



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

VSMY2943RGX01

VSMY2943GX01



DESCRIPTION

As part of the [SurfLight™](#) portfolio, the VSMY2943 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

- Automotive sensors
- 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: $\lambda_p = 940$ nm
- High reliability
- High radiant power
- Very high radiant intensity
- Angle of half intensity: $\varphi = \pm 28^\circ$
- Suitable for high pulse current operation
- Terminal configurations: gullwing or reverse gullwing
- Package matches with detector VEMD2503X01 series
- Floor life: 4 weeks, MSL 2a, acc. J-STD-020
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE



RoHS COMPLIANT
HALOGEN FREE
GREEN (5-2008)

| PRODUCT SUMMARY | | | | |
|-----------------|---------------|-----------------|------------------|------------|
| COMPONENT | I_e (mW/sr) | φ (deg) | λ_p (nm) | t_r (ns) |
| VSMY2943RGX01 | 50 | ± 28 | 940 | 10 |
| VSMY2943GX01 | 50 | ± 28 | 940 | 10 |

Note

- Test conditions see table "Basic Characteristics"

| ORDERING INFORMATION | | | |
|----------------------|---------------|------------------------------|------------------|
| ORDERING CODE | PACKAGING | REMARKS | PACKAGE FORM |
| VSMY2943RGX01 | Tape and reel | MOQ: 6000 pcs, 6000 pcs/reel | Reverse gullwing |
| VSMY2943GX01 | 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 | 100 | mA |
| Peak forward current | t _p /T = 0.5, t _p = 100 μs | I _{FM} | 200 | mA |
| Surge forward current | t _p = 100 μs | I _{FSM} | 1 | A |
| Power dissipation | | P _V | 180 | 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 | Acc. figure 7, J-STD-020 | T _{sd} | 260 | °C |
| Thermal resistance junction/ambient | J-STD-051, soldered on PCB | R _{thJA} | 250 | K/W |

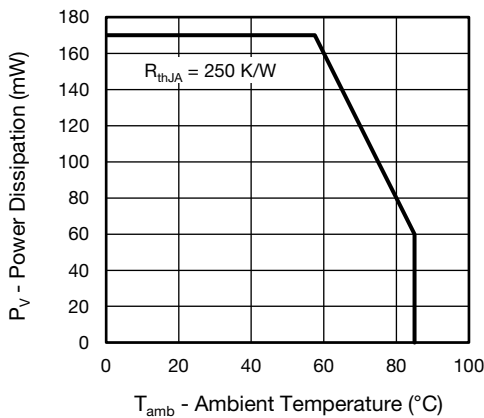


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

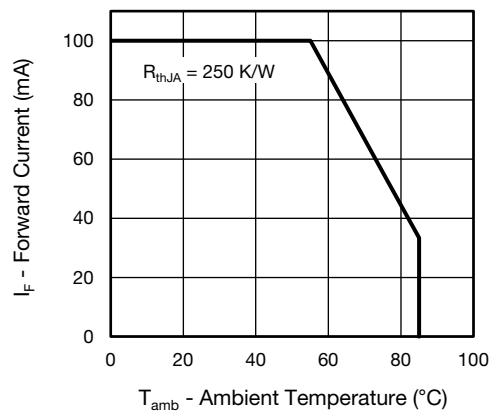


Fig. 2 - Forward Current Limit vs. Ambient Temperature

| BASIC CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified) | | | | | | |
|--|---|-----------------------------|------------------------------------|------|------|-------|
| PARAMETER | TEST CONDITION | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Forward voltage | I _F = 100 mA, t _p = 20 ms | V _F | - | 1.4 | 1.8 | V |
| | I _F = 1 A, t _p = 100 μs | V _F | - | 2.5 | - | V |
| Temperature coefficient of V _F | I _F = 100 mA | TK _{V_F} | - | -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/cm ² | C _J | - | 55 | - | pF |
| Radiant intensity | I _F = 100 mA, t _p = 20 ms | I _e | 27 | 50 | 75 | mW/sr |
| | I _F = 1 A, t _p = 100 μs | I _e | - | 350 | - | mW/sr |
| Radiant power | I _F = 100 mA, t _p = 20 ms | φ _e | - | 55 | - | mW |
| Temperature coefficient of radiant power | I _F = 100 mA | TK _{φ_e} | - | -0.2 | - | %/K |
| Angle of half intensity | | φ | - | ± 28 | - | deg |
| Peak wavelength | I _F = 100 mA | λ _p | 920 | 940 | 960 | nm |
| Spectral bandwidth | I _F = 100 mA | Δλ | - | 50 | - | nm |
| Temperature coefficient of λ _p | I _F = 100 mA | TK _{λ_p} | - | 0.25 | - | nm/K |
| Rise time | I _F = 100 mA, 10 % to 90 % | t _r | - | 10 | - | ns |
| Fall time | I _F = 100 mA, 10 % to 90 % | t _f | - | 10 | - | ns |

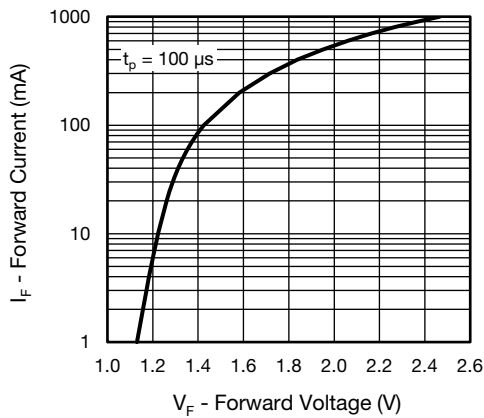
BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)


Fig. 3 - Forward Current vs. Forward Voltage

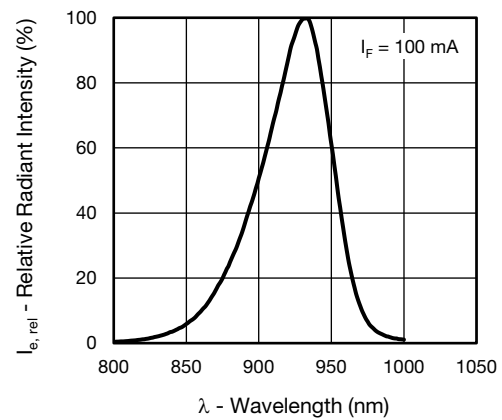


Fig. 5 - Relative Radiant Power vs. Wavelength

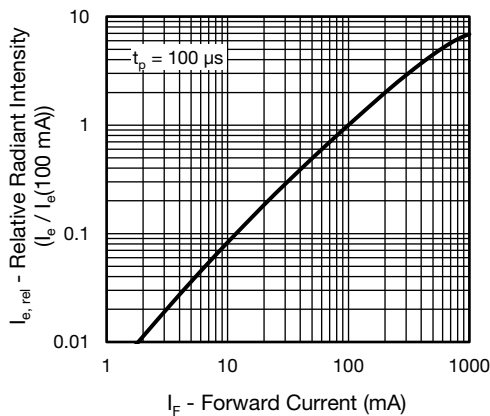


Fig. 4 - Radiant Intensity vs. Forward Current

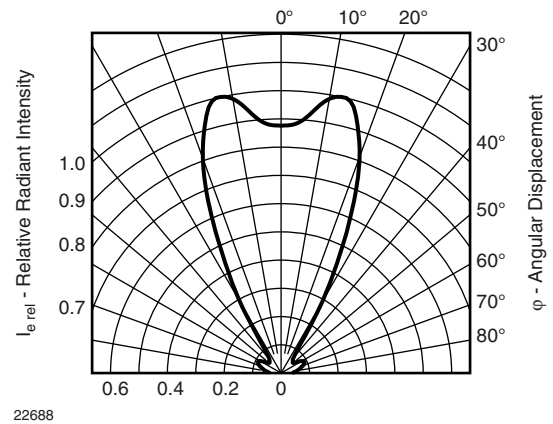


Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

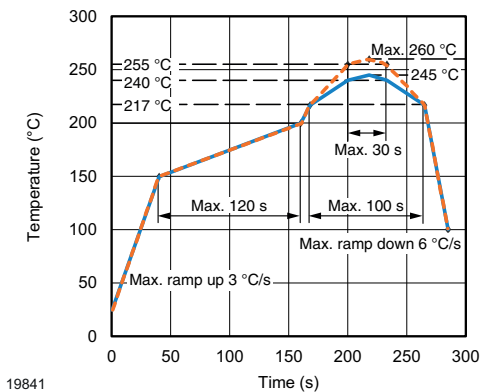
SOLDER PROFILE


Fig. 7 - Lead (Pb)-free Reflow Solder Profile acc. 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: $T_{amb} < 30\text{ }^{\circ}\text{C}$, $\text{RH} < 60\%$

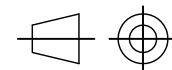
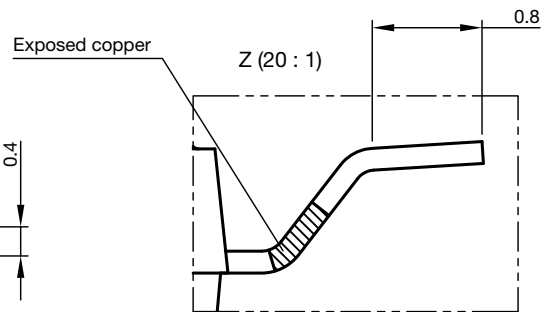
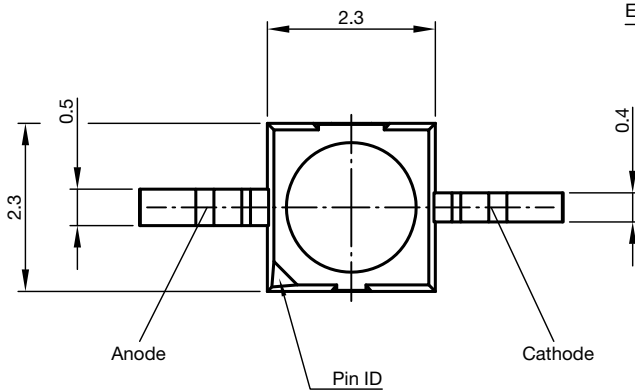
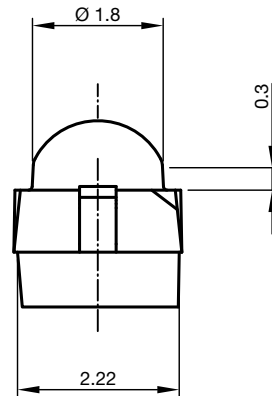
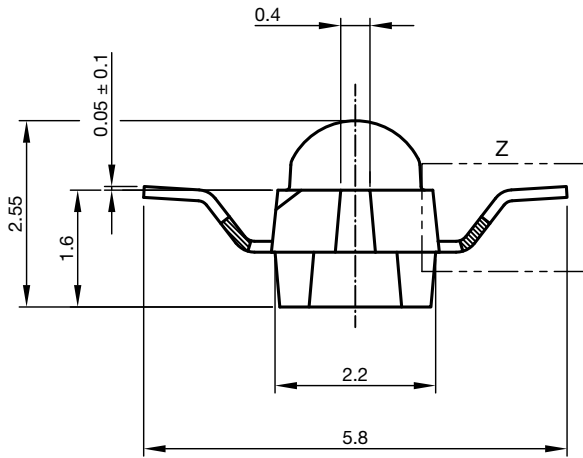
Moisture sensitivity level 2a, acc. to J-STD-020.

DRYING

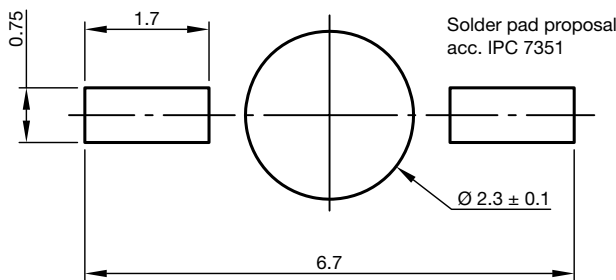
In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-020 or label. Devices taped on reel dry using recommended conditions 192 h at $40\text{ }^{\circ}\text{C}$ (+ 5 °C), $\text{RH} < 5\%$.



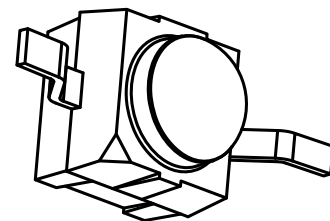
PACKAGE DIMENSIONS in millimeters: VSMY2943RGX01



Technical drawings according to DIN specifications



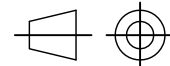
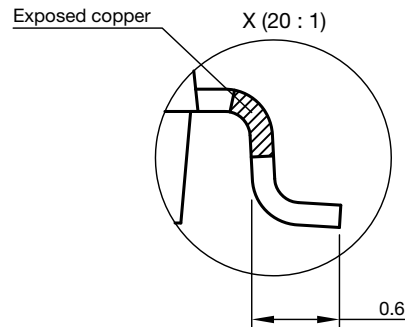
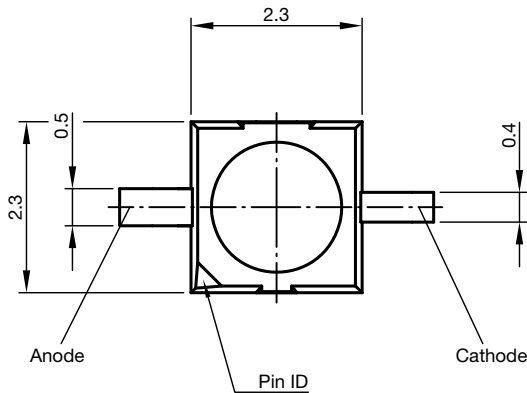
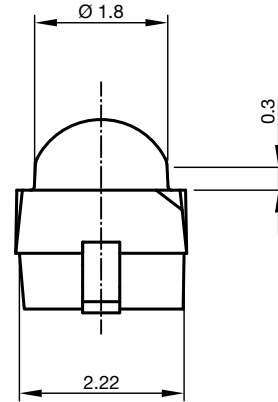
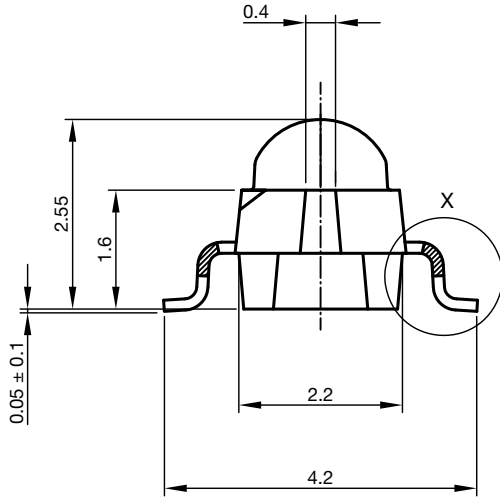
Not indicated tolerances ± 0.2



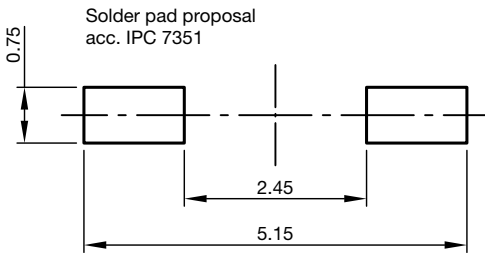
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Issue: 3; 02.10.15



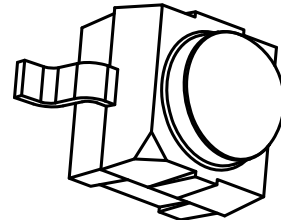
PACKAGE DIMENSIONS in millimeters: VSMY2943GX01



Technical drawings according to DIN specifications



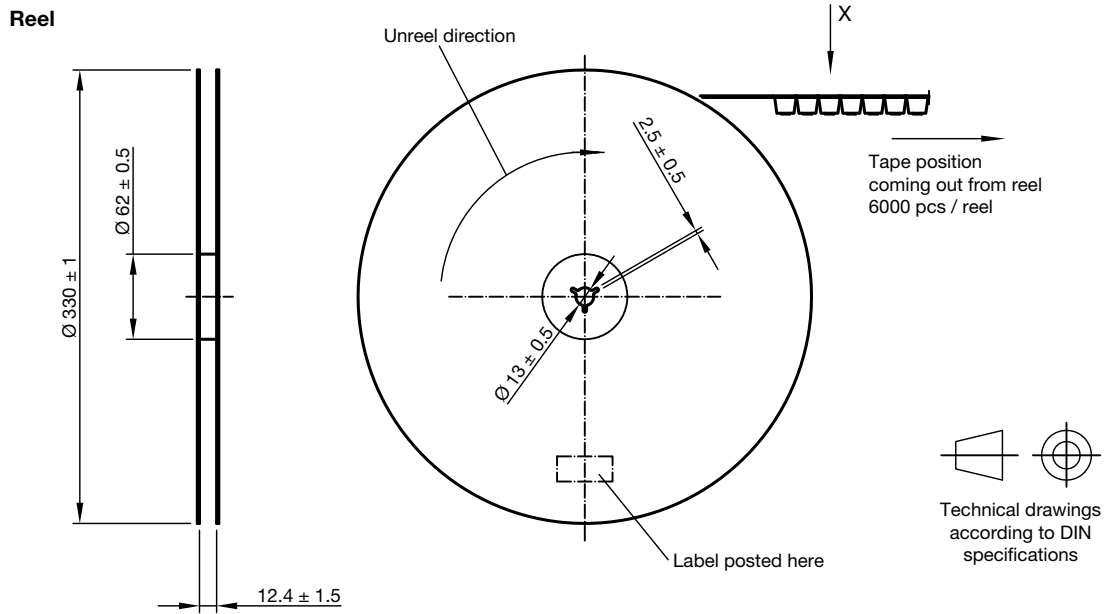
Not indicated tolerances ± 0.2



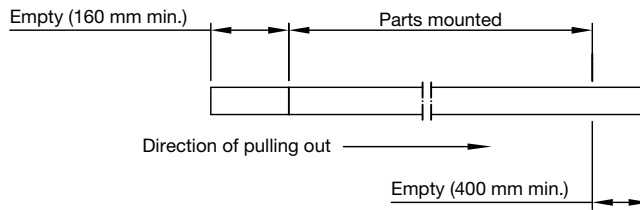
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Issue: 3; 02.10.15



TAPING AND REEL DIMENSIONS in millimeters: **VSMY2943RGX01**

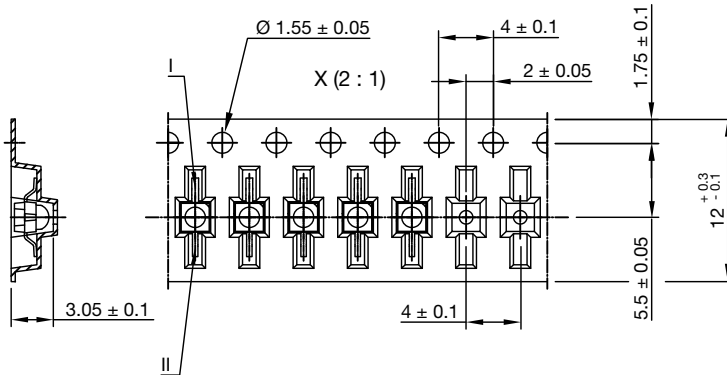


Leader and trailer tape



Terminal position in tape

| Device | Lead I | Lead II |
|---------------|-----------|---------|
| VSMB2943RGX01 | Cathode | Anode |
| VSMF2893RGX01 | | |
| VEMD2x03X01 | Collector | Emitter |
| VEMT2x03X01 | | |
| VSMY2853RG | Anode | Cathode |
| VSMY2943RG | | |
| VSMY294310RG | | |

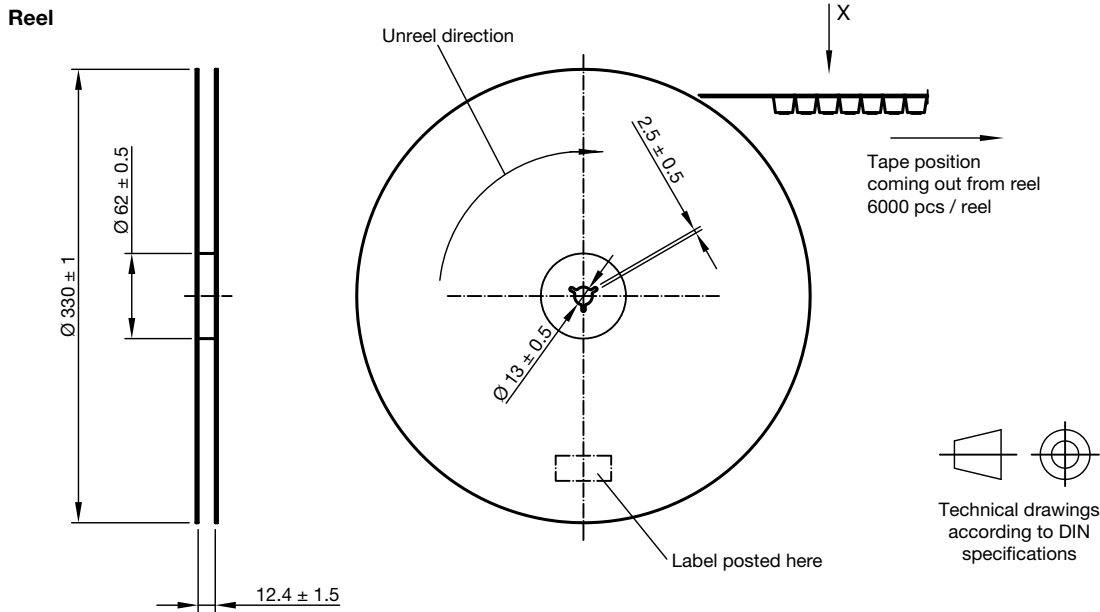


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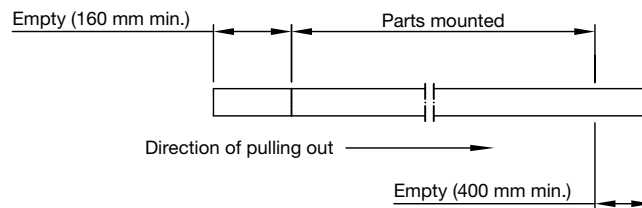
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TAPING AND REEL DIMENSIONS in millimeters: **VSMY2943GX01**

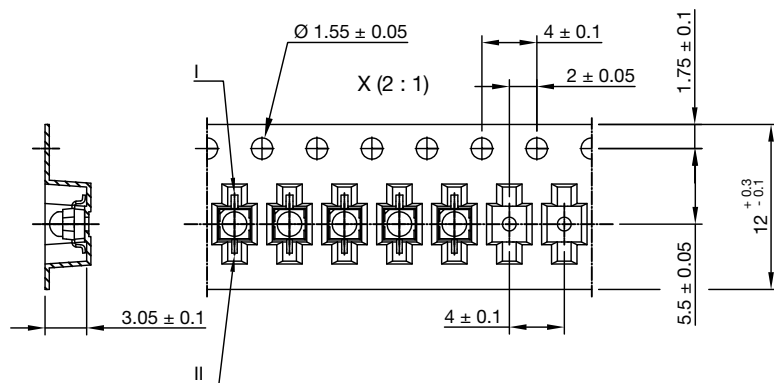


Leader and trailer tape



Terminal position in tape

| Device | Lead I | Lead II |
|--------------|-----------|---------|
| VSMB2943GX01 | Cathode | Anode |
| VSMF2893GX01 | | |
| VEMD2x23X01 | Collector | Emitter |
| VENT2x23X01 | | |
| VSMY2853G | Anode | Cathode |
| VSMY2943G | | |
| VSMY294310G | | |



Drawing-No.: 9.800-5091.21-4

Issue: 3; 02.10.15



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