



## 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:  $\phi = \pm 60^\circ$
- 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](http://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	$\phi$ (°)	$\lambda_p$ (nm)	$t_r$ (ns)
VSMY5940	14.5	$\pm 60$	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

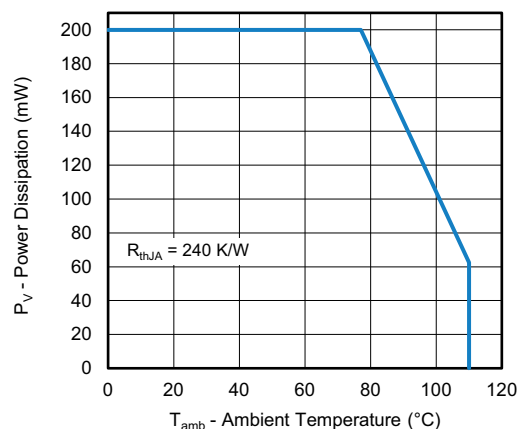


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

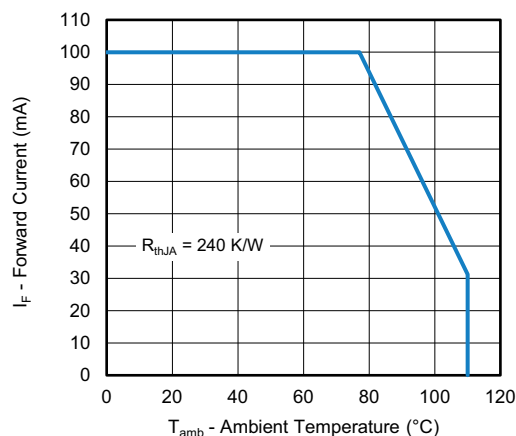


Fig. 2 - Forward Current Limit vs. Ambient Temperature

**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			$\mu\text{A}$
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	$I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$TK_{\Phi_e}$	-	-0.3	-	%/K
Angle of half intensity		$\phi$	-	$\pm 60$	-	$^{\circ}$
Peak wavelength	$I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$\lambda_p$	-	940	-	nm
Spectral bandwidth	$I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$\Delta\lambda$	-	65	-	nm
Temperature coefficient of $\lambda_p$	$I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$TK_{\lambda_p}$	-	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

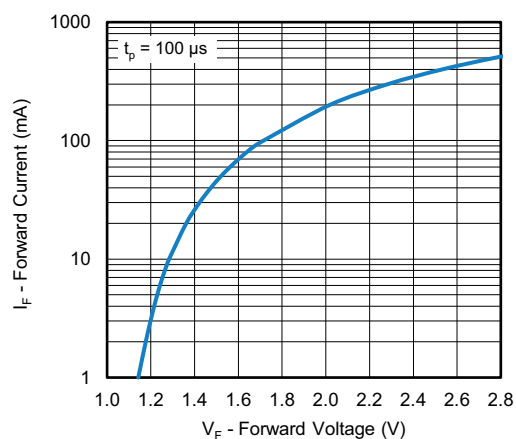
**BASIC CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

Fig. 3 - Forward Current vs. Forward Voltage

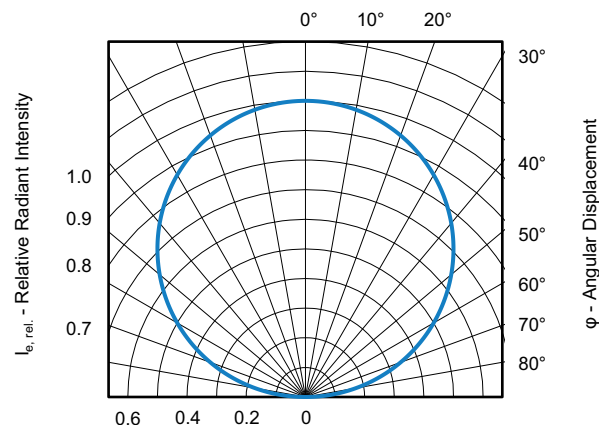


Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

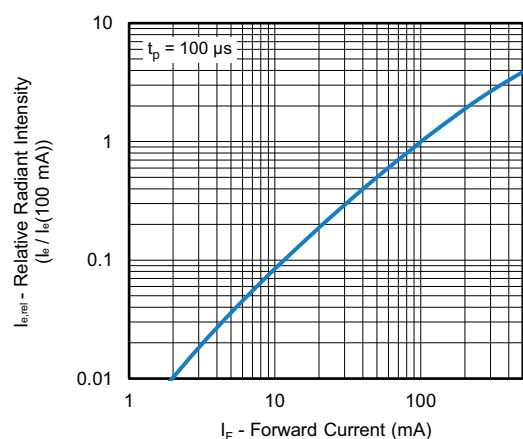


Fig. 4 - Relative Radiant Intensity vs. Forward Current

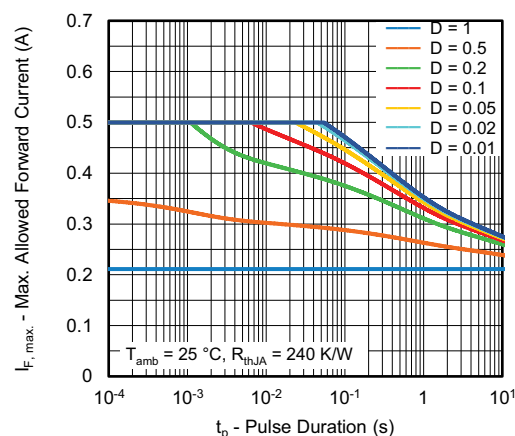


Fig. 7 - Max. Allowed Forward Current vs. Pulse Duration

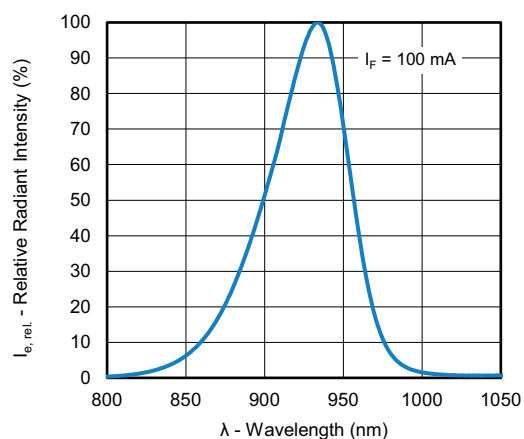


Fig. 5 - Relative Radiant Intensity vs. Wavelength

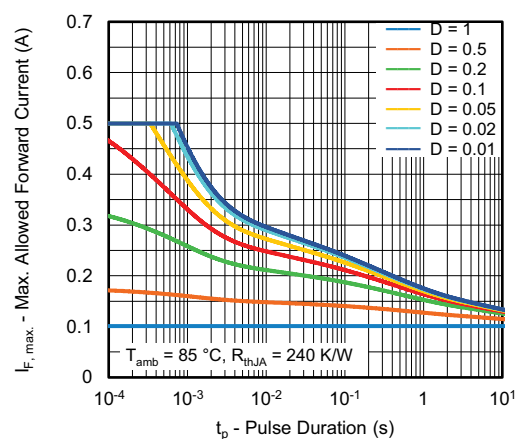


Fig. 8 - Max. Allowed Forward Current vs. Pulse Duration

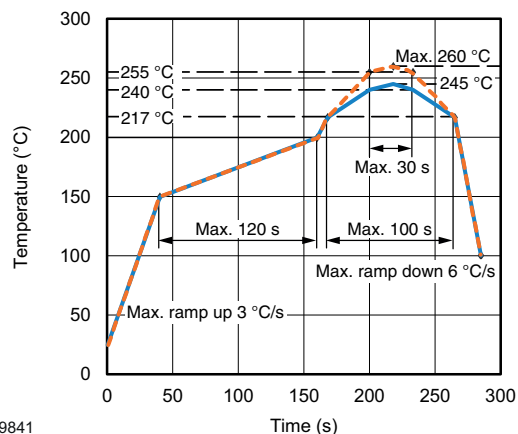
**REFLOW SOLDER PROFILE**

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

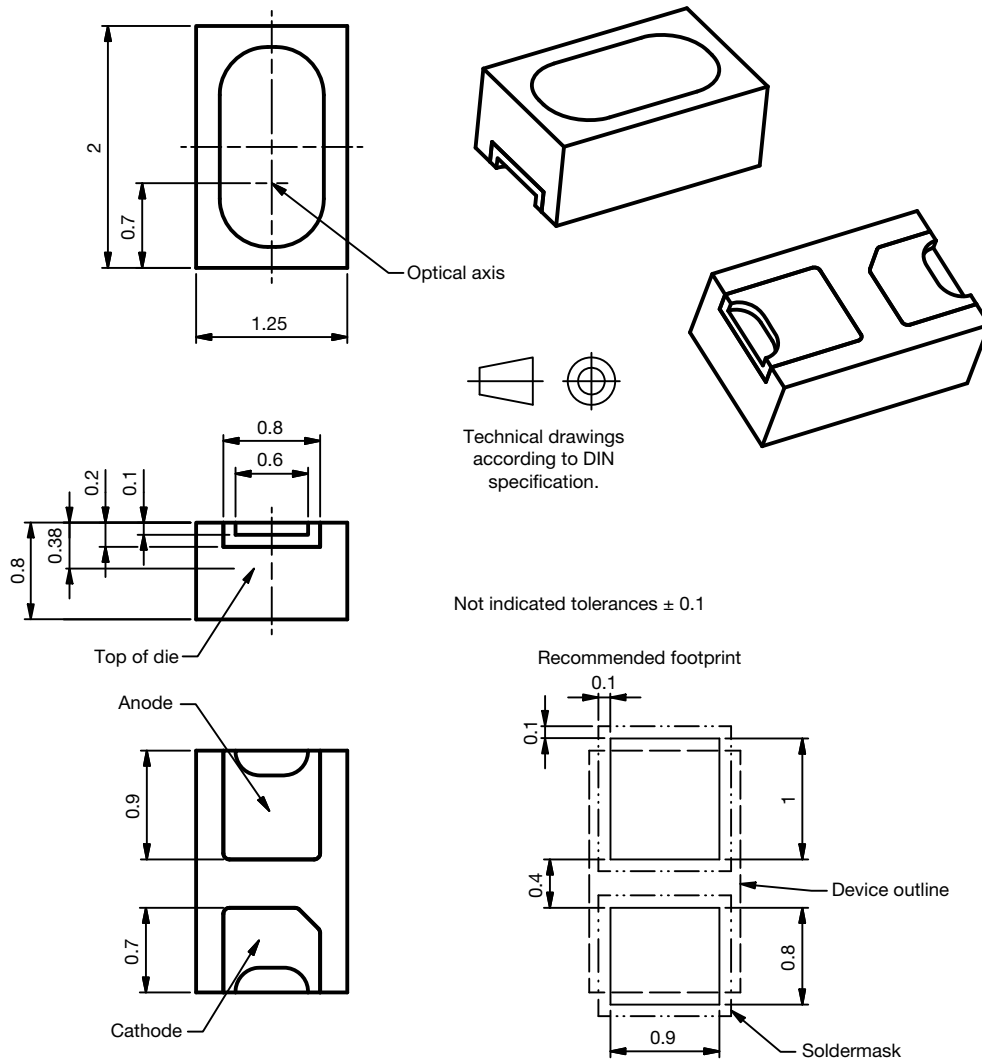
Conditions:  $T_{amb} < 30\text{ °C}$ ,  $RH < 60\%$

**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),  $RH < 5\%$ .



**PACKAGE DIMENSIONS** in millimeters

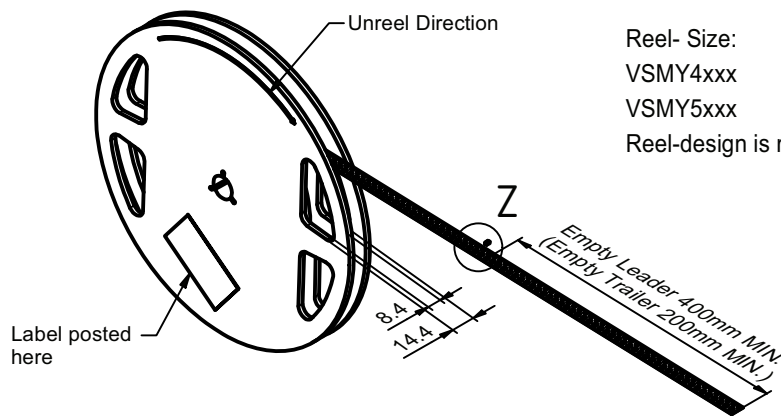


Drawing- No.: 6.550-5352.01-4  
Issue: 2\_A; prelim. 05.12.2024



TAPE AND REEL DIMENSIONS in millimeters

Non tolerated dimensions  $\pm 0.1$  mm

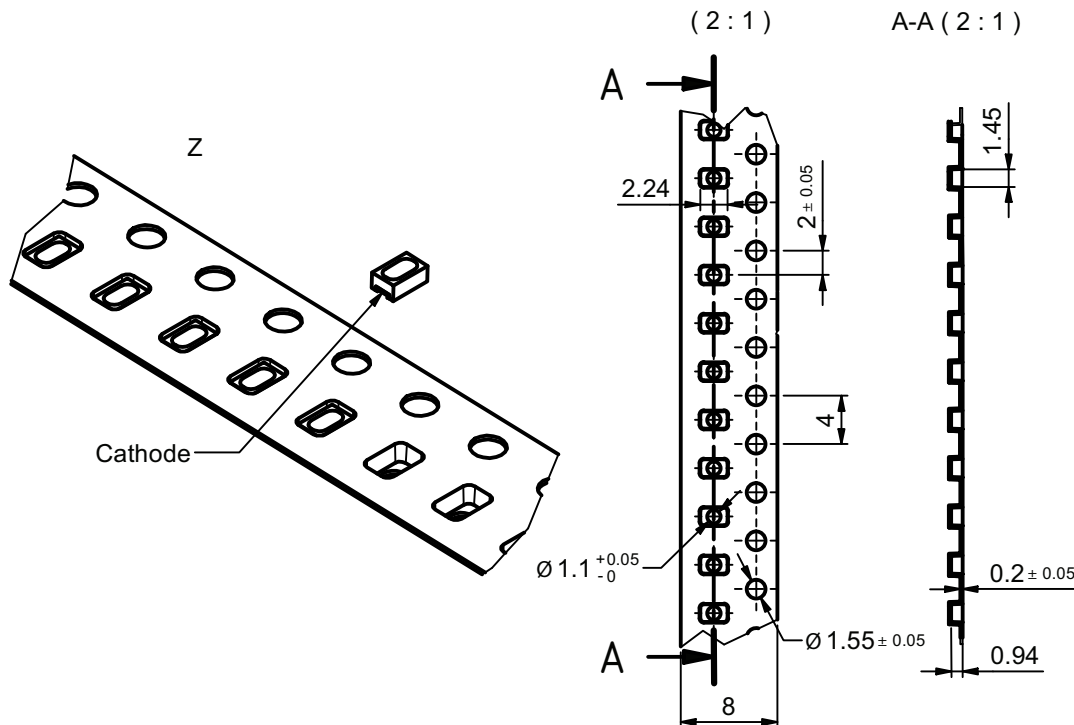


Reel- Size:

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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