

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



FEATURES

- Package type: surface-mount
- Package form: MiniLED
- Dimensions (L x W x H in mm): 2.3 x 1.3 x 1.4
- Peak wavelength: $\lambda_p = 940$ nm
- Angle of half intensity: $\phi = \pm 60^\circ$
- Floor life: 672 h, MSL 2a, according to J-STD-020
- Lead (Pb)-free reflow soldering
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



DESCRIPTION

As part of the [SurfLight™](#) portfolio, the VSMY23941 is an infrared, 940 nm emitting diode based on GaAlAs surface emitter chip technology with high radiant intensity, in a small white surface-mount (SMD) package.

APPLICATIONS

- Miniature light barrier
- Optical switch
- IR point source

PRODUCT SUMMARY

COMPONENT	I_e (mW/sr) at $I_F = 100$ mA	ϕ (°)	λ_p (nm)	t_r (ns)
VSMY23941	15.5	± 60	940	5

Note

- Test conditions see table “Basic Characteristics“

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VSMY23941	Tape and reel	MOQ: 3000 pcs, 3000 pcs/reel	MiniLED

Note

- MOQ: minimum order quantity



ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Forward current		I_F	100	mA
Peak forward current	$t_p/T = 0.1, t_p = 100\text{ }\mu\text{s}$	I_{FM}	200	mA
Surge forward current	$t_p = 100\text{ }\mu\text{s}$	I_{FSM}	500	mA
Power dissipation		P_V	200	mW
Junction temperature		T_j	110	$^{\circ}\text{C}$
Operating temperature range		T_{amb}	-40 to +100	$^{\circ}\text{C}$
Storage temperature range		T_{stg}	-40 to +100	$^{\circ}\text{C}$
Soldering temperature	According to Fig. 7, J-STD-020	T_{sd}	260	$^{\circ}\text{C}$
Thermal resistance junction to ambient	EIA / JESD51	R_{thJA}	350	K/W

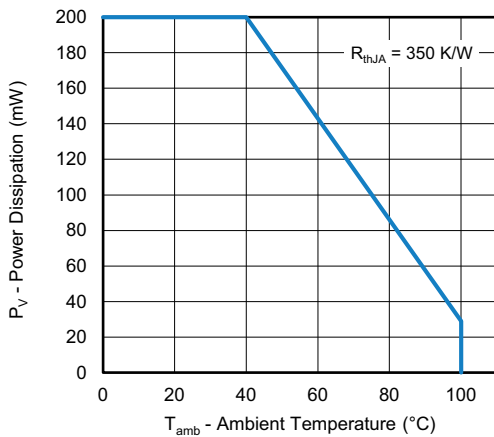


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

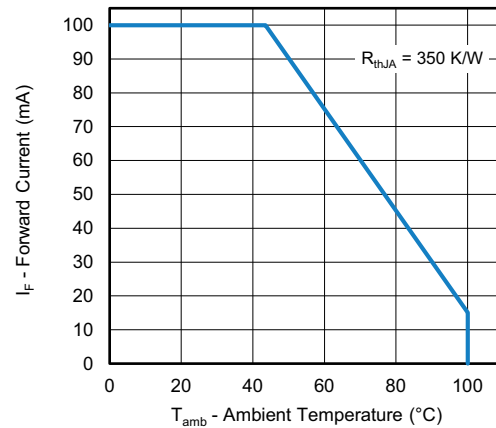


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 70\text{ mA}, t_p = 20\text{ ms}$	V_F	-	1.6	-	V
	$I_F = 100\text{ mA}, t_p = 20\text{ ms}$		-	1.7	2.0	
Temperature coefficient of V_F	$I_F = 100\text{ mA}, t_p = 20\text{ ms}$	TK_{V_F}	-	-0.7	-	mV/K
Reverse current		I_R	Not designed for reverse operation			μA
Junction capacitance	$V_R = 0\text{ V}, f = 1\text{ MHz}, E = 0\text{ mW/cm}^2$	C_J	-	30	-	pF
Radiant intensity	$I_F = 70\text{ mA}, t_p = 20\text{ ms}$	I_e	-	11	-	mW/sr
	$I_F = 100\text{ mA}, t_p = 20\text{ ms}$		11	15.5	20	
Temperature coefficient of radiant power	$I_F = 100\text{ mA}, t_p = 20\text{ ms}$	TK_{ϕ_e}	-	-0.27	-	%/K
Angle of half intensity		ϕ	-	± 60	-	$^{\circ}$
Peak wavelength	$I_F = 100\text{ mA}, t_p = 20\text{ ms}$	λ_p	925	940	955	nm
Spectral bandwidth	$I_F = 100\text{ mA}, t_p = 20\text{ ms}$	$\Delta\lambda$	-	55	-	nm
Temperature coefficient of λ_p	$I_F = 100\text{ mA}, t_p = 20\text{ ms}$	TK_{λ_p}	-	0.28	-	nm/K
Rise time	$I_F = 100\text{ mA}, 10\% \text{ to } 90\%$	t_r	-	5	-	ns
Fall time	$I_F = 100\text{ mA}, 10\% \text{ to } 90\%$	t_f	-	5	-	ns

BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

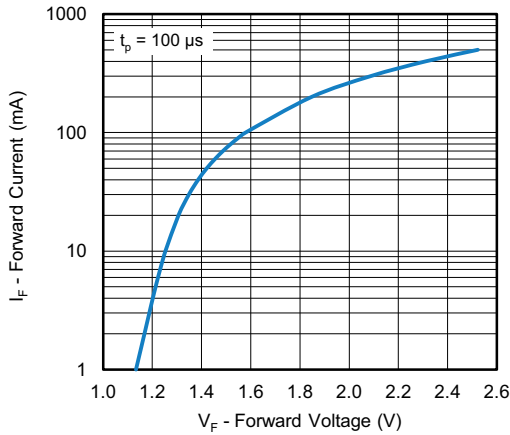


Fig. 3 - Forward Current vs. Forward Voltage

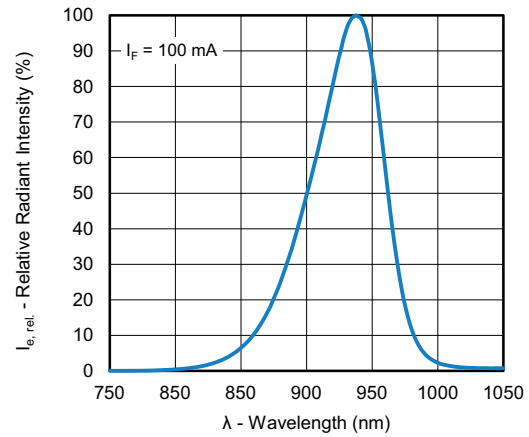


Fig. 5 - Relative Radiant Power vs. Wavelength

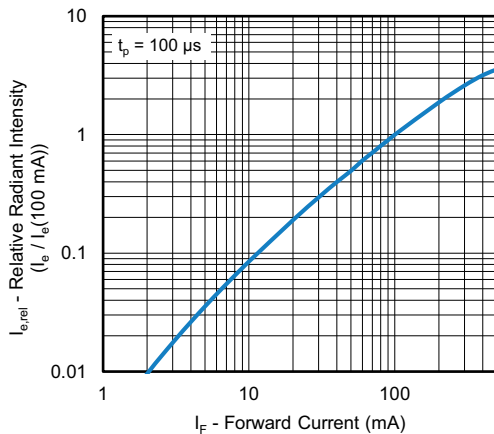


Fig. 4 - Relative Radiant Intensity vs. Forward Current



Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

REFLOW SOLDER PROFILE



19841

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 2a

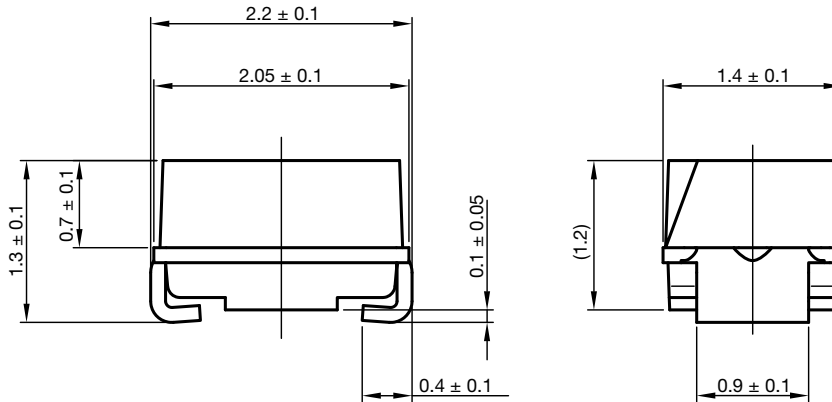
Floor life: 672 h

Conditions: $T_{amb} < 30\text{ }^{\circ}\text{C}$, RH < 60 %

DRYING

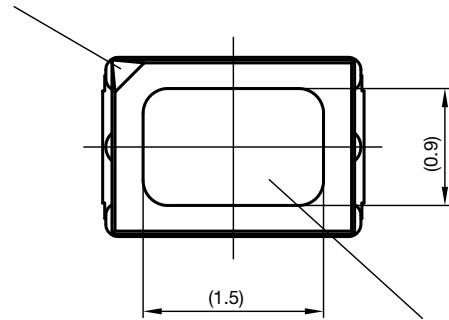
In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-033D or label. Devices taped on reel dry using recommended conditions 192 h at 40 °C (+ 5 °C), RH < 5 %.

PACKAGE DIMENSIONS in millimeters

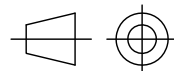
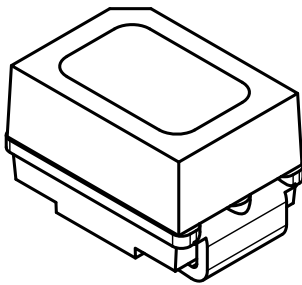


Not indicated tolerances ± 0.2

Anode mark



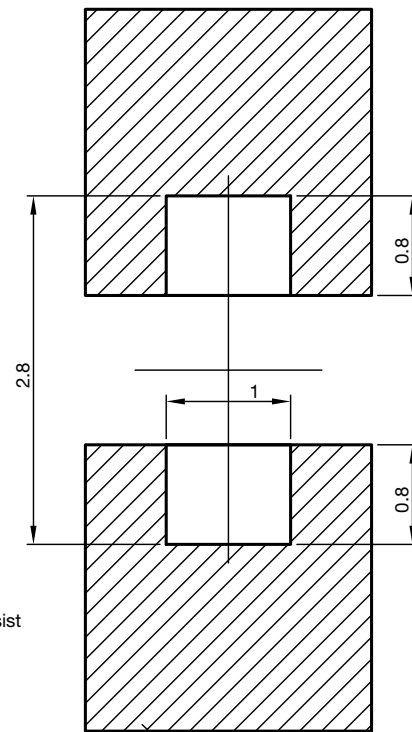
Area not flat



technical drawings according to DIN specifications



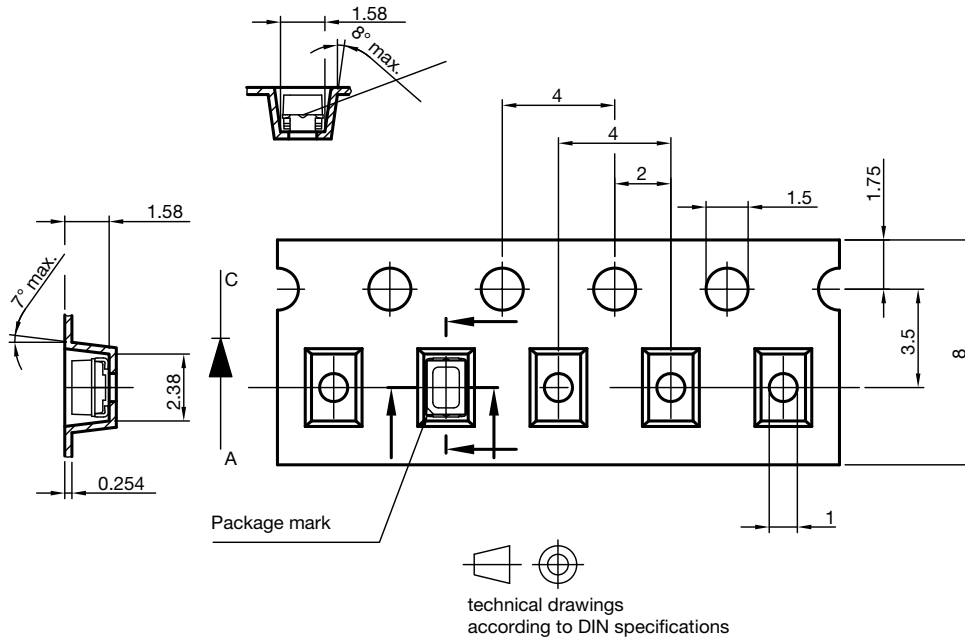
Proposed pad layout (for reference only)



Cu-area > 5 mm²

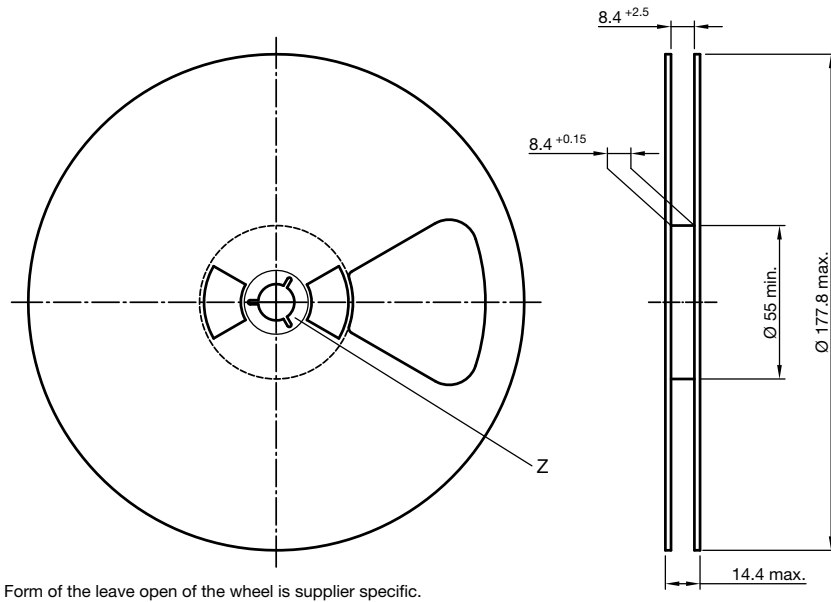
Drawing refers to following types:
 Drawing-No.: 6.541-5090.01-4
 Issue: 4; 20.07.17

BLISTER TAPE DIMENSIONS in millimeters

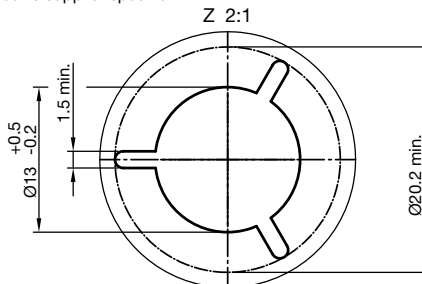


Drawing refers to following types: Mini - SMD - LED with reverse polarity: VLM. 233..., VLM. 235...
 Drawing-No.: 9.700-5381.01-4
 Issue: 2; 20.07.17

REEL DIMENSIONS in millimeters



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



Technical drawings according to DIN specification.

Drawing-No.: 9.800-5096.01-4
 Issue: 5; 20.12.2016



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