

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



20783

### DESCRIPTION

VSMY7852X01 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 20 mil chip provides outstanding low forward voltage and allows DC operation of the device up to 250 mA.

### 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:  $\varphi = \pm 60^\circ$
- Low forward voltage
- Designed for high drive currents: up to 250 mA DC and up to 1.5 A pulses
- Low thermal resistance:  $R_{thJP} = 15$  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

 AUTOMOTIVE  
GRADE

**RoHS**  
COMPLIANT

### APPLICATIONS

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

### PRODUCT SUMMARY

COMPONENT	$I_e$ (mW/sr)	$\varphi$ (deg)	$\lambda_p$ (nm)	$t_r$ (ns)
VSMY7852X01	42	$\pm 60$	850	15

#### Note

- Test conditions see table "Basic Characteristics"

### ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VSMY7852X01-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		$I_F$	250	mA
Peak forward current	$t_p/T = 0.5, t_p = 100 \mu\text{s}$	$I_{FM}$	500	mA
Surge forward current	$t_p = 100 \mu\text{s}$	$I_{FSM}$	1.5	A
Power dissipation		$P_V$	500	mW
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	$R_{thJP}$	15	K/W

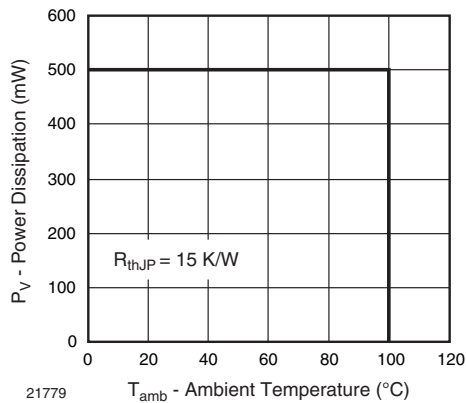


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

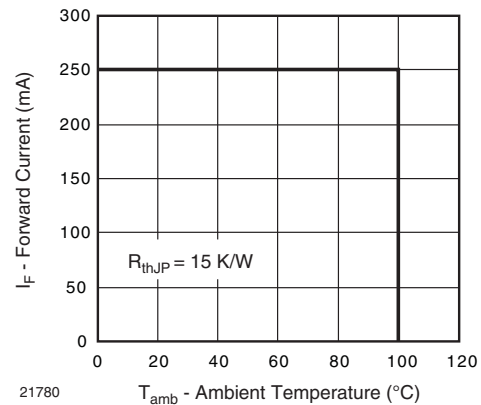


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 250\text{ mA}$ , $t_p = 20\text{ ms}$	$V_F$		1.8	2.0	V
	$I_F = 1.5\text{ A}$ , $t_p = 100\text{ }\mu\text{s}$	$V_F$		2.8		V
Temperature coefficient of $V_F$	$I_F = 1\text{ mA}$	$TK_{V_F}$		- 1.5		mV/K
Reverse current	$V_R = 5\text{ V}$	$I_R$	not designed for reverse operation			$\mu\text{A}$
Radiant intensity	$I_F = 250\text{ mA}$ , $t_p = 20\text{ ms}$	$I_e$	30	42	90	mW/sr
	$I_F = 1.5\text{ A}$ , $t_p = 100\text{ }\mu\text{s}$	$I_e$		220		mW/sr
Radiant power	$I_F = 250\text{ mA}$ , $t_p = 20\text{ ms}$	$\phi_e$		130		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	$I_F = 250\text{ mA}$	$\lambda_p$		850		nm
Spectral bandwidth	$I_F = 250\text{ mA}$	$\Delta\lambda$		30		nm
Temperature coefficient of $\lambda_p$	$I_F = 250\text{ mA}$	$TK_{\lambda_p}$		0.2		nm/K
Rise time	$I_F = 250\text{ mA}$	$t_r$		8		ns
Fall time	$I_F = 250\text{ mA}$	$t_f$		10		ns

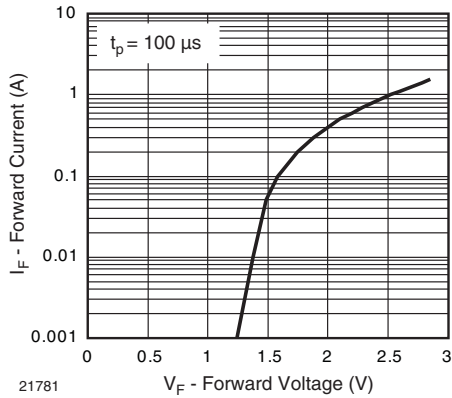
**BASIC CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)


Fig. 3 - Forward Current vs. Forward Voltage

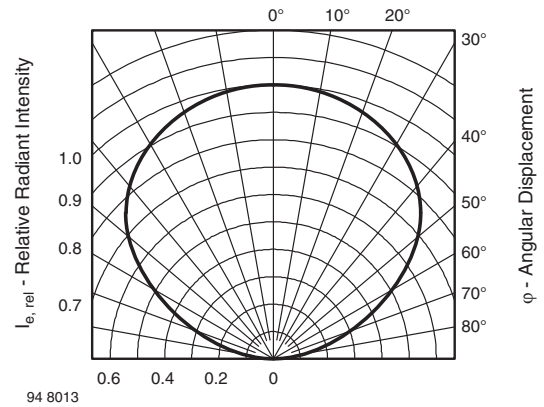


Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

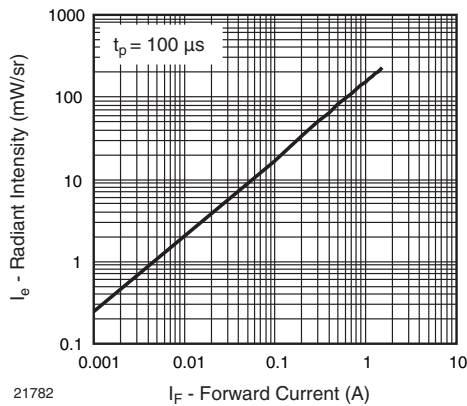


Fig. 4 - Radiant Intensity vs. Forward Current

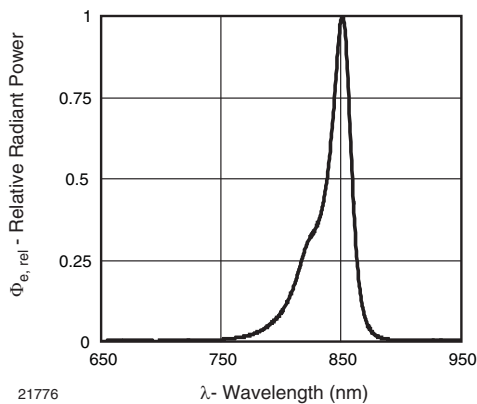


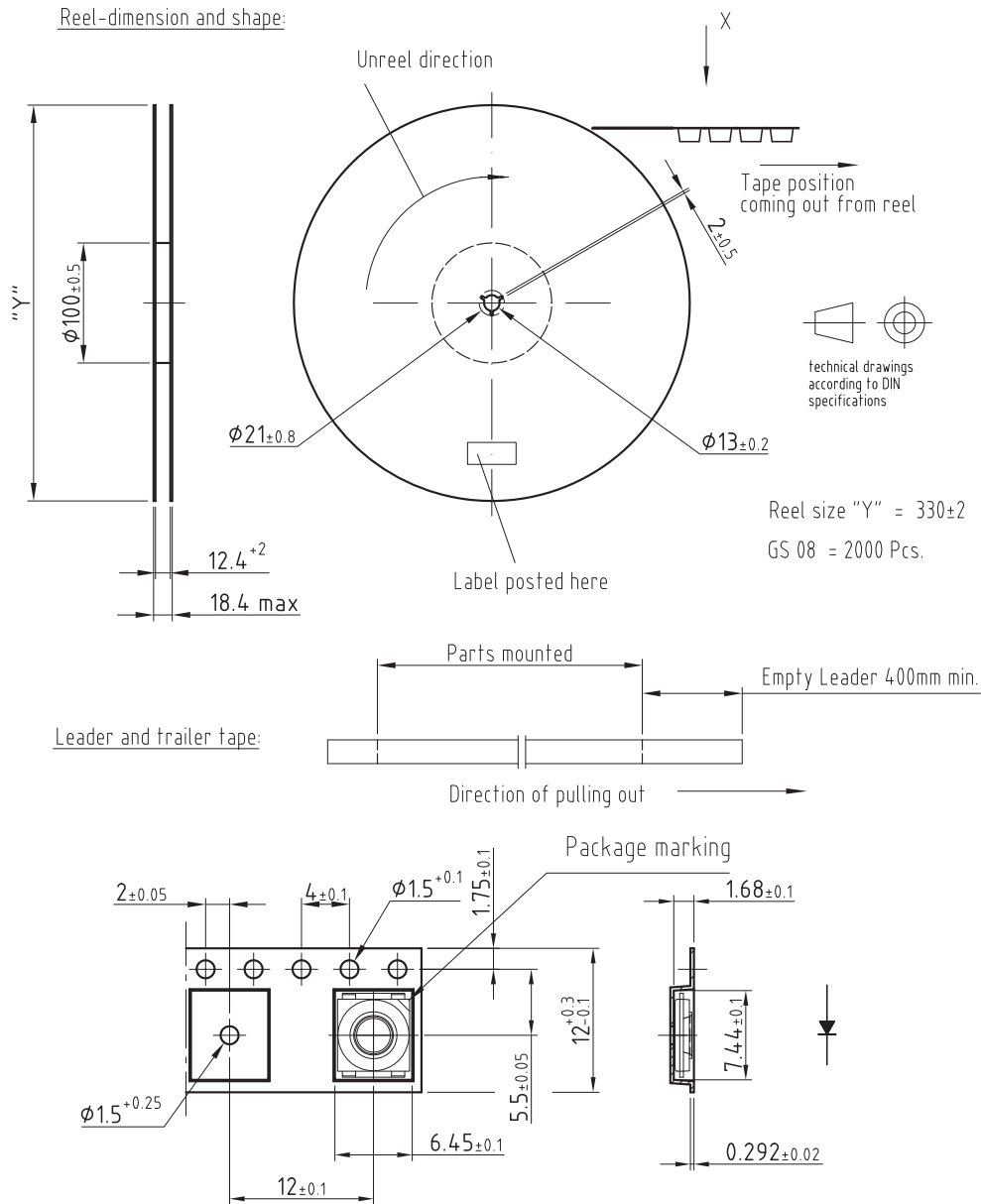
Fig. 5 - Relative Radiant Power vs. Wavelength

# VSMY7852X01



Vishay Semiconductors High Power Infrared Emitting Diode,  
850 nm, Surface Emitter Technology

## TAPING DIMENSIONS in millimeters

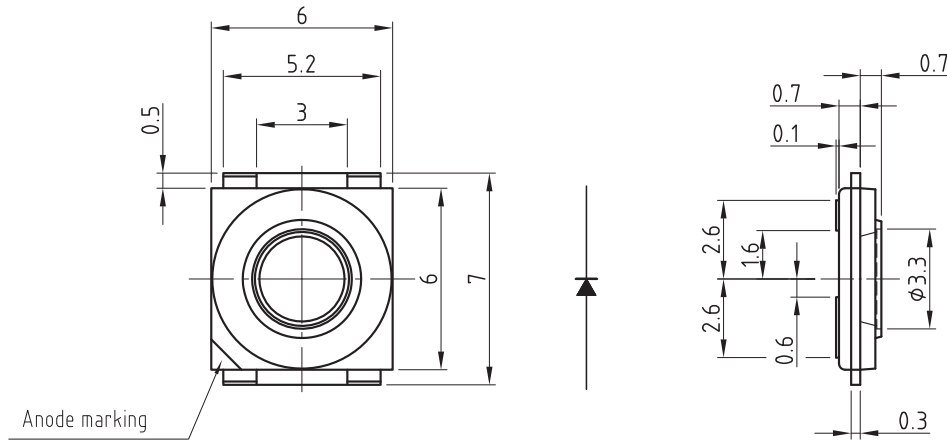


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Issue: 3; 22.01.08  
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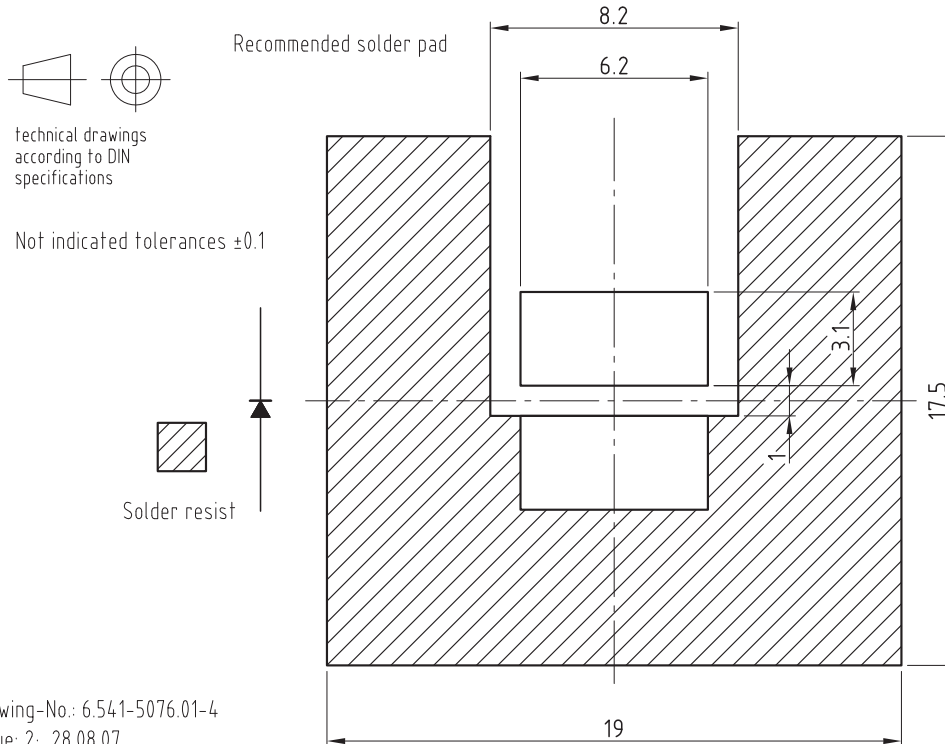


High Power Infrared Emitting Diode, Vishay Semiconductors  
850 nm, Surface Emitter Technology

PACKAGE DIMENSIONS in millimeters



Anode marking



Drawing-No.: 6.541-5076.01-4

Issue: 2; 28.08.07

20848

## SOLDER PROFILE

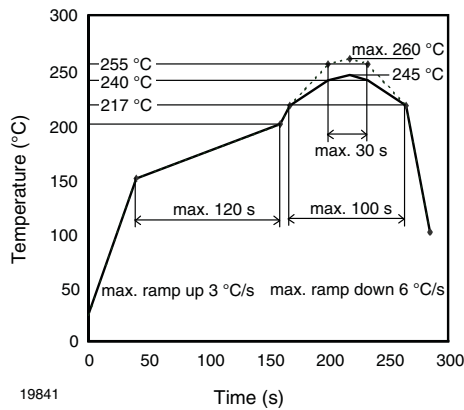


Fig. 7 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020 for Preconditioning acc. to JEDEC, Level 2a

## 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:  $T_{amb} < 30\text{ }^{\circ}\text{C}$ , 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  $40\text{ }^{\circ}\text{C}$  (+ 5 °C), RH < 5 %.



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