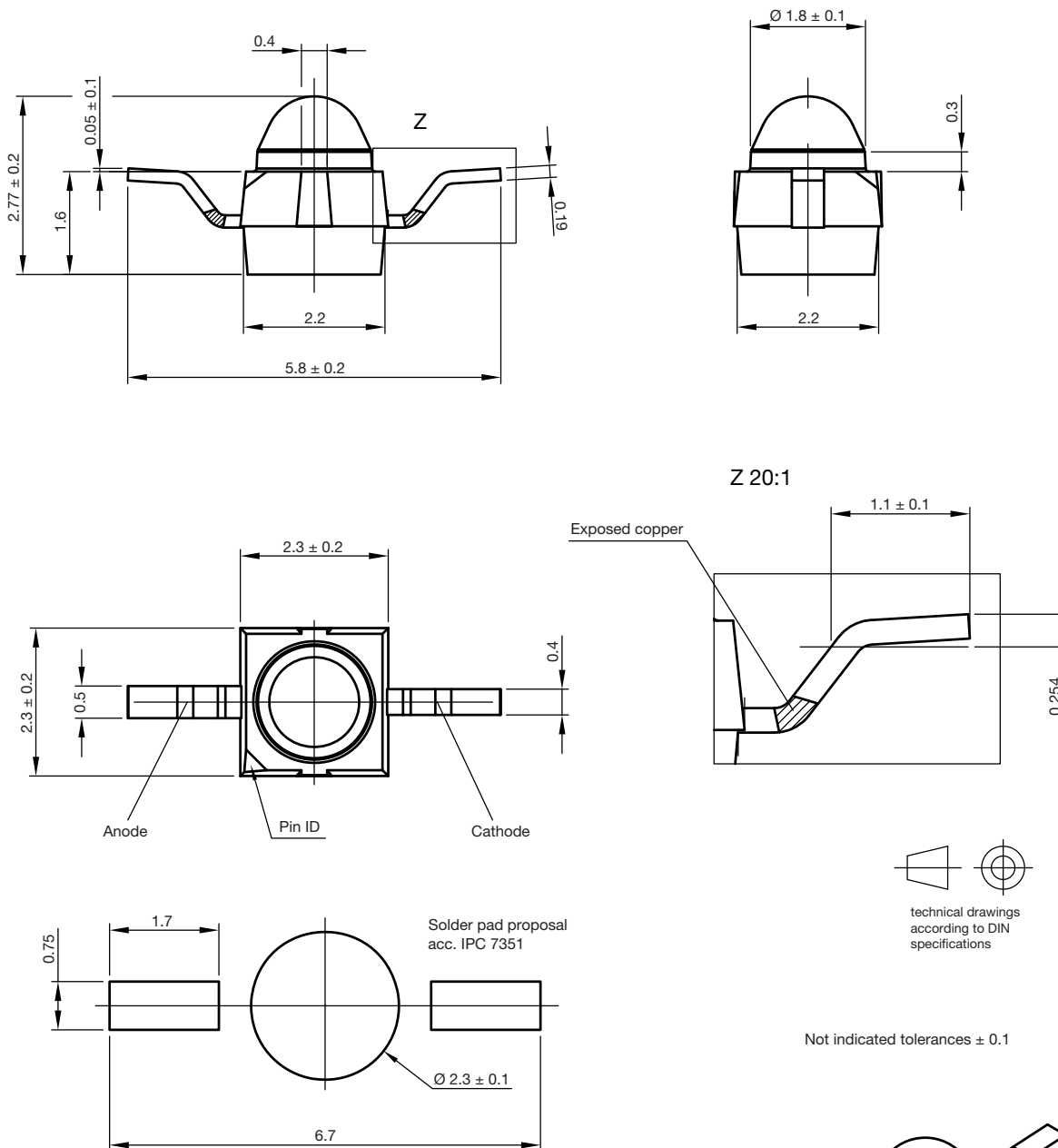
Moisture sensitivity level 2a, according to J-STD-020.

## 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),  $RH < 5\%$ .



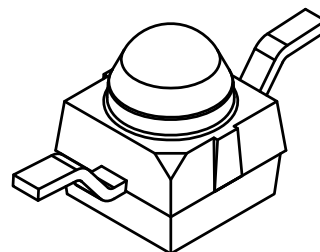
## PACKAGE DIMENSIONS in millimeters: VSMY2890RGX01



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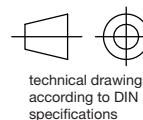
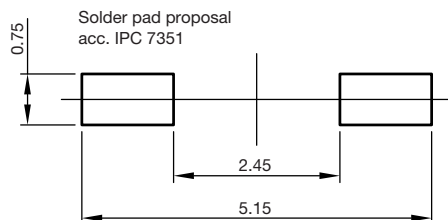
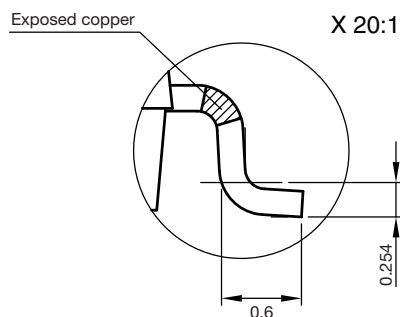
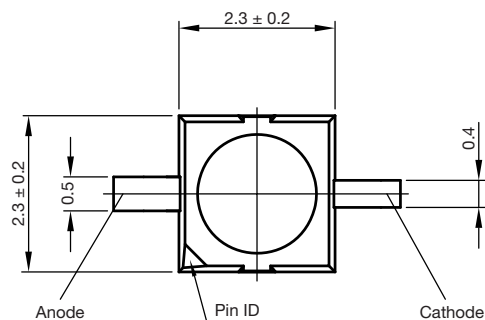
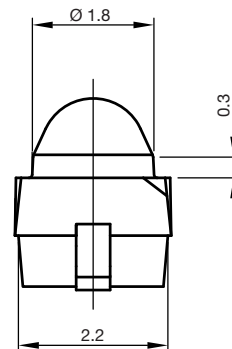
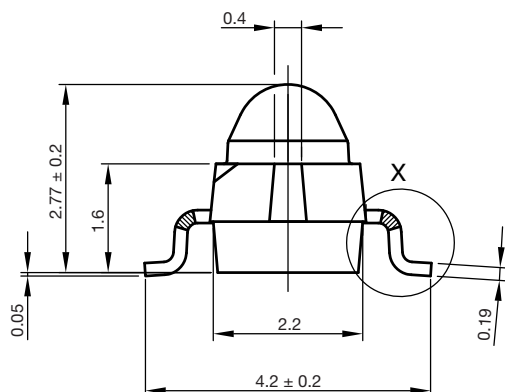
Issue: 1; 18.03.10

22100



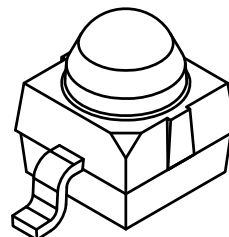


## PACKAGE DIMENSIONS in millimeters: VSMY2890GX01



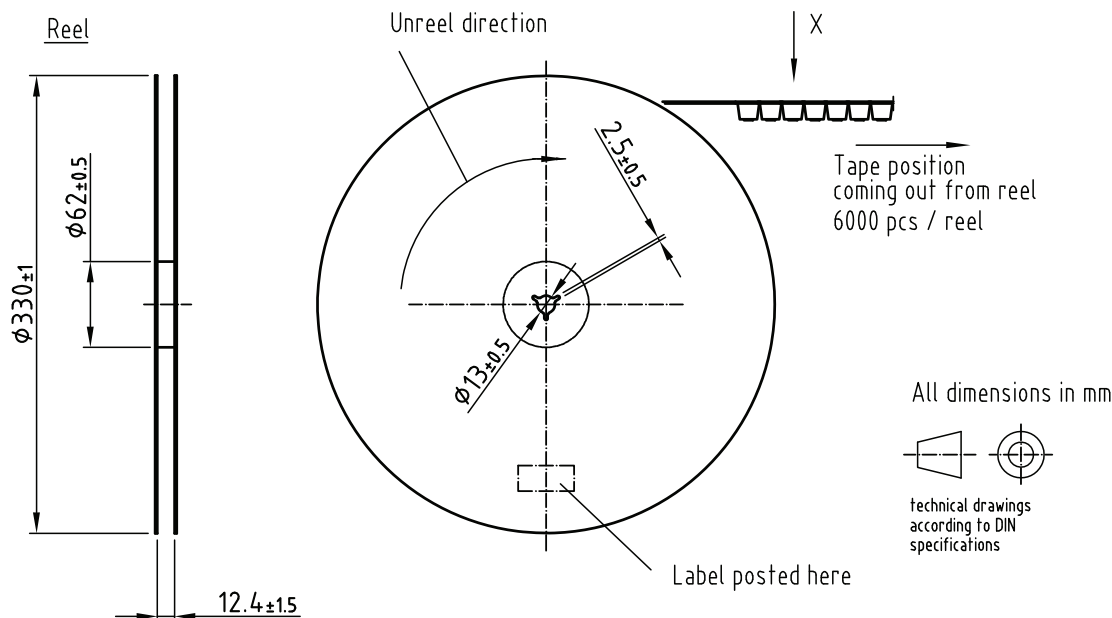
technical drawings  
according to DIN  
specifications

Not indicated tolerances  $\pm 0.1$

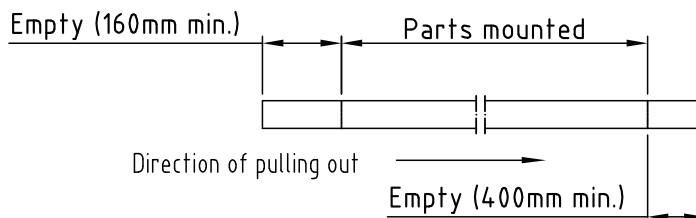


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Issue: 1; 18.03.10  
22099

**TAPING AND REEL DIMENSIONS** in millimeters: **VSMY2890RGX01**

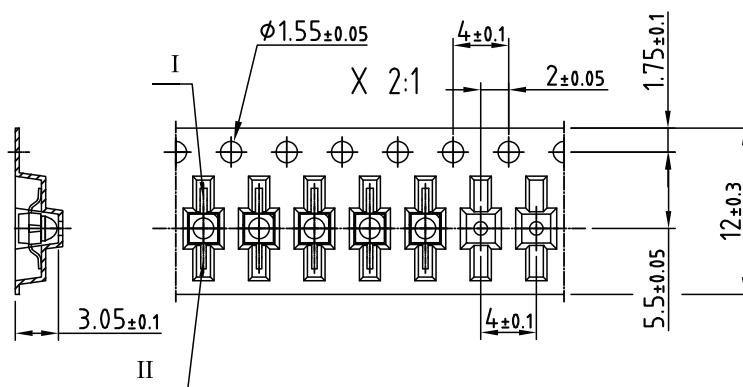


Leader and trailer tape:



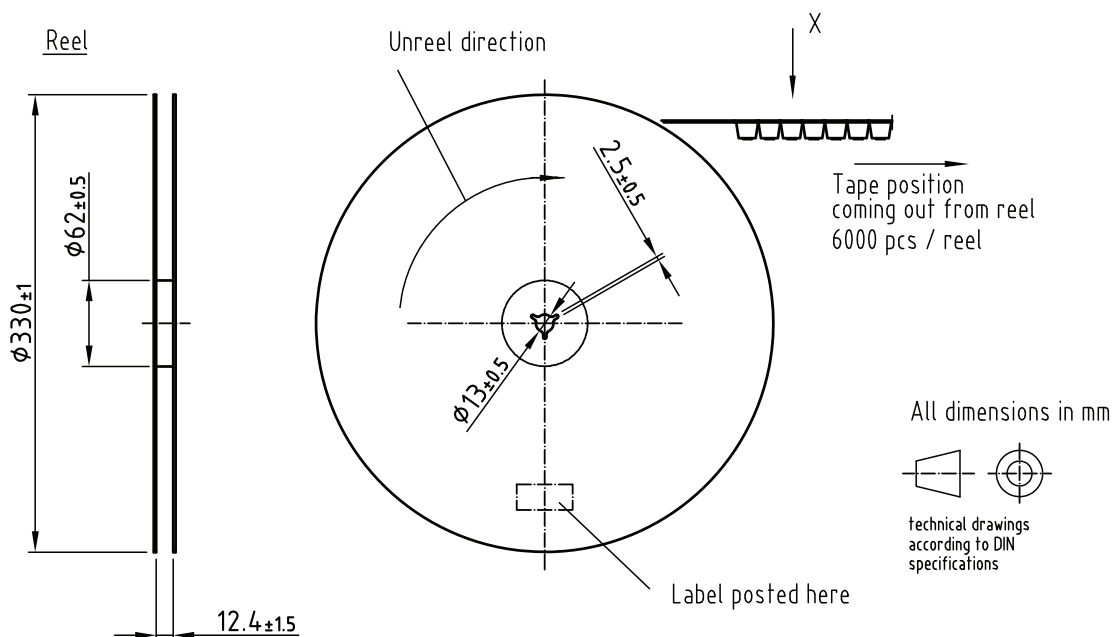
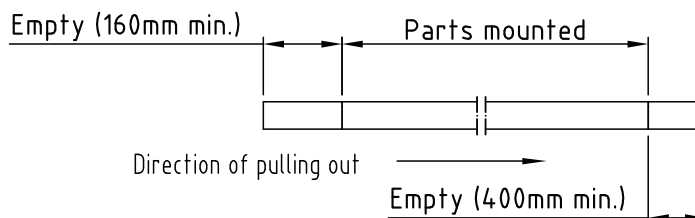
Terminal position in tape

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

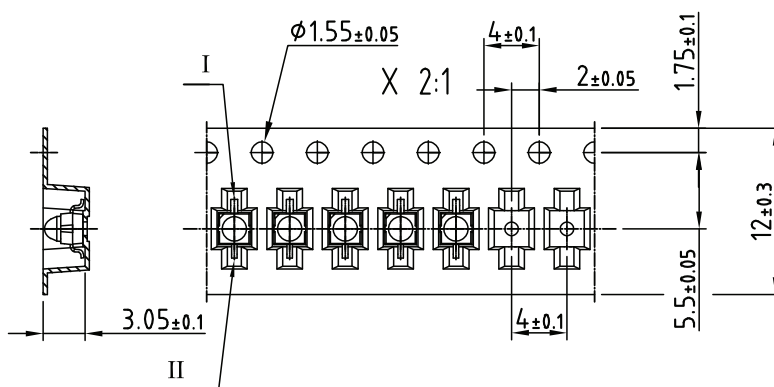


Drawing refers to following types: see table  
Reel dimensions and tape

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
V SMB 2020	Cathode	Anode
V SMG 2020		
V EMD 2020		
V EMD 2520		
V SMF 2890 G		
V SMB 294008 G	Collector	Emitter
V EMT 2020		
V EMT 2520		
V SMY 2xxx	Anode	Cathode
V SMF 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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