

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/doc299912

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	ϕ (°)	λ_p (nm)	t_r (ns)
VSMY2893RGX01	50	± 28	890	15
VSMY2893GX01	50	± 28	890	15
VSMY2893SLX01	50	± 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 ($T_{amb} = 25\text{ }^{\circ}\text{C}$, 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

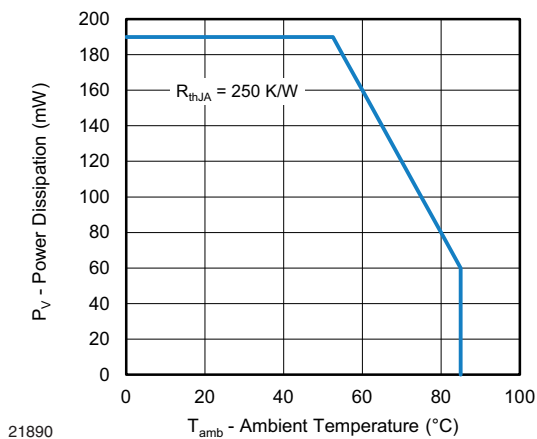


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

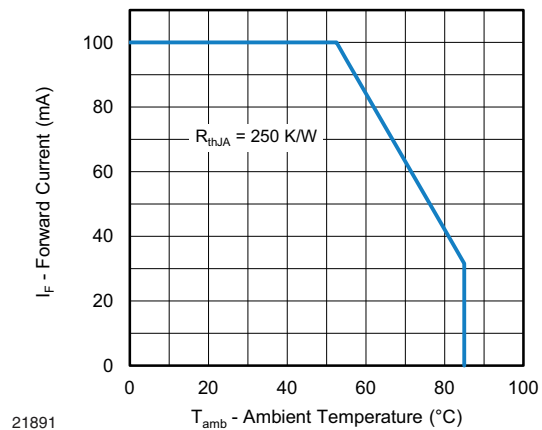


Fig. 2 - Forward Current Limit vs. Ambient Temperature

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	-	1.6	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			μA
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	27	50	75	mW/sr
	$I_F = 1\text{ A}$, $t_p = 100\text{ }\mu\text{s}$	I_e	-	350	-	mW/sr
Radiant power	$I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$	ϕ_e	-	55	-	mW
Temperature coefficient of radiant power	$I_F = 100\text{ mA}$	TK_{ϕ_e}	-	-0.15	-	%/K
Angle of half intensity		φ	-	± 28	-	$^{\circ}$
Peak wavelength	$I_F = 100\text{ mA}$	λ_p	870	890	910	nm
Spectral bandwidth	$I_F = 100\text{ mA}$	$\Delta\lambda$	-	35	-	nm
Temperature coefficient of λ_p	$I_F = 100\text{ mA}$	TK_{λ_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)

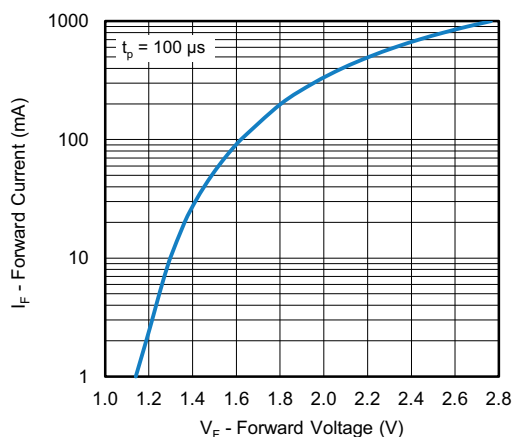


Fig. 3 - Forward Current vs. Forward Voltage

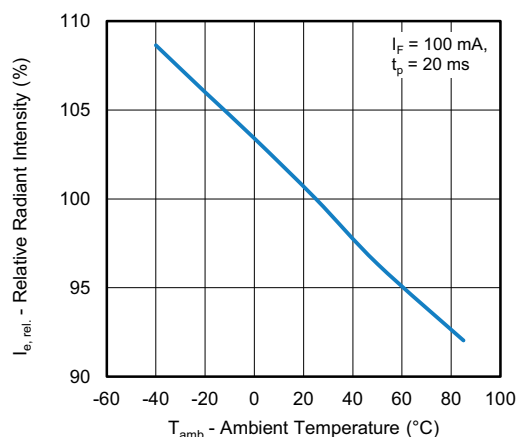


Fig. 6 - Relative Radiant Intensity vs. Ambient Temperature

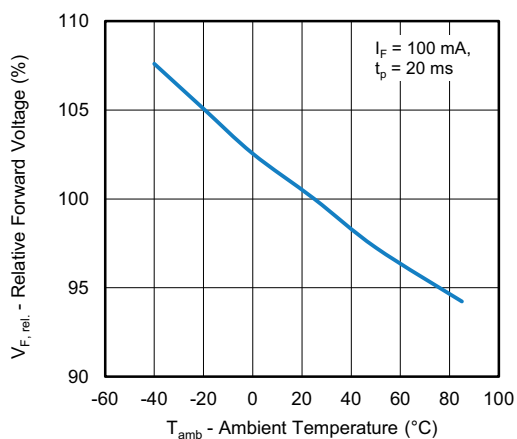


Fig. 4 - Relative Forward Voltage vs. Ambient Temperature

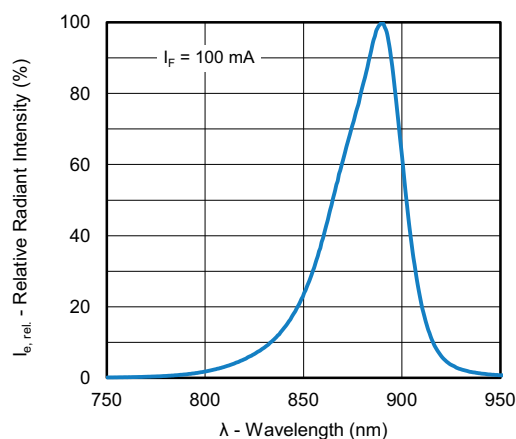


Fig. 7 - Relative Radiant Intensity vs. Wavelength

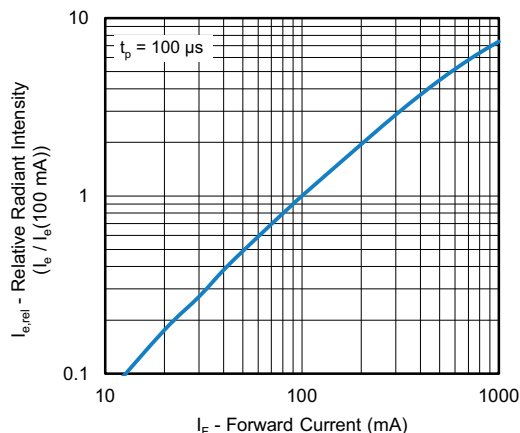


Fig. 5 - Relative Radiant Intensity vs. Forward Current

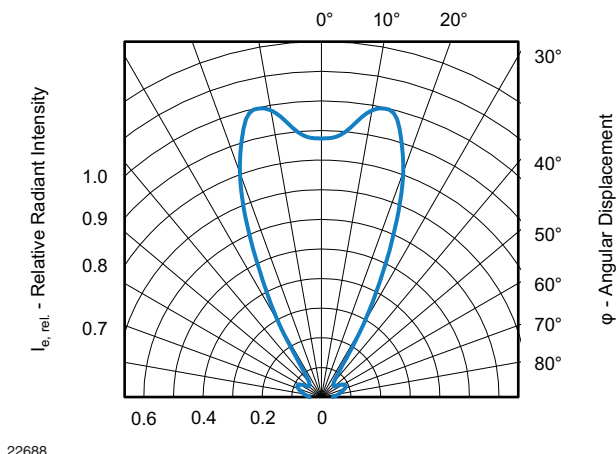


Fig. 8 - Relative Radiant Intensity vs. Angular Displacement



SOLDER PROFILE

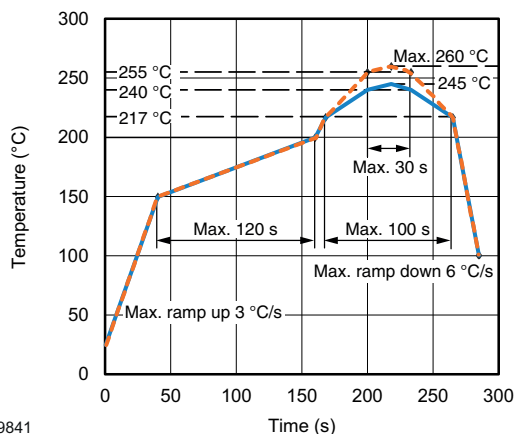


Fig. 9 - Lead (Pb)-free Reflow Solder Profile
According to J-STD-020

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

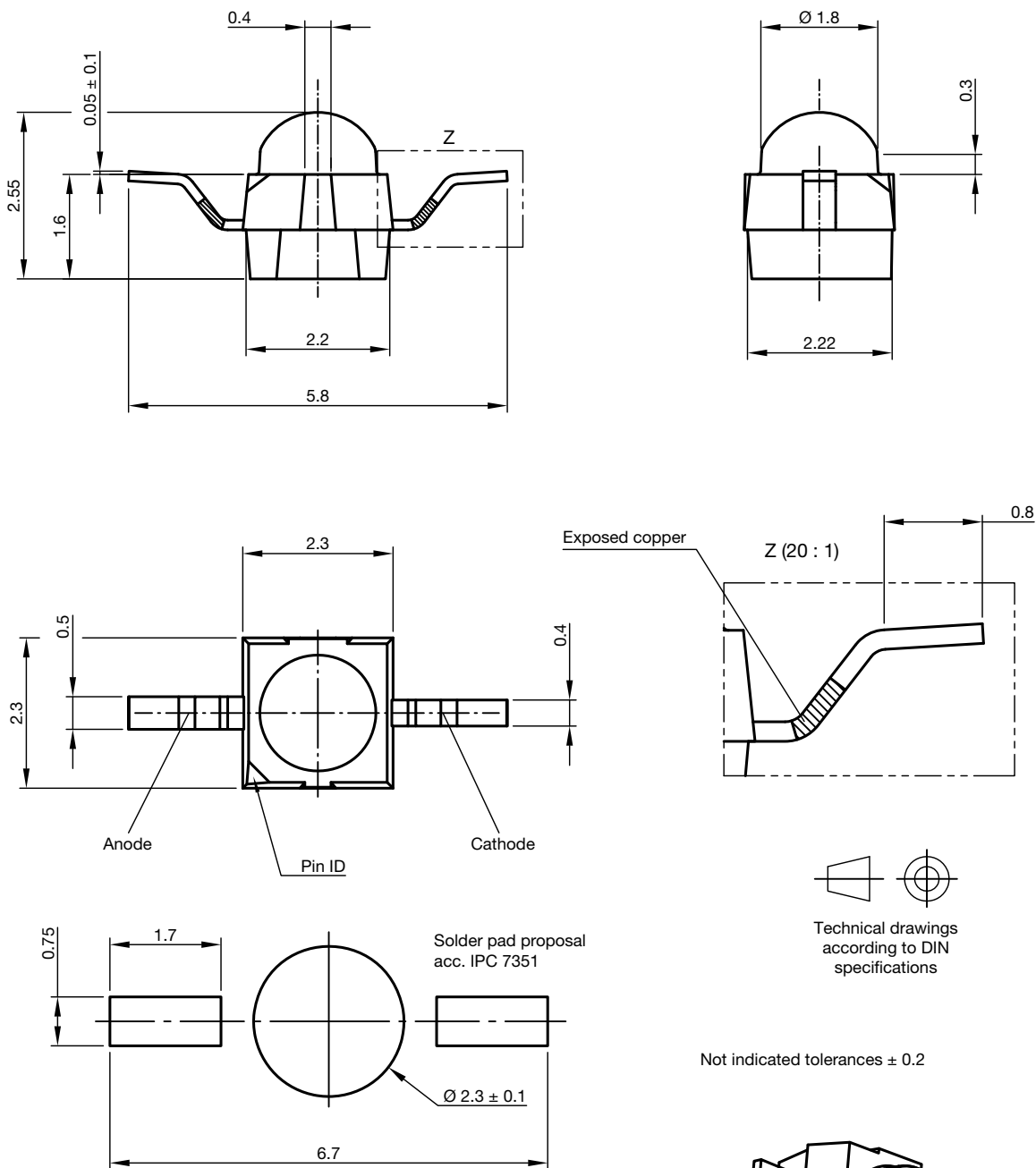
Moisture sensitivity level 2a, according to J-STD-020.

DRYING

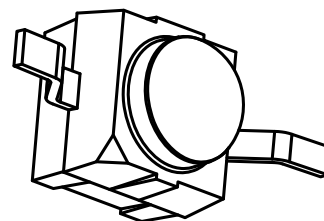
In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-033D or label. Devices taped on reel dry using recommended conditions 192 h at 40 °C (+ 5 °C), $RH < 5\%$.



PACKAGE DIMENSIONS in millimeters: VSMY2893RGX01

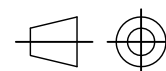
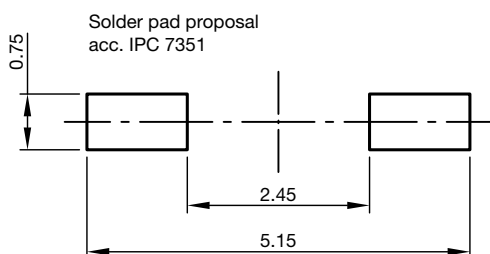
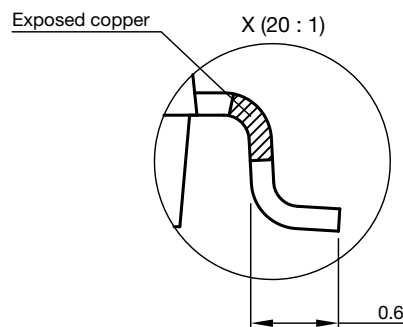
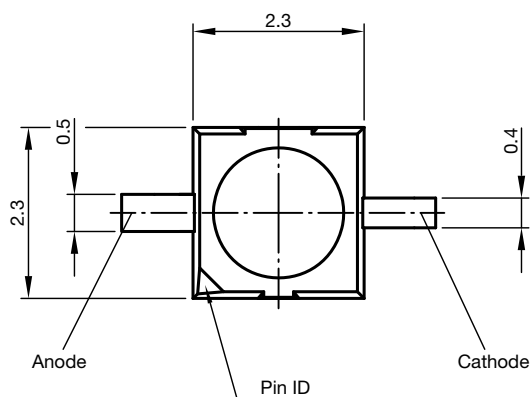
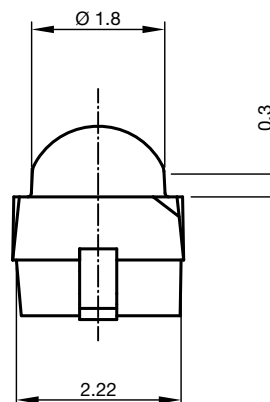
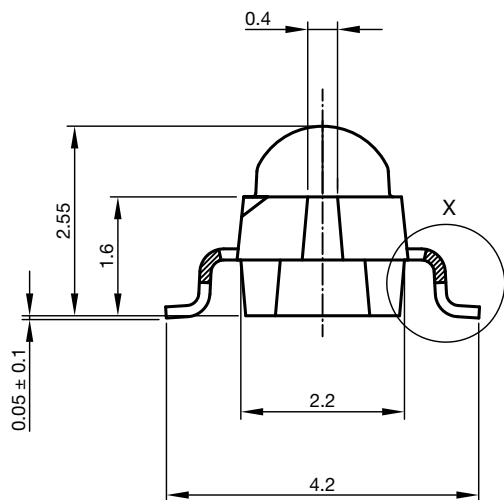


Drawing-No.: 6.544-5409.03-4
Issue: 3; 02.10.15



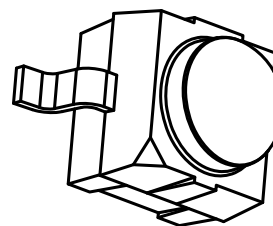


PACKAGE DIMENSIONS in millimeters: VSMY2893GX01



Technical drawings
according to DIN
specifications

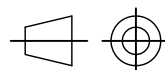
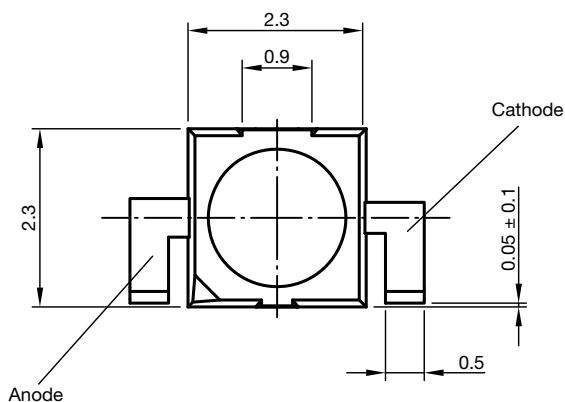
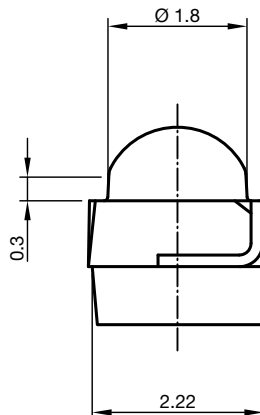
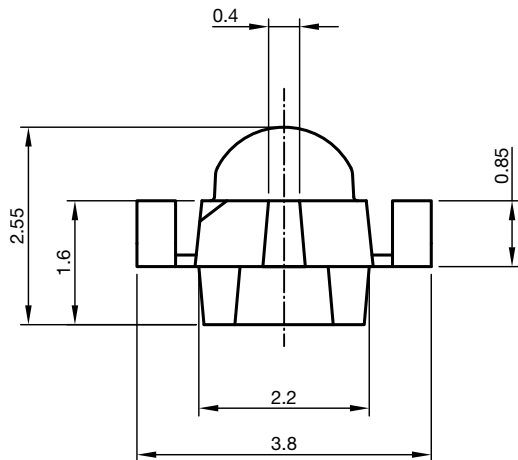
Not indicated tolerances ± 0.2



Drawing-No.: 6.544-5408.03-4
Issue: 3; 02.10.15



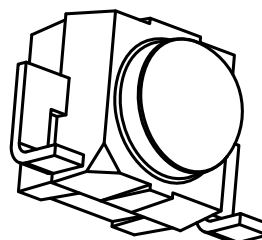
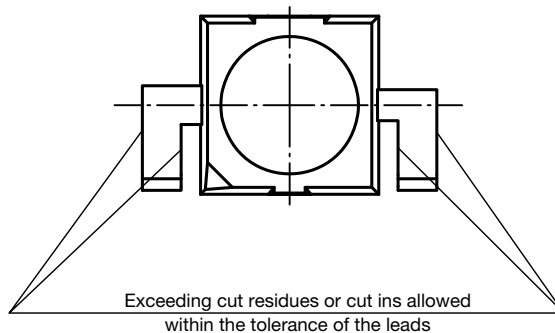
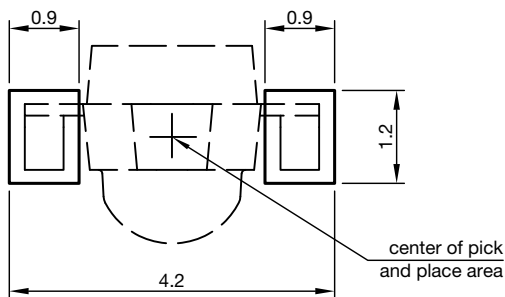
PACKAGE DIMENSIONS in millimeters: VSMY2893SLX01



Technical drawings
according to DIN
specifications

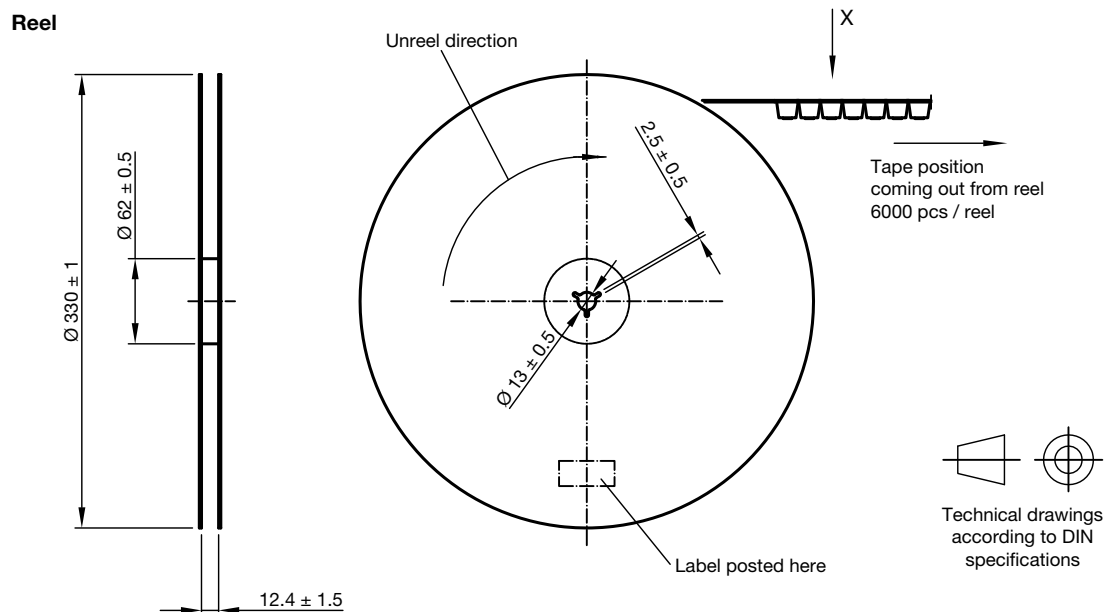
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Solder pad proposal
acc. IPC 7351

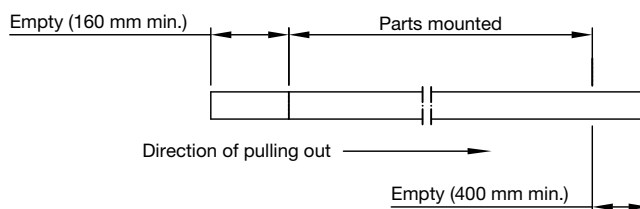


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Issue: 3; 02.10.15

TAPING AND REEL DIMENSIONS in millimeters: VSMY2893RGX01



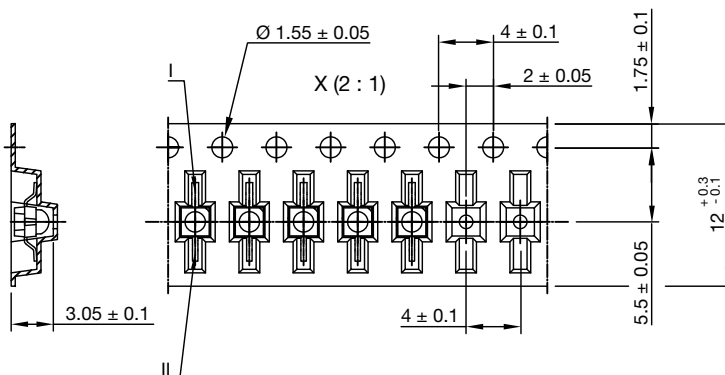
Leader and trailer tape



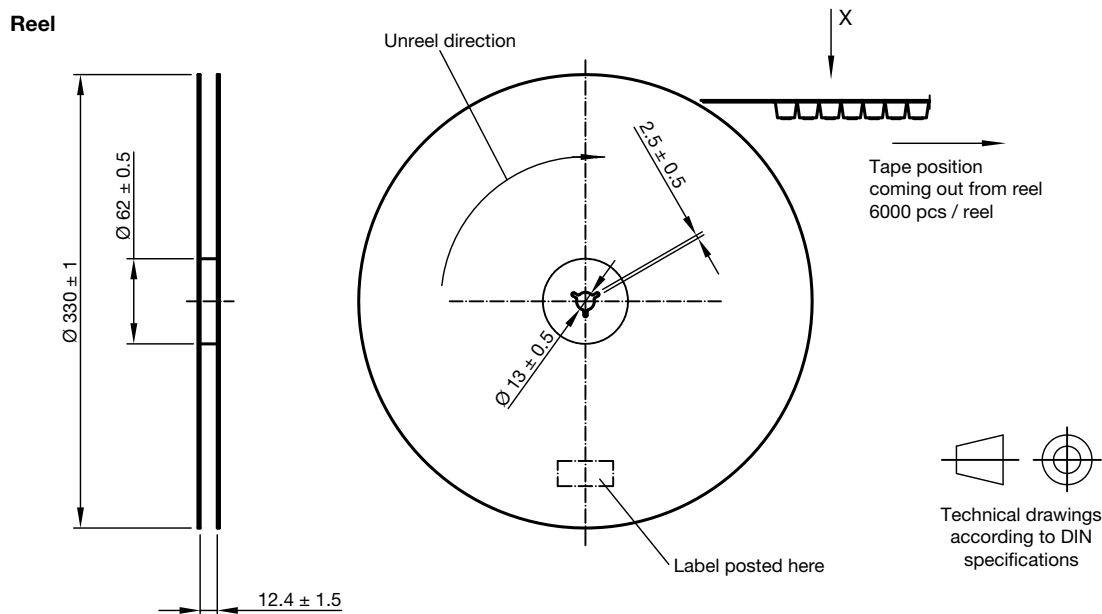
Terminal position in tape

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

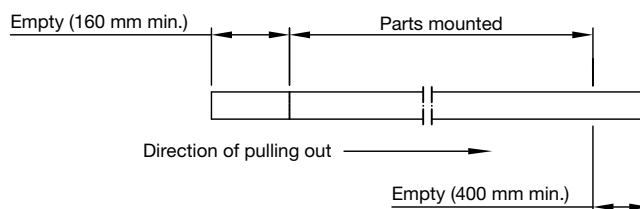
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Issue: prel.; 11.07.19



TAPING AND REEL DIMENSIONS in millimeters: VSMY2893GX01

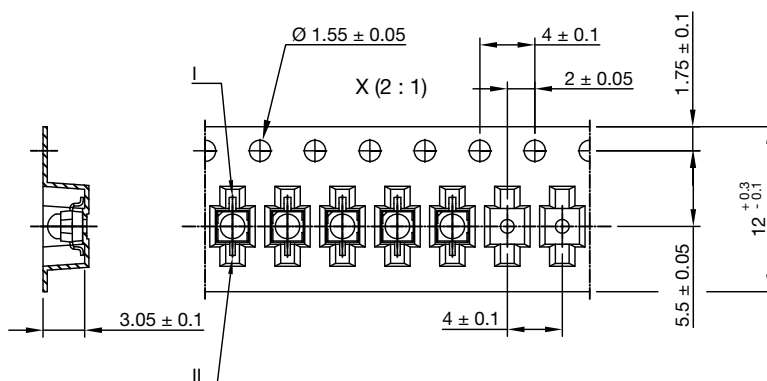


Leader and trailer tape



Terminal position in tape

Device	Lead I	Lead II
VSMB2943GX01	Cathode	Anode
VSMF2893GX01		
VEMD2x23X01	Collector	Emitter
VEMT2x23X01		
VSMY2xxx	Anode	Cathode

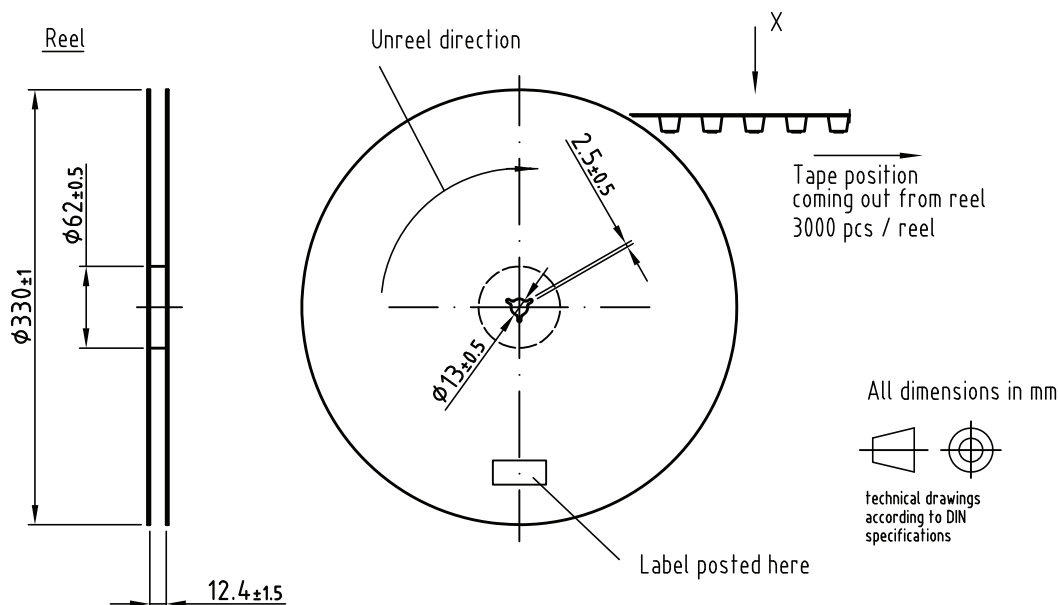


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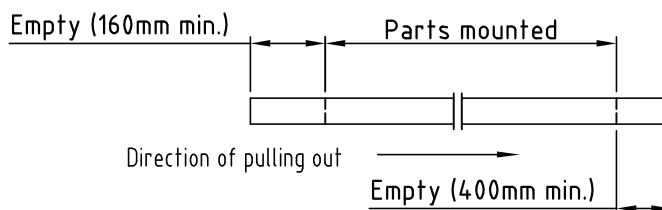
Issue: prel.; 11.07.19



TAPING AND REEL DIMENSIONS in millimeters: VSMY2893SLX01

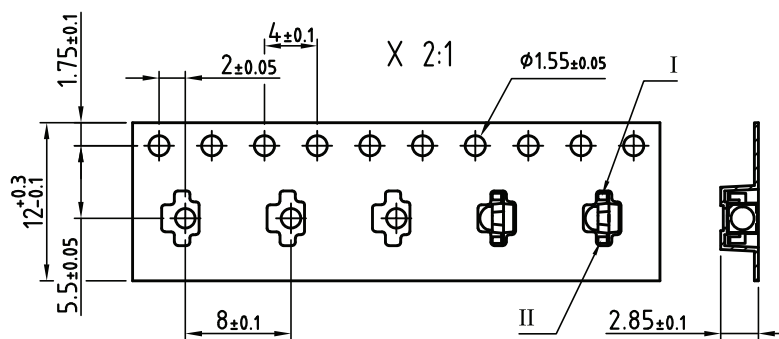


Leader and trailer tape:



Terminal position in tape

Device	Lead I	Lead II
V SMB2943SLX01	Cathode	Anode
V SMF2893SLX01		
V SMB2948SL		
V EMD2023SLX01		
V EMD2523SLX01	Collector	Emitter
V EMT2023SLX01		
V EMT2523SLX01		
V SMY2xxx	Anode	Cathode



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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