

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_{DC} 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

 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 _e (mW/sr)	φ (deg)	λ _p (nm)	t _r (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_{amb} = 25 °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 μs	I _{FM}	2	A
Surge forward current	t _p = 100 μs	I _{FSM}	5	A
Power dissipation		P _V	2.5	W
Junction temperature		T _j	125	°C
Operating temperature range		T _{amb}	-40 to +100	°C
Storage temperature range		T _{stg}	-40 to +100	°C
Soldering temperature	Acc. figure 7, J-STD-20	T _{sd}	260	°C
Thermal resistance junction/pin	Acc. J-STD-051, soldered on PCB	R _{thJP}	10	K/W

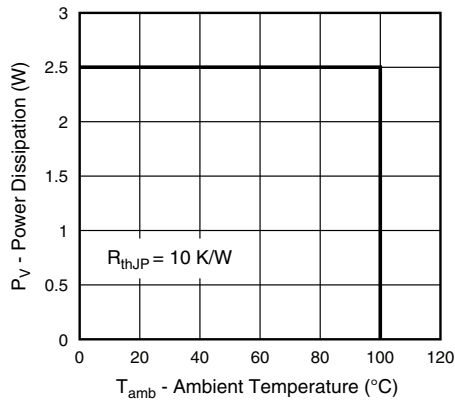


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

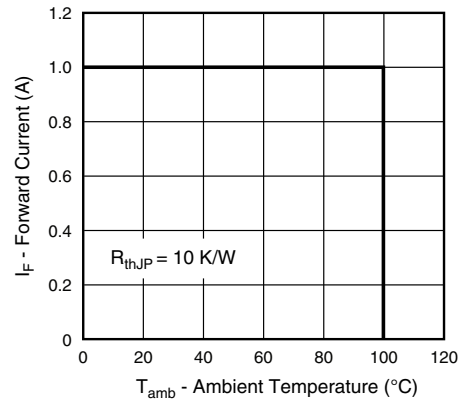


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, 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			μA
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	$I_F = 1\text{ A}$, $t_p = 20\text{ ms}$	ϕ_e		520		mW
Temperature coefficient of ϕ_e	$I_F = 1\text{ A}$	TK_{ϕ_e}		-0.5		%/K
Angle of half intensity		φ		± 60		deg
Peak wavelength	$I_F = 1\text{ A}$	λ_p		850		nm
Spectral bandwidth	$I_F = 1\text{ A}$	$\Delta\lambda$		30		nm
Temperature coefficient of λ_p	$I_F = 1\text{ A}$	TK_{λ_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)

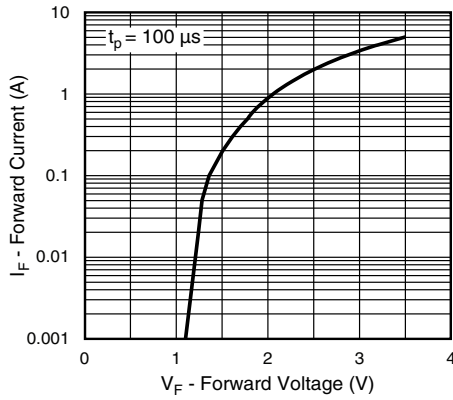


Fig. 3 - Forward Current vs. Forward Voltage

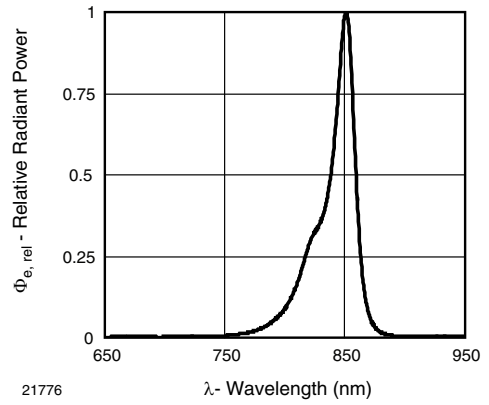


Fig. 5 - Relative Radiant Power vs. Wavelength

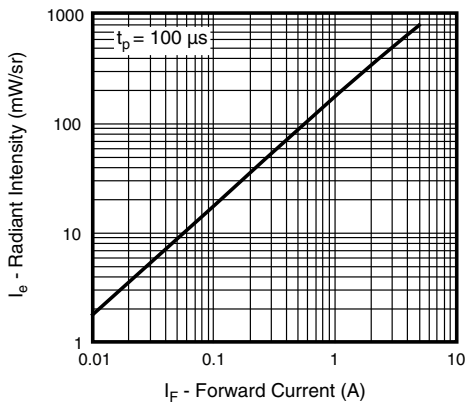


Fig. 4 - Radiant Intensity vs. Forward Current

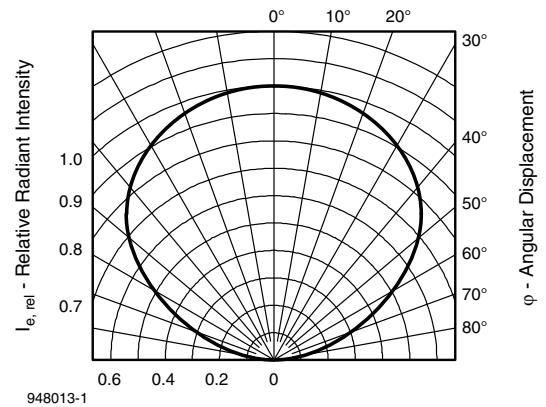
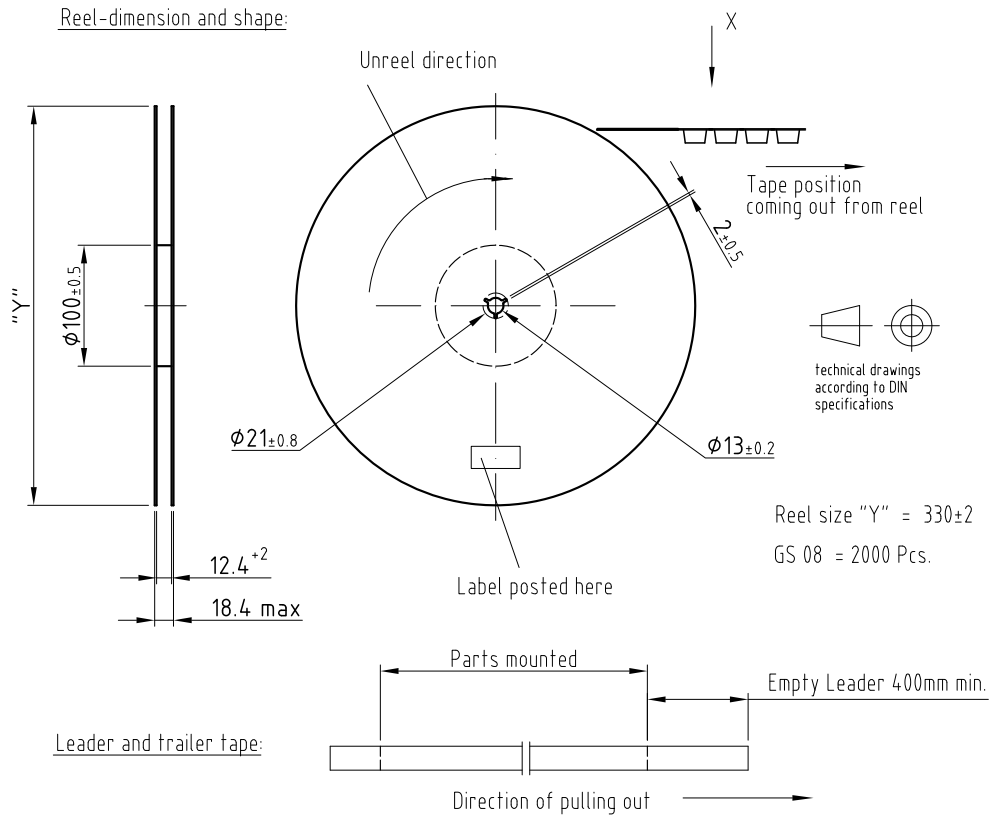
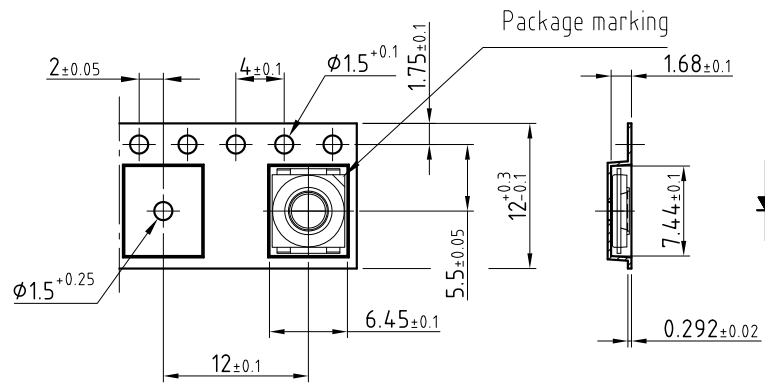


Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

TAPING DIMENSIONS in millimeters



Leader and trailer tape:



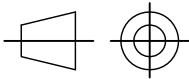
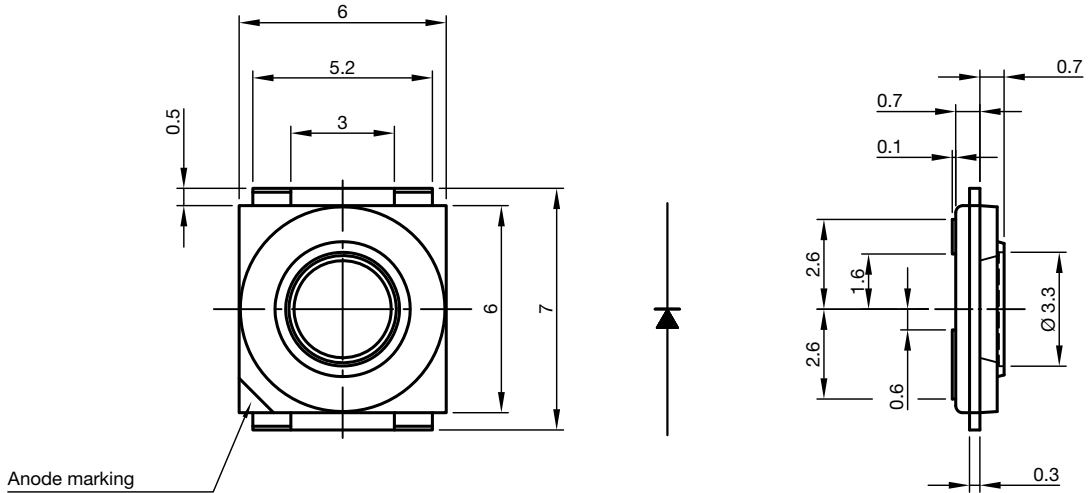
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Issue: 3; 22.01.08

20846



PACKAGE DIMENSIONS in millimeters



technical drawings according to DIN specifications

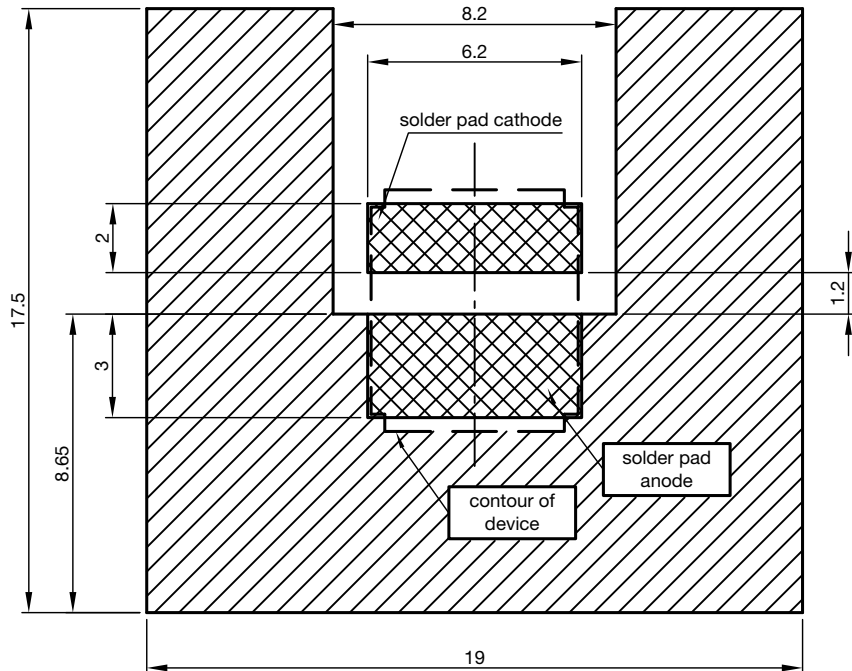
Recommended solder pad



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

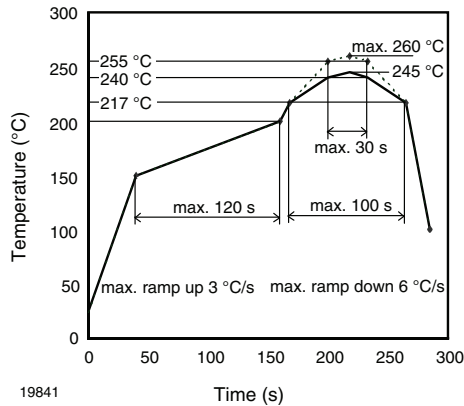


Fig. 7 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020 for Preconditioning acc. to JEDEC®, Level 2

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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