

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



21531

DESCRIPTION

As part of the [SurfLight™](#) portfolio, the VSMY1850X01 is an infrared, 850 nm emitting diode based on GaAlAs surface emitter chip technology with high radiant intensity, high optical power and high speed, molded in clear, untinted 0805 plastic package for surface mounting (SMD).

FEATURES

- Package type: surface mount
- Package form: 0805
- Dimensions (L x W x H in mm): 2 x 1.25 x 0.85
- AEC-Q101 qualified
- Peak wavelength: $\lambda_p = 850$ Nm
- High reliability
- High radiant power
- High radiant intensity
- High speed
- Angle of half sensitivity: $\vartheta = \pm 60^\circ$
- Suitable for high pulse current operation
- 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

 AUTOMOTIVE
GRADE

RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

APPLICATIONS

- IrDA compatible data transmission
- Miniature light barrier
- Photointerrupters
- Optical switch
- Emitter source for proximity sensors
- IR touch panels
- IR flash
- IR illumination
- 3D TV

PRODUCT SUMMARY

| COMPONENT | I_e (mW/sr) | φ (deg) | λ_p (nm) | t_r (ns) |
|-------------|---------------|-----------------|------------------|------------|
| VSMY1850X01 | 10 | ± 60 | 850 | 10 |

Note

- Test conditions see table "Basic Characteristics"

ORDERING INFORMATION

| ORDERING CODE | PACKAGING | REMARKS | PACKAGE FORM |
|---------------|---------------|------------------------------|--------------|
| VSMY1850X01 | Tape and reel | MOQ: 3000 pcs, 3000 pcs/reel | 0805 |

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. 7, J-STD-020 | T_{sd} | 260 | $^{\circ}\text{C}$ |
| Thermal resistance junction / ambient | JESD 51 | R_{thJA} | 270 | K/W |

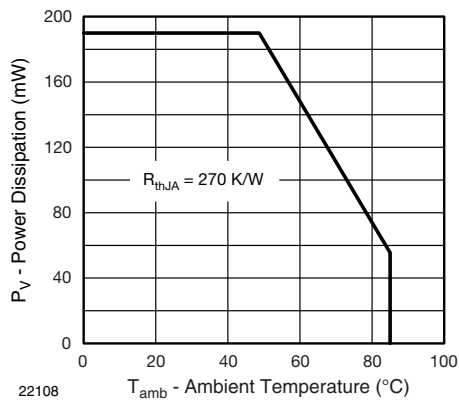


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

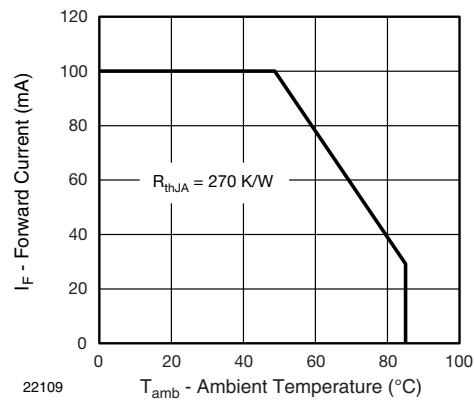


Fig. 2 - Forward Current Limit vs. Ambient Temperature

| 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} | - | -1.4 | - | mV/K |
| | $I_F = 10\text{ mA}$ | TK_{V_F} | - | -1.18 | - | 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 | - | 125 | - | pF |
| Radiant intensity | $I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$ | I_e | 5 | 10 | 15 | mW/sr |
| | $I_F = 1\text{ A}$, $t_p = 100\text{ }\mu\text{s}$ | I_e | - | 85 | - | mW/sr |
| Radiant power | $I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$ | ϕ_e | - | 50 | - | mW |
| Temperature coefficient of radiant power | $I_F = 100\text{ mA}$ | TK_{ϕ_e} | - | -0.35 | - | %/K |
| Angle of half intensity | | ϕ | - | ± 60 | - | 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 | $I_F = 100\text{ mA}$, 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 | - | 0.5 | - | mm |

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

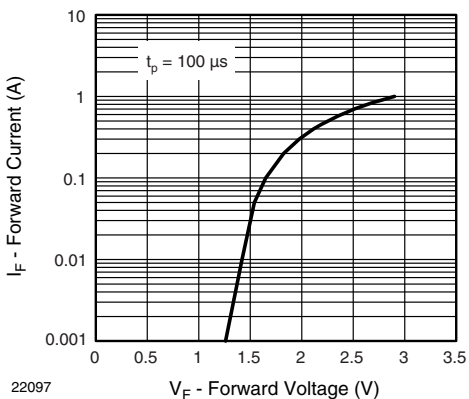


Fig. 3 - Forward Current vs. Forward Voltage

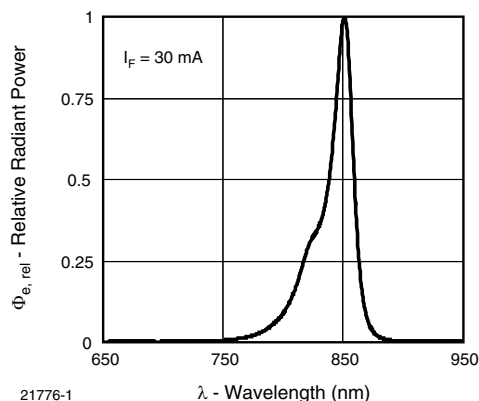


Fig. 5 - Relative Radiant Power vs. Wavelength

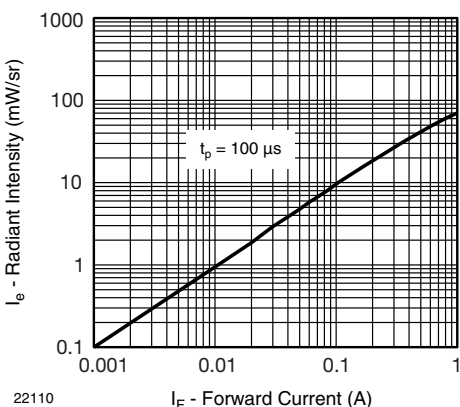


Fig. 4 - Radiant Intensity vs. Forward Current

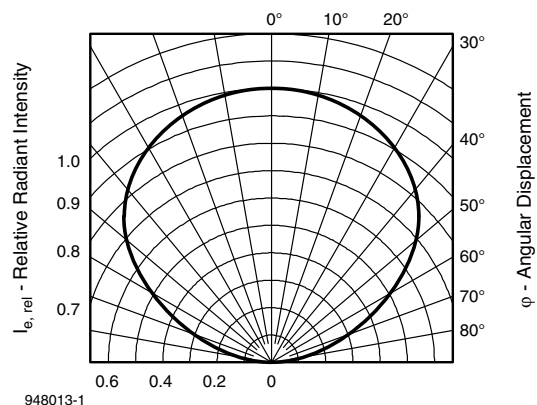


Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

REFLOW SOLDER PROFILE

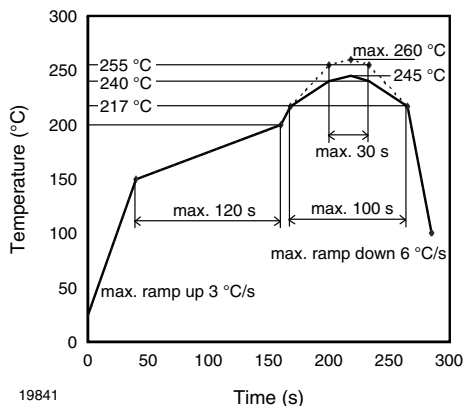


Fig. 7 - Lead (Pb)-free Reflow Solder Profile According to J-STD-020

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:

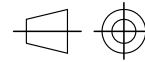
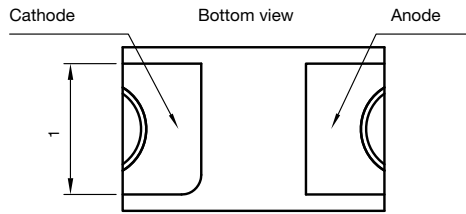
Moisture sensitivity: level 3
 Floor life: 168 h
 Conditions: $T_{amb} < 30\text{ }^{\circ}\text{C}$, $\text{RH} < 60\%$

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), $\text{RH} < 5\%$.

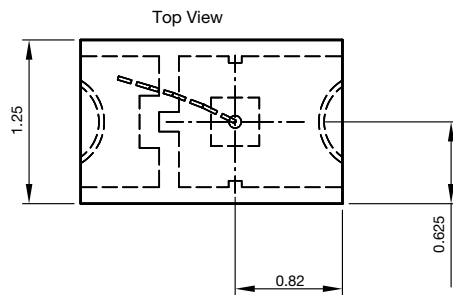
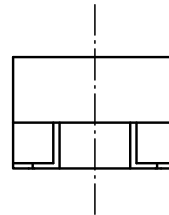
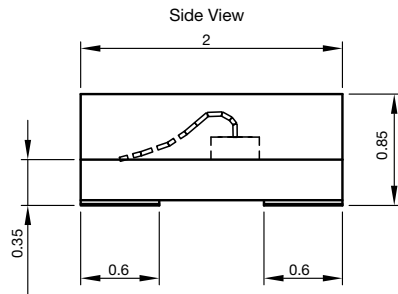


PACKAGE DIMENSIONS in millimeters

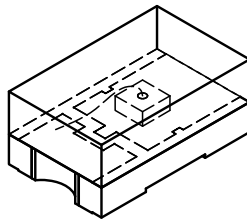
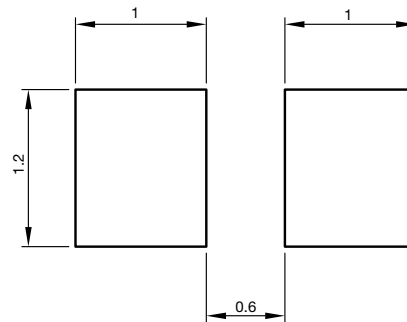


technical drawings
specifications
according to DIN

Not indicated tolerances ± 0.1

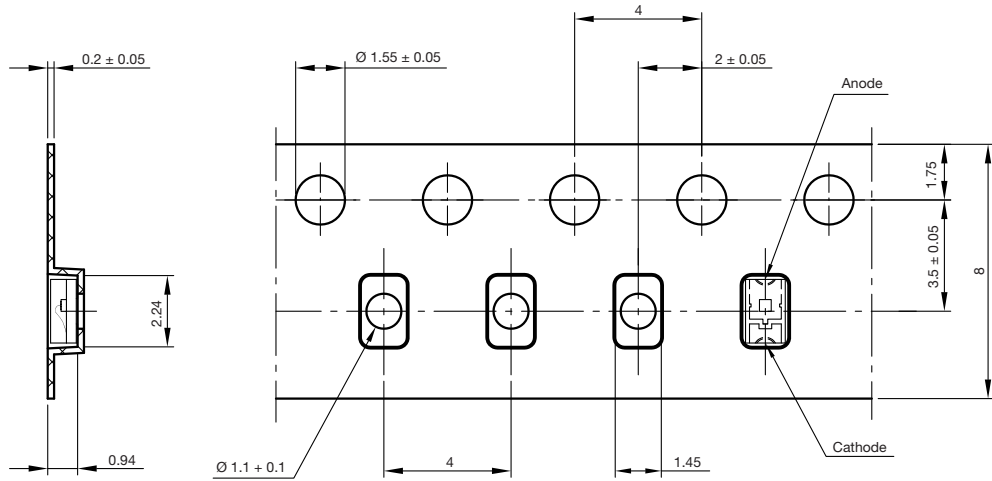


Recommended solder pad
footprint



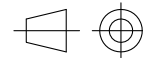
Drawing-No.: 6.541-5083.01-4
Issue: 2; 10.09.2013

BLISTER TAPE DIMENSIONS in millimeters



Not indicated tolerances ±0.1

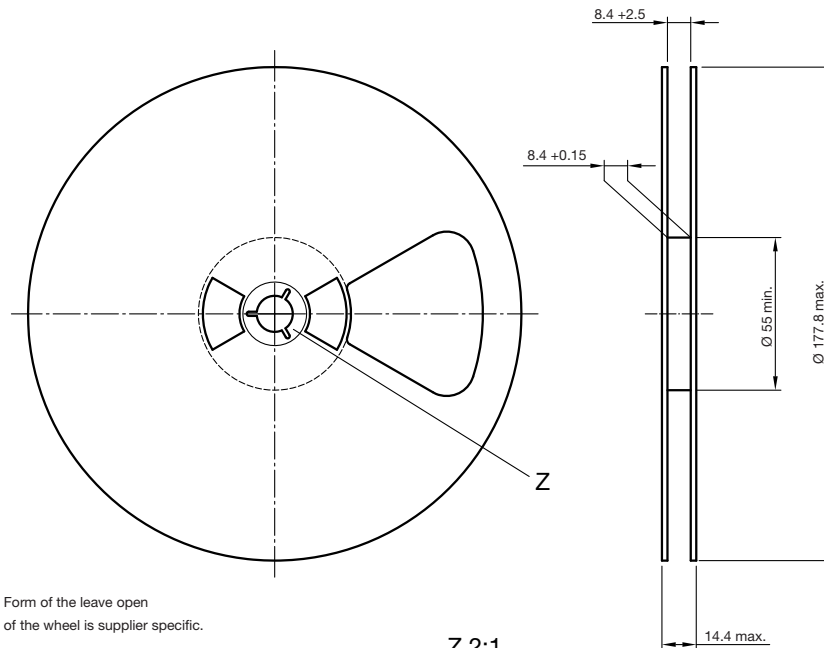
Reel off direction →



technical drawings according to DIN specifications

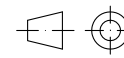
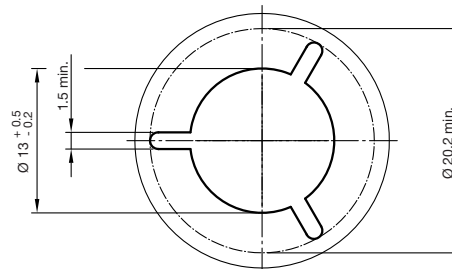
Drawing-No.: 9.700-5352.01-4
Issue: 1; 13.04.10
22112

REEL DIMENSIONS in millimeters



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

Z 2:1



technical drawings according to DIN specifications

Drawing-No.: 9.800-5096.01-4
Issue: 2; 26.04.10
20875



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