# **VSMY5890**



**Vishay Semiconductors** 

# High Speed Infrared Emitting Diodes, 890 nm, Surface Emitter Technology



As part of the SurfLight<sup>™</sup> portfolio, the VSMY5890 is an

infrared, 890 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

### **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: λ<sub>p</sub> = 890 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

#### **APPLICATIONS**

- Miniature light barrier
- · Optical switch
- IR point source

PRODUCT SUMMARY				
COMPONENT	$\rm I_{e}$ (mW/sr) at $\rm I_{F}$ = 100 mA	φ <b>(°)</b>	λ <sub>p</sub> (nm)	t <sub>r</sub> (ns)
VSMY5890	13	± 60	890	7

#### Note

DESCRIPTION

mount (SMD) package.

Test conditions see table "Basic Characteristics"

ORDERING INFORMATION				
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM	
VSMY5890	Tape and reel	MOQ: 3000 pcs, 3000 pcs/reel	0805	

Note

MOQ: minimum order guantity



COMPLIANT HALOGEN FREE <u>GREEN</u>

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<b>ABSOLUTE MAXIMUM RATINGS</b> ( $T_{amb} = 25 \text{ °C}$ , unless otherwise specified)					
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT	
Reverse voltage		V <sub>R</sub>	5	V	
Forward current		١ <sub>F</sub>	100	mA	
Peak forward current	$t_p/T = 0.1, t_p = 100 \ \mu s$	I <sub>FM</sub>	200	mA	
Surge forward current	t <sub>p</sub> = 100 μs	I <sub>FSM</sub>	500	mA	
Power dissipation		Pv	210	mW	
Junction temperature		Tj	125	°C	
Operating temperature range		T <sub>amb</sub>	-40 to +110	°C	
Storage temperature range		T <sub>stg</sub>	-40 to +110	°C	
Soldering temperature	According to Fig. 7, J-STD-020	T <sub>sd</sub>	260	°C	
Thermal resistance junction-to-ambient	EIA / JESD51	R <sub>thJA</sub>	280	K/W	

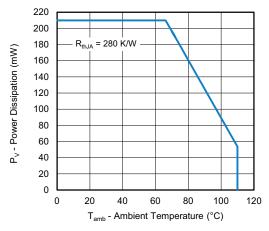


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

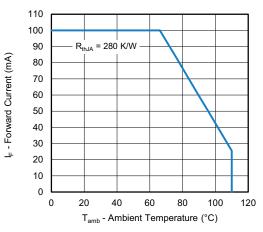


Fig. 2 - Forward Current Limit vs. Ambient Temperature

<b>BASIC CHARACTERISTICS</b> (T <sub>amb</sub> = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	I <sub>F</sub> = 100 mA, t <sub>p</sub> = 20 ms	V <sub>F</sub>	-	1.8	2.1	V
Temperature coefficient of V <sub>F</sub>	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	TK <sub>VF</sub>	-	-1.6	-	mV/K
Reverse current		I <sub>R</sub>	Not designed for reverse operation			μA
Junction capacitance	$V_R = 0 V, f = 1 MHz,$ E = 0 mW/cm <sup>2</sup>	CJ	-	30	-	pF
Radiant intensity	I <sub>F</sub> = 100 mA, t <sub>p</sub> = 20 ms	le	10	13	18	mW/sr
Temperature coefficient of radiant power	I <sub>F</sub> = 100 mA, t <sub>p</sub> = 20 ms	ΤKφ <sub>e</sub>	-	-0.2	-	%/K
Angle of half intensity		φ	-	± 60	-	0
Peak wavelength	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	λρ	-	890	-	nm
Spectral bandwidth	I <sub>F</sub> = 100 mA, t <sub>p</sub> = 20 ms	Δλ	-	40	-	nm
Temperature coefficient of $\lambda_p$	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	TK <sub>λp</sub>	-	0.25	-	nm/K
Rise time	I <sub>F</sub> = 100 mA, 10 % to 90 %	t <sub>r</sub>	-	8	-	ns
Fall time	I <sub>F</sub> = 100 mA, 10 % to 90 %	t <sub>f</sub>	-	8	-	ns

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For technical questions, contact: <u>emittertechsupport@vishay.com</u> THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT <u>www.vishay.com/doc?91000</u>



### **Vishay Semiconductors**

### BASIC CHARACTERISTICS (T<sub>amb</sub> = 25 °C, unless otherwise specified)

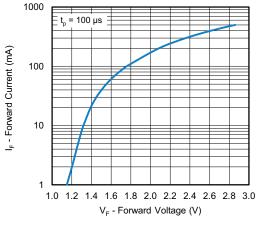


Fig. 3 - Forward Current vs. Forward Voltage

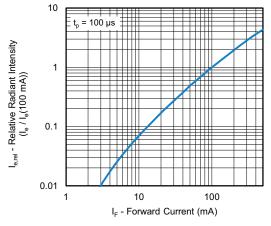


Fig. 4 - Relative Radiant Intensity vs. Forward Current

#### **REFLOW SOLDER PROFILE**

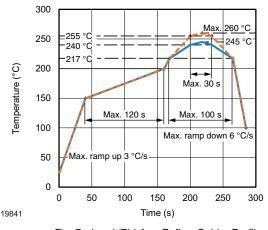


Fig. 7 - Lead (Pb)-free Reflow Solder Profile According to J-STD-020

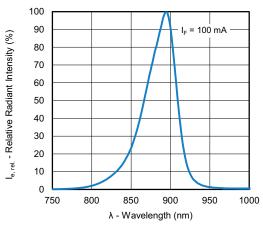


Fig. 5 - Relative Radiant Power vs. Wavelength

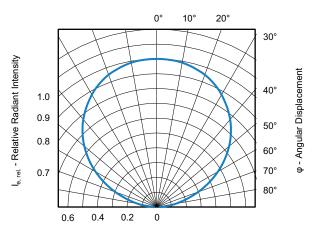


Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

#### 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 %.

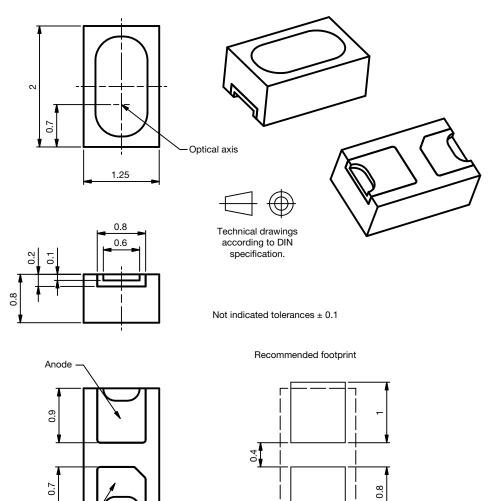
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#### **PACKAGE DIMENSIONS** in millimeters



0.9

Cathode

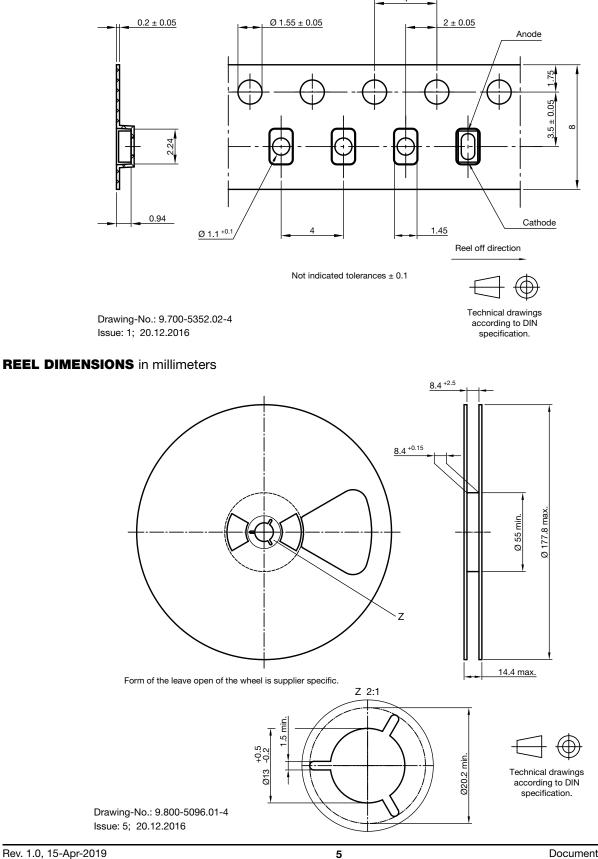
Drawing- No.: 6.550-5352.01-4

Issue: 1; 20.12.2016



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#### **BLISTER TAPE DIMENSIONS** in millimeters



Rev. 1.0, 15-Apr-2019

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Document Number: 80138

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Revision: 01-Jan-2024