



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



FEATURES

- Package type: surface-mount
- Package form: 0805
- Dimensions (L x W x H in mm): 2 x 1.25 x 0.8
- Peak wavelength: $\lambda_p = 940$ nm
- High speed
- Angle of half intensity: $\varphi = \pm 60^\circ$
- 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



RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

LINKS TO ADDITIONAL RESOURCES



DESCRIPTION

As part of the [SurfLight™](#) portfolio, the VSMY5940 is an infrared, 940 nm emitting diode based on GaAlAs surface emitter chip technology with high radiant intensity, high optical power and high speed, in a low profile 0805 surface-mount (SMD) package.

APPLICATIONS

- Miniature light barrier
- Optical switch
- IR point source
- [Wearables](#)

PRODUCT SUMMARY

COMPONENT	I_e (mW/sr) at $I_F = 100$ mA	φ (°)	λ_p (nm)	t_r (ns)
VSMY5940	14.5	± 60	940	5

Note

- Test conditions see table “Basic Characteristics”

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VSMY5940	Tape and reel	MOQ: 3000 pcs, 3000 pcs/reel	0805

Note

- MOQ: minimum order quantity

**ABSOLUTE MAXIMUM RATINGS** ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V_R	5	V
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	125	$^{\circ}\text{C}$
Operating temperature range		T_{amb}	-40 to +110	$^{\circ}\text{C}$
Storage temperature range		T_{stg}	-40 to +110	$^{\circ}\text{C}$
Soldering temperature	According to Fig. 7, J-STD-020	T_{sd}	260	$^{\circ}\text{C}$
Thermal resistance junction to ambient	EIA / JESD51	R_{thJA}	240	K/W
ESD sensitivity	According to ANSI / ESDA / JEDEC JS-001	V_{ESD}	2	kV

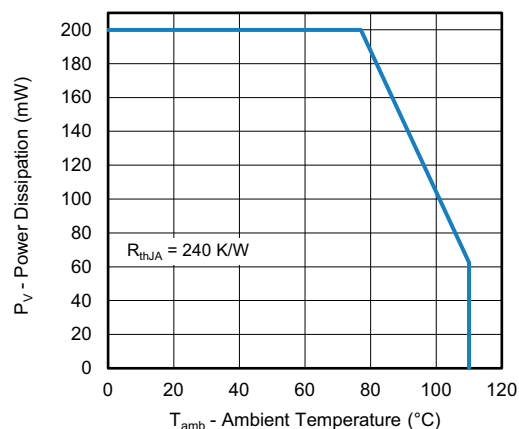


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

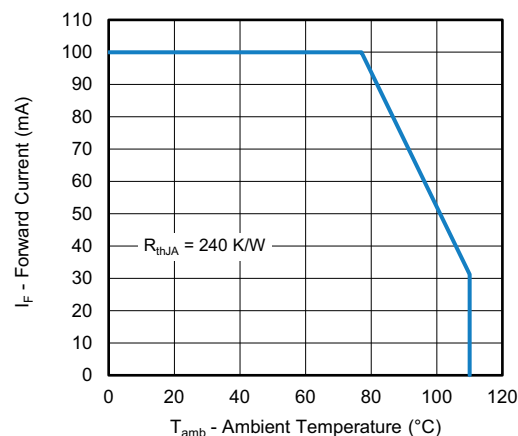


Fig. 2 - Forward Current Limit vs. Ambient Temperature

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

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$	V_F	1.4	1.7	2.0	V
Temperature coefficient of V_F	$I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$	TK_{VF}	-	-1.2	-	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	$I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$	I_e	10	14.5	19	mW/sr
Temperature coefficient of radiant power	$I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$	TK_{Φ_e}	-	-0.3	-	%/K
Angle of half intensity		ϕ	-	± 60	-	$^{\circ}$
Peak wavelength	$I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$	λ_p	-	940	-	nm
Spectral bandwidth	$I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$	$\Delta\lambda$	-	65	-	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 % to 90 %	t_r	-	5	-	ns
Fall time	$I_F = 100\text{ mA}$, 10 % to 90 %	t_f	-	5	-	ns



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

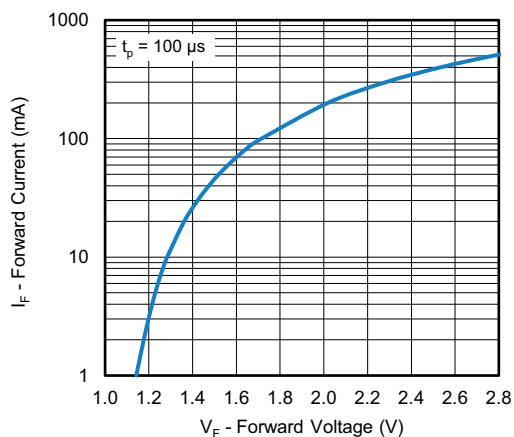


Fig. 3 - Forward Current vs. Forward Voltage

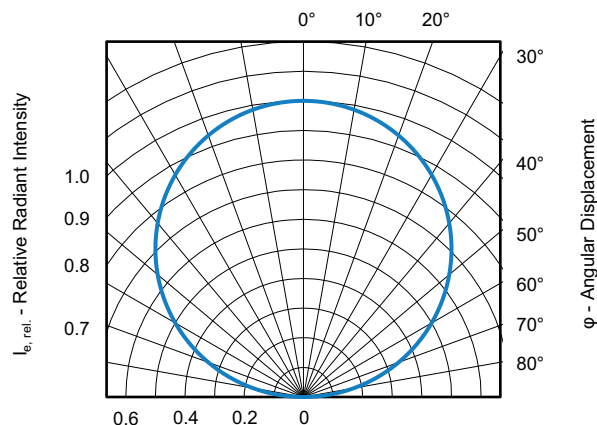


Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

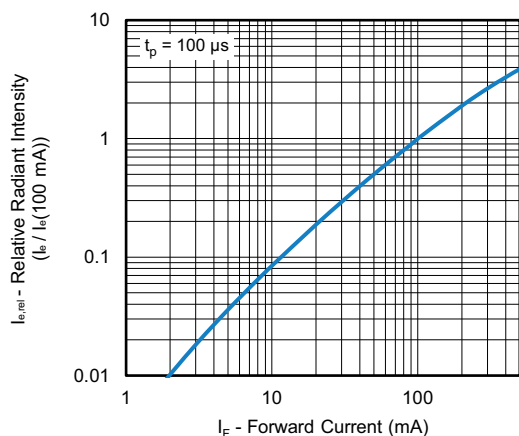


Fig. 4 - Relative Radiant Intensity vs. Forward Current

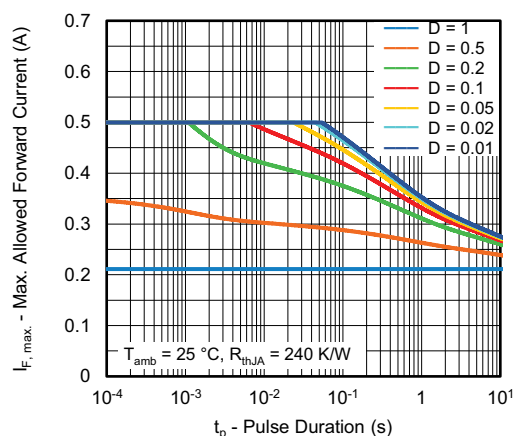


Fig. 7 - Max. Allowed Forward Current vs. Pulse Duration

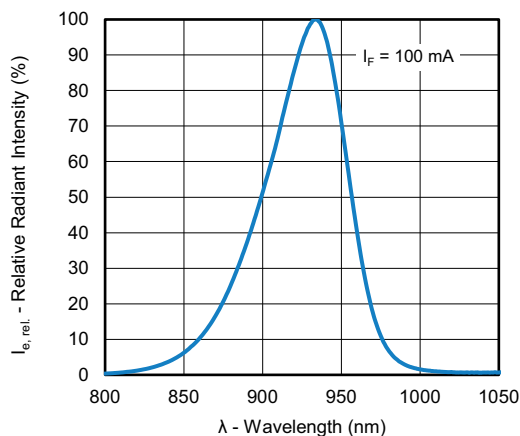


Fig. 5 - Relative Radiant Intensity vs. Wavelength

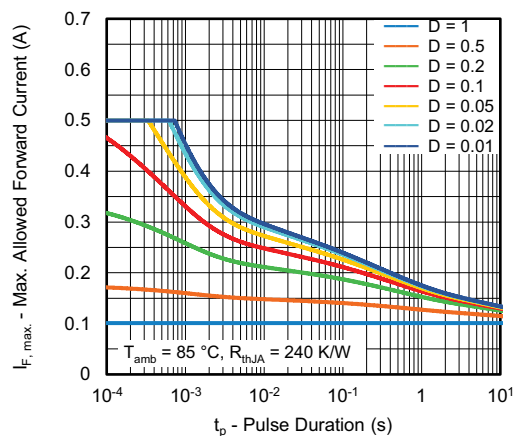


Fig. 8 - Max. Allowed Forward Current vs. Pulse Duration

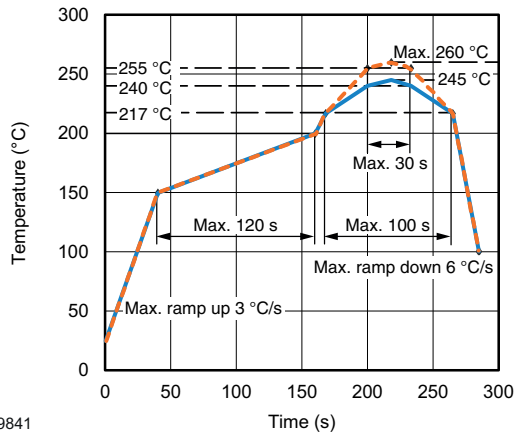
**REFLOW SOLDER PROFILE**

Fig. 9 - 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

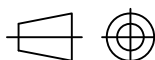
Conditions: $T_{amb} < 30\text{ °C}$, $RH < 60\%$

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), $RH < 5\%$.

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Technical drawing of a rectangular plate with a central slot. The plate has a total width of 2 and a total height of 1.25. The central slot has a width of 0.7. The drawing includes dimension lines and a center line.



Technical drawing of a mechanical part with dimensions. The drawing shows a cross-section of a part with a central hole. The dimensions are as follows:

- Overall width: 0.8
- Overall height: 0.38
- Inner hole diameter: 0.2
- Inner hole depth: 0.1
- Outer hole diameter: 0.6
- Outer hole depth: 0.8

A cross-sectional view of the battery assembly. It shows two main layers: an upper layer and a lower layer. The upper layer is labeled 'Anode' with an arrow pointing to it. The lower layer is labeled 'Cathode' with an arrow pointing to it. The thickness of the upper layer is indicated as 0.9, and the thickness of the lower layer is indicated as 0.7. The layers are separated by a thin line, and there are internal structures within each layer.

Cathode —

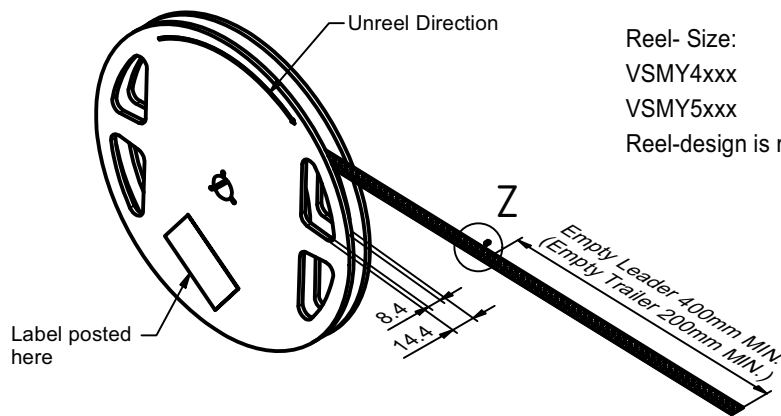
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Rev. 1.2, 07-Mar-2025



TAPE AND REEL DIMENSIONS in millimeters

Non tolerated dimensions ± 0.1 mm

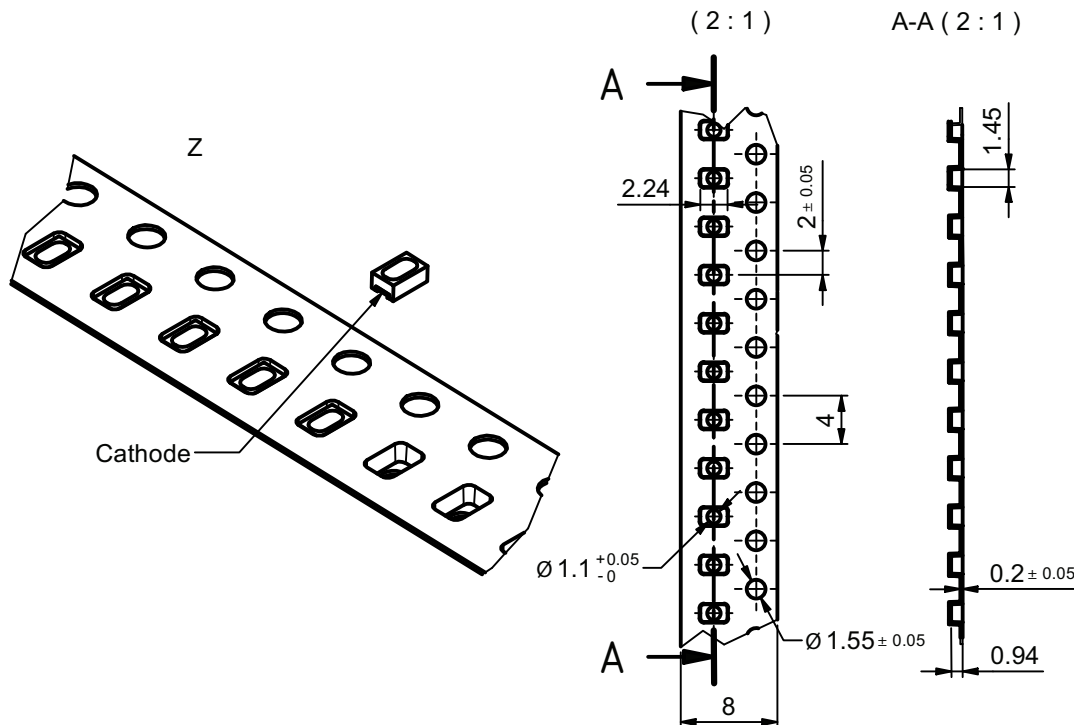


Reel- Size:

VSMY4xxx $\pm 178 \pm 2$ mm = 3000 pcs.

VSMY5xxx $\pm 178 \pm 2$ mm = 3000 pcs.

Reel-design is representative for different types.



Drawing-No.: PM-10035.100-000
Issue: 0_A; preliminary 10.12.2024



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