High Speed Infrared Emitting Diodes, 940 nm, Surface Emitter Technology

21531

ADDITIONAL RESOURCES

3D Models Footprints

DESCRIPTION

As part of the SurfLight™ portfolio, the VSMY1943X01 is an infrared, 940 nm emitting diode based on GaAlAs surface emitter chip technology with high radiant intensity, high optical power and high speed, molded in clear, untinted 0805 plastic package for surface mounting (SMD).

FEATURES

- Package type: surface-mount
- Package form: 0805
- Dimensions (L x W x H in mm): 2 x 1.25 x 0.85
- AEC-Q101 qualified
- Operating temperature range: -40 °C to +105 °C
- Peak wavelength: λ_p = 940 nm
- Angle of half sensitivity: φ = ± 60°
- 0805 standard surface-mountable package
- Floor life: 168 h, MSL 3, according to J-STD-020
- Lead (Pb)-free reflow soldering
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE
Pb-free
e4
RoHS COMPLIANT
HALOGEN FREE
GREEN (5-2008)

APPLICATIONS

- Miniature light barrier
- Photointerrupters
- Emitter source for proximity sensors

PRODUCT SUMMARY				
COMPONENT	I_e (mW/sr) at I_F = 50 mA	φ (°)	λ_p (nm)	t_r (ns)
VSMY1943X01	6	± 60	940	5

Note
- Test conditions see table “Basic Characteristics“

ORDERING INFORMATION			
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VSMY1943X01	Tape and reel	MOQ: 3000 pcs, 3000 pcs/reel	0805

Note
- MOQ: minimum order quantity

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ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)				
PARAMETER	**TEST CONDITION**	**SYMBOL**	**VALUE**	**UNIT**
Forward current		I_F	70	mA
Peak forward current	$t_p/T = 0.5$, $t_p = 100$ µs	I_{FM}	140	mA
Surge forward current	$t_p = 100$ µs	I_{FSM}	500	mA
Power dissipation		P_V	120	mW
Junction temperature		T_j	110	°C
Operating temperature range		T_{amb}	-40 to +105	°C
Storage temperature range		T_{stg}	-40 to +110	°C
Soldering temperature	According to Fig. 10, J-STD-020	T_{sd}	260	°C
Thermal resistance junction-to-ambient	EIA / JESD 51	R_{thJA}	280	K/W

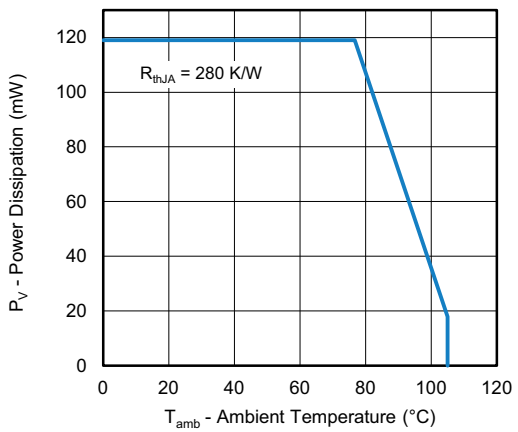

Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

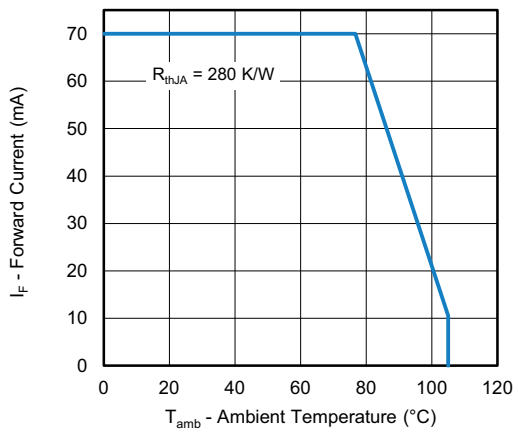

Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Forward voltage	$I_F = 50$ mA, $t_p = 20$ ms	V_F	-	1.4	1.7	V
	$I_F = 70$ mA, $t_p = 20$ ms	V_F	-	1.5	-	V
	$I_F = 500$ mA, $t_p = 100$ µs	V_F	-	2.5	-	V
Reverse current		I_R	Not designed for reverse operation			µA
Junction capacitance	$V_R = 0$ V, f = 1 MHz, E = 0 mW/cm^2	C_J	-	30	-	pF
Radiant intensity	$I_F = 50$ mA, $t_p = 20$ ms	I_e	4	6	8	mW/sr
	$I_F = 1$ A, $t_p = 100$ µs	I_e	-	80	-	mW/sr
Radiant power	$I_F = 70$ mA, $t_p = 20$ ms	ϕe	-	40	-	mW
Angle of half intensity		φ	-	± 60	-	°
Peak wavelength	$I_F = 70$ mA	λ_p	920	940	960	nm
Spectral bandwidth	$I_F = 70$ mA	$\Delta\lambda$	-	55	-	nm
Rise time	$I_F = 70$ mA, 10 % to 90 %	t_r	-	5	-	ns
Fall time	$I_F = 70$ mA, 10 % to 90 %	t_f	-	6	-	ns

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

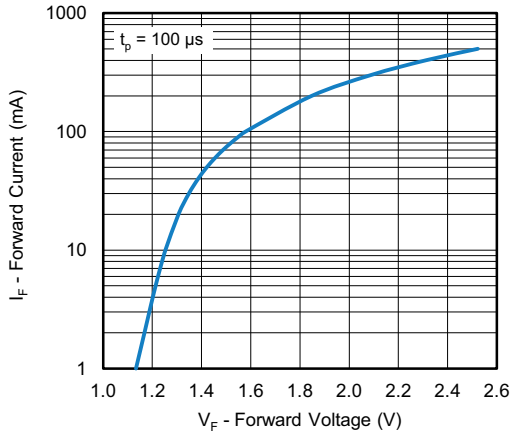

Fig. 3 - Forward Current vs. Forward Voltage

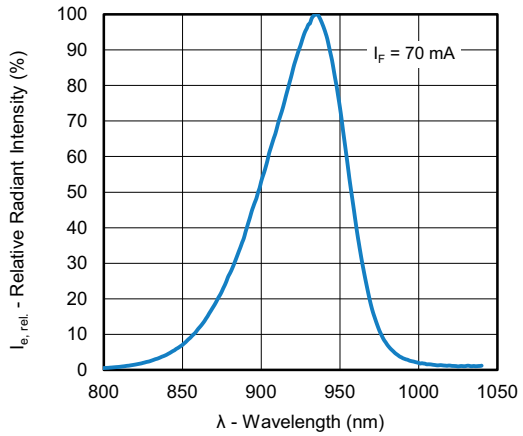

Fig. 5 - Relative Radiant Intensity vs. Wavelength

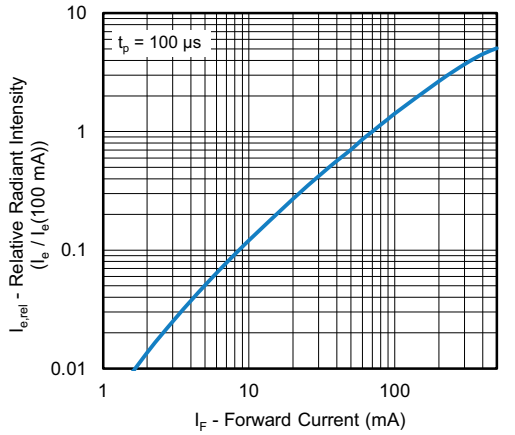

Fig. 4 - Relative Radiant Intensity vs. Ambient Temperature

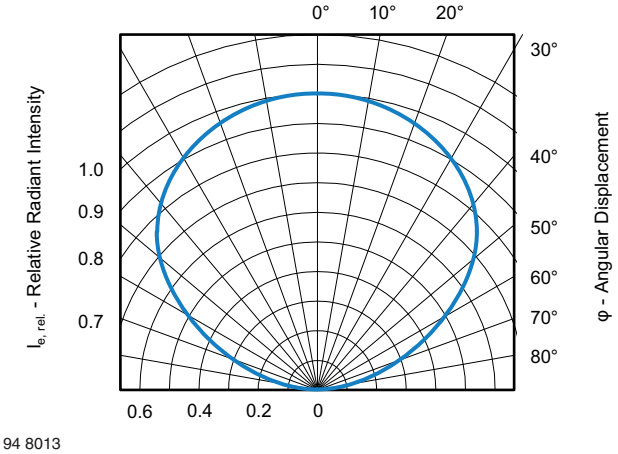

Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

REFLOW SOLDER PROFILE

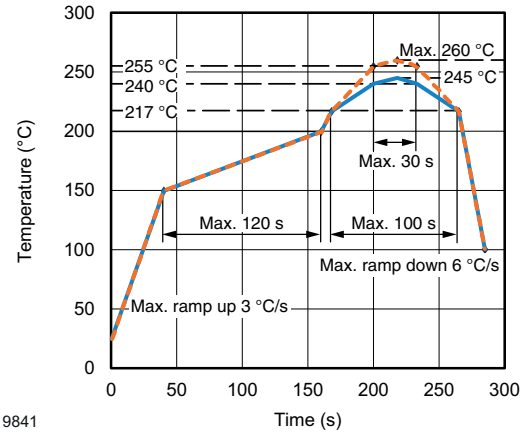

Fig. 7 - Lead (Pb)-free Reflow Solder Profile According to J-STD-020

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

Time between soldering and removing from MBB must not exceed the time indicated in J-STD-020:

Moisture sensitivity: level 3

Floor life: 168 h

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

DRYING

In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-033D or label. Devices taped on reel dry using recommended conditions 192 h at 40 °C (+ 5 °C), RH < 5 %.

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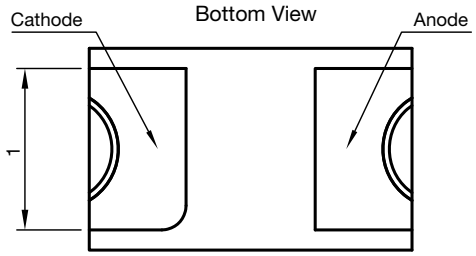
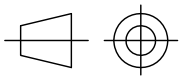
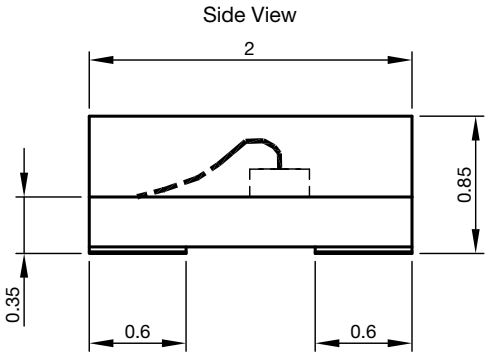
PACKAGE DIMENSIONS in millimeters

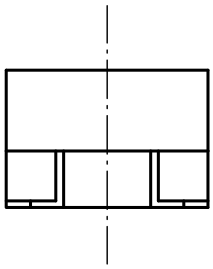


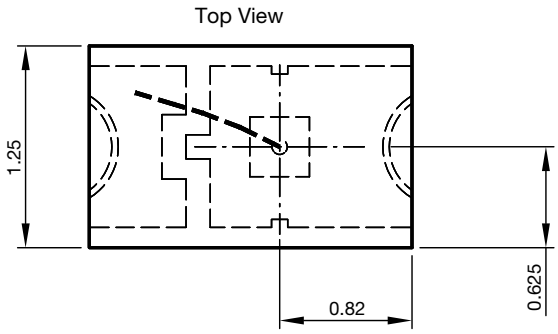


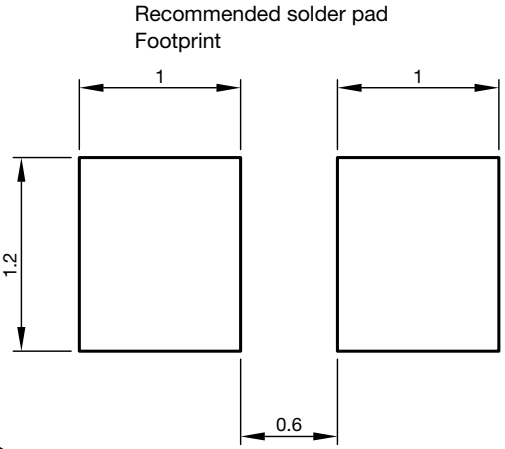
technical drawings according to DIN specifications

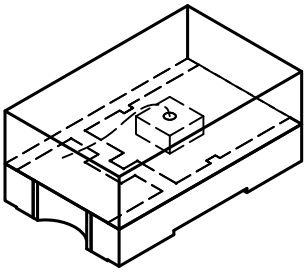
Not indicated tolerances ± 0.1











Drawing-No.: 6.541-5083.01-4
Issue: 2; 10.09.2013

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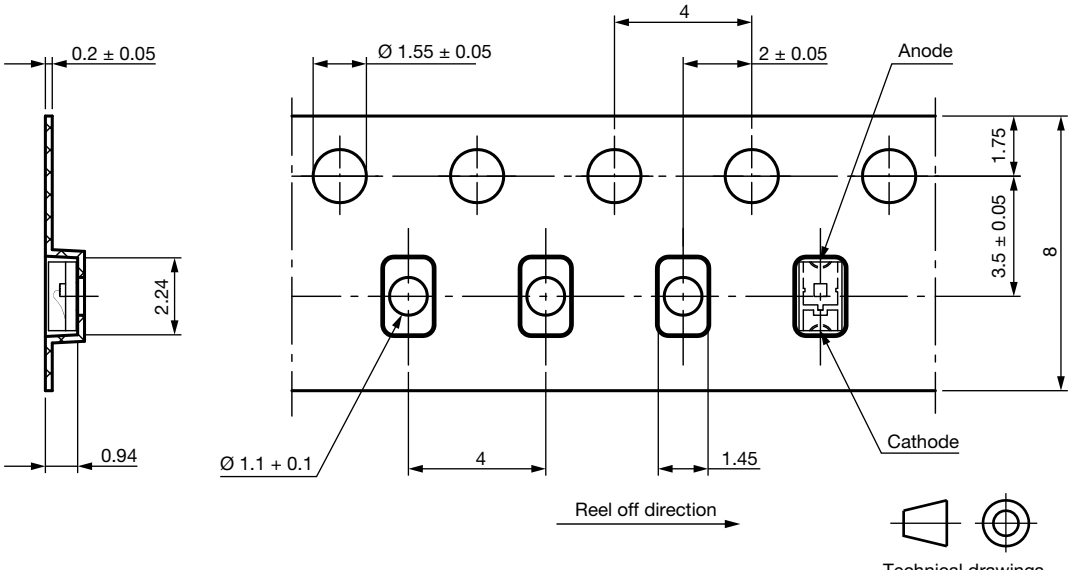
BLISTER TAPE DIMENSIONS in millimeters

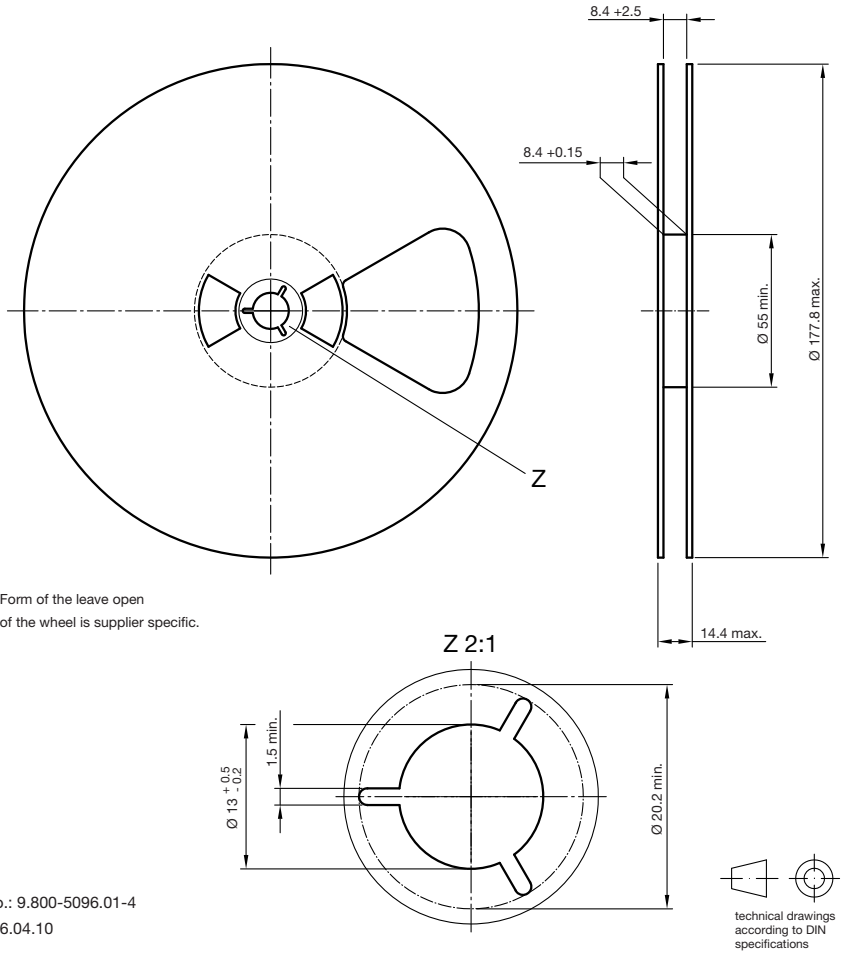


Drawing-No.: 9.700-5352.01-4
Issue: 2; 10.09.13

Not indicated tolerances ± 0.1

Technical drawings according to DIN specifications

REEL DIMENSIONS in millimeters



Form of the leave open
of the wheel is supplier specific.

Drawing-No.: 9.800-5096.01-4
Issue: 2; 26.04.10
20875

technical drawings according to DIN specifications

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