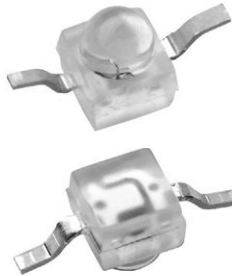


## High Speed Infrared Emitting Diodes, 850 nm, Surface Emitter Technology

VSMY2850RGX01



VSMY2850GX01



21725-3

### DESCRIPTION

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).

### 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 reserve gullwing
- Package matches with detector VEMD2500X01 series
- Floor life: 4 weeks, MSL 2a, acc. J-STD-020
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21 definition



### APPLICATIONS

- IrDA compatible data transmission
- Miniature light barrier
- Photointerrupters
- Optical switch
- Emitter source for proximity sensors
- IR touch panels
- IR illumination

| PRODUCT SUMMARY |               |              |                  |            |
|-----------------|---------------|--------------|------------------|------------|
| COMPONENT       | $I_e$ (mW/sr) | $\phi$ (deg) | $\lambda_p$ (nm) | $t_r$ (ns) |
| VSMY2850RG      | 100           | $\pm 10$     | 850              | 10         |
| VSMY2850G       | 100           | $\pm 10$     | 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

\*\* Please see document "Vishay Material Category Policy": [www.vishay.com/doc?99902](http://www.vishay.com/doc?99902)

| 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   | acc. figure 7, J-STD-020                       | $T_{sd}$   | 260           | $^{\circ}\text{C}$ |
| Thermal resistance junction/ambient   | J-STD-051, soldered on PCB                     | $R_{thJA}$ | 250           | K/W                |

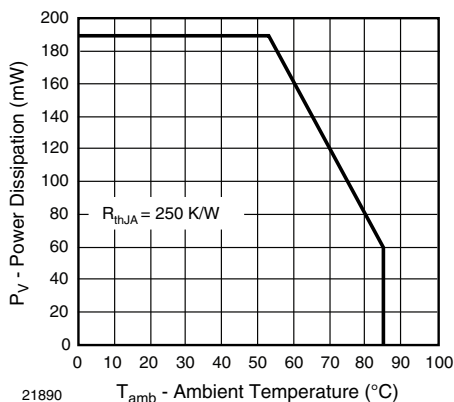


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

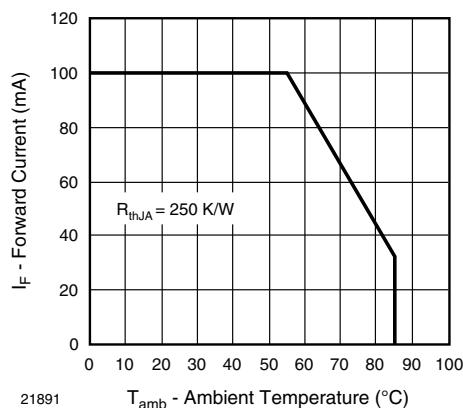


Fig. 2 - Forward Current Limit vs. Ambient Temperature

| BASIC CHARACTERISTICS ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) |  |                  |                                    |          |      |               |
|--|--|------------------|------------------------------------|----------|------|---------------|
| PARAMETER  | TEST CONDITION   | SYMBOL           | MIN.                               | TYP.     | MAX. | UNIT          |
| Forward voltage  | $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$                     | $V_F$            |                                    | 1.65     | 1.9  | V             |
|  | $I_F = 1\text{ A}$ , $t_p = 100\text{ }\mu\text{s}$              | $V_F$            |                                    | 2.9      |      | V             |
| Temperature coefficient of $V_F$   | $I_F = 1\text{ mA}$  | $TK_{V_F}$       |                                    | - 1.45   |      | mV/K          |
|  | $I_F = 10\text{ mA}$   | $TK_{V_F}$       |                                    | - 1.3    |      | mV/K          |
| Reverse current  |  | $I_R$            | not designed for reverse operation |          |      | $\mu\text{A}$ |
| Junction capacitance   | $V_R = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0\text{ mW/cm}^2$ | $C_J$            |                                    | 125      |      | pF            |
| Radiant intensity  | $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$                     | $I_e$            | 50                                 | 100      | 150  | mW/sr         |
|  | $I_F = 1\text{ A}$ , $t_p = 100\text{ }\mu\text{s}$              | $I_e$            |                                    | 850      |      | mW/sr         |
| Radiant power  | $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$                     | $\phi_e$         |                                    | 55       |      | mW            |
| Temperature coefficient of radiant power   | $I_F = 100\text{ mA}$  | $TK_{\phi_e}$    |                                    | - 0.35   |      | %/K           |
| Angle of half intensity  |  | $\phi$           |                                    | $\pm 10$ |      | deg           |
| Peak wavelength  | $I_F = 100\text{ mA}$  | $\lambda_p$      | 840                                | 850      | 870  | nm            |
| Spectral bandwidth   | $I_F = 30\text{ mA}$   | $\Delta\lambda$  |                                    | 30       |      | nm            |
| Temperature coefficient of $\lambda_p$   | $I_F = 30\text{ mA}$   | $TK_{\lambda_p}$ |                                    | 0.25     |      | nm/K          |
| Rise time  | $I_F = 100\text{ mA}$ , 20 % to 80 %                             | $t_r$            |                                    | 10       |      | ns            |
| Fall time  | $I_F = 100\text{ mA}$ , 20 % to 80 %                             | $t_f$            |                                    | 10       |      | ns            |
| Virtual source diameter  |  | $d$              |                                    | 1.5      |      | mm            |

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

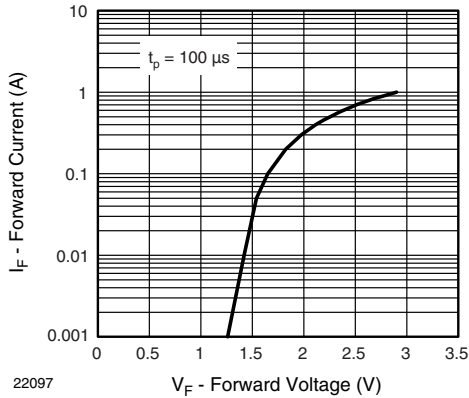


Fig. 3 - Forward Current vs. Forward Voltage

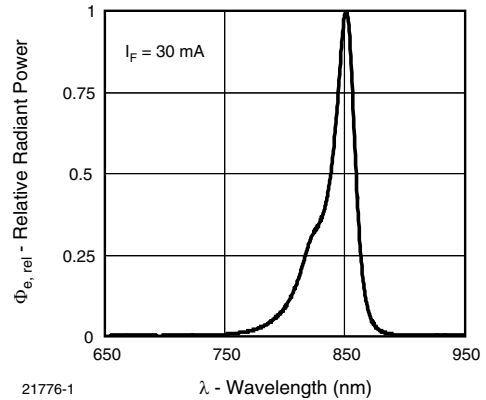


Fig. 5 - Relative Radiant Power vs. Wavelength

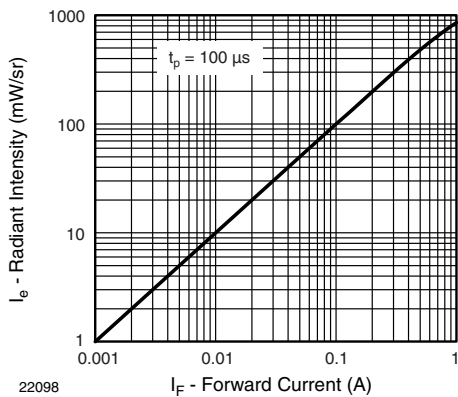


Fig. 4 - Radiant Intensity vs. Forward Current

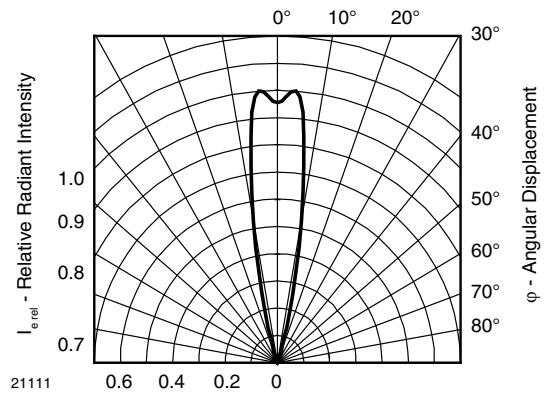


Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

### SOLDER PROFILE

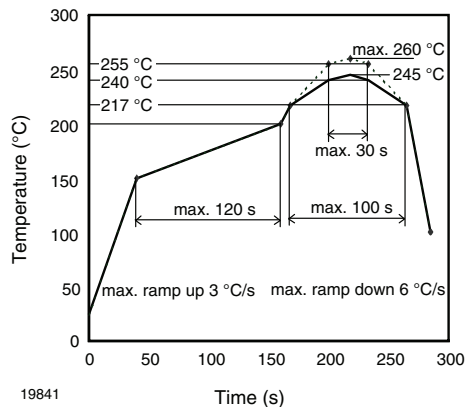


Fig. 7 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020

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

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

### DRYING

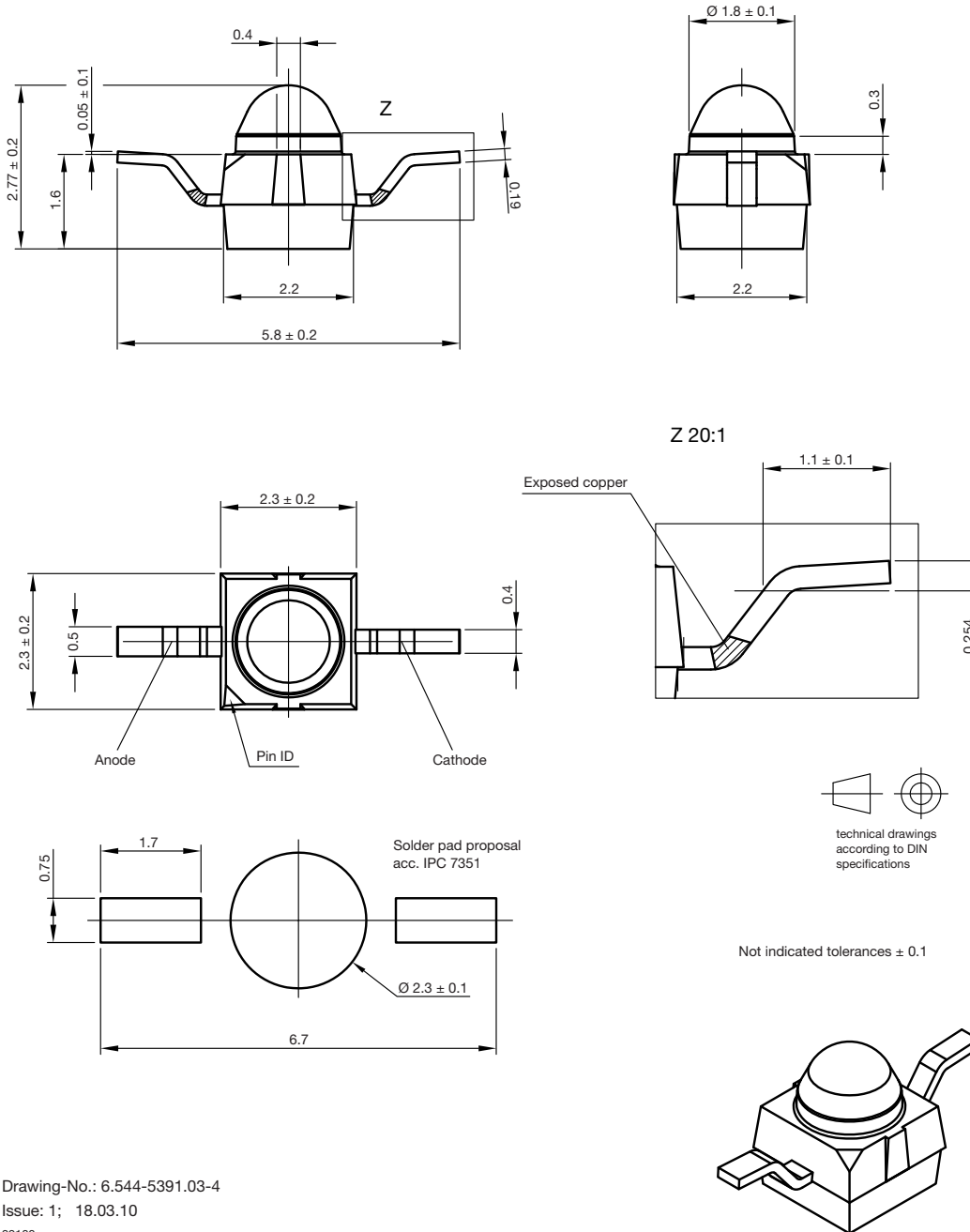
In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-020 or label. Devices taped on reel dry using recommended conditions 192 h at  $40\text{ }^{\circ}\text{C}$  (+ 5  $^{\circ}\text{C}$ ), RH < 5 %.

# VSMY2850RG, VSMY2850G



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

## PACKAGE DIMENSIONS in millimeters: VSMY2850RG



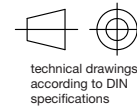
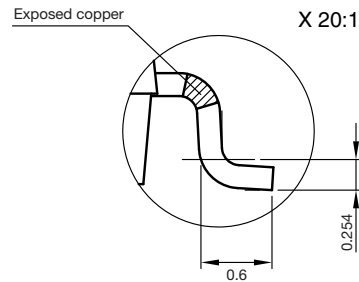
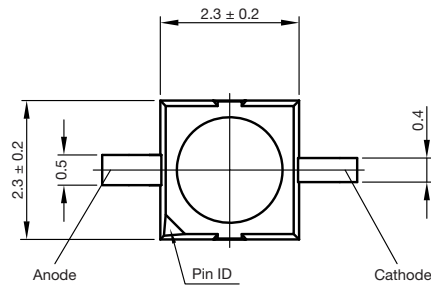
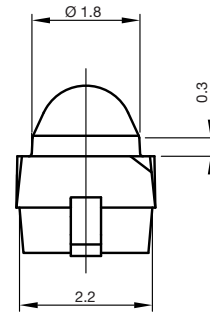
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Issue: 1; 18.03.10  
22100



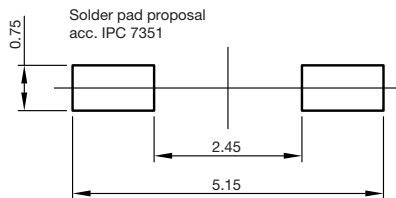
# VSMY2850RG, VSMY2850G

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

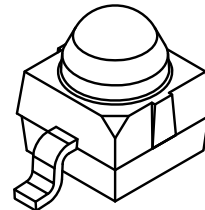
## PACKAGE DIMENSIONS in millimeters: VSMY2850G



technical drawings  
according to DIN  
specifications



Not indicated tolerances ± 0.1



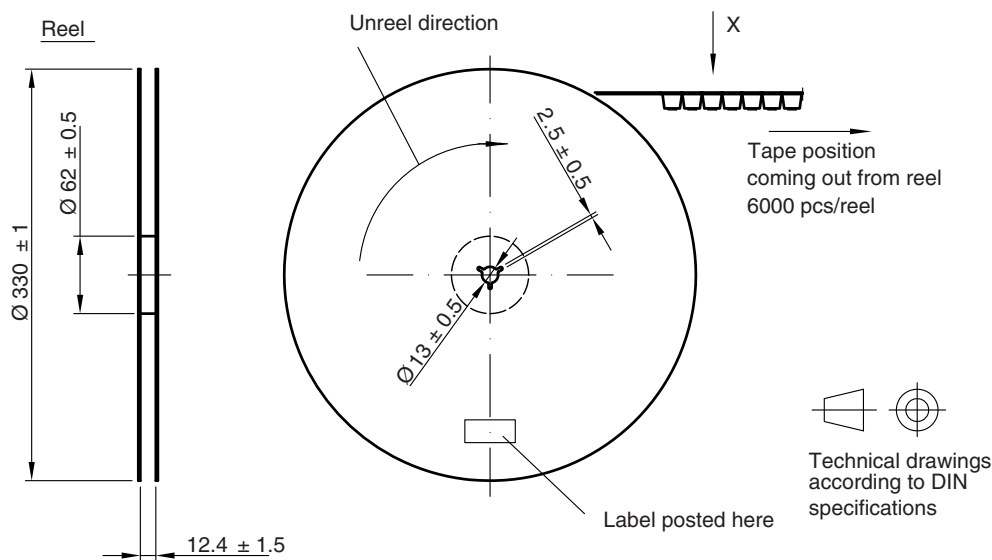
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22099

# VSMY2850RG, VSMY2850G

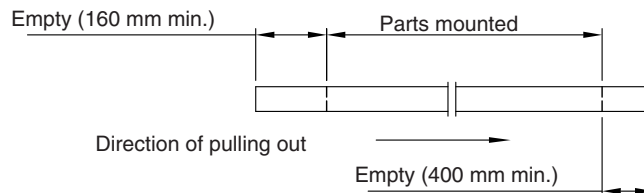


Vishay Semiconductors High Speed Infrared Emitting Diodes,  
850 nm, Surface Emitter Technology

## TAPING AND REEL DIMENSIONS in millimeters: VSMY2850RG

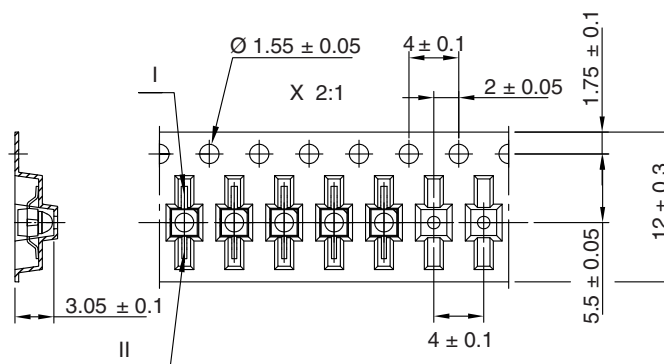


Leader and trailer tape:



Terminal position in tape

| Devicce    | Lead I    | Lead II |
|------------|-----------|---------|
| VEMT2000   | Collector | Emitter |
| VEMT2500   |           |         |
| VEMD2000   | Cathode   | Anode   |
| VEMD2500   |           |         |
| VSMB2000   |           |         |
| VSMG2000   | Anode     | Cathode |
| VSMY2850RG |           |         |



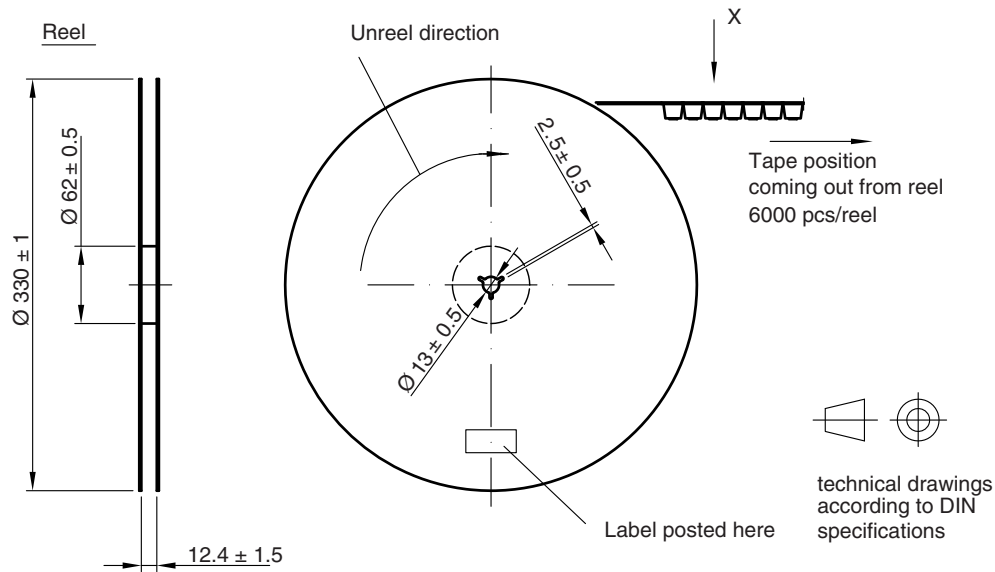
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Issue: 2; 18.03.10  
21572



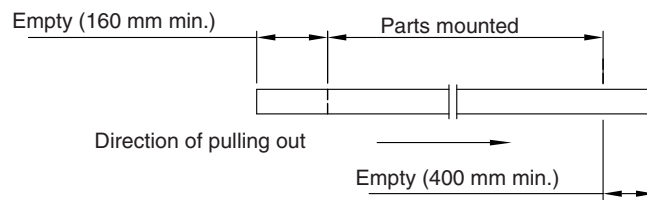
# VSMY2850RG, VSMY2850G

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

## TAPING AND REEL DIMENSIONS in millimeters: VSMY2850G

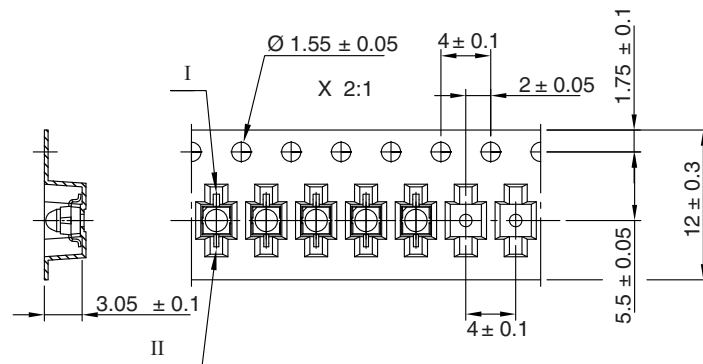


Leader and trailer tape:



Terminal position in tape

| Devicce   | Lead I    | Lead II |
|-----------|-----------|---------|
| VEMT2020  | Collector | Emitter |
| VEMT2520  |           |         |
| VSMB2020  | Cathode   | Anode   |
| VSMG2020  |           |         |
| VEMD2020  |           |         |
| VEMD2520  | Anode     | Cathode |
| VSMY2850G |           |         |



Drawing-No.: 9.800-5091.01-4

Issue: 3; 18.03.09

21571



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