



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



21783

## DESCRIPTION

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 DC and up to 5 A pulses
- Low thermal resistance:  $R_{thJP} = 10$  K/W
- Floor life: 4 weeks, MSL 2a, acc. J-STD-020
- Lead (Pb)-free reflow soldering
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC



RoHS COMPLIANT

## APPLICATIONS

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

PRODUCT SUMMARY				
COMPONENT	$I_e$ (mW/sr)	$\phi$ (deg)	$\lambda_p$ (nm)	$t_r$ (ns)
VSMY7850X01	170	$\pm 60$	850	20

### 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 ( $T_{amb} = 25^\circ\text{C}$ , unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		$V_R$	5	V
Forward current		$I_F$	1	A
Peak forward current	$t_p/T = 0.5, t_p = 100 \mu\text{s}$	$I_{FM}$	2	A
Surge forward current	$t_p = 100 \mu\text{s}$	$I_{FSM}$	5	A
Power dissipation		$P_V$	2.5	W
Junction temperature		$T_j$	125	$^\circ\text{C}$
Operating temperature range		$T_{amb}$	- 40 to + 100	$^\circ\text{C}$
Storage temperature range		$T_{stg}$	- 40 to + 100	$^\circ\text{C}$
Soldering temperature	Acc. figure 7, J-STD-20	$T_{sd}$	260	$^\circ\text{C}$
Thermal resistance junction/pin	Acc. J-STD-051, soldered on PCB	$R_{thJP}$	10	K/W

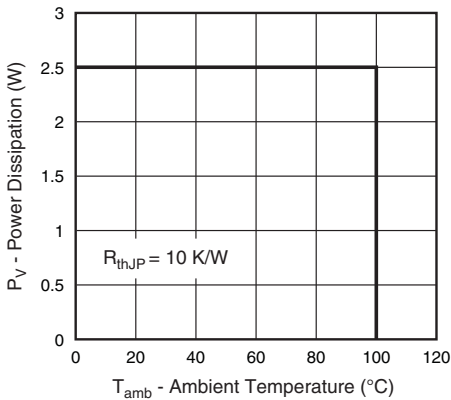


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

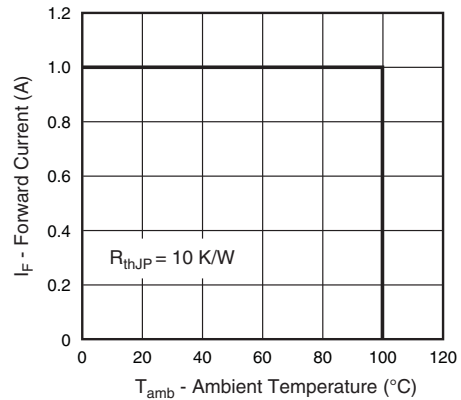


Fig. 2 - Forward Current Limit vs. Ambient Temperature

<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)

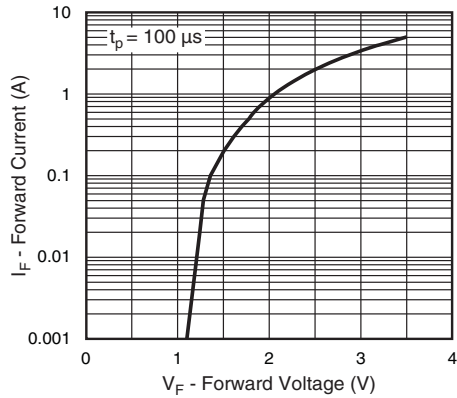


Fig. 3 - Forward Current vs. Forward Voltage

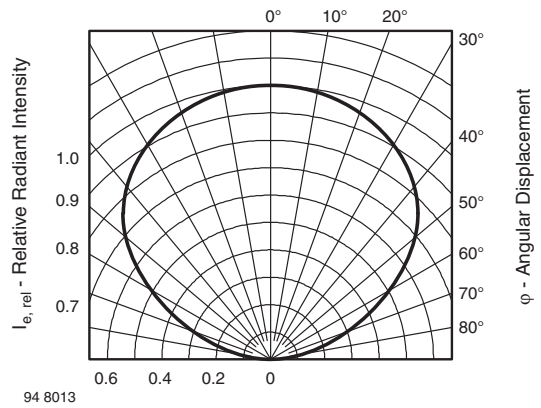


Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

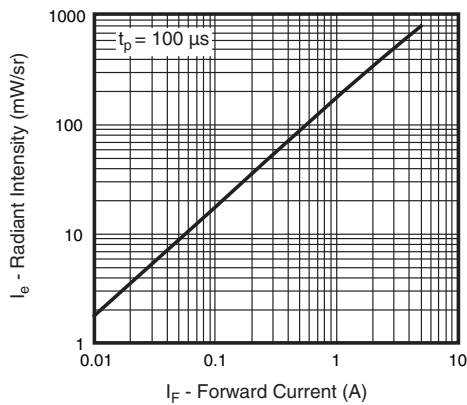


Fig. 4 - Radiant Intensity vs. Forward Current

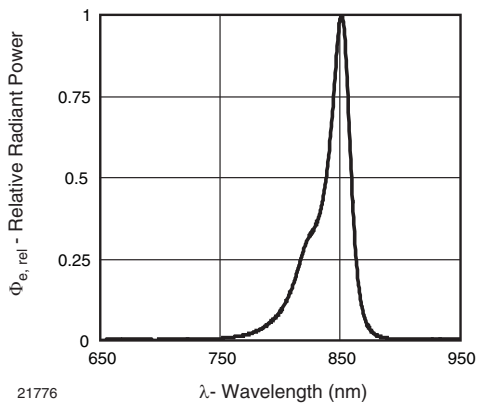
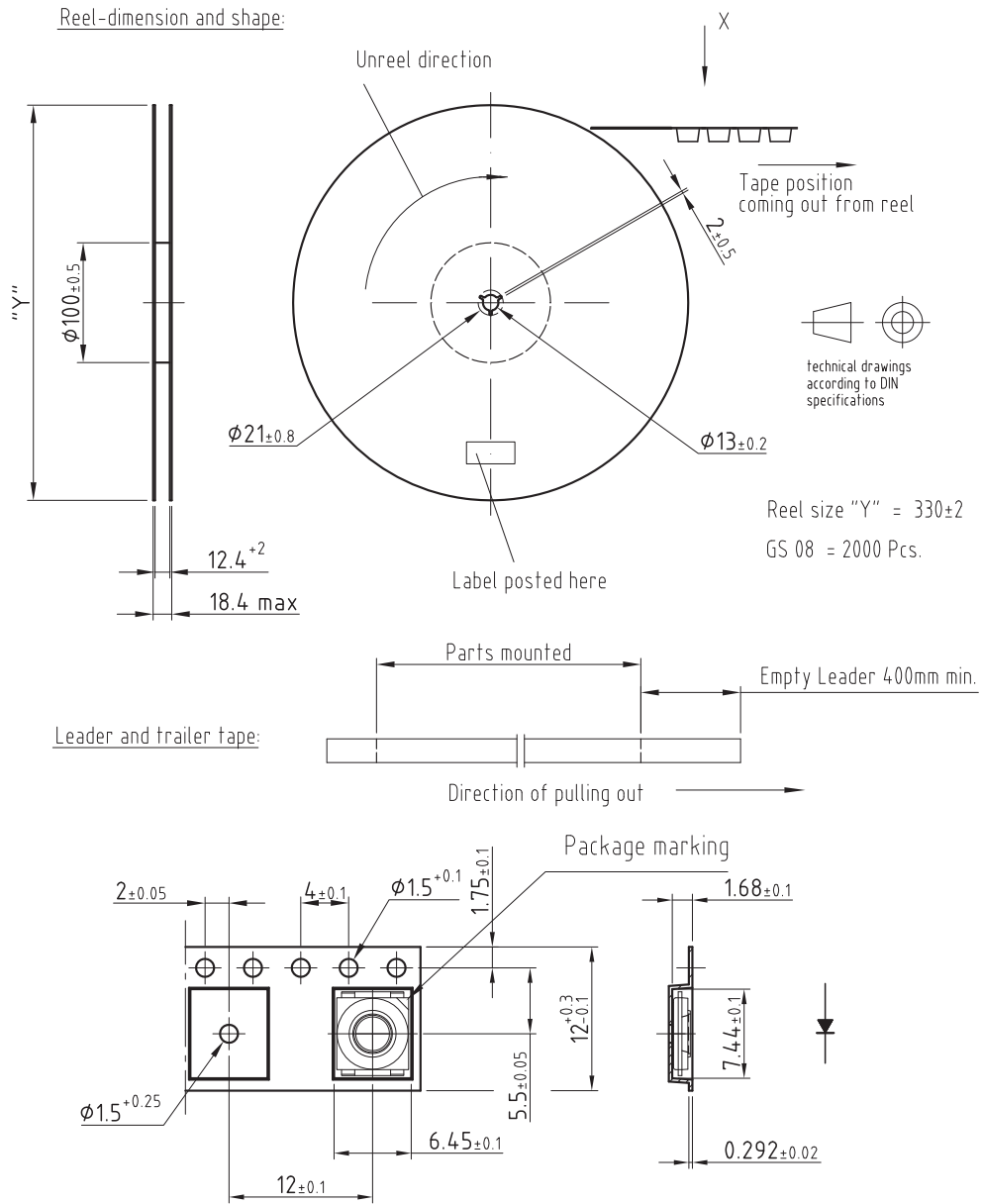


Fig. 5 - Relative Radiant Power vs. Wavelength

**TAPING DIMENSIONS** in millimeters



Drawing-No.: 9.800-5094.01-4

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**SOLDER PROFILE**

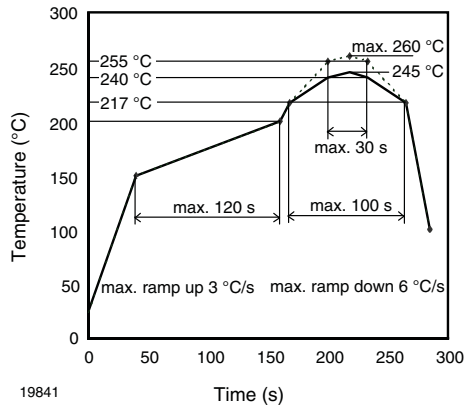


Fig. 7 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020 for Preconditioning acc. to JEDEC, Level 2a

**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: 4 weeks

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

Moisture sensitivity level 2a, 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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