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

21783

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: λ_p = 850 nm
- High reliability
- High radiant power
- High radiant intensity
- Angle of half intensity: φ = ± 60°
- 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, according to J-STD-020
- Lead (Pb)-free reflow soldering
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

e3

RoHS COMPLIANT

HALOGEN FREE

GREEN (5-2008)

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.

APPLICATIONS

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

PRODUCT SUMMARY

COMPONENT	I_e (mW/sr)	φ (deg)	λ_p (nm)	t_r (ns)
VSMY7850X01	200	± 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	According to Fig. 7, J-STD-20	T_{sd}	260	°C
Thermal resistance junction / pin	According to J-STD-051, soldered on PCB	R_{thJP}	10	K/W

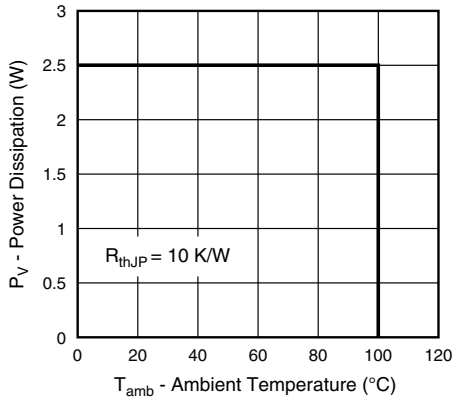


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

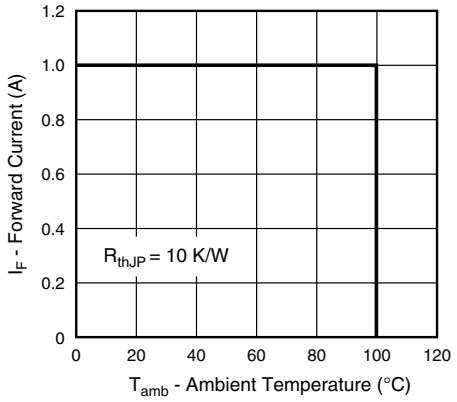


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Forward voltage	I_F = 1 A, t_p = 20 ms	V_F	-	2.0	2.5	V
Temperature coefficient of V_F	I_F = 1 A	TK_{VF}	-	-0.2	-	mV/K
Reverse current	V_R = 5 V	I_R	not designed for reverse operation			µA
Radiant intensity	I_F = 1 A, t_p = 20 ms	I_e	130	200	390	mW/sr
Radiant power	I_F = 1 A, t_p = 20 ms	ϕ_e	-	800	-	mW
Temperature coefficient of ϕ_e	I_F = 1 A	$TK\phi_e$	-	-0.5	-	%/K
Angle of half intensity		φ	-	± 60	-	deg
Peak wavelength	I_F = 1 A	λ_p	-	850	-	nm
Spectral bandwidth	I_F = 1 A	$\Delta\lambda$	-	30	-	nm
Temperature coefficient of λ_p	I_F = 1 A	$TK\lambda_p$	-	0.2	-	nm/K
Rise time	I_F = 1 A	t_r	-	15	-	ns
Fall time	I_F = 1 A	t_f	-	18	-	ns

BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

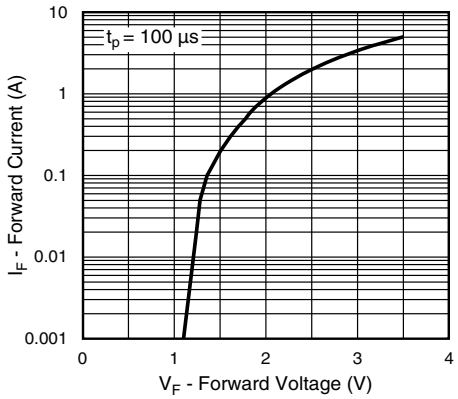


Fig. 3 - Forward Current vs. Forward Voltage

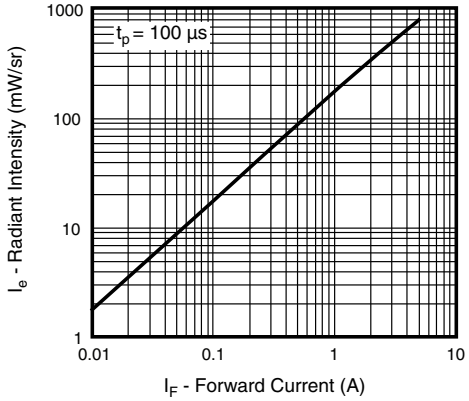


Fig. 4 - Radiant Intensity vs. Forward Current

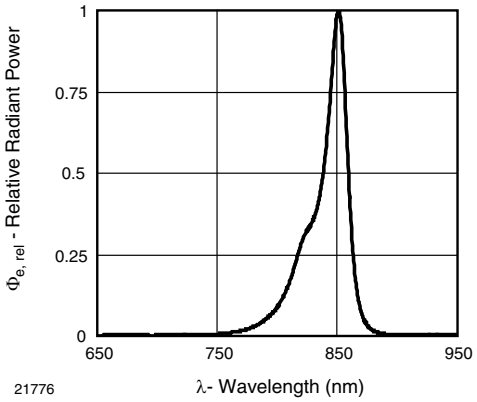


Fig. 5 - Relative Radiant Power vs. Wavelength

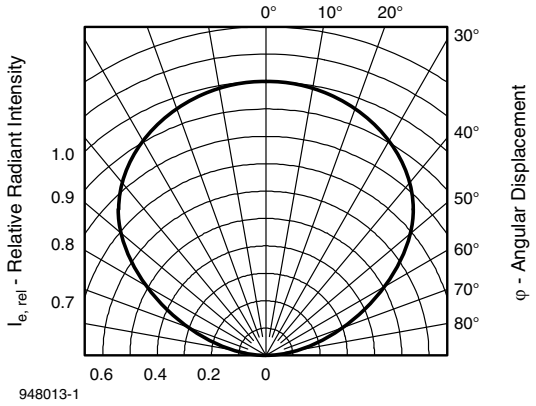
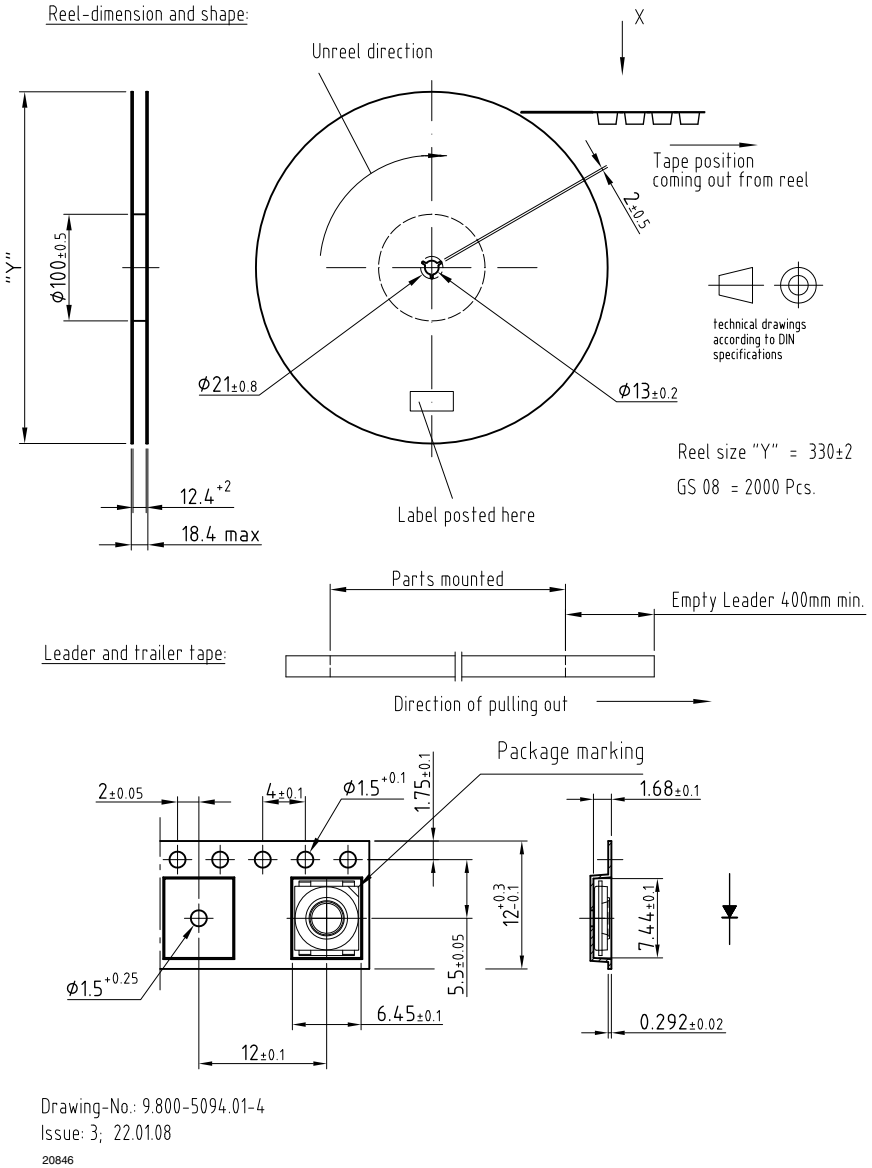
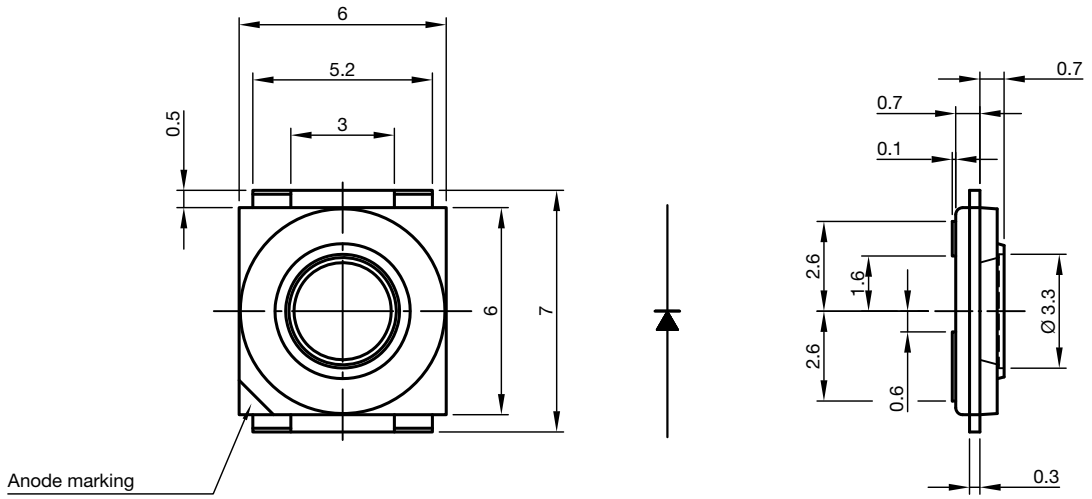


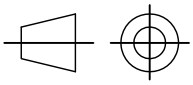
Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

TAPING DIMENSIONS in millimeters



PACKAGE DIMENSIONS in millimeters



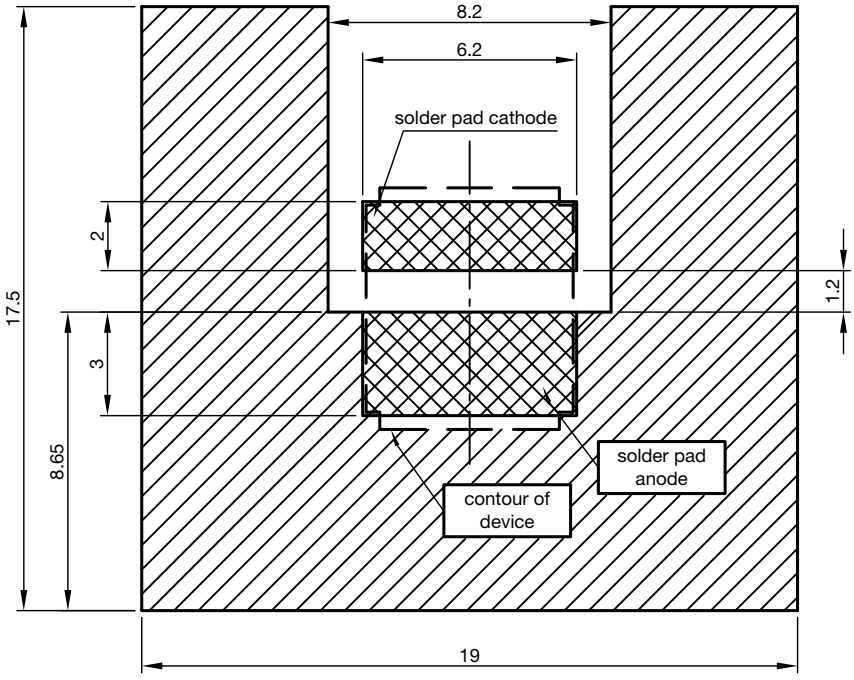


technical drawings
according to DIN
specifications

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

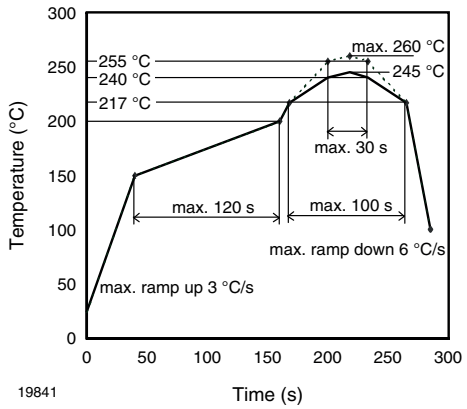


Fig. 7 - Lead (Pb)-free Reflow Solder Profile According to J-STD-020 for Preconditioning According to JEDEC®, Level 2

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 °C, RH < 60 %

Moisture sensitivity level 2, according 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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