

## High Power Infrared Emitting Diode, 850 nm, Surface Emitter Technology



21783

### DESCRIPTION

As part of the [SurfLight™](#) portfolio, the VSMY7850X01 is an infrared, 850 nm emitting diode based on surface emitter technology with high radiant power and high speed, molded in low thermal resistance Little Star package. A 42 mil chip provides outstanding low forward voltage and allows DC operation of the device up to 1 A.

### FEATURES

- Package type: surface mount
- Package form: Little Star®
- Dimensions (L x W x H in mm): 6.0 x 7.0 x 1.5
- Peak wavelength:  $\lambda_p = 850$  nm
- High reliability
- High radiant power
- High radiant intensity
- Angle of half intensity:  $\phi = \pm 60^\circ$
- Low forward voltage
- Designed for high drive currents: up to 1 A<sub>DC</sub> and up to 5 A pulses
- Low thermal resistance:  $R_{thJP} = 10$  K/W
- Floor life: 1 year, MSL 2, acc. J-STD-020
- Lead (Pb)-free reflow soldering
- AEC-Q101 qualified
- 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

- Infrared illumination for CMOS cameras (CCTV)
- Driver assistance systems
- Machine vision IR data transmission
- 3D TV

### PRODUCT SUMMARY

COMPONENT	I <sub>e</sub> (mW/sr)	φ (deg)	λ <sub>p</sub> (nm)	t <sub>r</sub> (ns)
VSMY7850X01	170	± 60	850	15

#### Note

- Test conditions see table “Basic Characteristics”

### ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VSMY7850X01-GS08	Tape and reel	MOQ: 2000 pcs, 2000 pcs/reel	Little Star

#### 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>	1	A
Peak forward current	t <sub>p</sub> /T = 0.5, t <sub>p</sub> = 100 μs	I <sub>FM</sub>	2	A
Surge forward current	t <sub>p</sub> = 100 μs	I <sub>FSM</sub>	5	A
Power dissipation		P <sub>V</sub>	2.5	W
Junction temperature		T <sub>j</sub>	125	°C
Operating temperature range		T <sub>amb</sub>	-40 to +100	°C
Storage temperature range		T <sub>stg</sub>	-40 to +100	°C
Soldering temperature	Acc. figure 7, J-STD-20	T <sub>sd</sub>	260	°C
Thermal resistance junction/pin	Acc. J-STD-051, soldered on PCB	R <sub>thJP</sub>	10	K/W

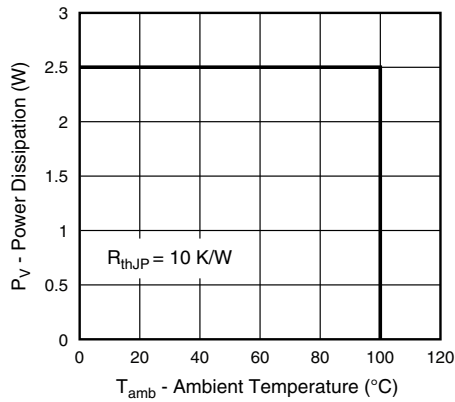


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

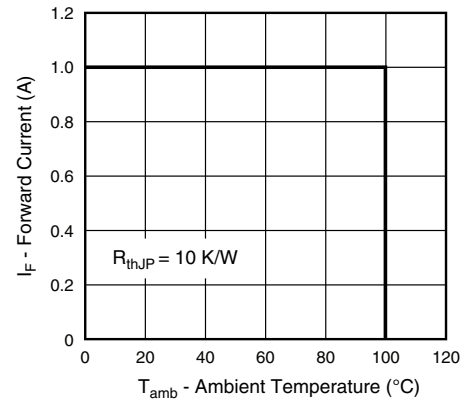


Fig. 2 - Forward Current Limit vs. Ambient Temperature

<b>BASIC CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 1\text{ A}$ , $t_p = 20\text{ ms}$	$V_F$		2.0	2.5	V
	$I_F = 5\text{ A}$ , $t_p = 100\text{ }\mu\text{s}$	$V_F$		3.5		V
Temperature coefficient of $V_F$	$I_F = 1\text{ A}$	$TK_{V_F}$		-0.2		mV/K
Reverse current	$V_R = 5\text{ V}$	$I_R$	not designed for reverse operation			$\mu\text{A}$
Radiant intensity	$I_F = 1\text{ A}$ , $t_p = 20\text{ ms}$	$I_e$	130	170	390	mW/sr
	$I_F = 5\text{ A}$ , $t_p = 100\text{ }\mu\text{s}$	$I_e$		780		mW/sr
Radiant power	$I_F = 1\text{ A}$ , $t_p = 20\text{ ms}$	$\phi_e$		520		mW
Temperature coefficient of $\phi_e$	$I_F = 1\text{ A}$	$TK_{\phi_e}$		-0.5		%/K
Angle of half intensity		$\varphi$		$\pm 60$		deg
Peak wavelength	$I_F = 1\text{ A}$	$\lambda_p$		850		nm
Spectral bandwidth	$I_F = 1\text{ A}$	$\Delta\lambda$		30		nm
Temperature coefficient of $\lambda_p$	$I_F = 1\text{ A}$	$TK_{\lambda_p}$		0.2		nm/K
Rise time	$I_F = 1\text{ A}$	$t_r$		15		ns
Fall time	$I_F = 1\text{ A}$	$t_f$		18		ns

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

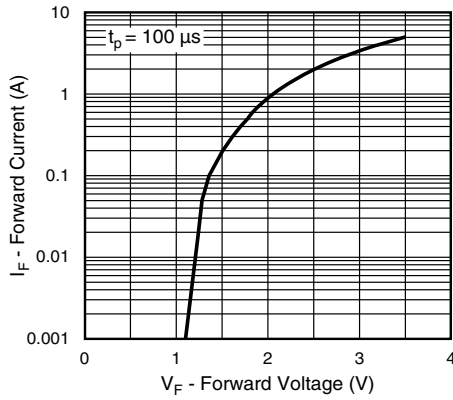


Fig. 3 - Forward Current vs. Forward Voltage

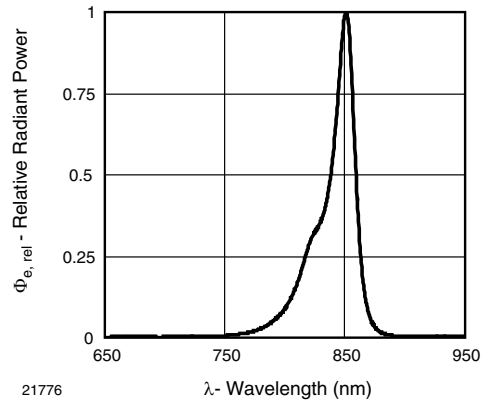


Fig. 5 - Relative Radiant Power vs. Wavelength

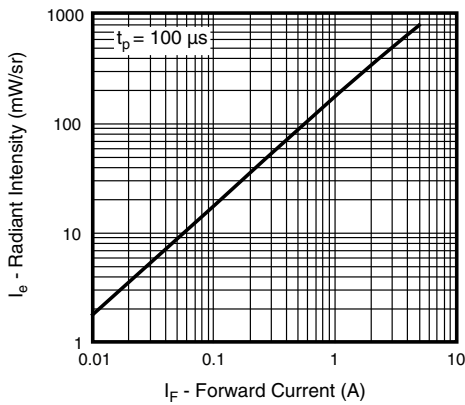


Fig. 4 - Radiant Intensity vs. Forward Current

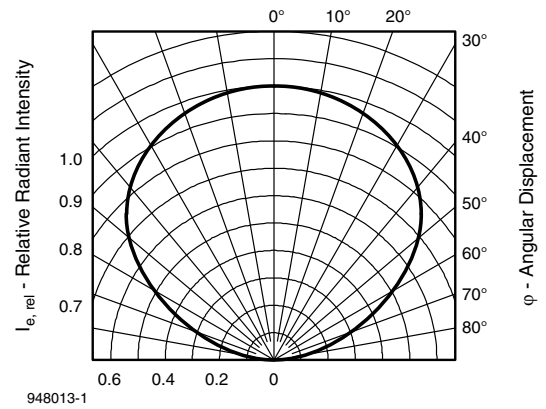
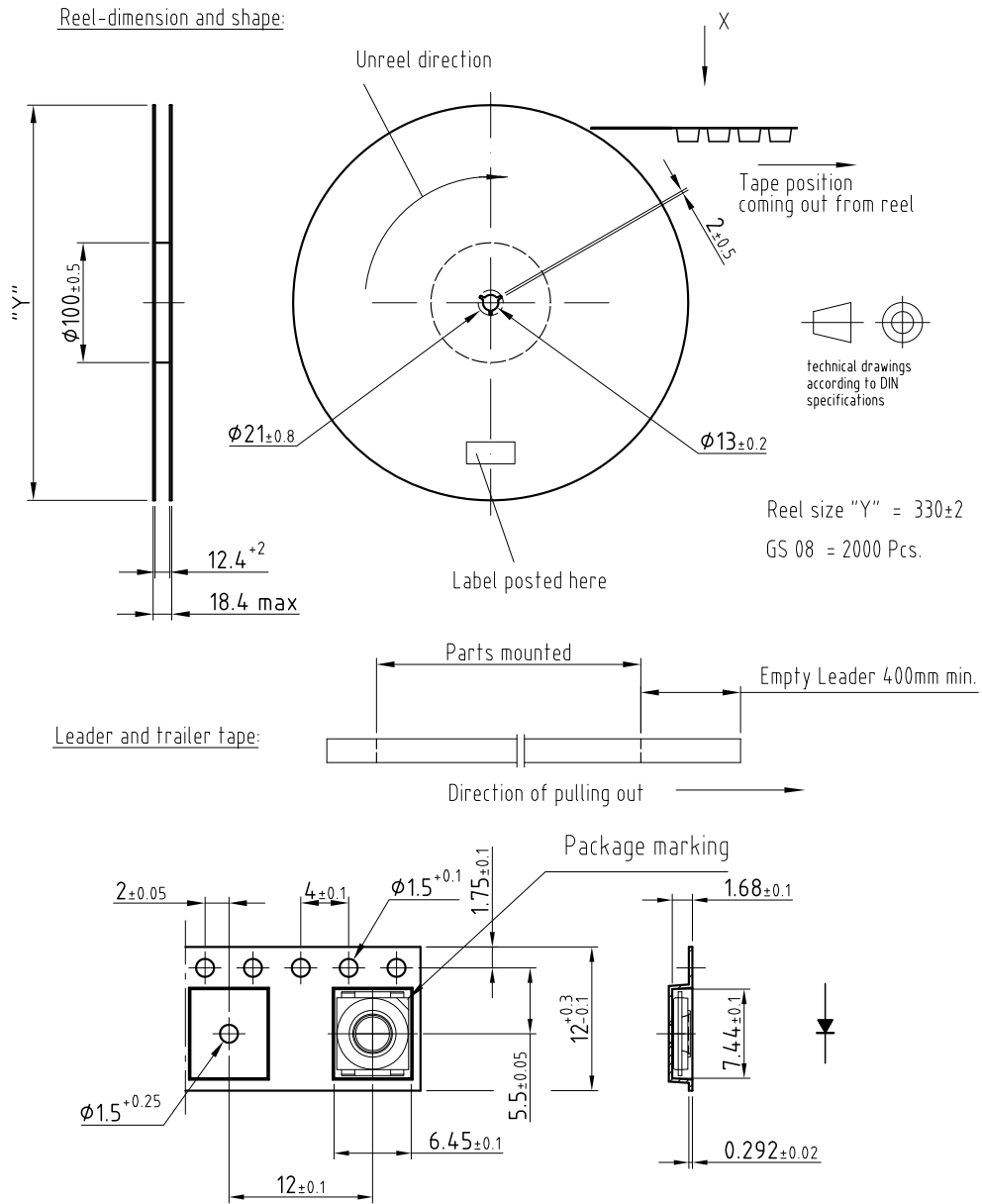


Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

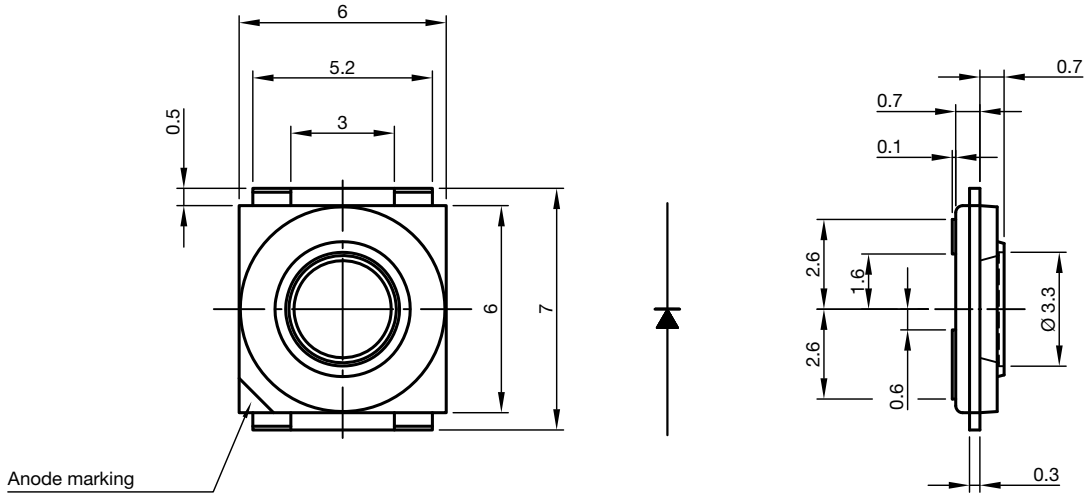
**TAPING DIMENSIONS** in millimeters



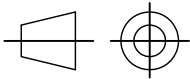
Drawing-No.: 9.800-5094.01-4  
Issue: 3; 22.01.08  
20846



PACKAGE DIMENSIONS in millimeters



Anode marking



technical drawings according to DIN specifications

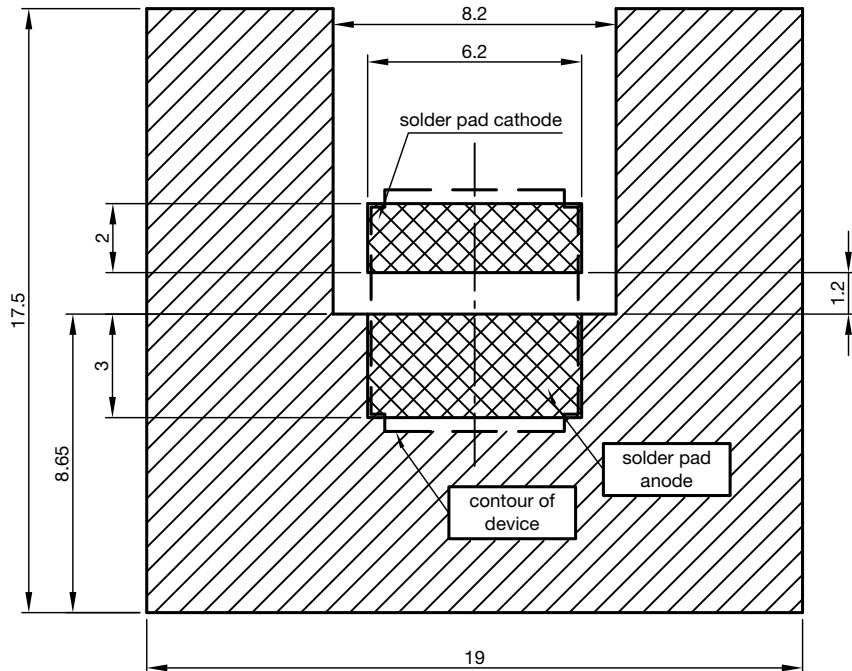
Recommended solder pad



Recommended area for heat sink connected with anode pad



Not indicated tolerances ± 0.1



Drawing-No.: 6.541-5076.01-4  
Issue: 3; 22.10.14

**SOLDER PROFILE**

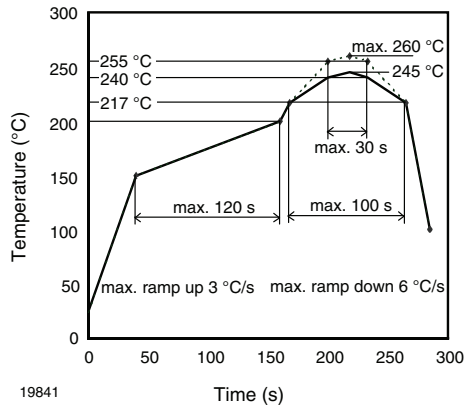


Fig. 7 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020 for Preconditioning acc. to JEDEC®, Level 2

**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: 1 year

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

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

**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 °C (+ 5 °C),  $RH < 5\%$ .



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