

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

VSMY2850RG



VSMY2850G



DESCRIPTION

As part of the [SurfLight™](#) portfolio, the VSMY2850 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

- 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 2.8
- Peak wavelength: $\lambda_p = 850$ nm
- High reliability
- High radiant power
- Very high radiant intensity
- Angle of half intensity: $\phi = \pm 10^\circ$
- Suitable for high pulse current operation
- Terminal configurations: gullwing or reverse gullwing
- Package matches with detector VEMD2500X01 series
- Floor life: 4 weeks, MSL 2a, according to J-STD-020
- Material categorization: for definitions of compliance please see www.vishay.com/doc?999912



PRODUCT SUMMARY

| COMPONENT | I_e (mW/sr) | ϕ (deg) | λ_p (nm) | t_r (ns) |
|------------|---------------|--------------|------------------|------------|
| VSMY2850RG | 125 | ± 10 | 850 | 10 |
| VSMY2850G | 125 | ± 10 | 850 | 10 |

Note

- Test conditions see table "Basic Characteristics"

ORDERING INFORMATION

| ORDERING CODE | PACKAGING | REMARKS | PACKAGE FORM |
|---------------|---------------|------------------------------|------------------|
| VSMY2850RG | Tape and reel | MOQ: 6000 pcs, 6000 pcs/reel | Reverse gullwing |
| VSMY2850G | Tape and reel | MOQ: 6000 pcs, 6000 pcs/reel | Gullwing |

Note

- MOQ: minimum order quantity

**ABSOLUTE MAXIMUM RATINGS** ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
|--|--|------------|-------------|--------------------|
| Reverse voltage | | V_R | 5 | V |
| Forward current | | I_F | 100 | mA |
| Peak forward current | $t_p/T = 0.5$, $t_p = 100\text{ }\mu\text{s}$ | 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. 10, J-STD-020 | T_{sd} | 260 | $^{\circ}\text{C}$ |
| Thermal resistance junction-to-ambient | EIA / JESD51 | R_{thJA} | 250 | K/W |

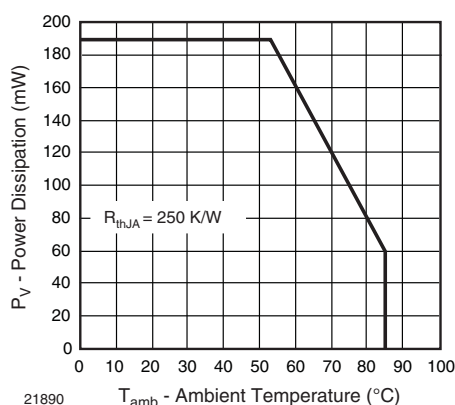


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

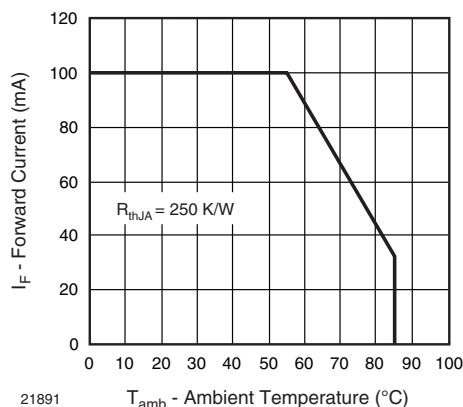


Fig. 2 - Forward Current Limit vs. Ambient Temperature

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} | - | -1.5 | - | 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 | - | 50 | - | pF |
| Radiant intensity | $I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$ | I_e | 70 | 125 | 210 | mW/sr |
| | $I_F = 1\text{ A}$, $t_p = 100\text{ }\mu\text{s}$ | I_e | - | 1000 | - | 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} | - | -0.12 | - | %/K |
| Angle of half intensity | | ϕ | - | ± 10 | - | deg |
| Peak wavelength | $I_F = 100\text{ mA}$ | λ_p | 840 | 850 | 870 | nm |
| Spectral bandwidth | $I_F = 30\text{ mA}$ | $\Delta\lambda$ | - | 30 | - | nm |
| Temperature coefficient of λ_p | $I_F = 30\text{ mA}$ | TK_{λ_p} | - | 0.25 | - | nm/K |
| Rise time | $I_F = 100\text{ mA}$, 10 % to 90 % | t_r | - | 10 | - | ns |
| Fall time | $I_F = 100\text{ mA}$, 10 % to 90 % | t_f | - | 10 | - | ns |

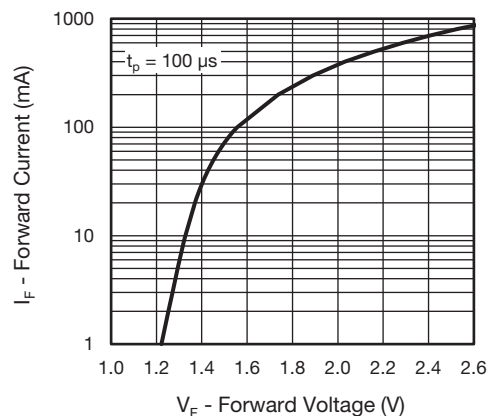
BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)


Fig. 3 - Forward Current vs. Forward Voltage

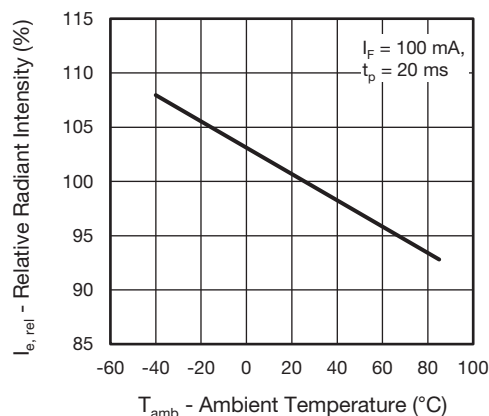


Fig. 6 - Relative Radiant Intensity vs. Ambient Temperature

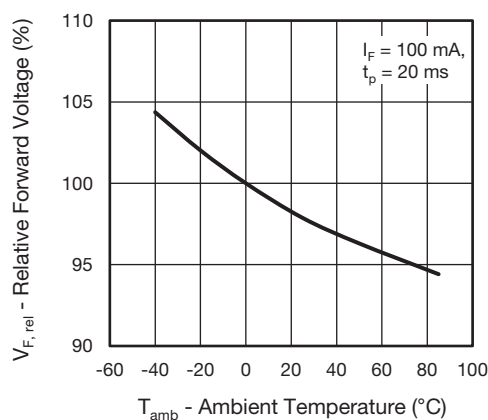


Fig. 4 - Relative Forward Voltage vs. Ambient Temperature

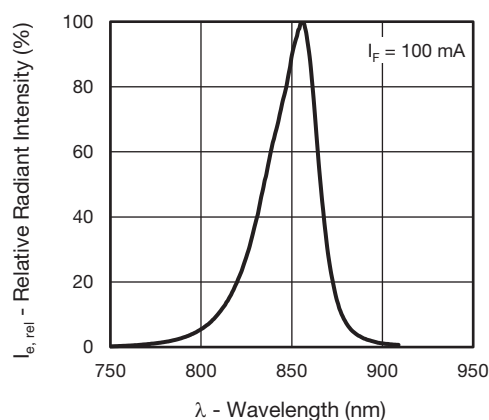


Fig. 7 - Relative Radiant Intensity vs. Wavelength

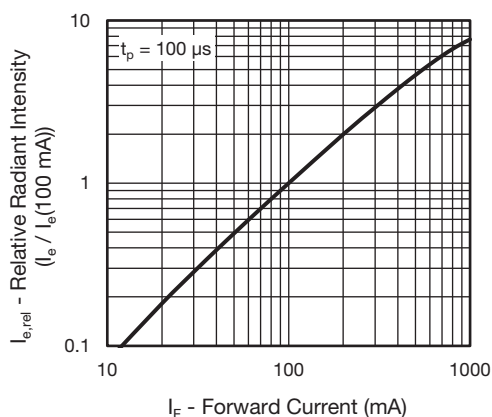


Fig. 5 - Relative Radiant Intensity vs. Forward Current

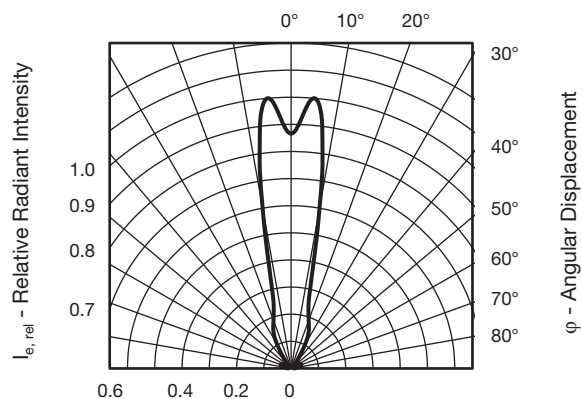


Fig. 8 - Relative Radiant Intensity vs. Angular Displacement



SOLDER PROFILE

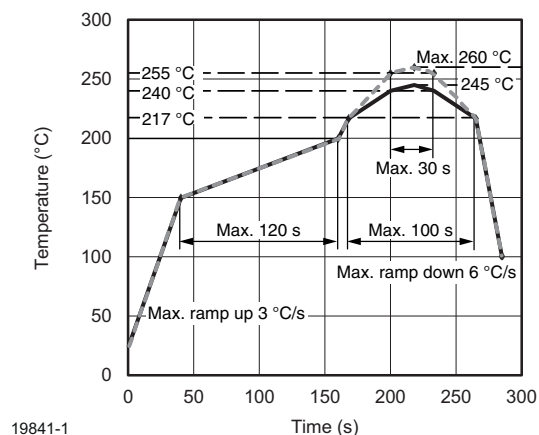


Fig. 9 - Lead (Pb)-free Reflow Solder Profile
According to J-STD-020

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

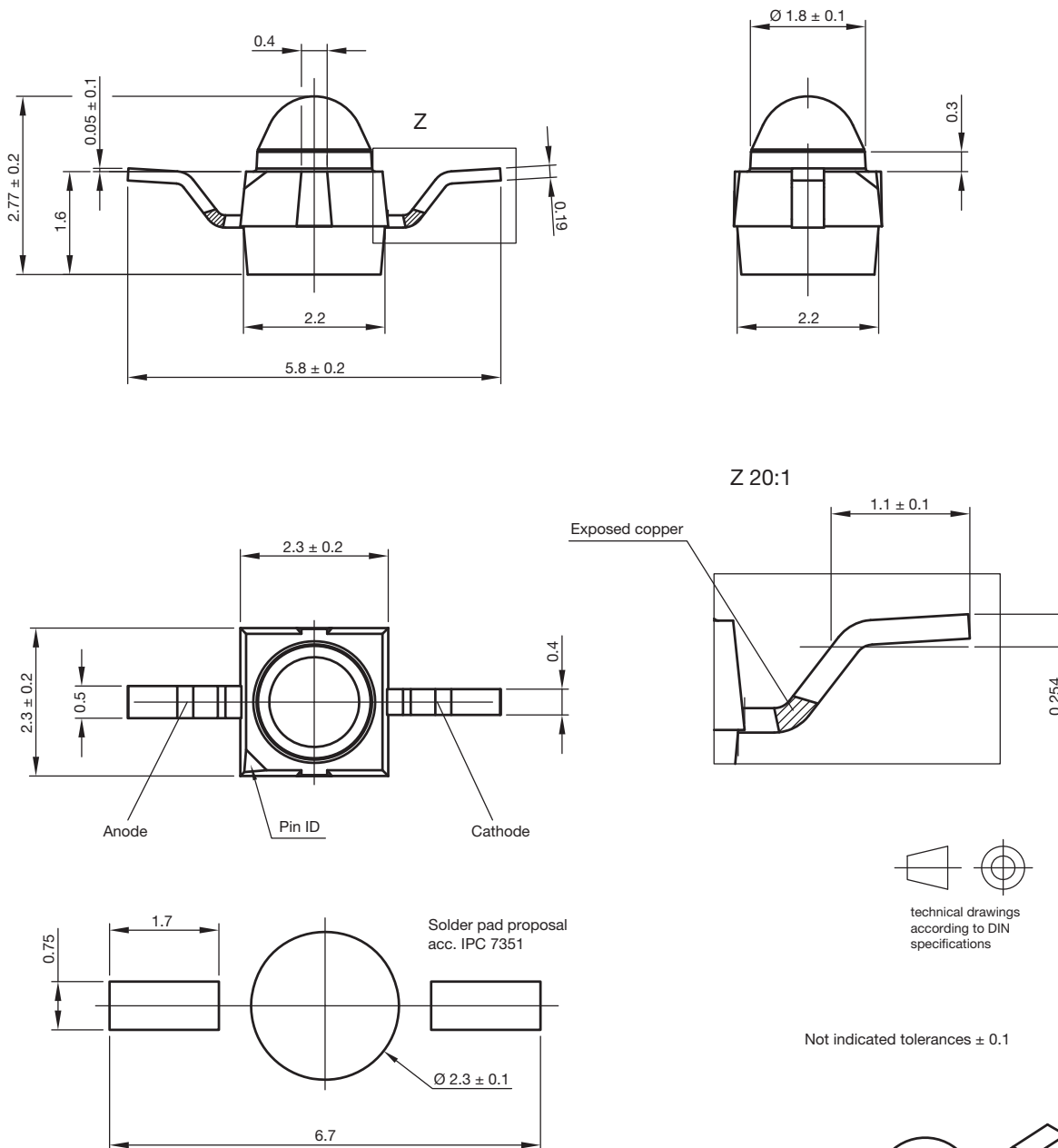
Moisture sensitivity level 2a, according to J-STD-020.

DRYING

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



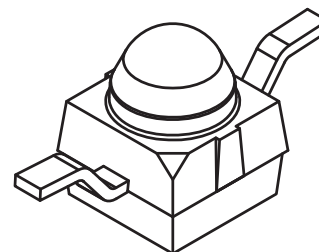
PACKAGE DIMENSIONS in millimeters: VSMY2850RG



Drawing-No.: 6.544-5391.03-4

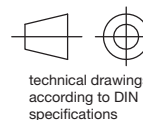
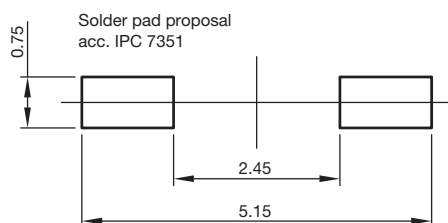
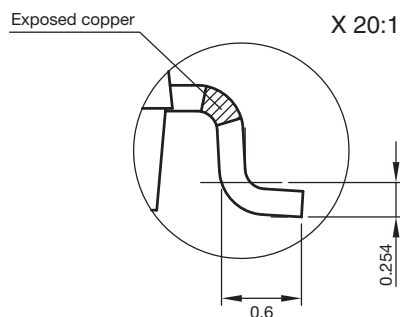
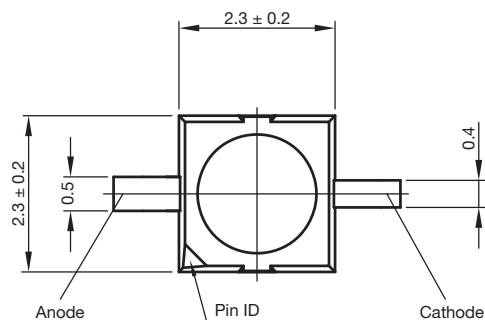
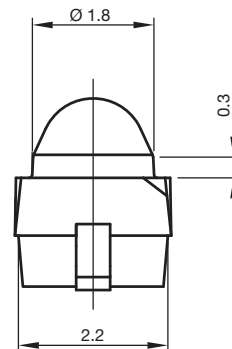
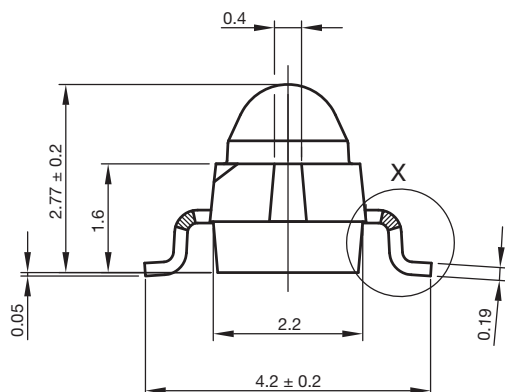
Issue: 1; 18.03.10

22100



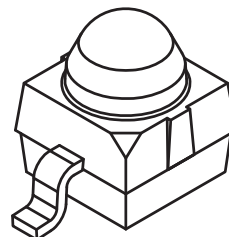


PACKAGE DIMENSIONS in millimeters: VSMY2850G

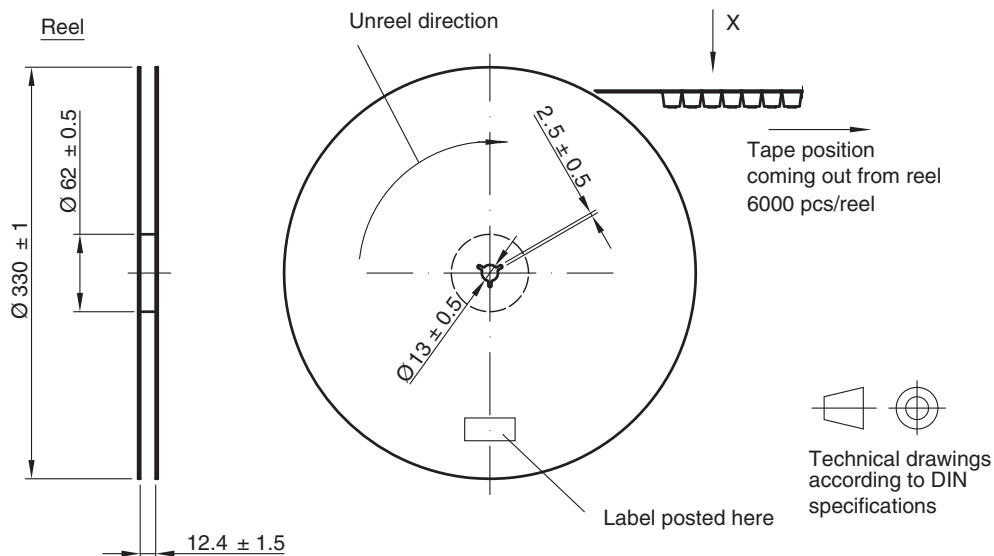


technical drawings
according to DIN
specifications

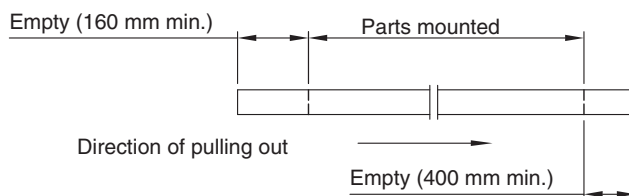
Not indicated tolerances ± 0.1



Drawing-No.: 6.544-5383.03-4
Issue: 1; 18.03.10
22099

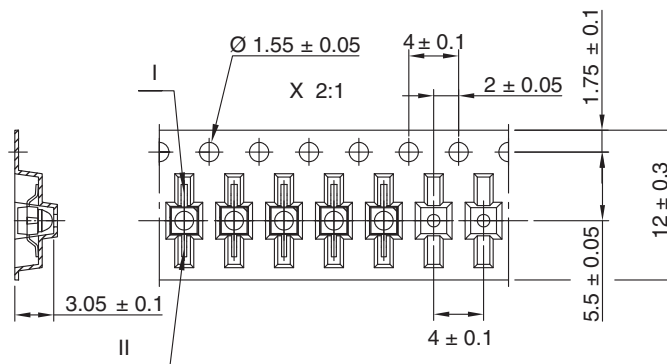
TAPING AND REEL DIMENSIONS in millimeters: **VSMY2850RG**


Leader and trailer tape:

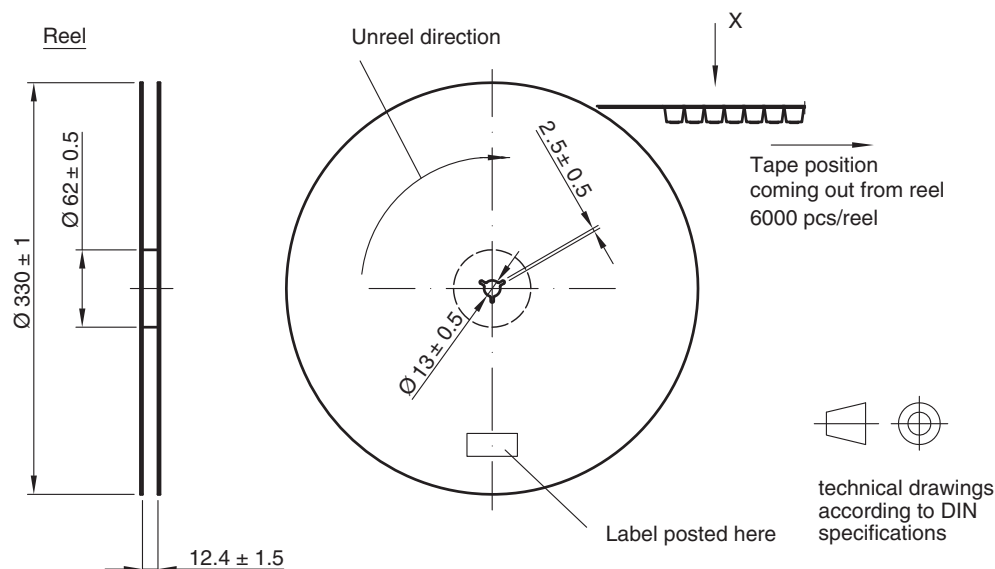
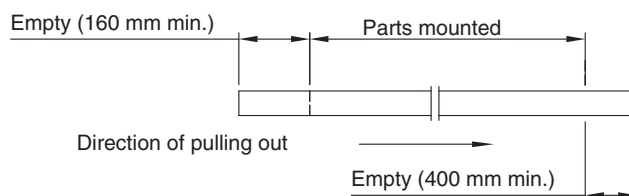


Terminal position in tape

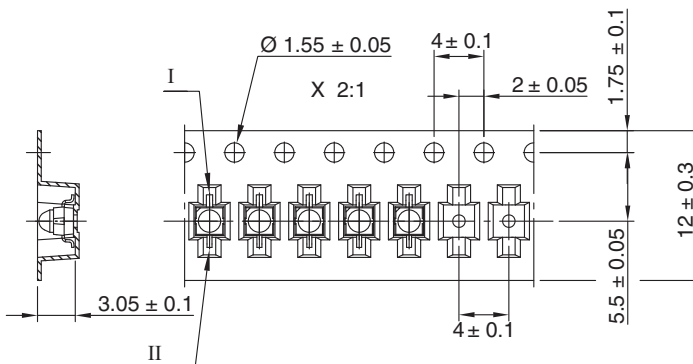
| Device | Lead I | Lead II |
|------------|-----------|---------|
| VENT2000 | Collector | Emitter |
| VENT2500 | | |
| VEMD2000 | Cathode | Anode |
| VEMD2500 | | |
| VSMB2000 | | |
| VSMG2000 | Anode | Cathode |
| VSMY2850RG | | |



Drawing-No.: 9.800-5100.01-4
Issue: 2; 18.03.10
21572

TAPING AND REEL DIMENSIONS in millimeters: **VSMY2850G**

Leader and trailer tape:

Terminal position in tape

| Device | Lead I | Lead II |
|-----------|-----------|---------|
| VENT2020 | Collector | Emitter |
| VENT2520 | | |
| VSMB2020 | Cathode | Anode |
| VSMG2020 | | |
| VEMD2020 | | |
| VEMD2520 | Anode | Cathode |
| VSMY2850G | | |



Drawing-No.: 9.800-5091.01-4

Issue: 3; 18.03.10

21571



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