

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


 AUTOMOTIVE
GRADE

RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

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: $\lambda_p = 850$ nm
- AEC-Q101 qualified
- 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

DESCRIPTION

As part of the [SurfLight™](#) portfolio, the VSMY5850X01 is an infrared, 850 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.

APPLICATIONS

- Miniature light barrier
- Automotive sensors
- Optical switch
- IR point source

PRODUCT SUMMARY

| COMPONENT | I_e (mW/sr) at $I_F = 100$ mA | ϕ (°) | λ_p (nm) | t_r (ns) |
|-------------|---------------------------------|------------|------------------|------------|
| VSMY5850X01 | 13 | ± 60 | 850 | 7 |

Note

- Test conditions see table “Basic Characteristics“

ORDERING INFORMATION

| ORDERING CODE | PACKAGING | REMARKS | PACKAGE FORM |
|---------------|---------------|------------------------------|--------------|
| VSMY5850X01 | Tape and reel | MOQ: 3000 pcs, 3000 pcs/reel | 0805 |

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 | 5 | V |
| Forward current | | I _F | 100 | mA |
| Peak forward current | t _p /T = 0.1, t _p = 100 μs | I _{FM} | 200 | mA |
| Surge forward current | t _p = 100 μs | I _{FSM} | 500 | mA |
| Power dissipation | | P _V | 210 | mW |
| Junction temperature | | T _j | 125 | °C |
| Operating temperature range | | T _{amb} | -40 to +110 | °C |
| Storage temperature range | | T _{stg} | -40 to +110 | °C |
| Soldering temperature | According to Fig. 7, J-STD-020 | T _{sd} | 260 | °C |
| Thermal resistance junction-to-ambient | EIA / JESD51 | R _{thJA} | 280 | K/W |

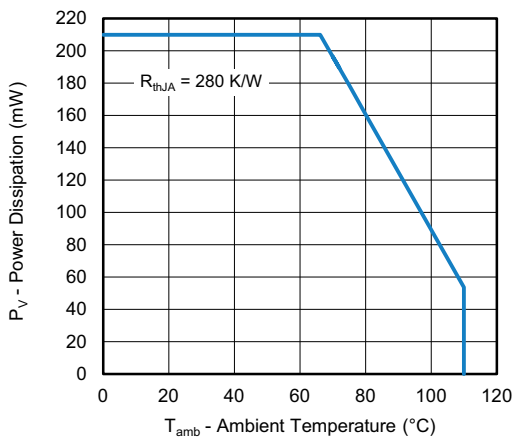


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

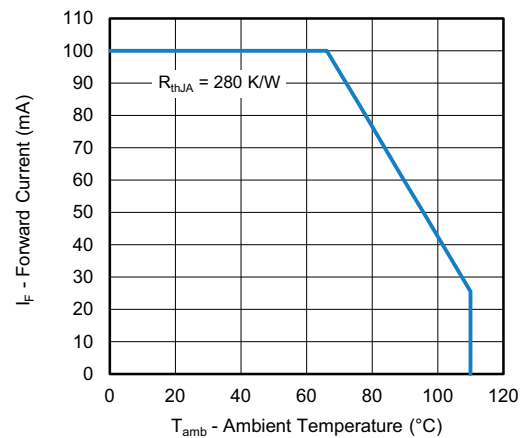


Fig. 2 - Forward Current Limit vs. Ambient Temperature

| BASIC CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified) | | | | | | |
|------------------------------------------------------------------------------|-----------------------------------------------------------|-----------------------------|------------------------------------|-------|------|-------|
| PARAMETER | TEST CONDITION | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Forward voltage | I _F = 100 mA, t _p = 20 ms | V _F | - | 1.8 | 2.1 | V |
| Temperature coefficient of V _F | I _F = 100 mA, t _p = 20 ms | TK _{V_F} | - | -1.8 | - | mV/K |
| Reverse current | | I _R | Not designed for reverse operation | | | μA |
| Junction capacitance | V _R = 0 V, f = 1 MHz, E = 0 mW/cm ² | C _J | - | 30 | - | pF |
| Radiant intensity | I _F = 100 mA, t _p = 20 ms | I _e | 9 | 13 | 18 | mW/sr |
| Temperature coefficient of radiant power | I _F = 100 mA, t _p = 20 ms | TK _{φ_e} | - | -0.16 | - | %/K |
| Angle of half intensity | | φ | - | ± 60 | - | ° |
| Peak wavelength | I _F = 100 mA, t _p = 20 ms | λ _p | - | 850 | - | nm |
| Spectral bandwidth | I _F = 100 mA, t _p = 20 ms | Δλ | - | 35 | - | nm |
| Temperature coefficient of λ _p | I _F = 100 mA, t _p = 20 ms | TK _{λ_p} | - | 0.25 | - | nm/K |
| Rise time | I _F = 100 mA, 10 % to 90 % | t _r | - | 7 | - | ns |
| Fall time | I _F = 100 mA, 10 % to 90 % | t _f | - | 7 | - | ns |

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

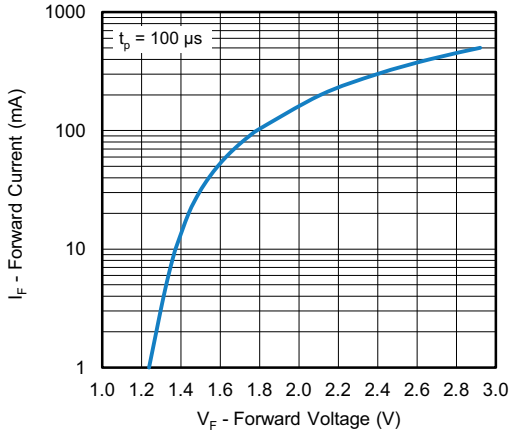


Fig. 3 - Forward Current vs. Forward Voltage

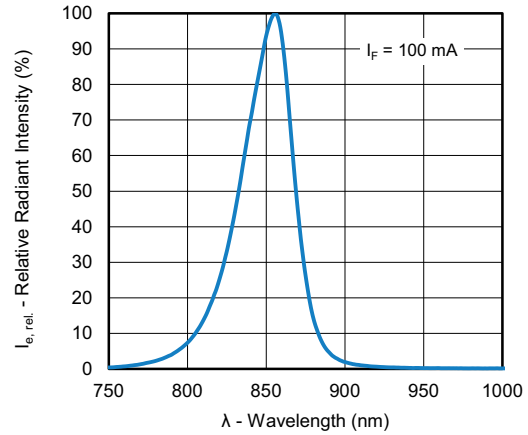


Fig. 5 - Relative Radiant Power vs. Wavelength

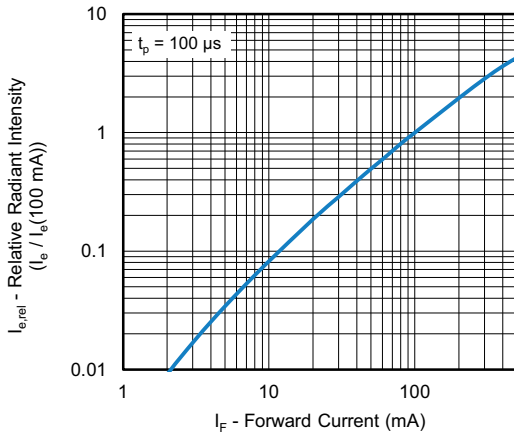


Fig. 4 - Relative Radiant Intensity vs. Forward Current

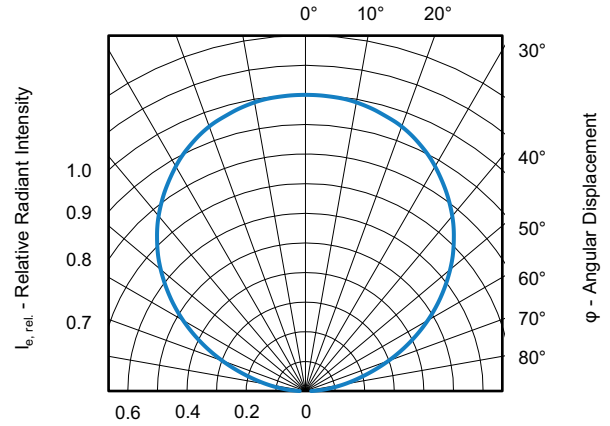


Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

REFLOW SOLDER PROFILE

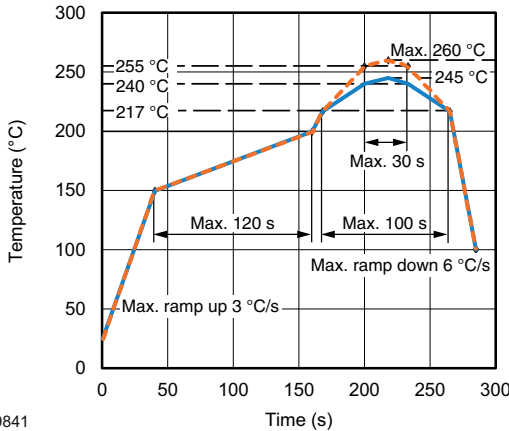


Fig. 7 - Lead (Pb)-free Reflow Solder Profile According to J-STD-020

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

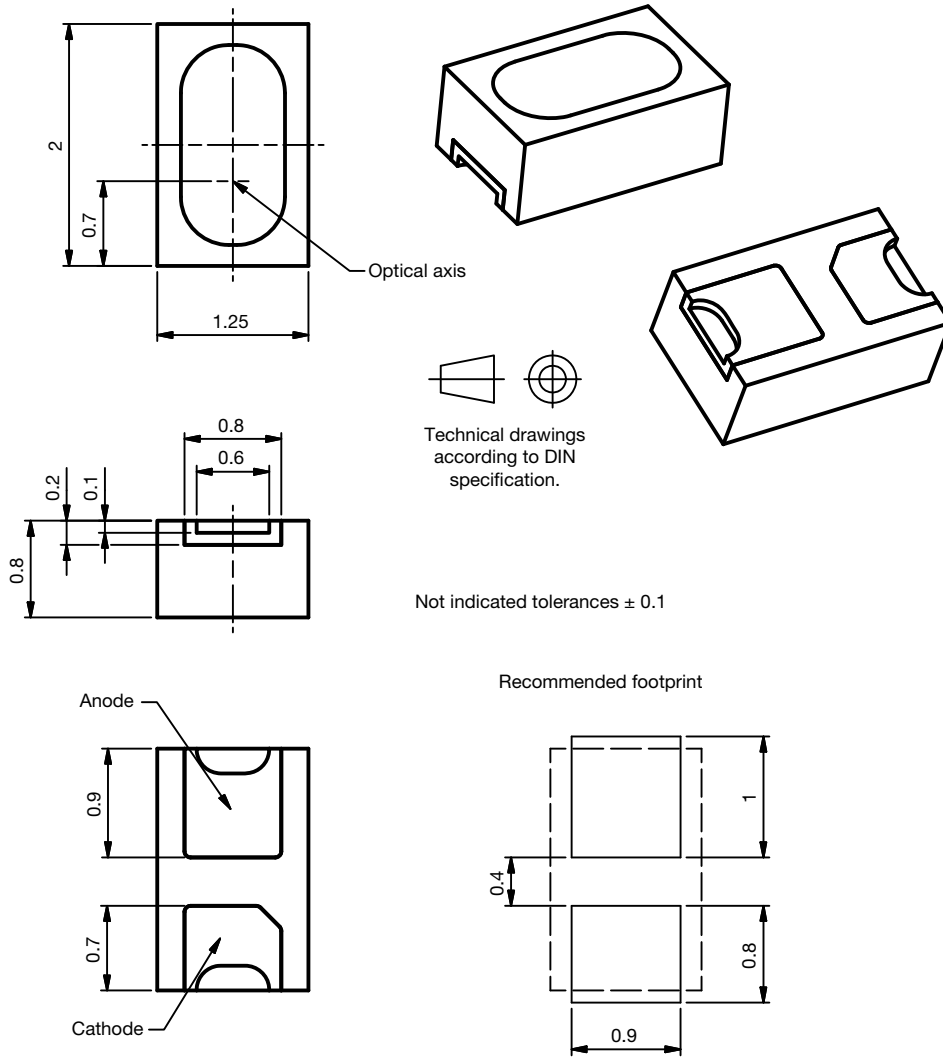
Conditions: $T_{amb} < 30\text{ }^{\circ}\text{C}$, RH < 60 %

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 °C (+ 5 °C), RH < 5 %.

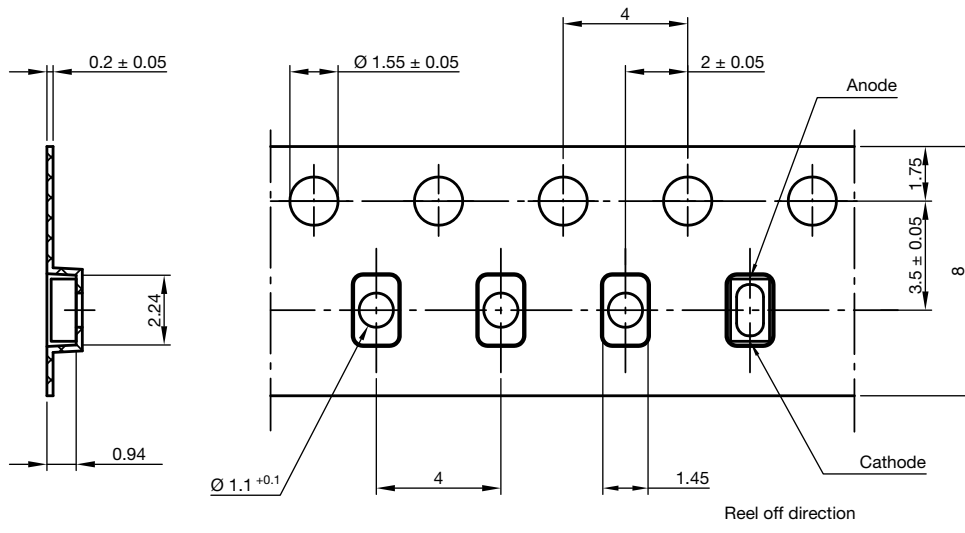
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PACKAGE DIMENSIONS in millimeters

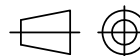


Drawing- No.: 6.550-5352.01-4
 Issue: 1; 20.12.2016

BLISTER TAPE DIMENSIONS in millimeters



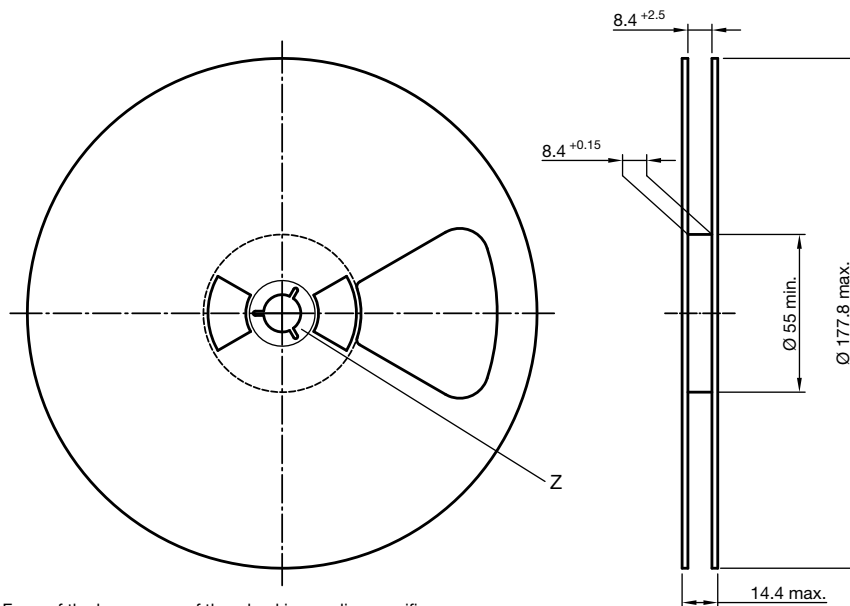
Not indicated tolerances ± 0.1



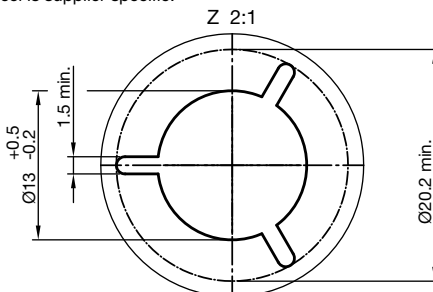
Technical drawings according to DIN specification.

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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