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

FFEATURES

- 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 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

Pb-free

e3

RoHS COMPLIANT

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.

AAPPLICATIONS

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

PRODUCT SUMMARY				
COMPONENT	I_e (mW/sr)	φ (deg)	λ_p (nm)	t_r (ns)
VSMY7852X01	42	± 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 °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 µs	I_{FM}	500	mA
Surge forward current	t_p = 100 µs	I_{FSM}	1.5	A
Power dissipation		P_V	500	mW
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}	15	K/W

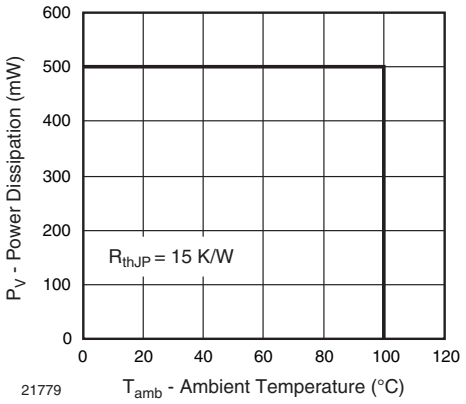


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

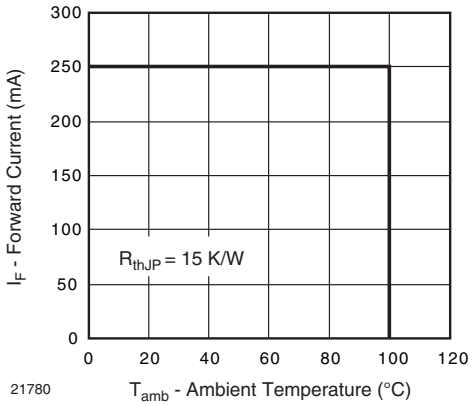


Fig. 2 - Forward Current Limit vs. Ambient Temperature

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

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

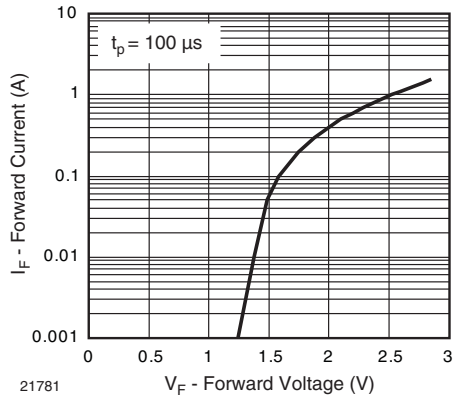


Fig. 3 - Forward Current vs. Forward Voltage

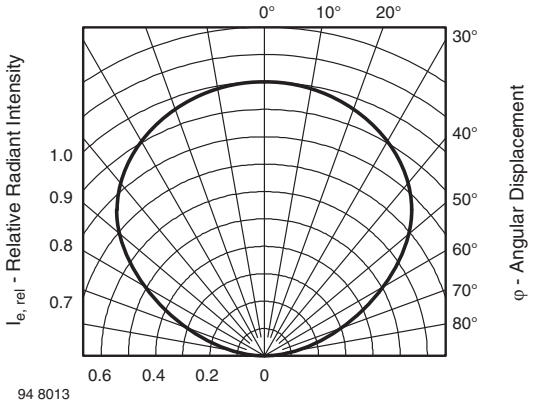


Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

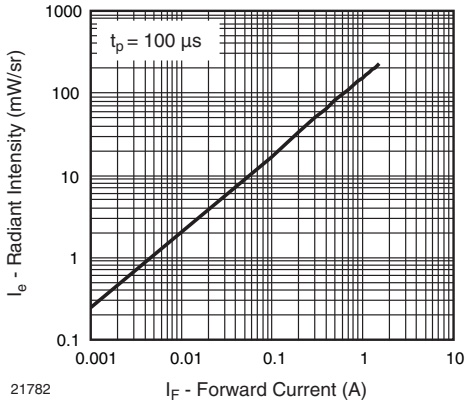


Fig. 4 - Radiant Intensity vs. Forward Current

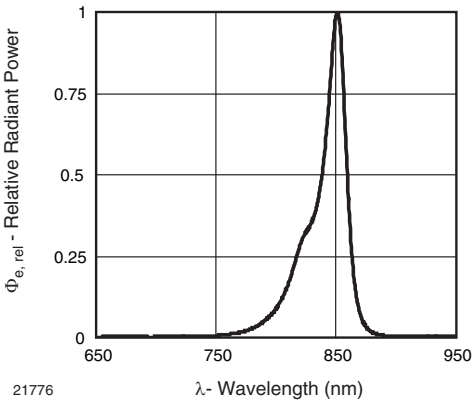
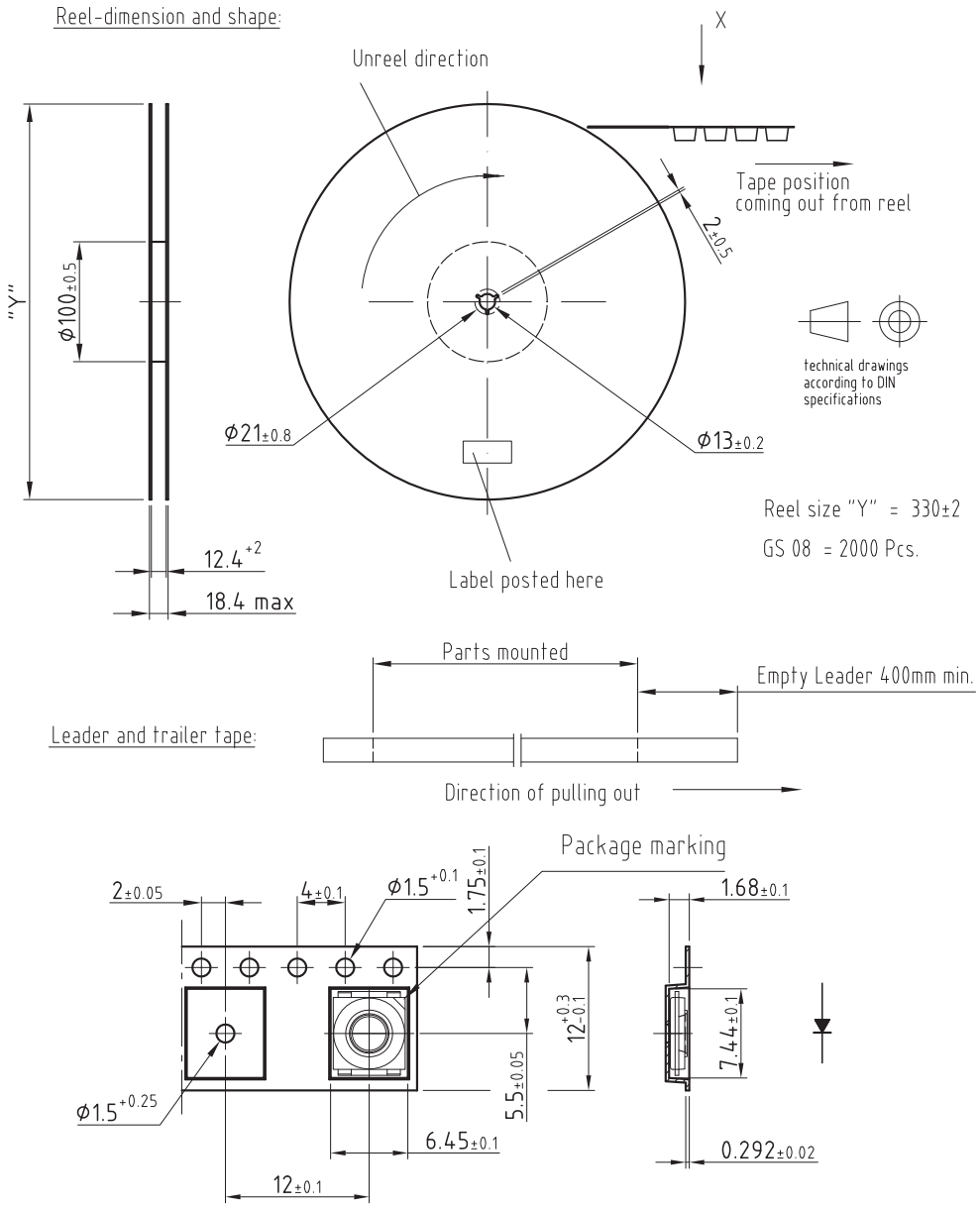


Fig. 5 - Relative Radiant Power vs. Wavelength

TAPING DIMENSIONS in millimeters



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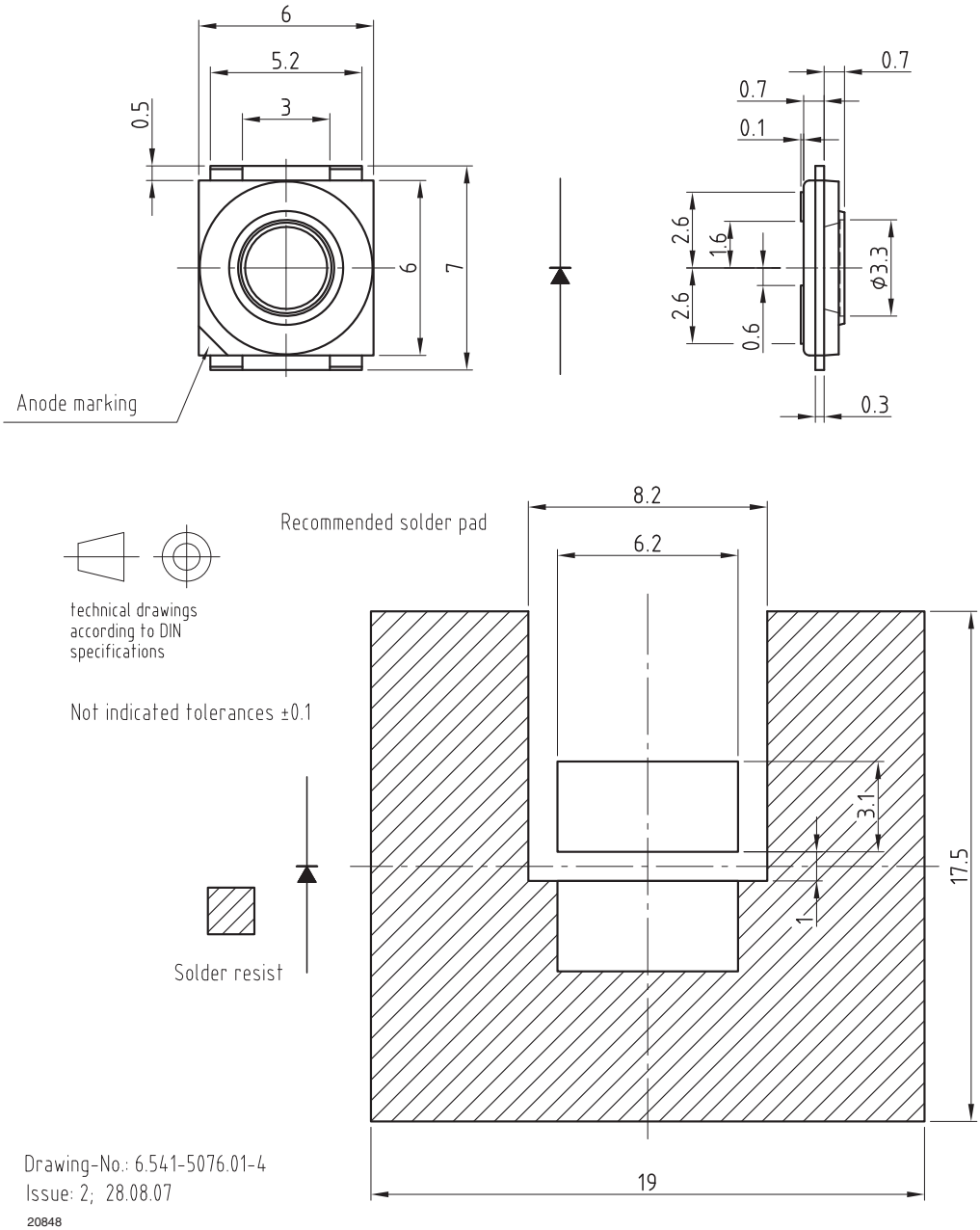
PACKAGE DIMENISONS in millimeters



SOLDER PROFILE

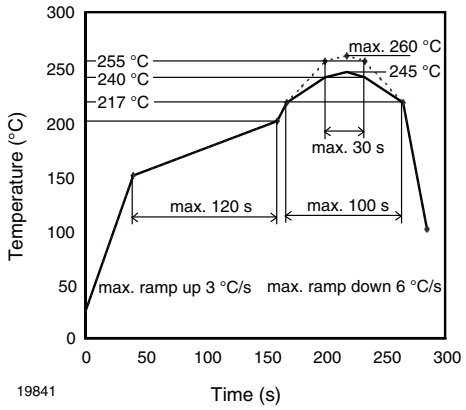


Fig. 7 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020 for Preconditioning acc. to JEDEC, Level 2a

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: $T_{amb} < 30$ °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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