

## High Speed Infrared Emitting Diodes, 890 nm, Surface Emitter Technology



### DESCRIPTION

As part of the [SurfLight™](#) portfolio, the VSMY5890 is an infrared, 890 nm emitting diode based on GaAlAs surface emitter chip technology with high radiant intensity, high optical power and high speed, in a low profile 0805 surface mount (SMD) package.

### FEATURES

- Package type: surface-mount
- Package form: 0805
- Dimensions (L x W x H in mm): 2 x 1.25 x 0.8
- Peak wavelength:  $\lambda_p = 890$  nm
- High speed
- Angle of half intensity:  $\phi = \pm 60^\circ$
- 0805 standard surface-mountable package
- Floor life: 168 h, MSL 3, according to J-STD-020
- Lead (Pb)-free reflow soldering
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)

### APPLICATIONS

- Miniature light barrier
- Optical switch
- IR point source

### PRODUCT SUMMARY

| COMPONENT | $I_e$ (mW/sr) at $I_F = 100$ mA | $\phi$ (°) | $\lambda_p$ (nm) | $t_r$ (ns) |
|-----------|---------------------------------|------------|------------------|------------|
| VSMY5890  | 13                              | $\pm 60$   | 890              | 7          |

#### Note

- Test conditions see table "Basic Characteristics"

### ORDERING INFORMATION

| ORDERING CODE | PACKAGING     | REMARKS                      | PACKAGE FORM |
|---------------|---------------|------------------------------|--------------|
| VSMY5890      | Tape and reel | MOQ: 3000 pcs, 3000 pcs/reel | 0805         |

#### Note

- MOQ: minimum order quantity

| <b>ABSOLUTE MAXIMUM RATINGS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) |                                                |            |             |                    |
|--------------------------------------------------------------------------------------------------------|------------------------------------------------|------------|-------------|--------------------|
| PARAMETER                                                                                              | TEST CONDITION                                 | SYMBOL     | VALUE       | UNIT               |
| Reverse voltage                                                                                        |                                                | $V_R$      | 5           | V                  |
| Forward current                                                                                        |                                                | $I_F$      | 100         | mA                 |
| Peak forward current                                                                                   | $t_p/T = 0.1$ , $t_p = 100\text{ }\mu\text{s}$ | $I_{FM}$   | 200         | mA                 |
| Surge forward current                                                                                  | $t_p = 100\text{ }\mu\text{s}$                 | $I_{FSM}$  | 500         | mA                 |
| Power dissipation                                                                                      |                                                | $P_V$      | 210         | mW                 |
| Junction temperature                                                                                   |                                                | $T_j$      | 125         | $^{\circ}\text{C}$ |
| Operating temperature range                                                                            |                                                | $T_{amb}$  | -40 to +110 | $^{\circ}\text{C}$ |
| Storage temperature range                                                                              |                                                | $T_{stg}$  | -40 to +110 | $^{\circ}\text{C}$ |
| Soldering temperature                                                                                  | According to Fig. 7, J-STD-020                 | $T_{sd}$   | 260         | $^{\circ}\text{C}$ |
| Thermal resistance junction-to-ambient                                                                 | EIA / JESD51                                   | $R_{thJA}$ | 280         | K/W                |

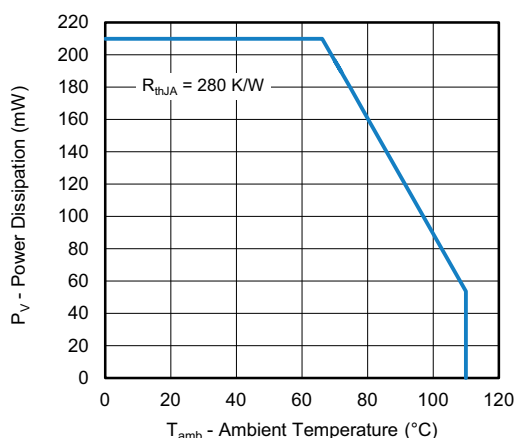


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

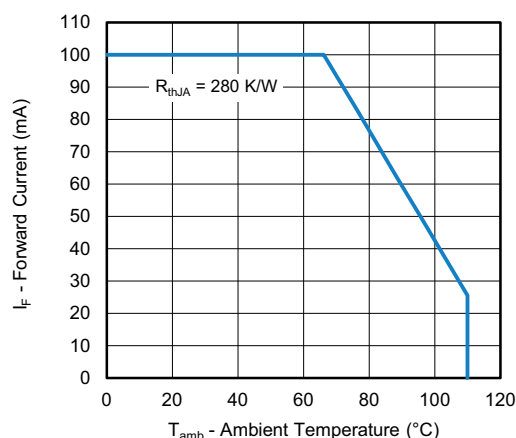


Fig. 2 - Forward Current Limit vs. Ambient Temperature

| <b>BASIC CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) |                                                                     |                  |                                    |          |      |               |
|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|------------------|------------------------------------|----------|------|---------------|
| PARAMETER                                                                                           | TEST CONDITION                                                      | SYMBOL           | MIN.                               | TYP.     | MAX. | UNIT          |
| Forward voltage                                                                                     | $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$                        | $V_F$            | -                                  | 1.8      | 2.1  | V             |
| Temperature coefficient of $V_F$                                                                    | $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$                        | $TK_{VF}$        | -                                  | -1.6     | -    | mV/K          |
| Reverse current                                                                                     |                                                                     | $I_R$            | Not designed for reverse operation |          |      | $\mu\text{A}$ |
| Junction capacitance                                                                                | $V_R = 0\text{ V}$ , $f = 1\text{ MHz}$ ,<br>$E = 0\text{ mW/cm}^2$ | $C_J$            | -                                  | 30       | -    | pF            |
| Radiant intensity                                                                                   | $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$                        | $I_e$            | 10                                 | 13       | 18   | mW/sr         |
| Temperature coefficient of radiant power                                                            | $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$                        | $TK_{\phi_e}$    | -                                  | -0.2     | -    | %/K           |
| Angle of half intensity                                                                             |                                                                     | $\phi$           | -                                  | $\pm 60$ | -    | $^{\circ}$    |
| Peak wavelength                                                                                     | $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$                        | $\lambda_p$      | -                                  | 890      | -    | nm            |
| Spectral bandwidth                                                                                  | $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$                        | $\Delta\lambda$  | -                                  | 40       | -    | nm            |
| Temperature coefficient of $\lambda_p$                                                              | $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$                        | $TK_{\lambda_p}$ | -                                  | 0.25     | -    | nm/K          |
| Rise time                                                                                           | $I_F = 100\text{ mA}$ , 10 % to 90 %                                | $t_r$            | -                                  | 8        | -    | ns            |
| Fall time                                                                                           | $I_F = 100\text{ mA}$ , 10 % to 90 %                                | $t_f$            | -                                  | 8        | -    | ns            |

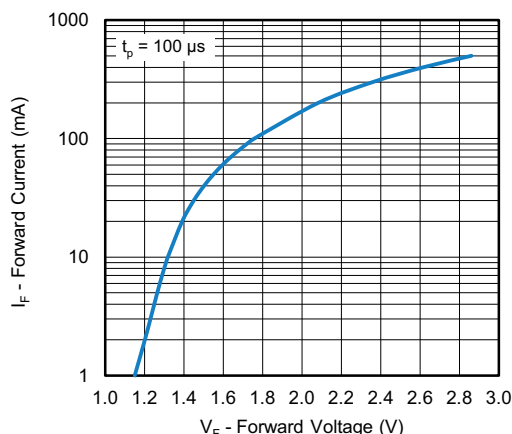
**BASIC CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)


Fig. 3 - Forward Current vs. Forward Voltage

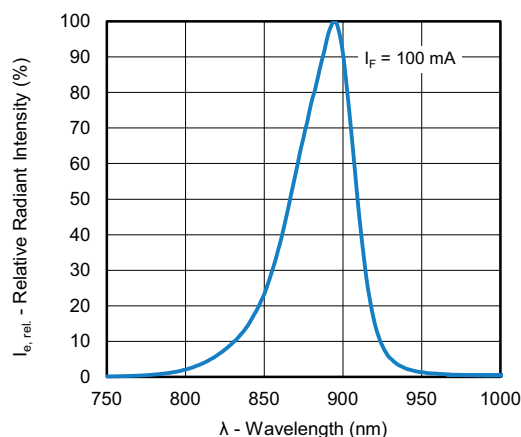


Fig. 5 - Relative Radiant Power vs. Wavelength

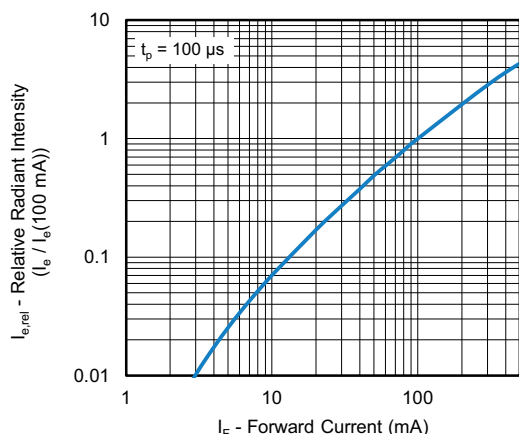


Fig. 4 - Relative Radiant Intensity vs. Forward Current

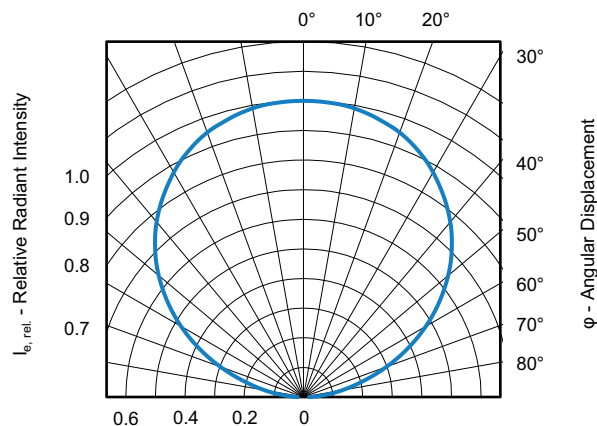


Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

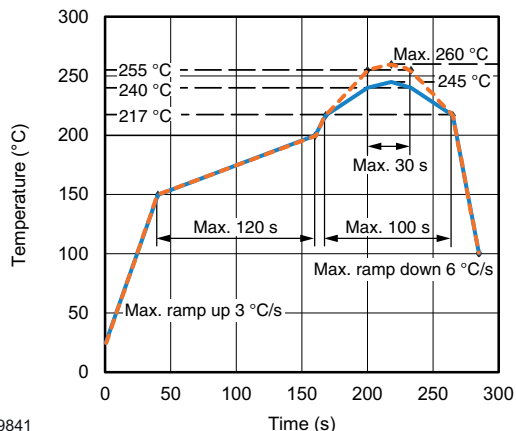
**REFLOW SOLDER PROFILE**


Fig. 7 - 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**

Time between soldering and removing from MBB must not exceed the time indicated in J-STD-020:

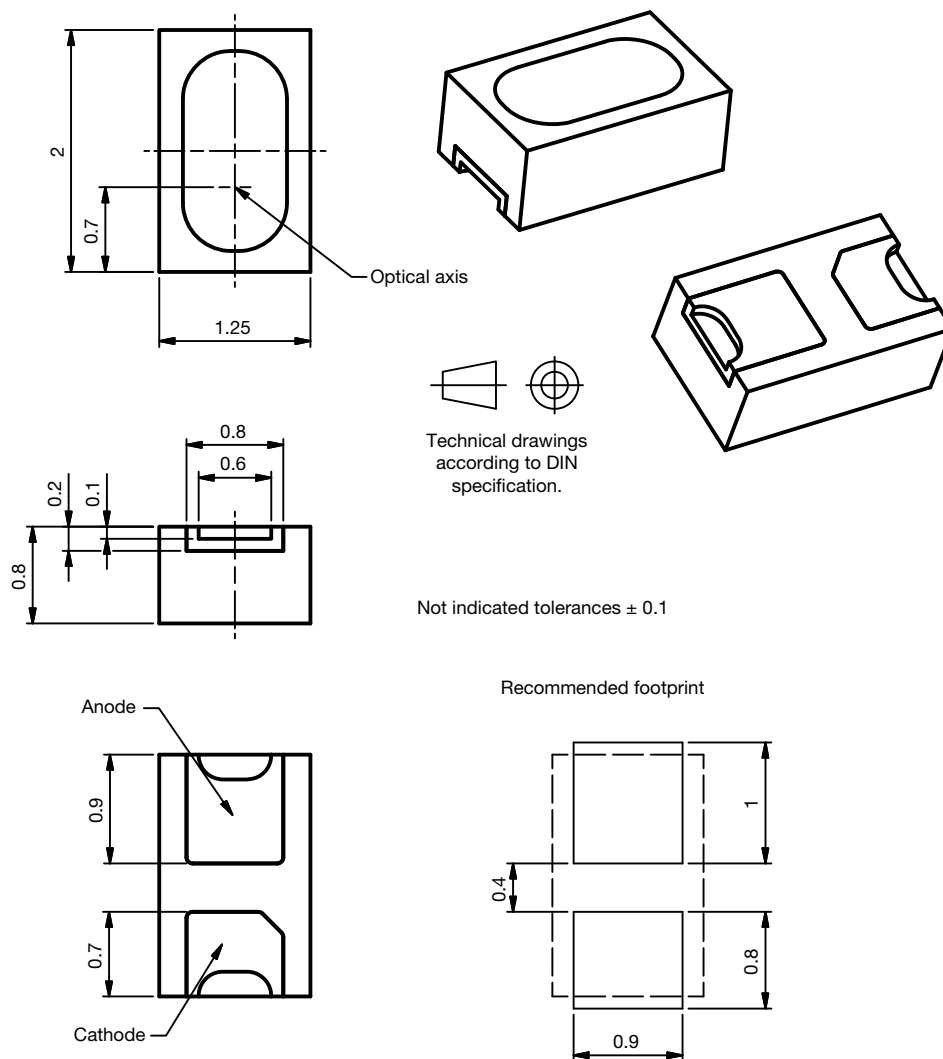
Moisture sensitivity: level 3

Floor life: 168 h

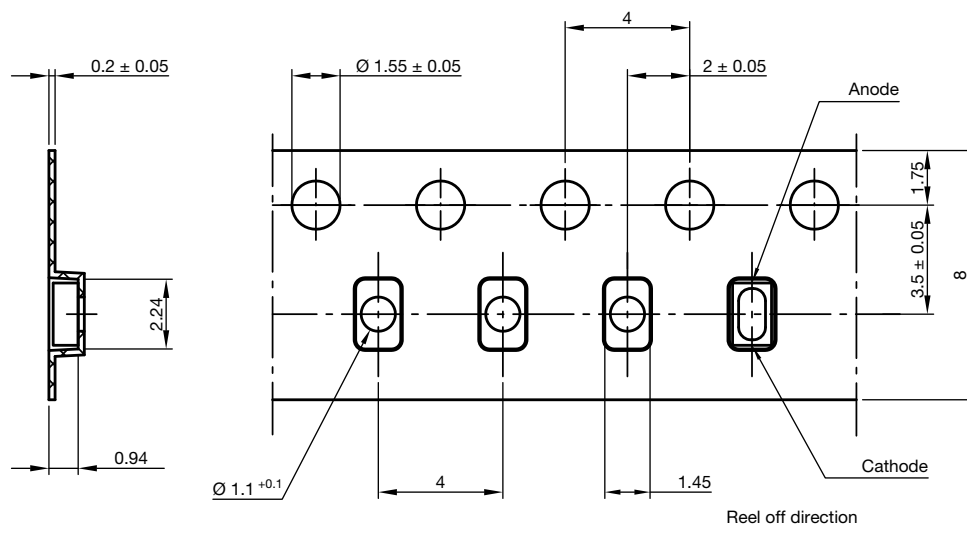
Conditions:  $T_{amb} < 30\text{ }^{\circ}\text{C}$ , RH < 60 %

**DRYING**

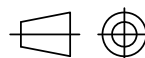
In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-033D or label. Devices taped on reel dry using recommended conditions 192 h at  $40\text{ }^{\circ}\text{C}$  (+ 5 °C), RH < 5 %.

**PACKAGE DIMENSIONS** in millimeters


Drawing- No.: 6.550-5352.01-4  
Issue: 1; 20.12.2016

**BLISTER TAPE DIMENSIONS** in millimeters

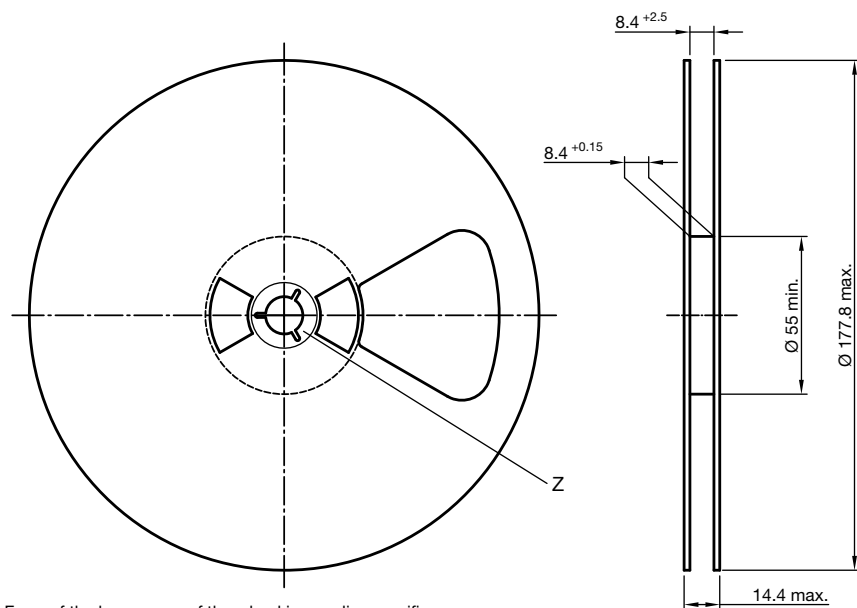
Not indicated tolerances  $\pm 0.1$



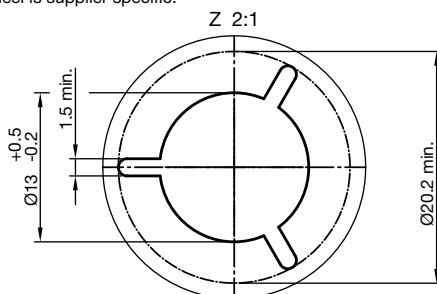
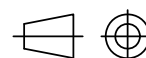
Technical drawings  
according to DIN  
specification.

Drawing-No.: 9.700-5352.02-4  
Issue: 1; 20.12.2016

### REEL DIMENSIONS in millimeters



Form of the leave open of the wheel is supplier specific.



Technical drawings  
according to DIN  
specification.

Drawing-No.: 9.800-5096.01-4  
Issue: 5; 20.12.2016



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