



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

VSMY2853RGX01

VSMY2853GX01



### DESCRIPTION

As part of the [SurfLight™](#) portfolio, the VSMY2853 series are infrared, 850 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
- 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
- AEC-Q101 qualified
- 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
- 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)

PRODUCT SUMMARY				
COMPONENT	$I_e$ (mW/sr)	$\phi$ (deg)	$\lambda_p$ (nm)	$t_r$ (ns)
VSMY2853RGX01	50	$\pm 28$	850	10
VSMY2853GX01	50	$\pm 28$	850	10

#### Note

- Test conditions see table "Basic Characteristics"

ORDERING INFORMATION			
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VSMY2853RGX01	Tape and reel	MOQ: 6000 pcs, 6000 pcs/reel	Reverse gullwing
VSMY2853GX01	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>	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. 7, J-STD-020	T <sub>sd</sub>	260	°C
Thermal resistance junction-to-ambient	EIA / JESD51	R <sub>thJA</sub>	250	K/W

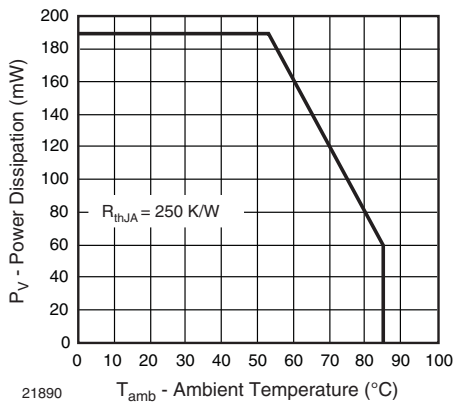


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

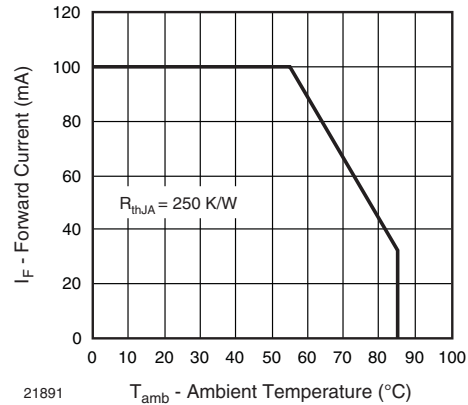


Fig. 2 - Forward Current Limit vs. Ambient Temperature

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>	-	-1.5	-	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>	-	50	-	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>	-	-0.12	-	%/K
Angle of half intensity		φ	-	± 28	-	deg
Peak wavelength	I <sub>F</sub> = 100 mA	λ <sub>p</sub>	840	850	870	nm
Spectral bandwidth	I <sub>F</sub> = 100 mA	Δλ	-	30	-	nm
Temperature coefficient of λ <sub>p</sub>	I <sub>F</sub> = 100 mA	TK <sub>λ<sub>p</sub></sub>	-	0.25	-	nm/K
Rise time	I <sub>F</sub> = 100 mA, 10 % to 90 %	t <sub>r</sub>	-	10	-	ns
Fall time	I <sub>F</sub> = 100 mA, 10 % to 90 %	t <sub>f</sub>	-	10	-	ns

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

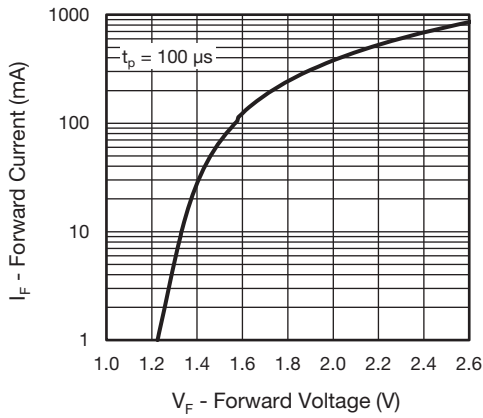


Fig. 3 - Forward Current vs. Forward Voltage

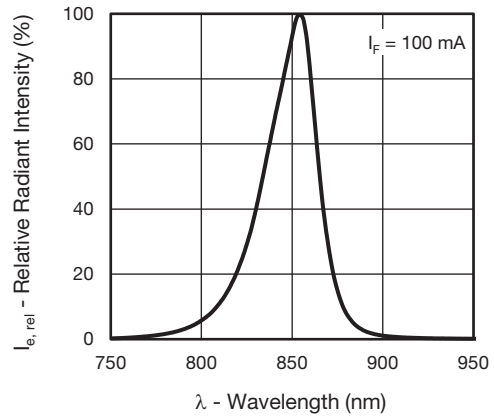


Fig. 5 - Relative Radiant Power vs. Wavelength

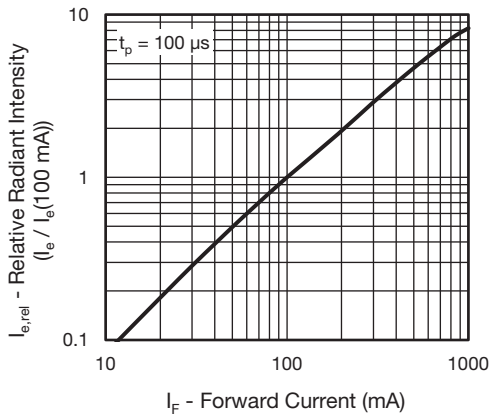


Fig. 4 - Relative Radiant vs. Forward Current

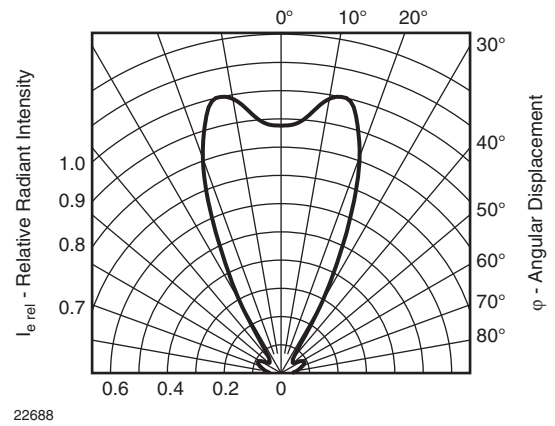


Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

**SOLDER PROFILE**

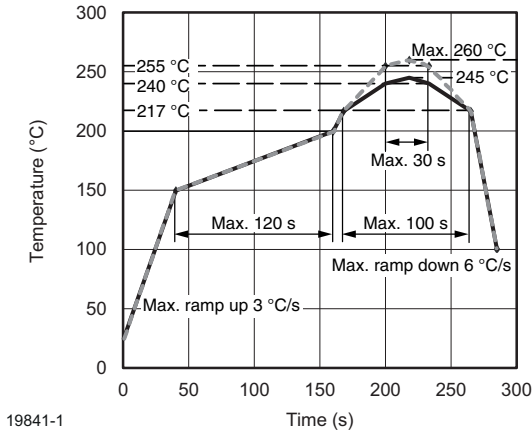


Fig. 7 - Lead (Pb)-free Reflow Solder Profile According to J-STD-020

**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 %

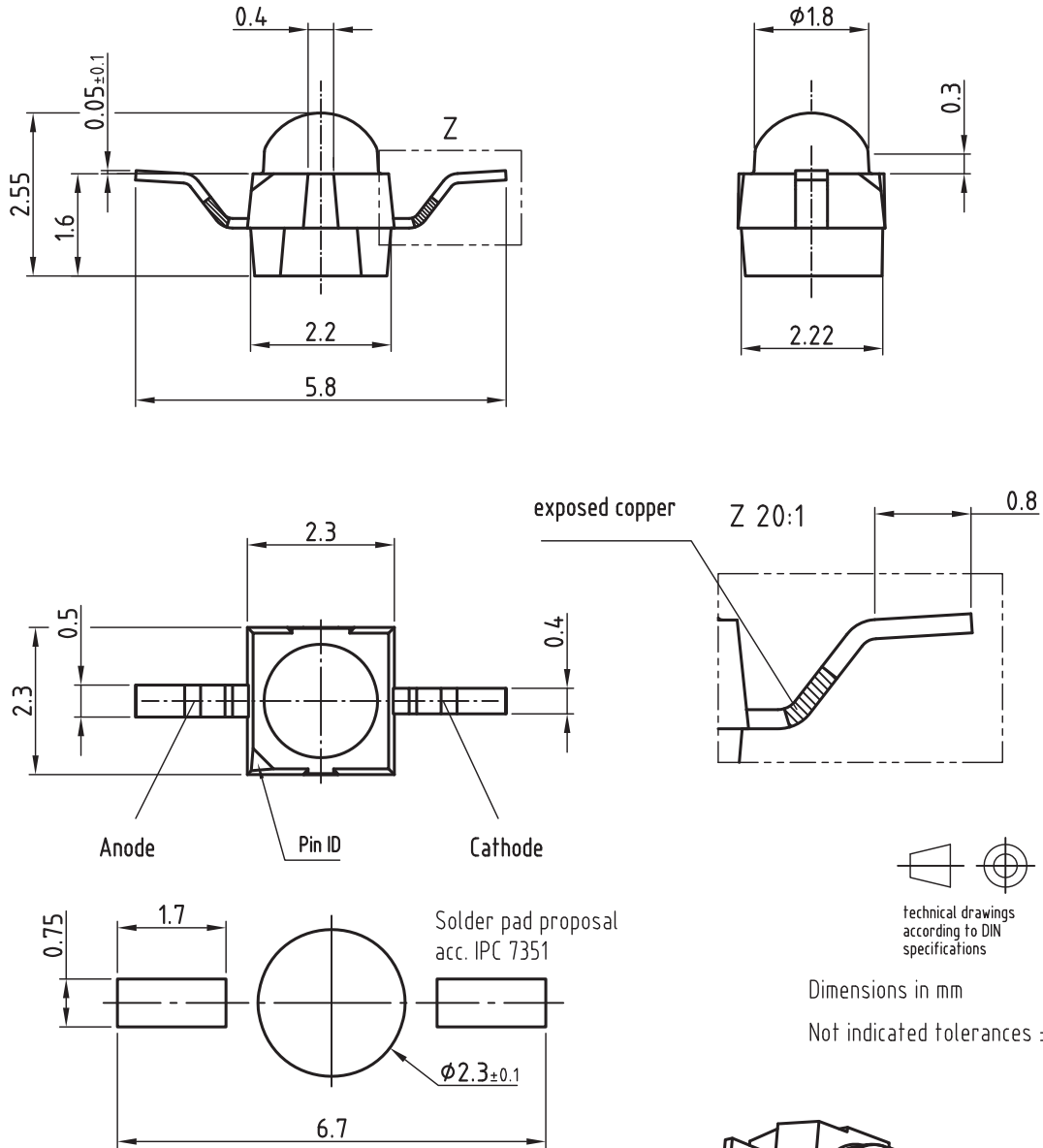
Moisture sensitivity level 2a, according to J-STD-020.

**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 %.

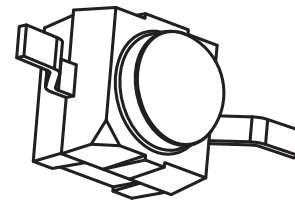


## PACKAGE DIMENSIONS in millimeters: VSMY2853RGX01



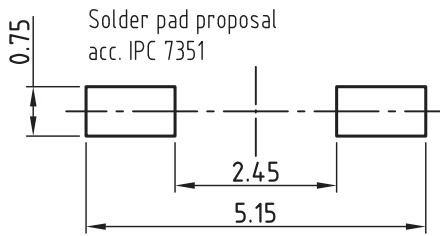
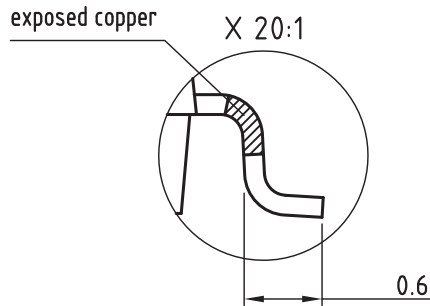
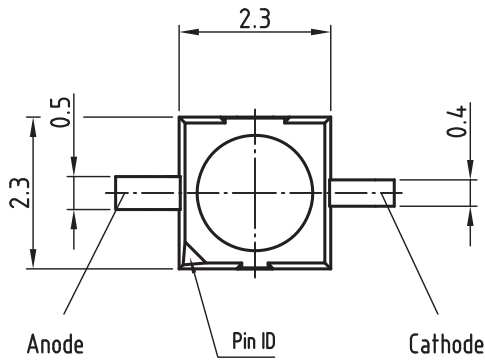
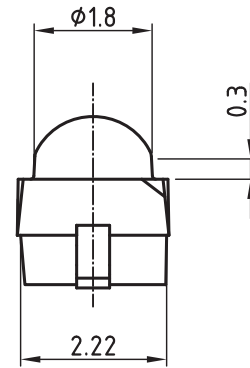
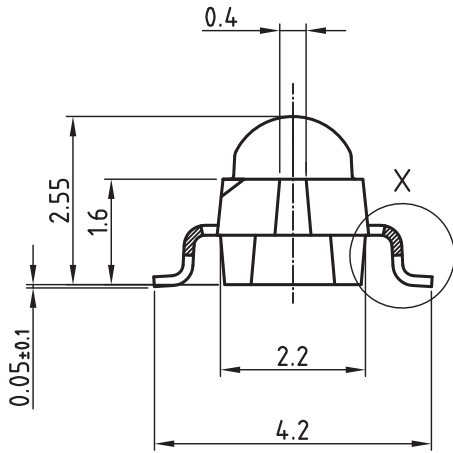
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Issue: prel. 03.08.12

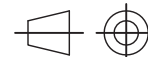




## PACKAGE DIMENSIONS in millimeters: VSMY2853GX01



Solder pad proposal acc. IPC 7351



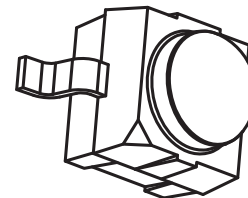
technical drawings according to DIN specifications

Dimensions in mm

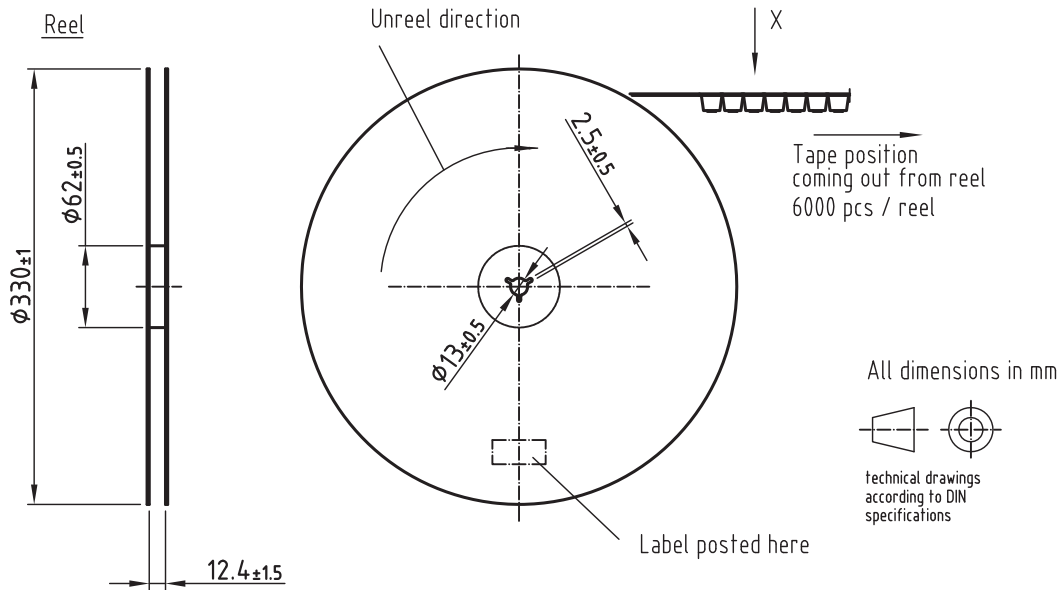
Not indicated tolerances ±0.2

Drawing refers to following types: VSMY2853G

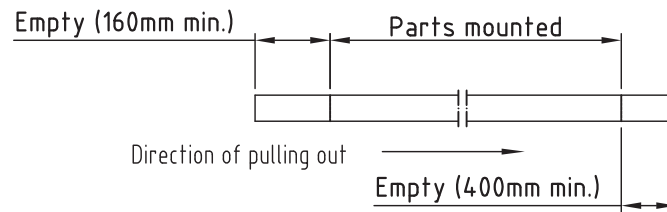
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Issue: prel; 03.08.12



## TAPING AND REEL DIMENSIONS in millimeters: VSMY2853RGX01

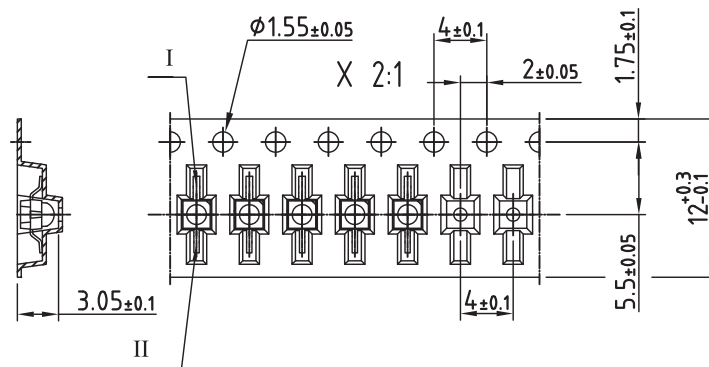


### Leader and trailer tape:



### Terminal position in tape

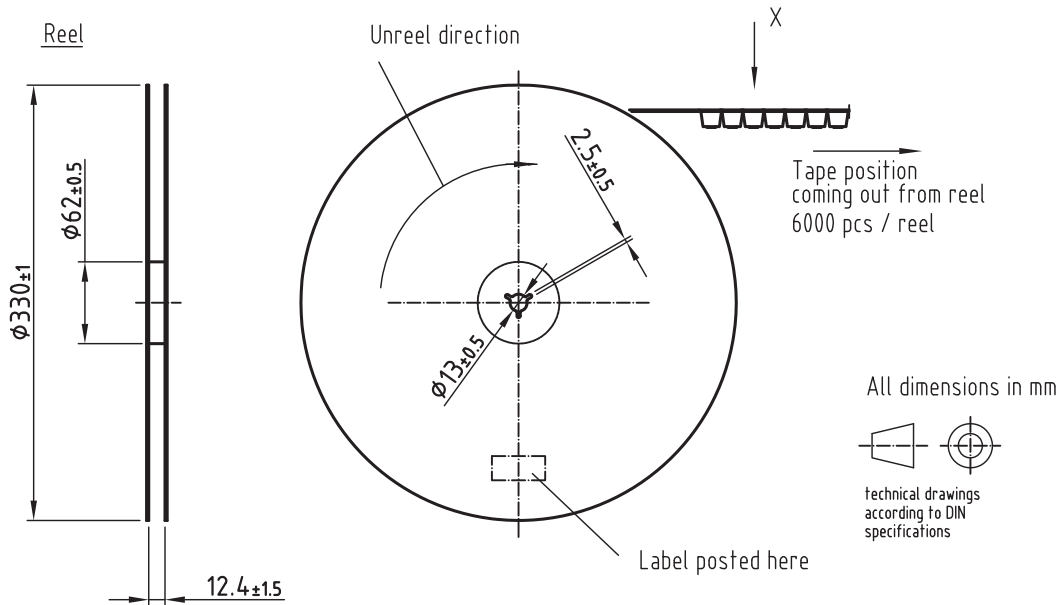
Device	Lead I	Lead II
V SMB2943RGX01	Cathode	Anode
V SMF2893RGX01		
V EMD2x03X01		
V EMT2x03X01	Collector	Emitter
V SMY2853RG	Anode	Cathode



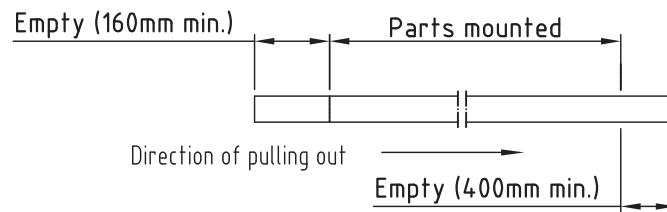
Drawing refers to following types: see table  
Reel dimensions and tape

Drawing-No.: 9.800-5100.02-4  
Issue: prel; 03.08.12

## TAPING AND REEL DIMENSIONS in millimeters: VSMY2853GX01

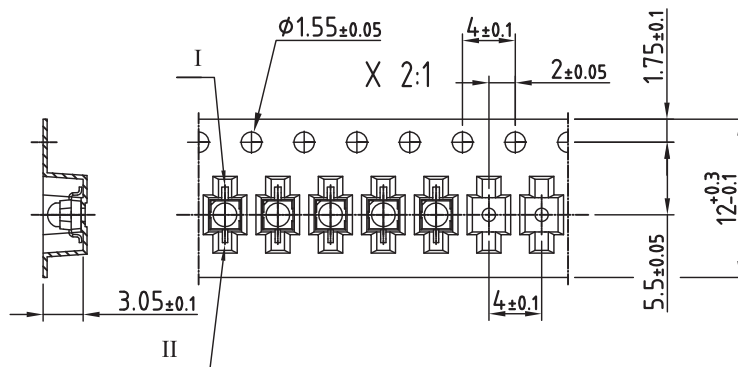


Leader and trailer tape:



Terminal position in tape

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



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

Drawing-No.: 9.800-5091.21-4  
Issue: prel; 03.08.12



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