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

VSMY2941RGX01



VSMY2941GX01



DESCRIPTION

As part of the SurfLight™ portfolio, the VSMY2941X01 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

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
- Peak wavelength: λ_p = 940 nm
- AEC-Q101 qualified
- High radiant power
- Very high radiant intensity
- Angle of half intensity: φ = ± 8°
- Terminal configurations: gullwing or reverse gullwing
- Package matches with detector VEMD2000X01 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

AUTOMOTIVE GRADE

Pb-free

e3

RoHS COMPLIANT

HALOGEN FREE GREEN (5-2008)

PRODUCT SUMMARY

COMPONENT	I_e (mW/sr)	φ (deg)	λ_p (nm)	t_r (ns)
VSMY2941RGX01	160	± 8	940	5
VSMY2941GX01	160	± 8	940	5

Note

- Test conditions see table “Basic Characteristics“

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VSMY2941RGX01	Tape and reel	MOQ: 6000 pcs, 6000 pcs/reel	Reverse gullwing
VSMY2941GX01	Tape and reel	MOQ: 6000 pcs, 6000 pcs/reel	Gullwing

Note

- MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V_R	5	V
Forward current		I_F	70	mA
Peak forward current	t_p/T = 0.5, t_p = 100 µs	I_{FM}	140	mA
Surge forward current	t_p = 100 µs	I_{FSM}	500	mA
Power dissipation		P_V	120	mW
Junction temperature		T_j	100	°C
Operating temperature range		T_{amb}	-40 to +85	°C
Storage temperature range		T_{stg}	-40 to +100	°C
Soldering temperature	According to Fig. 10, J-STD-020	T_{sd}	260	°C
Thermal resistance junction-to-ambient	J-STD-051, soldered on PCB	R_{thJA}	250	K/W

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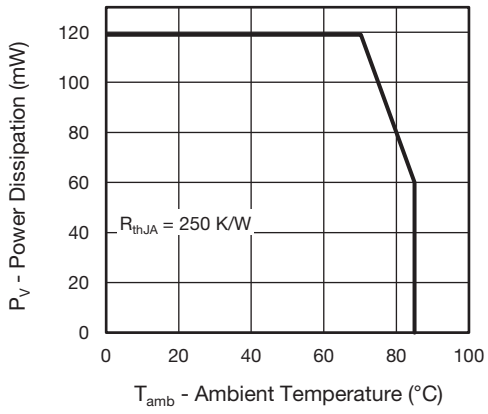


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

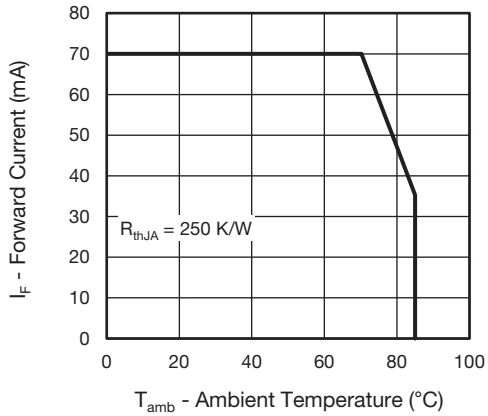


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Forward voltage	I_F = 50 mA, t_p = 20 ms	V_F	-	1.4	1.7	V
	I_F = 70 mA, t_p = 20 ms	V_F	-	1.5	-	V
	I_F = 500 mA, t_p = 100 µs	V_F	-	2.6	-	V
Temperature coefficient of V_F	I_F = 50 mA	TK_{VF}	-	-0.7	-	mV/K
Reverse current		I_R	Not designed for reverse operation			µA
Junction capacitance	V_R = 0 V, f = 1 MHz, E = 0 mW/cm²	C_J	-	30	-	pF
Radiant intensity	I_F = 50 mA, t_p = 20 ms	I_e	60	115	170	mW/sr
	I_F = 70 mA, t_p = 20 ms	I_e	-	160	-	mW/sr
	I_F = 500 mA, t_p = 100 µs	I_e	-	850	-	mW/sr
Radiant power	I_F = 70 mA, t_p = 20 ms	ϕ_e	-	40	-	mW
Temperature coefficient of radiant power	I_F = 50 mA	$TK\phi_e$	-	-0.2	-	%/K
Angle of half intensity		φ	-	± 8	-	deg
Peak wavelength	I_F = 50 mA	λ_p	920	940	960	nm
Spectral bandwidth	I_F = 70 mA	$\Delta\lambda$	-	55	-	nm
Temperature coefficient of λ_p	I_F = 70 mA	$TK\lambda_p$	-	0.28	-	nm/K
Rise time	I_F = 70 mA, 10 % to 90 %	t_r	-	5	-	ns
Fall time	I_F = 70 mA, 10 % to 90 %	t_f	-	6	-	ns

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BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

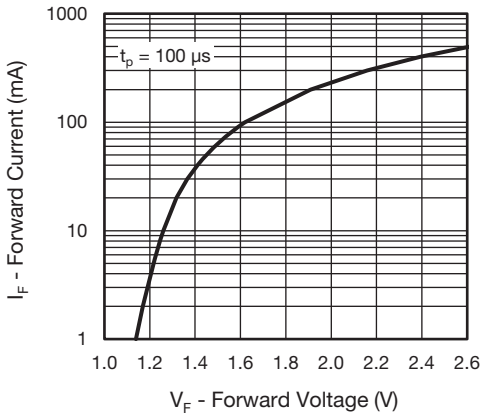


Fig. 3 - Forward Current vs. Forward Voltage

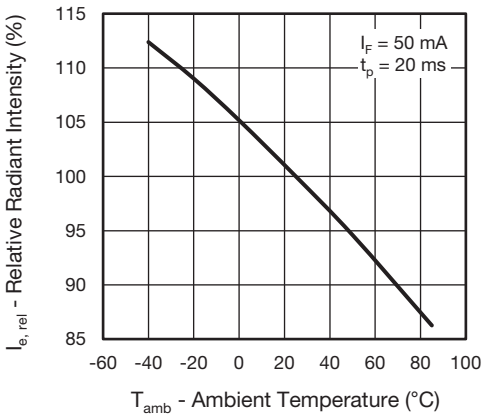


Fig. 6 - Relative Radiant Intensity vs. Ambient Temperature

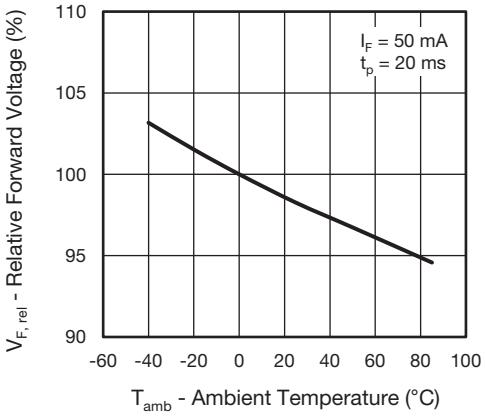


Fig. 4 - Relative Forward Voltage vs. Ambient Temperature

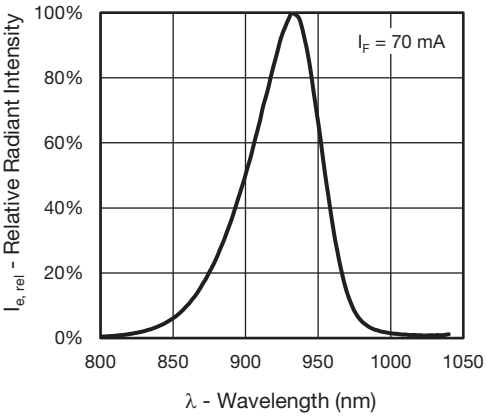


Fig. 7 - Relative Radiant Intensity vs. Wavelength

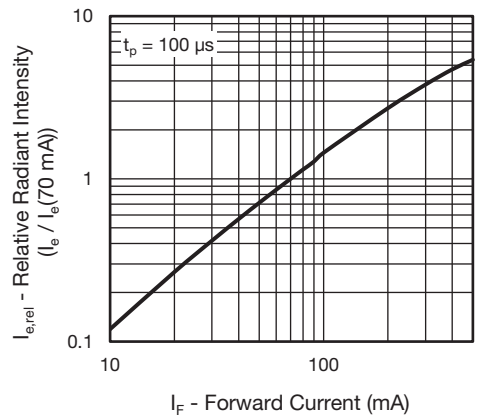


Fig. 5 - Radiant Intensity vs. Forward Current

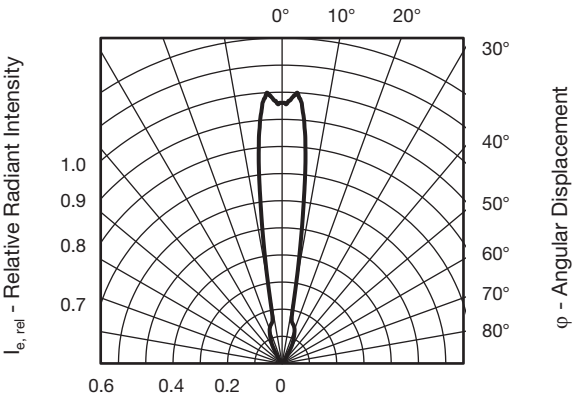


Fig. 8 - Relative Radiant Intensity vs. Angular Displacement

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SOLDER PROFILE

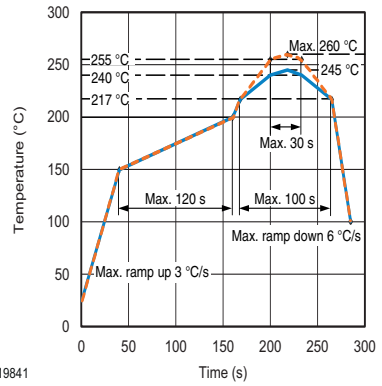


Fig. 9 - Lead (Pb)-free Reflow Solder Profile
According to J-STD-020

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.

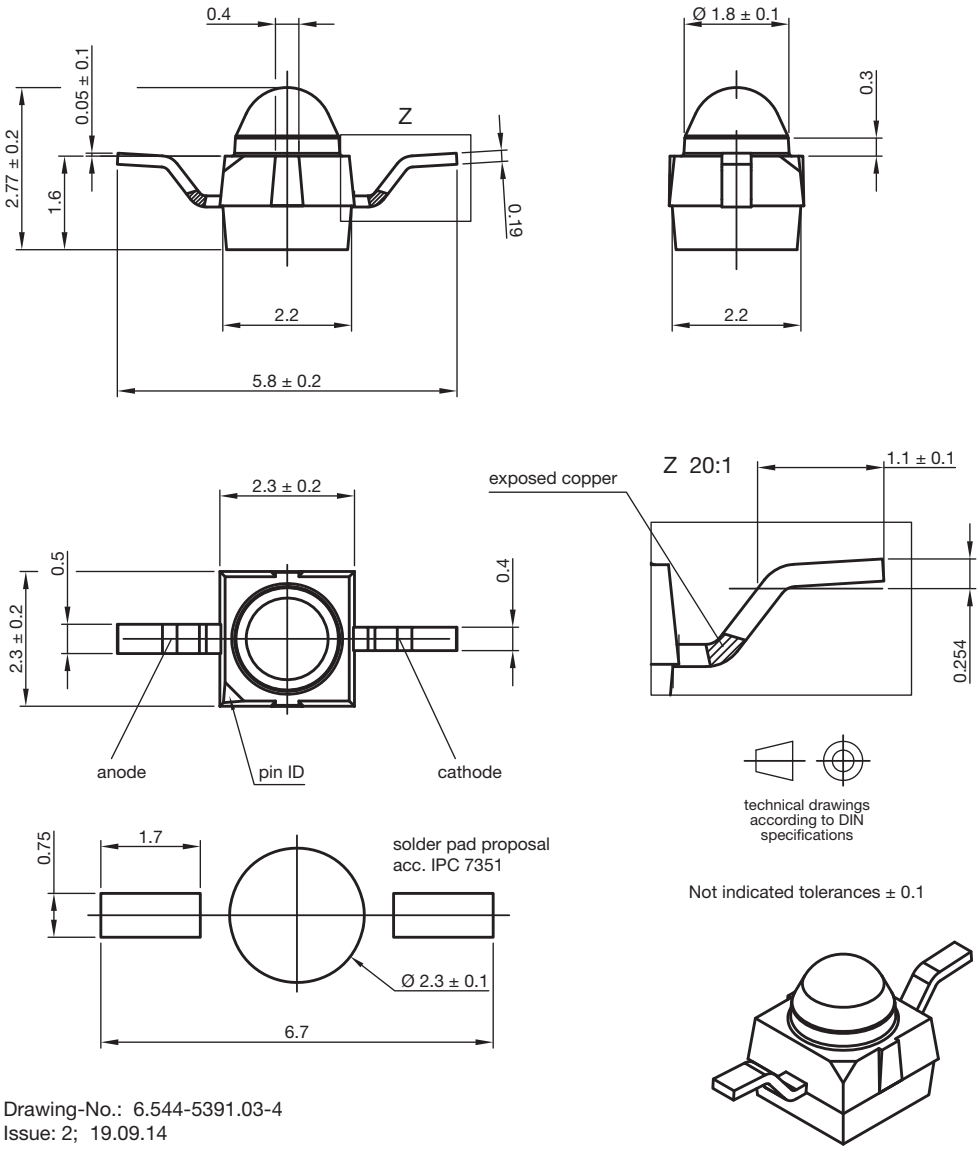
FLOOR LIFE

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 °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 °C (+ 5 °C), RH < 5 %.

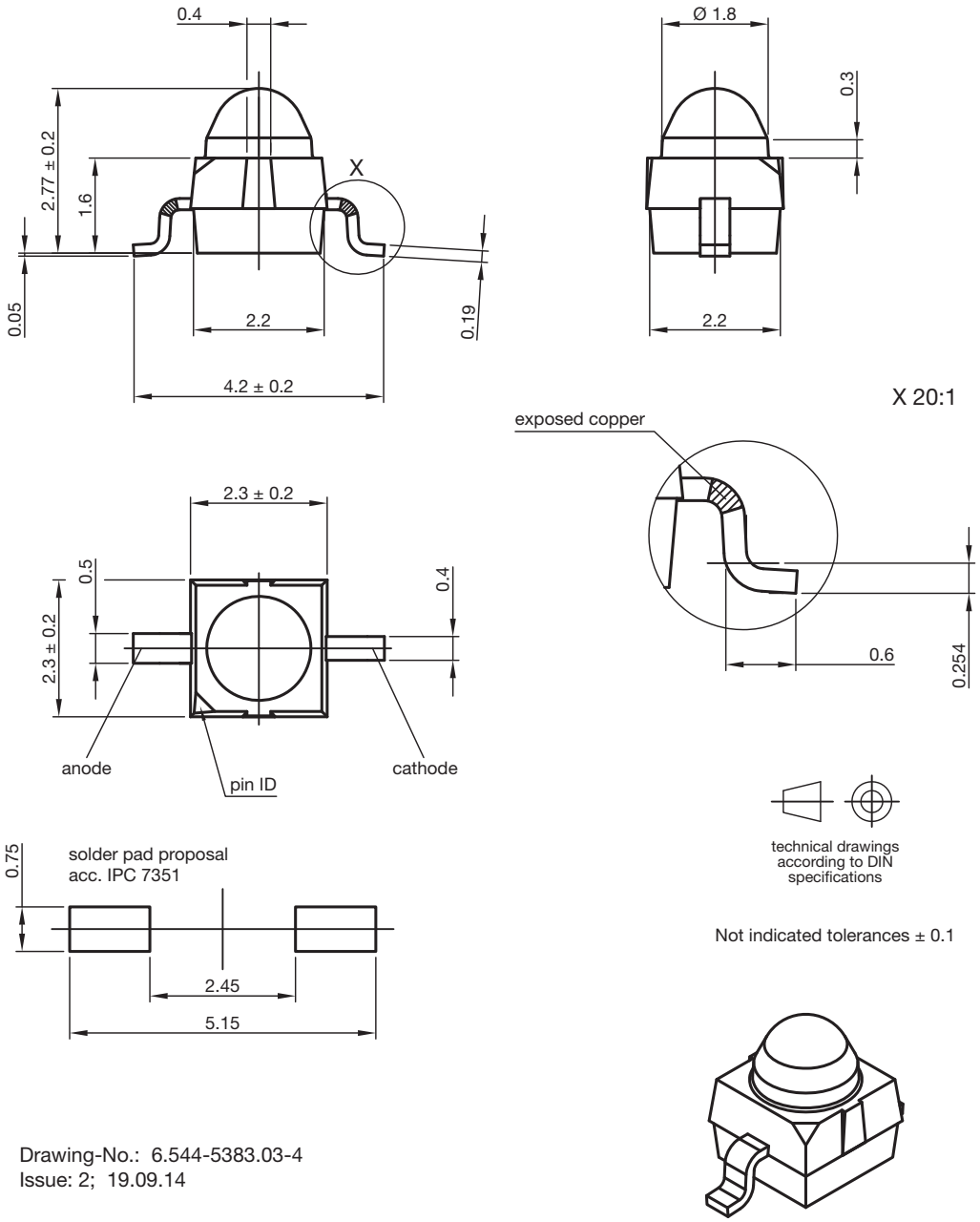
PACKAGE DIMENSIONS in millimeters: VSMY2941RGX01



Drawing-No.: 6.544-5391.03-4
Issue: 2; 19.09.14

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PACKAGE DIMENSIONS in millimeters: **VSMY2941GX01**

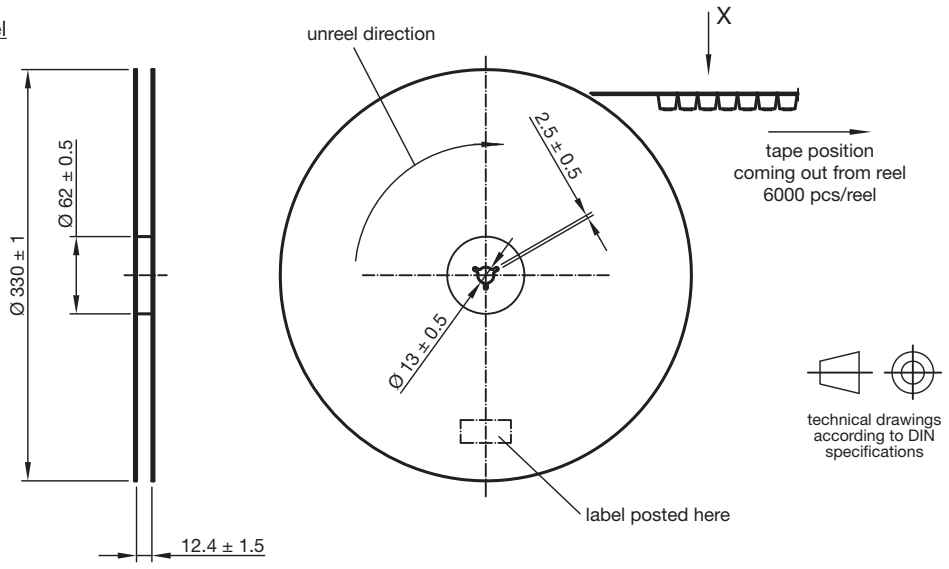


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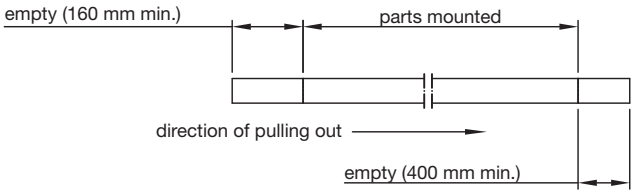
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TAPING AND REEL DIMENSIONS in millimeters: **VSMY2941RGX01**

Reel

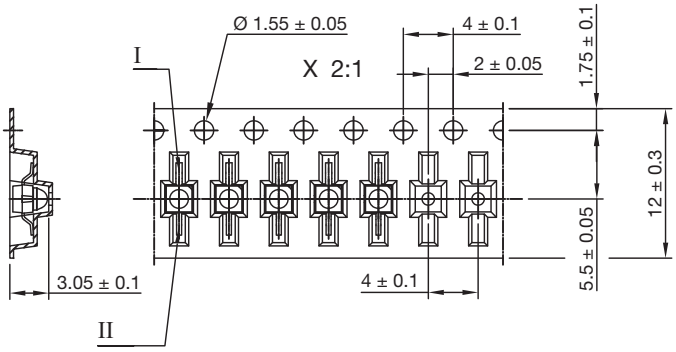


Leader and trailer tape



Terminal position in tape

Device	Lead I	Lead II
VEMT2000	Collector	Emitter
VEMT2500		
VEMD2000	Cathode	Anode
VEMD2500		
VSMB2000		
VSMG2000		
VSMF2890RG		
VSMY2850RG	Anode	Cathode
VSMY2940RG		

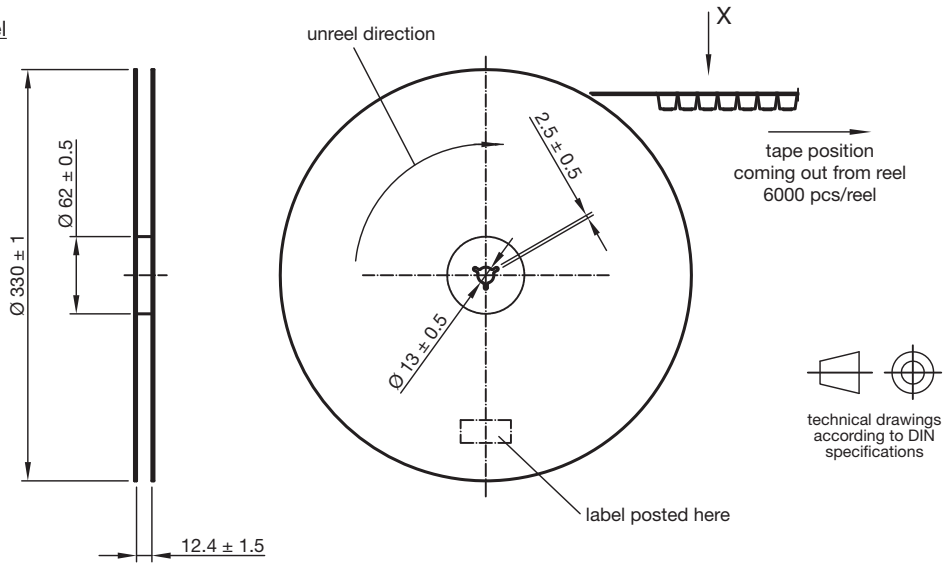


Drawing-No.: 9.800-5100.01-4
Issue: 4; 19.09.14

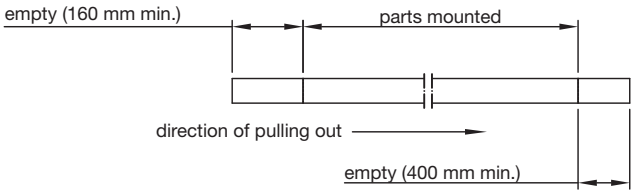
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TAPING AND REEL DIMENSIONS in millimeters: **VSMY2941GX01**

Reel

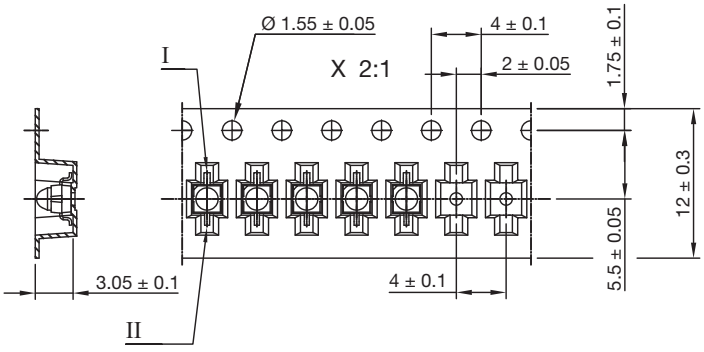


Leader and trailer tape



Terminal position in tape

Device	Lead I	Lead II
VSMB2020	Cathode	Anode
VSMG2020		
VEMD2020		
VEMD2520		
VSMF2890G		
VEMT2020	Collector	Emitter
VEMT2520		
VSMY2850G	Anode	Cathode
VSMY2940G		



Drawing-No.: 9.800-5091.01-4
Issue: 5; 19.09.14

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