VSMY5940X01



Vishay Semiconductors

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



As part of the <u>SurfLight</u>TM portfolio, the VSMY5940X01 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

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: $\lambda_p = 940 \text{ nm}$
- AEC-Q101 qualified
- 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

APPLICATIONS

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

PRODUCT SUMMARY COMPONENT I_e (mW/sr) at I_F = 100 mA λ_p (nm) t_r (ns) φ (°) 7 VSMY5940X01 13 ± 60 940

Note

DESCRIPTION

mount (SMD) package.

Test conditions see table "Basic Characteristics"

ORDERING INFORMATION							
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM				
VSMY5940X01	Tape and reel	MOQ: 3000 pcs, 3000 pcs/reel	0805				

Note

MOQ: minimum order quantity

ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishav.com/doc?91000





RoHS COMPLIANT

- HALOGEN
- FREE **GREEN**
- (5-2008)

www.vishay.com

SHAY

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ABSOLUTE MAXIMUM RATINGS (T _{amb} = 25 °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	$t_p/T = 0.1, t_p = 100 \ \mu s$	I _{FM}	200	mA				
Surge forward current	t _p = 100 μs	I _{FSM}	500	mA				
Power dissipation		Pv	190	mW				
Junction temperature		Тj	125	°C				
Operating temperature range		T _{amb}	-40 to +110	°C				
Storage temperature range		T _{stg}	-40 to +110	°C				
Soldering temperature	According to Fig. 7, J-STD-020	T _{sd}	260	°C				
Thermal resistance junction-to-ambient	EIA / JESD51	R _{thJA}	280	K/W				

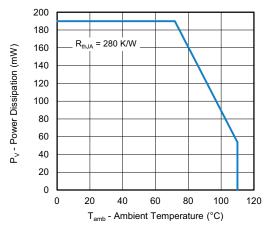


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

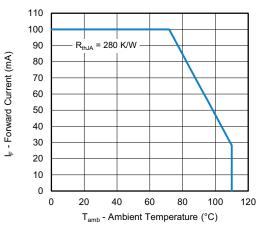


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified)								
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT		
Forward voltage	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	V _F	-	1.6	1.9	V		
Temperature coefficient of V _F	I _F = 100 mA, t _p = 20 ms	TK _{VF}	-	-0.7	-	mV/K		
Reverse current		I _R	Not designed for reverse operation			μA		
Junction capacitance	$V_R = 0 V$, f = 1 MHz, E = 0 mW/cm ²	CJ	-	30	-	pF		
Radiant intensity	I _F = 100 mA, t _p = 20 ms	l _e	9	13	18	mW/sr		
Temperature coefficient of radiant power	I _F = 100 mA, t _p = 20 ms	ΤKφ _e	-	-0.2	-	%/K		
Angle of half intensity		φ	-	± 60	-	0		
Peak wavelength	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	λρ	-	940	-	nm		
Spectral bandwidth	I _F = 100 mA, t _p = 20 ms	Δλ	-	55	-	nm		
Temperature coefficient of λ_p	$I_F = 100 \text{ mA}, t_p = 20 \text{ ms}$	TK _{λp}	-	0.28	-	nm/K		
Rise time	I _F = 100 mA, 10 % to 90 %	tr	-	5	-	ns		
Fall time	I _F = 100 mA, 10 % to 90 %	t _f	-	5	-	ns		

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BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

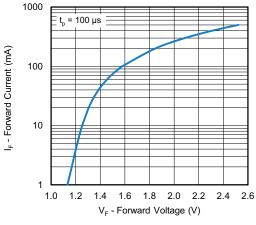


Fig. 3 - Forward Current vs. Forward Voltage

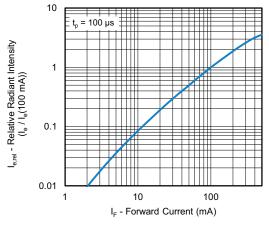


Fig. 4 - Relative Radiant Intensity vs. Forward Current

REFLOW SOLDER PROFILE

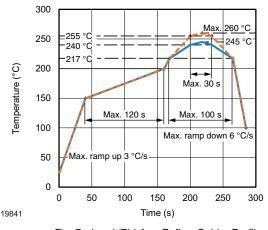


Fig. 7 - Lead (Pb)-free Reflow Solder Profile According to J-STD-020

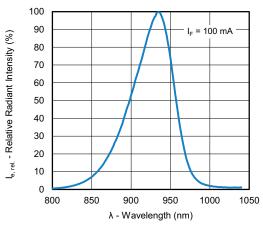


Fig. 5 - Relative Radiant Power vs. Wavelength

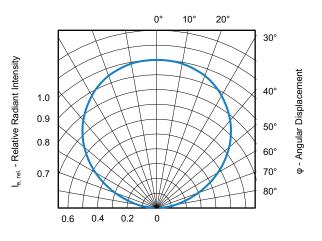


Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

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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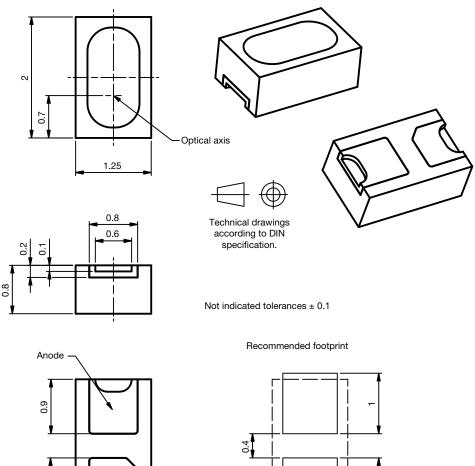
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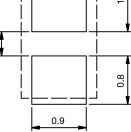
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PACKAGE DIMENSIONS in millimeters



Cathode

0.7



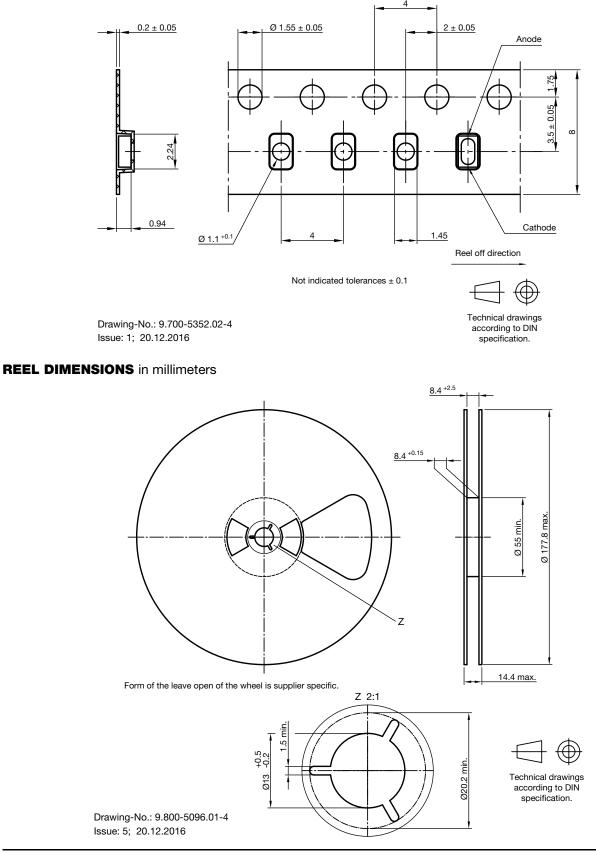
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BLISTER TAPE DIMENSIONS in millimeters



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