

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



21531

### DESCRIPTION

As part of the [SurfLight™](#) portfolio, the VSMY1850ITX01 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
- Enhanced operating temperature range: -40 °C to +105 °C
- Peak wavelength:  $\lambda_p = 850$  nm
- High reliability
- High radiant power
- High radiant intensity
- High speed
- Angle of half intensity:  $\phi = \pm 60^\circ$
- Suitable for high pulse current operation
- 0805 standard surface-mountable package
- Floor life: 72 h, MSL 4, 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)

 AUTOMOTIVE  
GRADE

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

### APPLICATIONS

- Miniature light barrier
- Photointerrupters
- Optical switch
- Emitter source for proximity sensors
- IR touch panels
- IR flash
- IR illumination
- Emitter for automotive applications (e.g. rain sensor)

### PRODUCT SUMMARY

COMPONENT	$I_e$ (mW/sr)	$\phi$ (deg)	$\lambda_p$ (nm)	$t_r$ (ns)
VSMY1850ITX01	10	$\pm 60$	850	10

#### Note

- Test conditions see table "Basic Characteristics"

### ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VSMY1850ITX01	Tape and reel	MOQ: 3000 pcs, 3000 pcs/reel	0805

#### Note

- MOQ: minimum order quantity



ABSOLUTE MAXIMUM RATINGS (T <sub>amb</sub> = 25 °C, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V <sub>R</sub>	5	V
Forward current		I <sub>F</sub>	100	mA
Peak forward current	t <sub>p</sub> /T = 0.5, t <sub>p</sub> = 100 μs	I <sub>FM</sub>	200	mA
Surge forward current	t <sub>p</sub> = 100 μs	I <sub>FSM</sub>	1	A
Power dissipation		P <sub>V</sub>	190	mW
Junction temperature		T <sub>j</sub>	100	°C
Operating temperature range		T <sub>amb</sub>	-40 to +105	°C
Storage temperature range		T <sub>stg</sub>	-40 to +110	°C
Soldering temperature	According to Fig. 7, J-STD-020	T <sub>sd</sub>	260	°C
Thermal resistance junction / ambient	JESD 51	R <sub>thJA</sub>	270	K/W

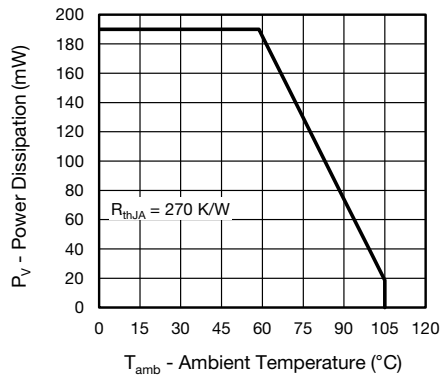


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

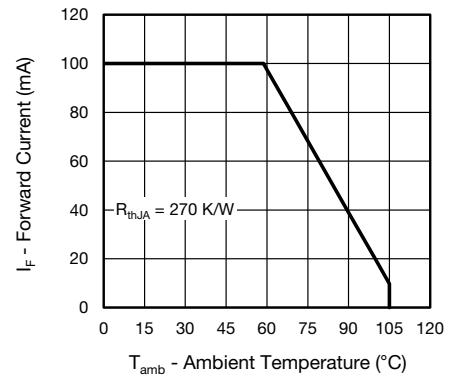


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS (T <sub>amb</sub> = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	I <sub>F</sub> = 100 mA, t <sub>p</sub> = 20 ms	V <sub>F</sub>	-	1.65	1.9	V
	I <sub>F</sub> = 1 A, t <sub>p</sub> = 100 μs	V <sub>F</sub>	-	2.9	-	V
Temperature coefficient of V <sub>F</sub>	I <sub>F</sub> = 1 mA	TK <sub>V<sub>F</sub></sub>	-	-1.4	-	mV/K
	I <sub>F</sub> = 10 mA	TK <sub>V<sub>F</sub></sub>	-	-1.18	-	mV/K
Reverse current		I <sub>R</sub>	Not designed for reverse operation			μA
Junction capacitance	V <sub>R</sub> = 0 V, f = 1 MHz, E = 0 mW/cm <sup>2</sup>	C <sub>J</sub>	-	125	v	pF
Radiant intensity	I <sub>F</sub> = 100 mA, t <sub>p</sub> = 20 ms	I <sub>e</sub>	5	10	15	mW/sr
	I <sub>F</sub> = 1 A, t <sub>p</sub> = 100 μs	I <sub>e</sub>	-	85	-	mW/sr
Radiant power	I <sub>F</sub> = 100 mA, t <sub>p</sub> = 20 ms	φ <sub>e</sub>	-	50	-	mW
Temperature coefficient of radiant power	I <sub>F</sub> = 100 mA	TK <sub>φ<sub>e</sub></sub>	-	-0.35	-	%/K
Angle of half intensity		φ	-	± 60	-	deg
Peak wavelength	I <sub>F</sub> = 100 mA	λ <sub>p</sub>	840	850	870	nm
Spectral bandwidth	I <sub>F</sub> = 30 mA	Δλ	-	30	-	nm
Temperature coefficient of λ <sub>p</sub>	I <sub>F</sub> = 30 mA	TK <sub>λ<sub>p</sub></sub>	-	0.25	-	nm/K
Rise time	I <sub>F</sub> = 100 mA, 20 % to 80 %	t <sub>r</sub>	-	10	-	ns
Fall time	I <sub>F</sub> = 100 mA, 20 % to 80 %	t <sub>f</sub>	-	10	-	ns
Virtual source diameter		d	-	0.5	-	mm

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

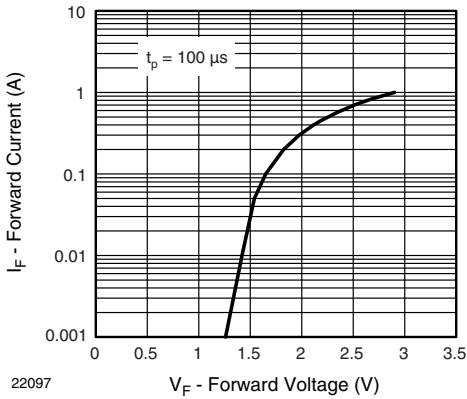


Fig. 3 - Forward Current vs. Forward Voltage

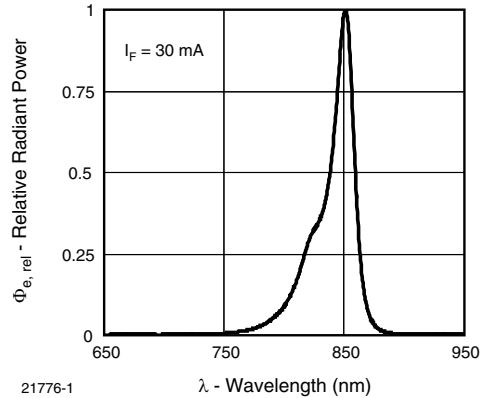


Fig. 5 - Relative Radiant Power vs. Wavelength

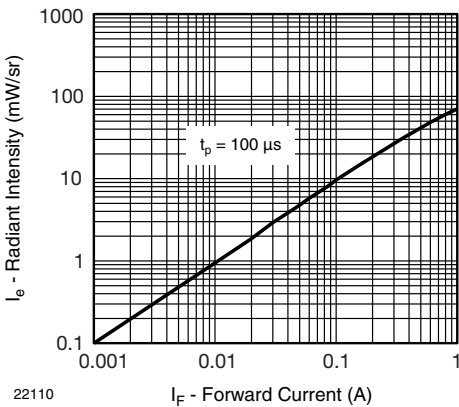


Fig. 4 - Radiant Intensity vs. Forward Current

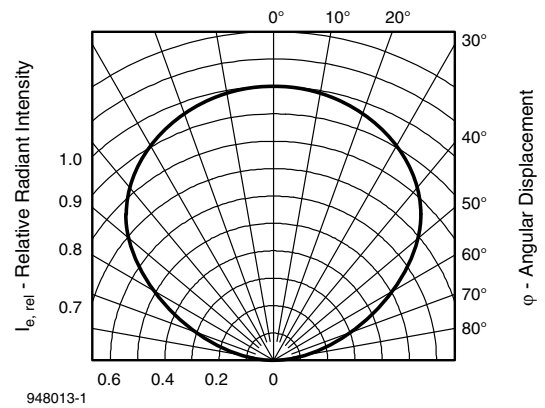


Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

**REFLOW SOLDER PROFILE**

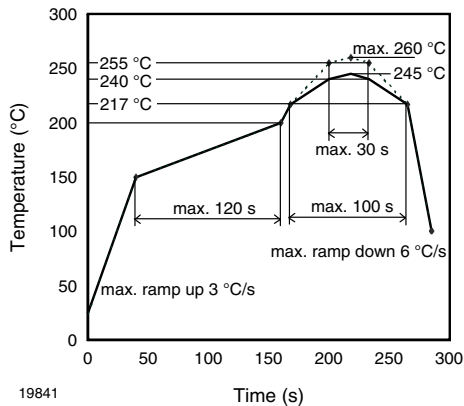


Fig. 7 - Lead (Pb)-free Reflow Solder Profile According to J-STD-020

**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 4

Floor life: 72 h

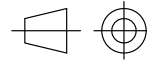
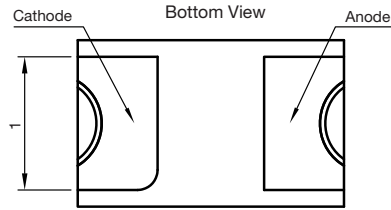
Conditions:  $T_{amb} < 30\text{ }^{\circ}\text{C}$ , RH < 60 %

**DRYING**

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

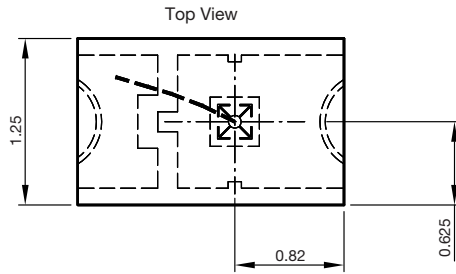
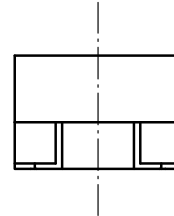
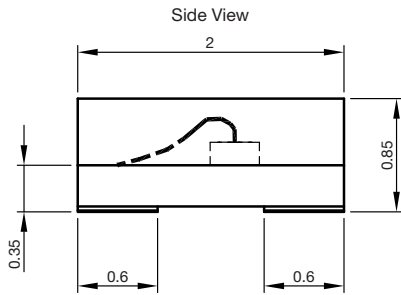


**PACKAGE DIMENSIONS** in millimeters

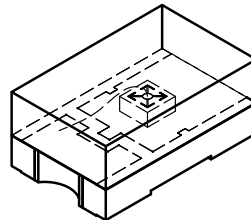
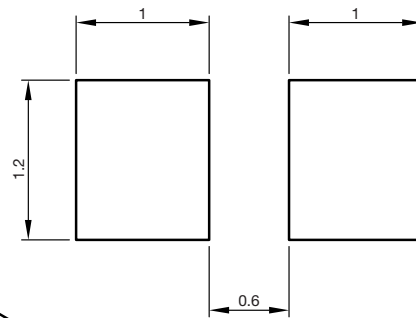


technical drawings according to DIN specifications

Not indicated tolerances  $\pm 0.1$



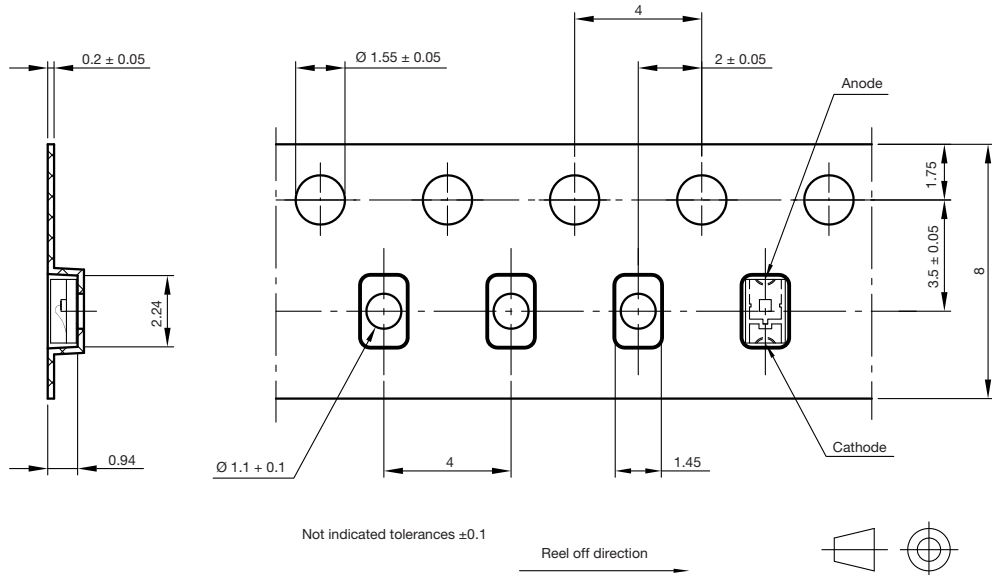
Recommended solder pad Footprint



Drawing-No.: 6.541-5083.01-4  
Issue: 1; 29.03.10  
22111



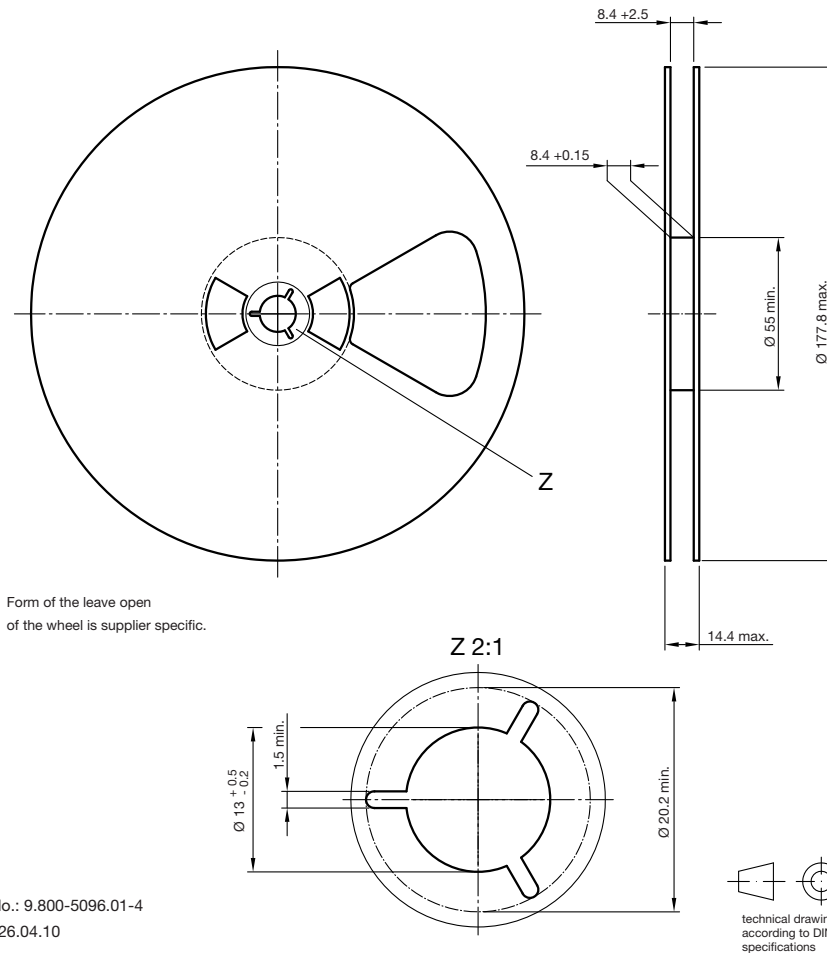
**BLISTER TAPE DIMENSIONS** in millimeters



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

technical drawings  
according to DIN  
specifications

**REEL DIMENSIONS** in millimeters



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

technical drawings  
according to DIN  
specifications



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