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



21531

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)

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).

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

For technical questions, contact: emittertechsupport@vishay.com

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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

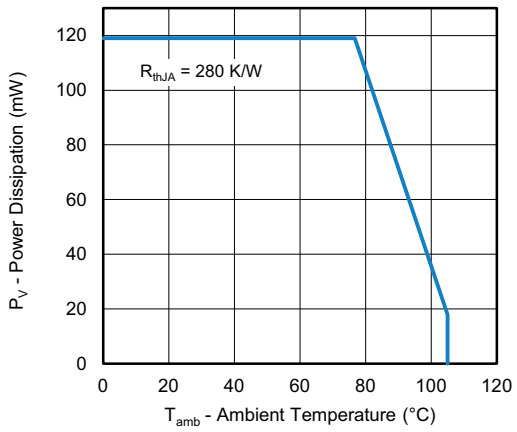


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

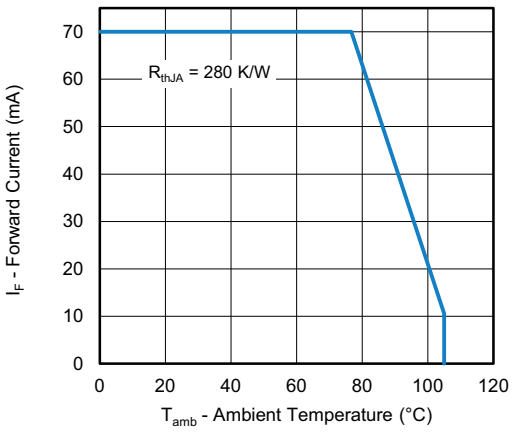


Fig. 2 - Forward Current Limit vs. Ambient Temperature

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/cm²	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)

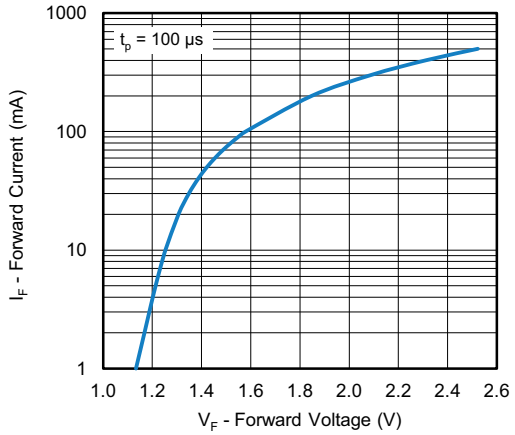


Fig. 3 - Forward Current vs. Forward Voltage

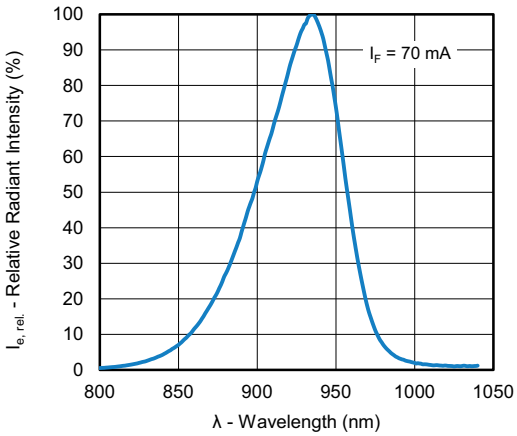


Fig. 5 - Relative Radiant Intensity vs. Wavelength

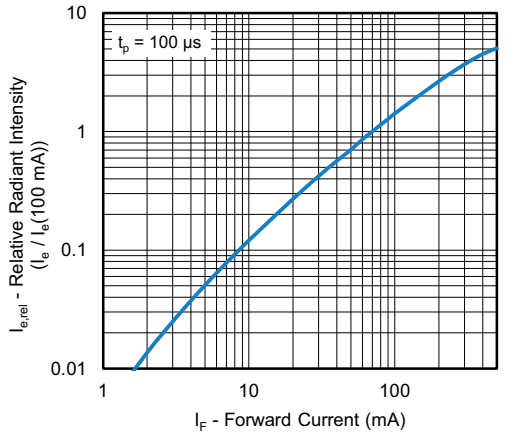


Fig. 4 - Relative Radiant Intensity vs. Ambient Temperature

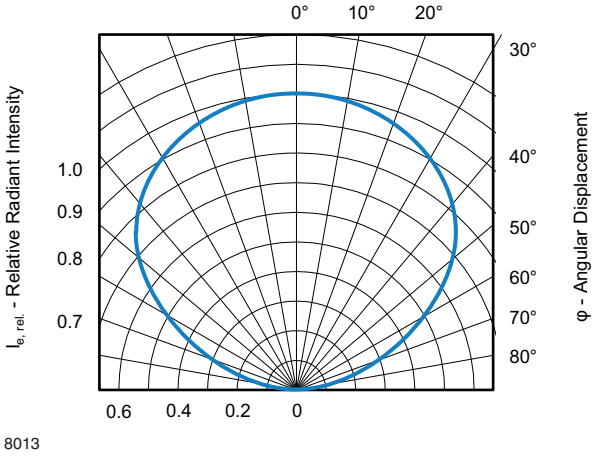


Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

REFLOW SOLDER PROFILE

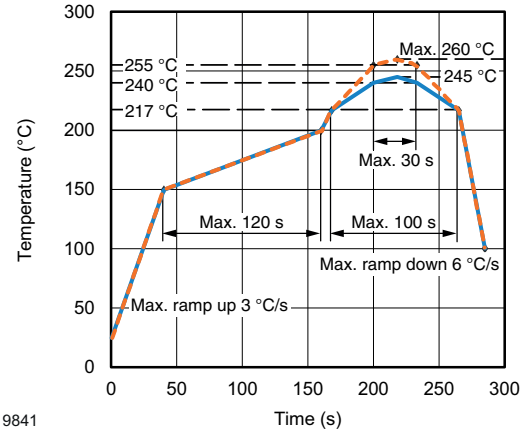


Fig. 7 - Lead (Pb)-free Reflow Solder Profile According to J-STD-020

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

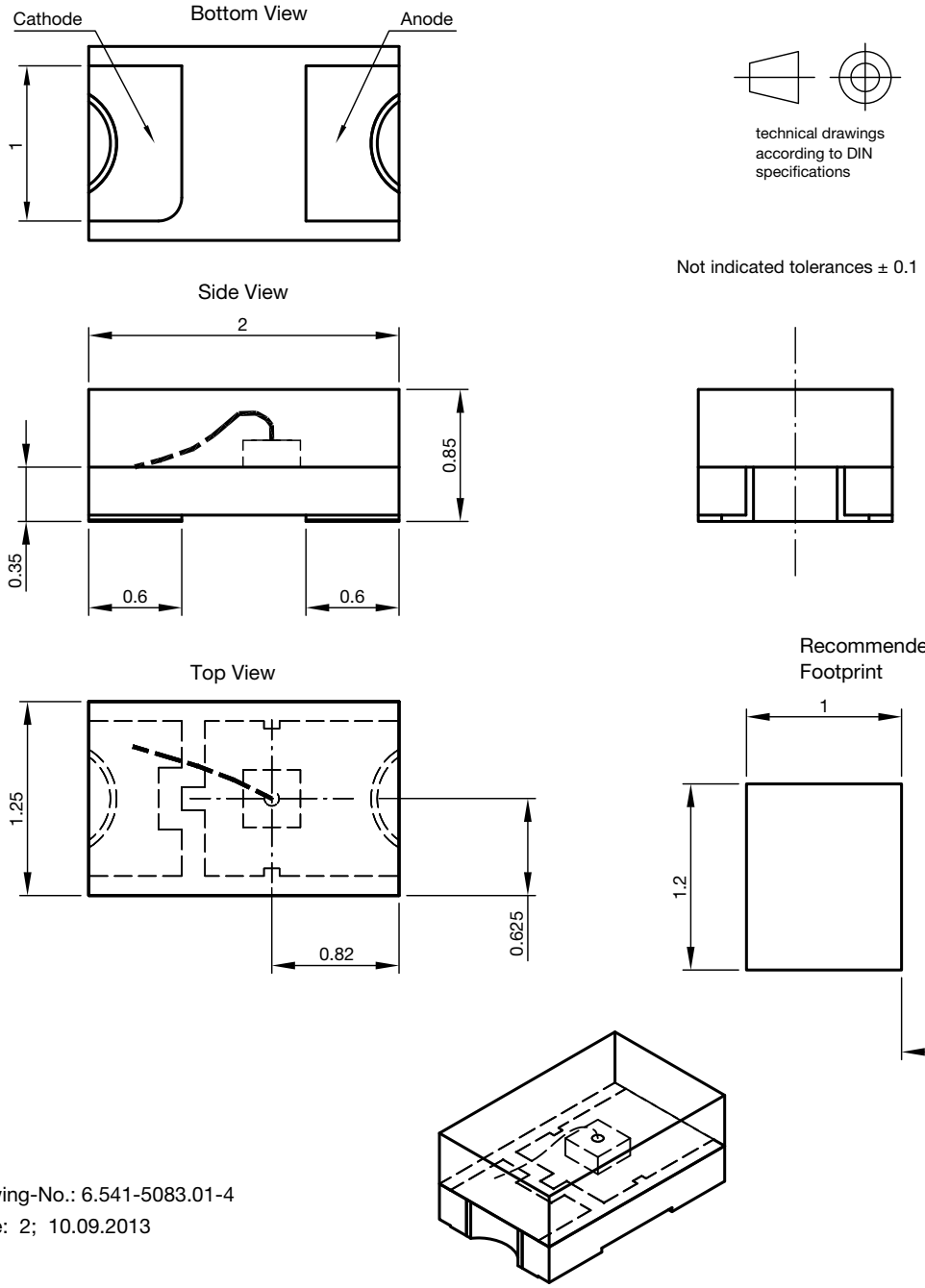
Conditions: T_{amb} < 30 °C, RH < 60 %

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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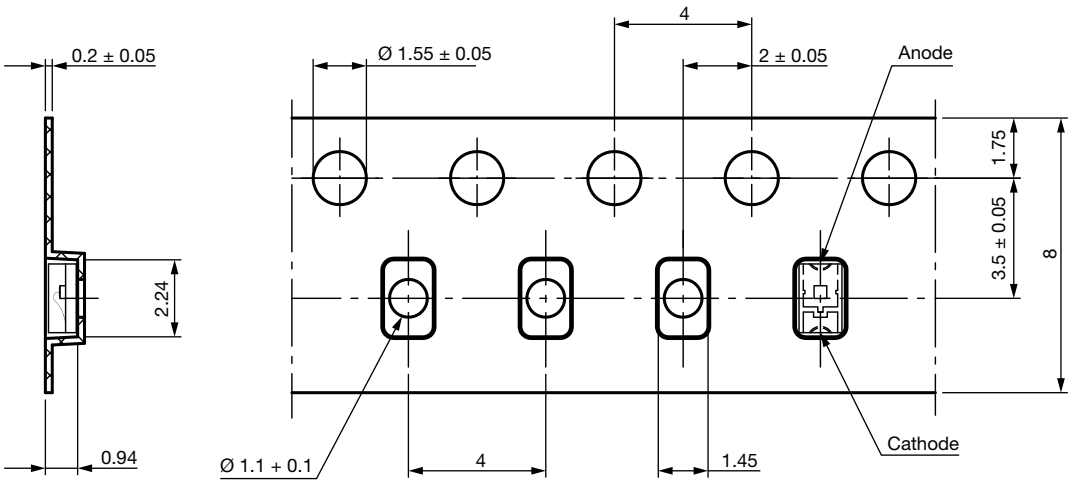
PACKAGE DIMENSIONS in millimeters



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

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BLISTER TAPE DIMENSIONS in millimeters

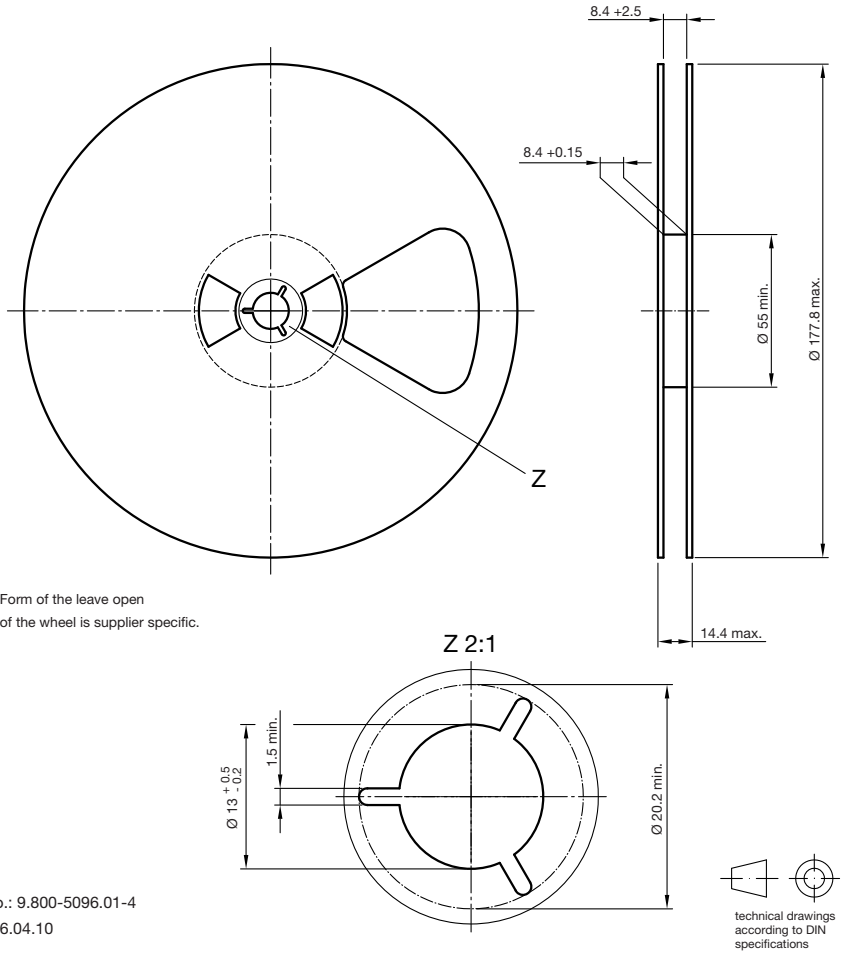


Technical drawings according to DIN specifications

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

Not indicated tolerances ± 0.1

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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