



Silicon PIN Photodiode

VEMD2503X01



VEMD2523X01



DESCRIPTION

VEMD2503X01 and VEMD2523X01 are high speed and high sensitive PIN photodiodes in a miniature surface mount package (SMD) with dome lens. The clear epoxy allows light detection of a wide wavelength range from 350 nm to 1120 nm. The photo sensitive area of the chip is 0.23 mm².

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
- High radiant sensitivity
- Suitable for visible and near infrared radiation
- Fast response times
- Angle of half sensitivity: $\phi = \pm 35^\circ$
- Package matched with IR emitter series VSMB2943X01
- Floor life: 4 weeks, MSL 2a, acc. J-STD-020
- Lead (Pb)-free reflow soldering
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE



RoHS COMPLIANT
HALOGEN FREE
GREEN (5-2008)

APPLICATIONS

- High speed photo detector
- Light curtain
- Detector for optical switch

| PRODUCT SUMMARY | | | |
|-----------------|----------------------|---------|-----------------------|
| COMPONENT | I _{ra} (μA) | φ (deg) | λ _{0.1} (nm) |
| VEMD2503X01 | 10 | ± 35 | 350 to 1120 |
| VEMD2523X01 | 10 | ± 35 | 350 to 1120 |

Note

- Test conditions see table “Basic Characteristics”

| ORDERING INFORMATION | | | |
|----------------------|---------------|------------------------------|------------------|
| ORDERING CODE | PACKAGING | REMARKS | PACKAGE FORM |
| VEMD2503X01 | Tape and reel | MOQ: 6000 pcs, 6000 pcs/reel | Reverse gullwing |
| VEMD2523X01 | 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 | 60 | V |
| Power dissipation | T _{amb} ≤ 25 °C | P _V | 215 | mW |
| Junction temperature | | T _j | 100 | °C |
| Operating temperature range | | T _{amb} | - 40 to + 100 | °C |
| Storage temperature range | | T _{stg} | - 40 to + 100 | °C |
| Soldering temperature | Acc. reflow solder profile fig. 7 | T _{sd} | 260 | °C |
| Thermal resistance junction/ambient | Acc. J-STD-051 | R _{thJA} | 250 | K/W |



| BASIC CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified) | | | | | | |
|--|--|-----------------------------|------|-------------|------|------|
| PARAMETER | TEST CONDITION | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Forward voltage | I _F = 50 mA | V _F | | 1 | | V |
| Breakdown voltage | I _R = 100 μA, E = 0 | V _(BR) | 32 | | | V |
| Reverse dark current | V _R = 10 V, E = 0 | I _{ro} | | 1 | 10 | nA |
| Diode capacitance | V _R = 0 V, f = 1 MHz, E = 0 | C _D | | 4 | | pF |
| | V _R = 5 V, f = 1 MHz, E = 0 | C _D | | 1.3 | | pF |
| Open circuit voltage | E _e = 1 mW/cm ² , λ = 950 nm | V _o | | 350 | | mV |
| Temperature coefficient of V _o | E _e = 1 mW/cm ² , λ = 950 nm | TK _{V_o} | | - 2.6 | | mV/K |
| Short circuit current | E _e = 1 mW/cm ² , λ = 950 nm | I _k | | 10 | | μA |
| Temperature coefficient of I _k | E _e = 1 mW/cm ² , λ = 950 nm | TK _{I_k} | | 0.1 | | %/K |
| Reverse light current | E _e = 1 mW/cm ² , λ = 950 nm, V _R = 5 V | I _{ra} | 7 | 10 | 14 | μA |
| Angle of half sensitivity | | φ | | ± 35 | | deg |
| Wavelength of peak sensitivity | | λ _p | | 900 | | nm |
| Range of spectral bandwidth | | λ _{0.1} | | 350 to 1120 | | nm |
| Rise time | V _R = 10 V, R _L = 1 kΩ, λ = 820 nm | t _r | | 100 | | ns |
| Fall time | V _R = 10 V, R _L = 1 kΩ, λ = 820 nm | t _f | | 100 | | ns |

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

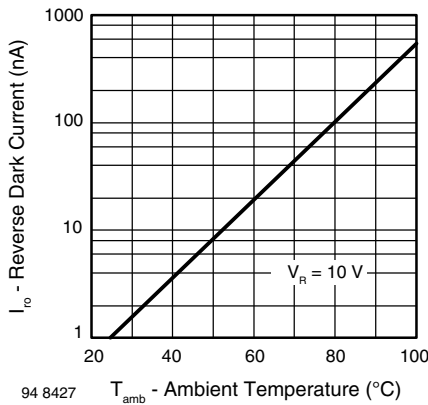


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

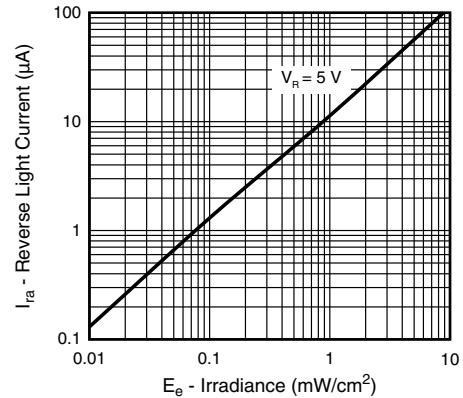


Fig. 3 - Reverse Light Current vs. Irradiance

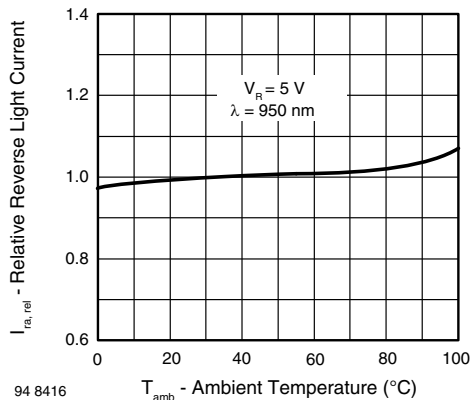


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

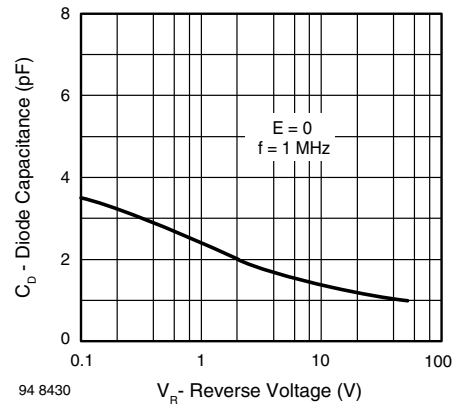


Fig. 4 - Diode Capacitance vs. Reverse Voltage

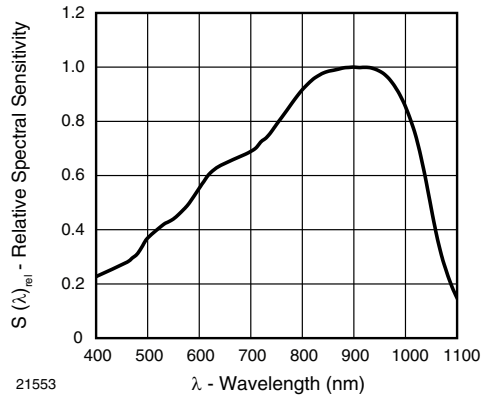


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

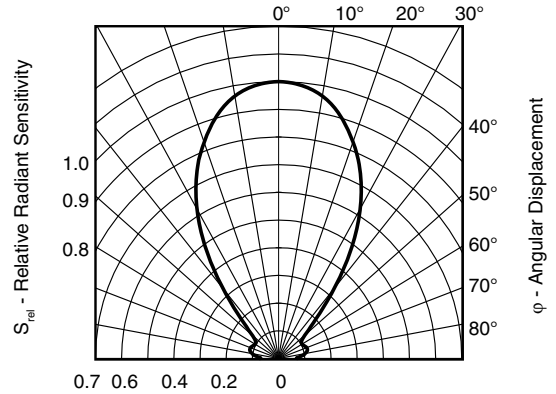


Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

REFLOW SOLDER PROFILE

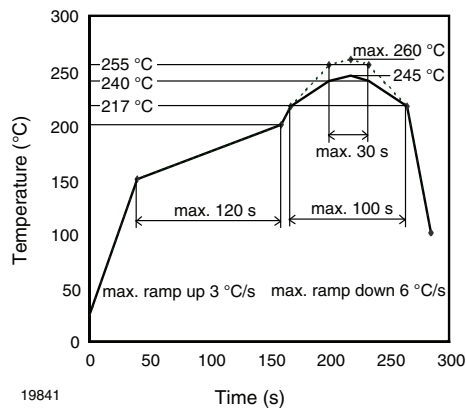


Fig. 7 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020D

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

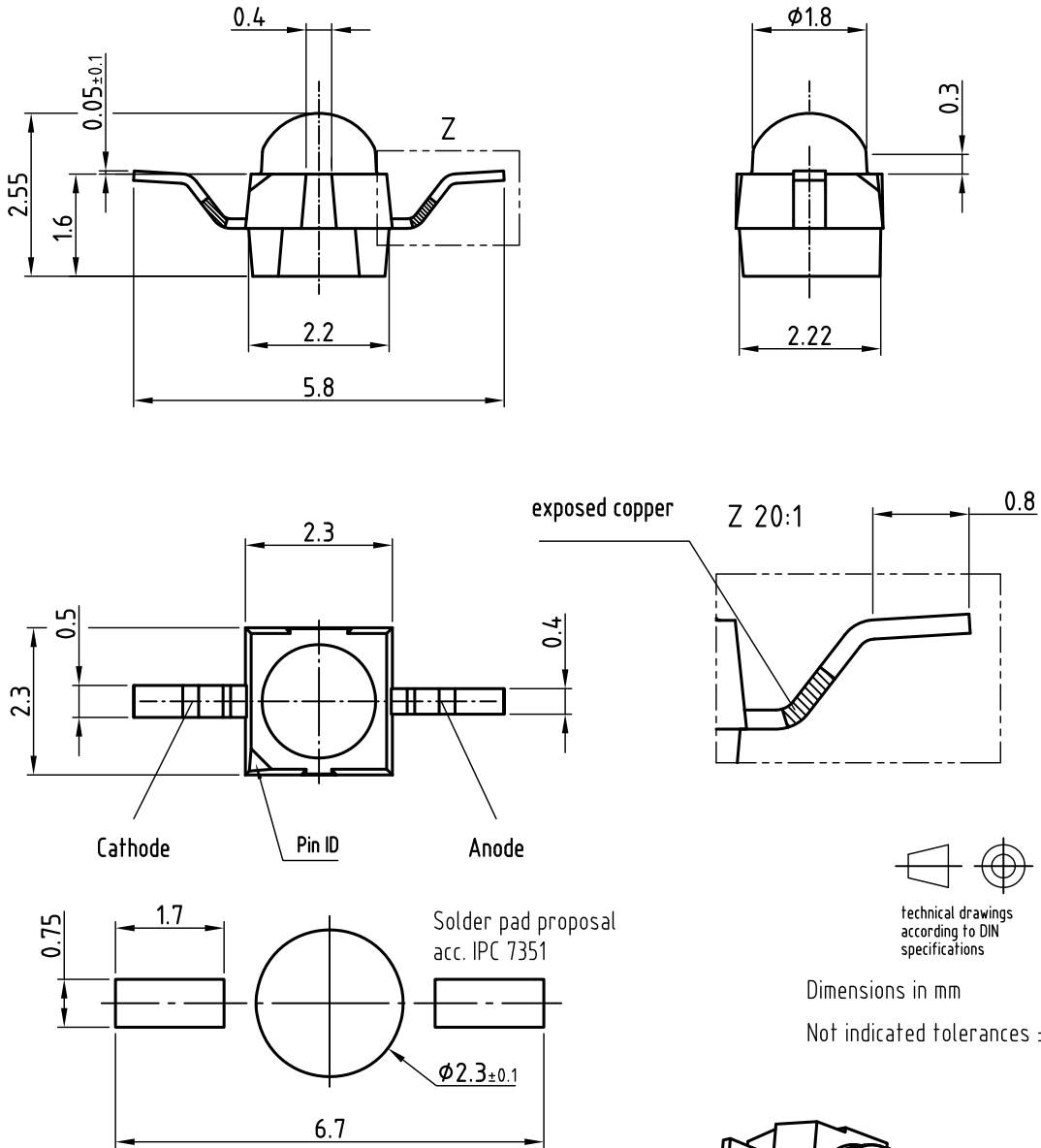
Moisture sensitivity level 2a, acc. to J-STD-020.

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 $40\text{ }^{\circ}\text{C}$ (+ $5\text{ }^{\circ}\text{C}$), $RH < 5\%$.

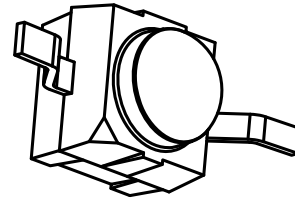


PACKAGE DIMENSIONS in millimeters: VEMD2503



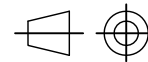
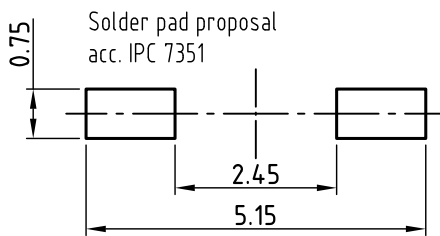
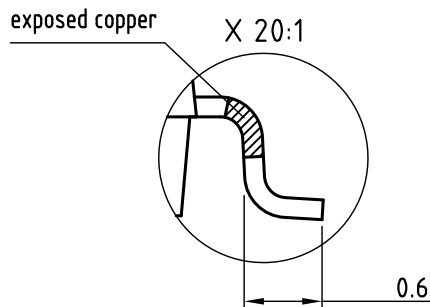
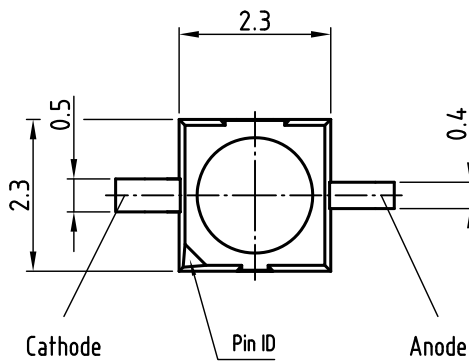
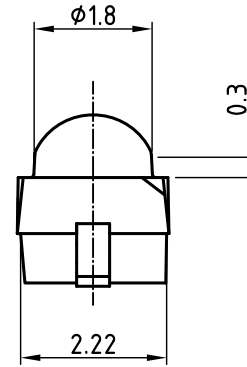
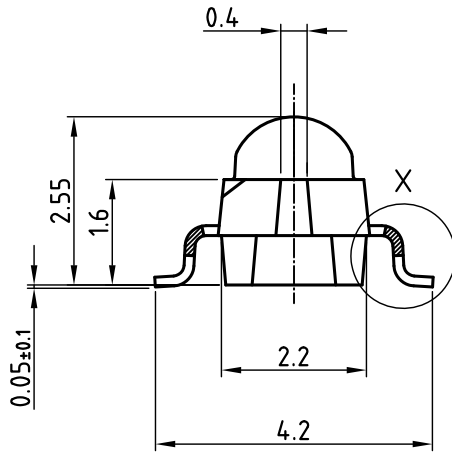
Drawing refers to following types: VSMB2943RGX01
VSMF2893RGX01
VEMD2x23X01

Drawing-No.: 6.544-5409.01-4
Issue: prel. 03.08.12





PACKAGE DIMENSIONS in millimeters: VEMD2523



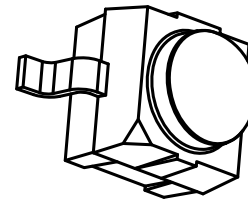
technical drawings according to DIN specifications

Dimensions in mm

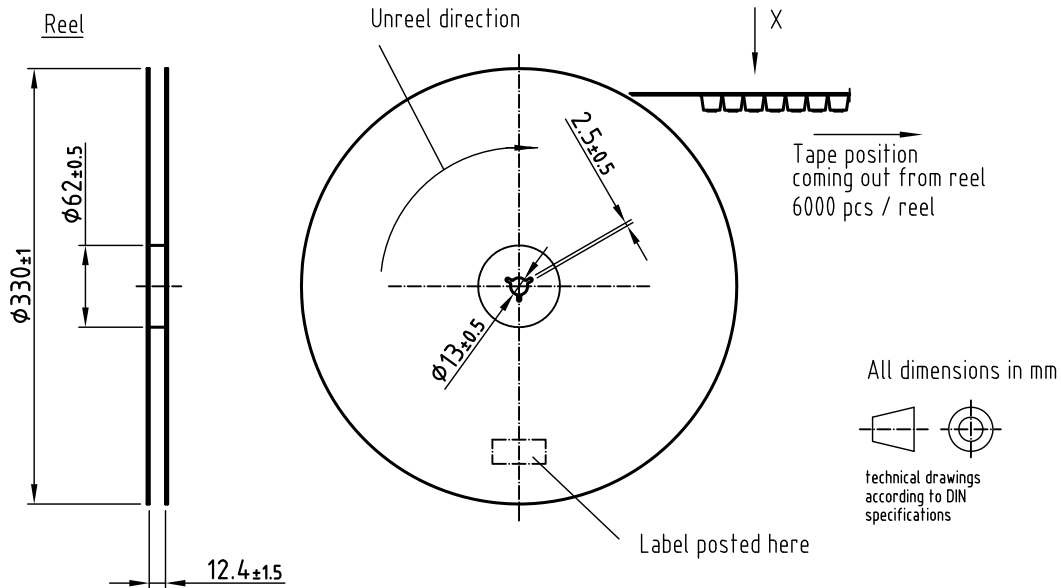
Not indicated tolerances ±0.2

Drawing refers to following types: VSMB2943GX01
 VSMF2893GX01
 VEMD2x23X01

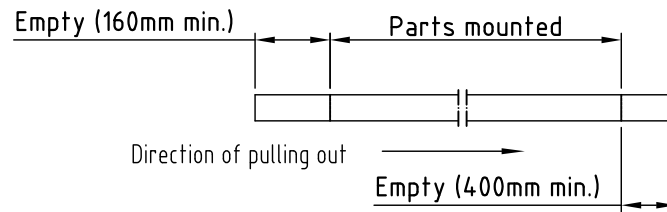
Drawing-No.: 6.544-5408.01-4
 Issue: prel; 03.08.12



TAPING AND REEL DIMENSIONS in millimeters: VEMD2503

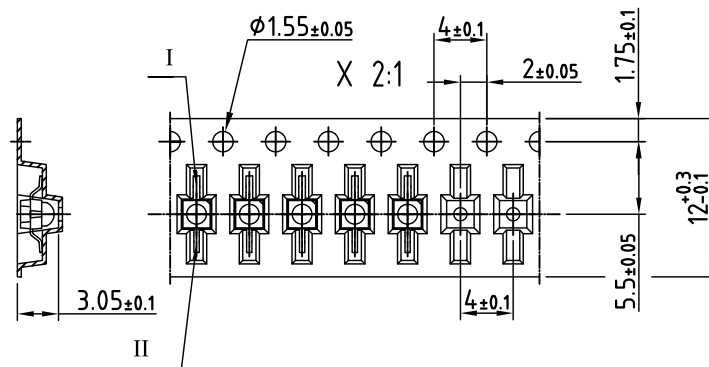


Leader and trailer tape:



Terminal position in tape

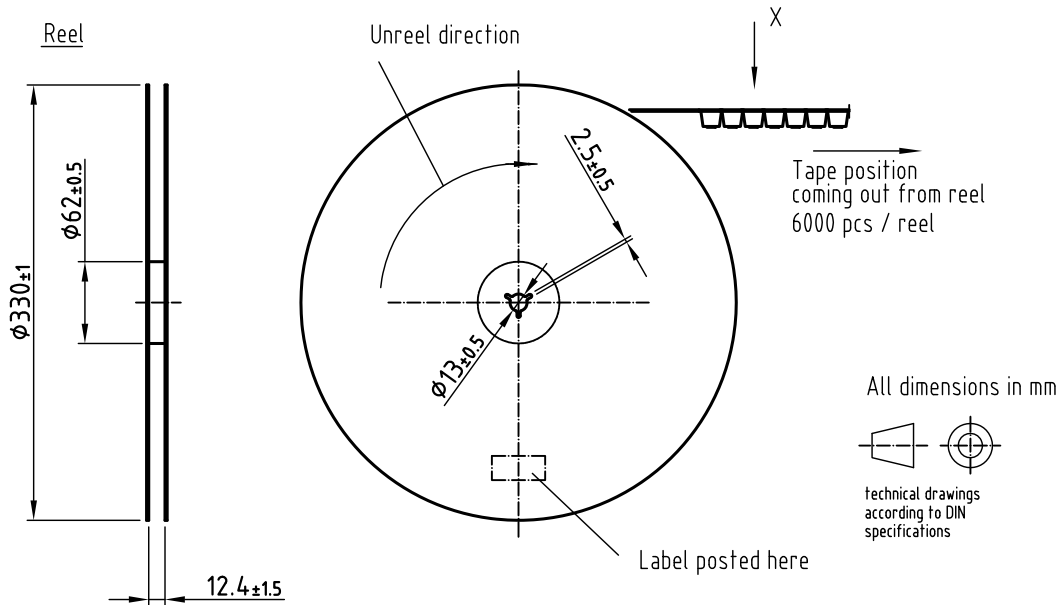
| Device | Lead I | Lead II |
|-----------------|-----------|---------|
| V SMB294.3RGX01 | Cathode | Anode |
| V SMF2893RGX01 | | |
| V EMD2x03X01 | | |
| V EMT2x03X01 | Collector | Emitter |
| V SMY2853RG | Anode | Cathode |



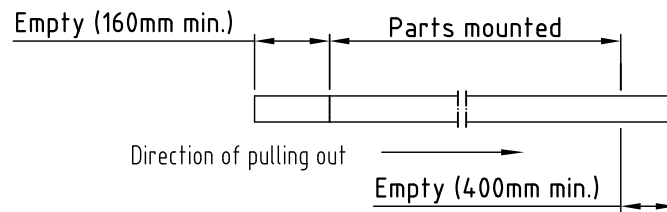
Drawing refers to following types: see table
Reel dimensions and tape

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

TAPING AND REEL DIMENSIONS in millimeters: VEMD2523

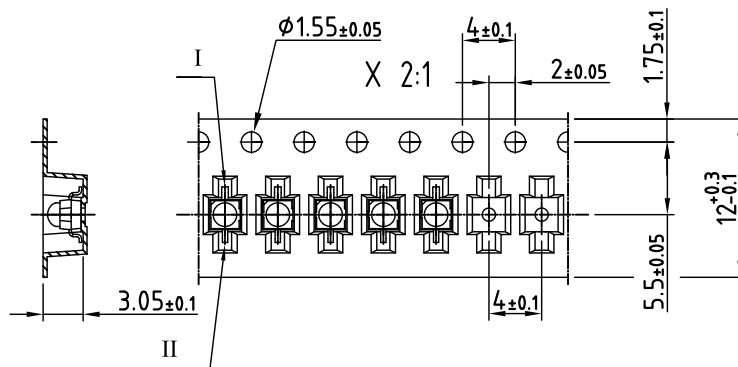


Leader and trailer tape:



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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