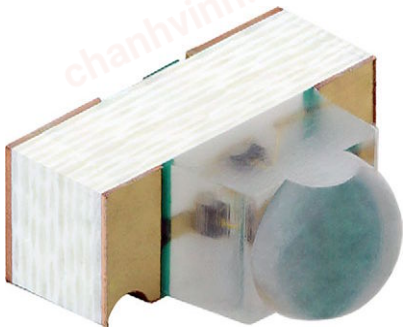
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High Speed Infrared Emitting Diodes, 940 nm, Surface Emitter Technology



FEATURES

- Package type: surface-mount
- Package form: side view
- Dimensions (L x W x H in mm): 3.0 x 2.51 x 1.2
- Peak wavelength: λ_p = 940 nm
- High reliability
- High radiant power
- Very high radiant intensity
- Angle of half intensity: φ = ± 9°
- Suitable for high pulse current operation
- Floor life: 168 h, MSL 3, according to J-STD-020
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free
e3
RoHS COMPLIANT
HALOGEN FREE
GREEN (5-2008)

DESCRIPTION

As part of the SurfLight™ portfolio, the VSMY14940 is an infrared, 940 nm, side looking emitting diode based on GaAlAs surface emitter chip technology with extreme high radiant intensities, high optical power and high speed, molded in clear, untinted PCB based package (with lens) for surface mounting (SMD).

APPLICATIONS

- Emitter for remote control (38 kHz)
- Learning remote control
- Photointerrupters
- Optical switch

PRODUCT SUMMARY

COMPONENT	I_e (mW/sr)	φ (deg)	λ_p (nm)	t_r (ns)
VSMY14940	90	± 9	940	5

Note

- Test condition see table “Basic Characteristics”

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VSMY14940	Tape and reel	MOQ: 1500 pcs, 1500 pcs/reel	Side view

Note

- MOQ: minimum order quantity

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	70	mA
Surge forward current	t_p = 100 µs	I_{FSM}	0.7	A
Power dissipation		P_V	119	mW
Junction temperature		T_j	100	°C
Operating temperature range		T_{amb}	-40 to +85	°C
Storage temperature range		T_{stg}	-55 to +100	°C
Soldering temperature	According to Fig. 10, J-STD-020	T_{sd}	260	°C
Thermal resistance junction-to-ambient	J-STD-051, soldered on PCB	R_{thJA}	390	K/W

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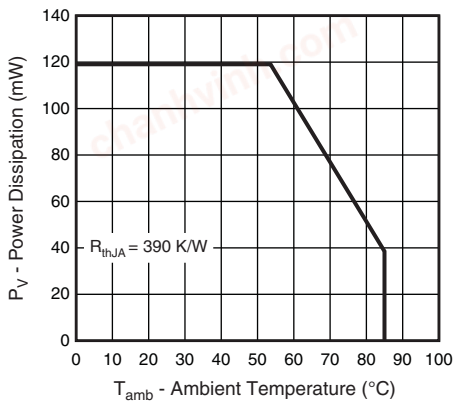


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

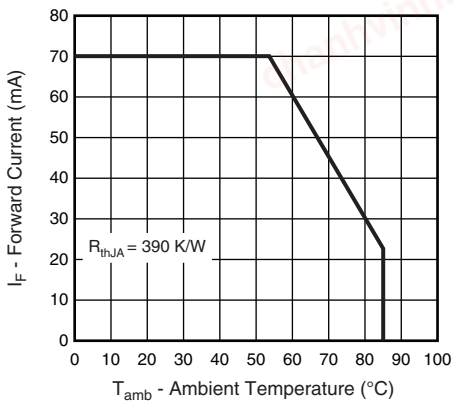


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Forward voltage	I_F = 20 mA, t_p = 20 ms	V_F	1.1	1.3	1.5	V
	I_F = 70 mA, t_p = 20 ms	V_F	-	1.5	-	V
	I_F = 0.7 A, t_p = 100 µs	V_F	-	3.0	-	V
Temperature coefficient of V_F	I_F = 20 mA	TK_{VF}	-	-0.9	-	mV/K
Reverse current		I_R	Not designed for reverse operation			nA
Junction capacitance	V_R = 0 V, f = 1 MHz, E = 0 mW/cm²	C_J	-	30	-	pF
Radiant intensity	I_F = 20 mA, t_p = 20 ms	I_e	15	25	-	mW/sr
	I_F = 70 mA, t_p = 20 ms	I_e	-	90	-	mW/sr
	I_F = 0.7 A, t_p = 100 µs	I_e	-	560	-	mW/sr
Reverse light current	E_e = 1 mW/cm², λ = 950 nm, V_R = 5 V	I_{ra}	-	0.5	-	µA
Radiant power	I_F = 70 mA, t_p = 20 ms	ϕ_e	-	40	-	mW
Temperature coefficient of radiant power	I_F = 70 mA	$TK\phi_e$	-	-0.21	-	%/K
Angle of half intensity		φ	-	± 9	-	deg
Peak wavelength	I_F = 70 mA	λ_p	920	940	960	nm
Spectral bandwidth	I_F = 70 mA	Δλ	-	55	-	nm
Temperature coefficient of λ_p	I_F = 70 mA	$TK\lambda_p$	-	0.28	-	nm/K
Rise time	I_F = 70 mA, 10 % to 90 %	t_r	-	5	-	ns
Fall time	I_F = 70 mA, 10 % to 90 %	t_f	-	6	-	ns

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

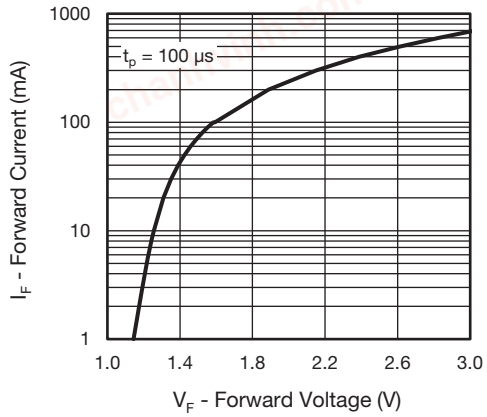


Fig. 3 - Forward Current vs. Forward Voltage

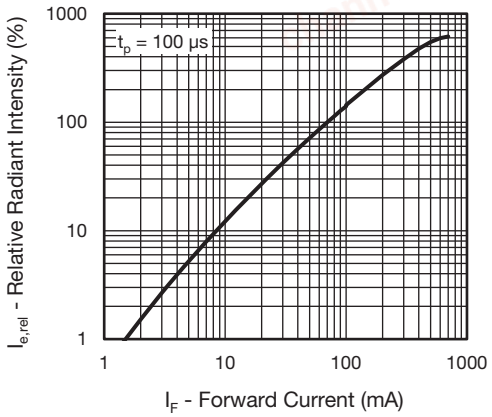


Fig. 6 - Relative Radiant Intensity vs. Forward Current

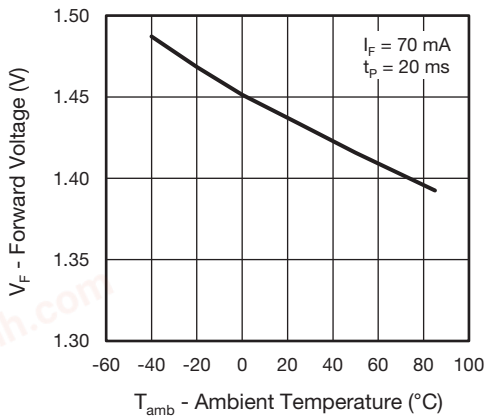


Fig. 4 - Forward Voltage vs. Ambient Temperature

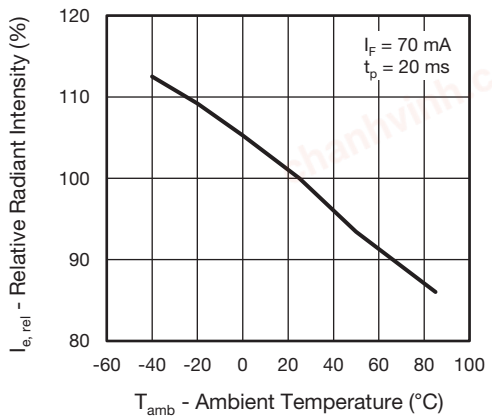


Fig. 7 - Relative Radiant Intensity vs. Ambient Temperature

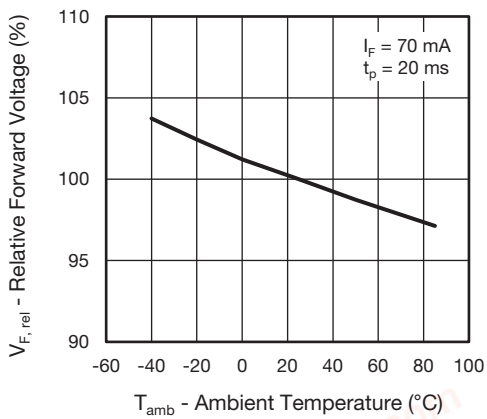


Fig. 5 - Relative Forward Voltage vs. Ambient Temperature

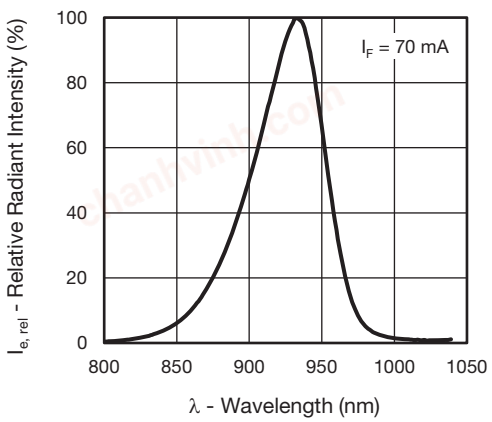


Fig. 8 - Relative Radiant Intensity vs. Wavelength

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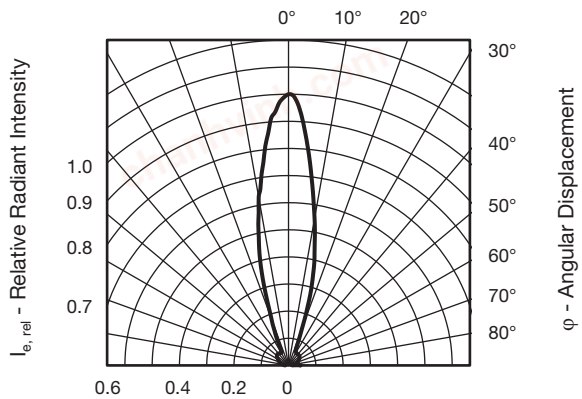


Fig. 9 - Relative Radiant Intensity vs. Angular Displacement

SOLDER PROFILE

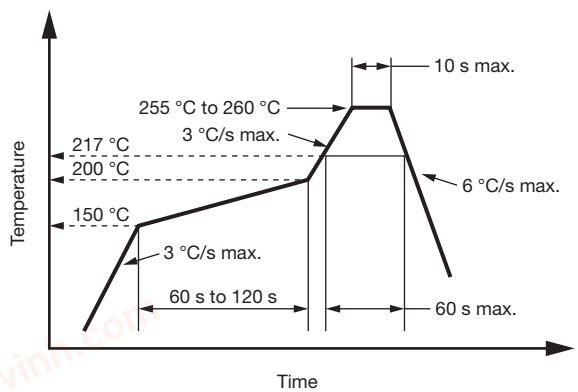


Fig. 10 - Lead (Pb)-free Reflow Solder Profile
According to J-STD-020

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

Floor life (time between soldering and removing from MBB) must not exceed the time indicated on MBB label:

Floor life: 168 h

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

Moisture sensitivity level 3, according to J-STD-020.

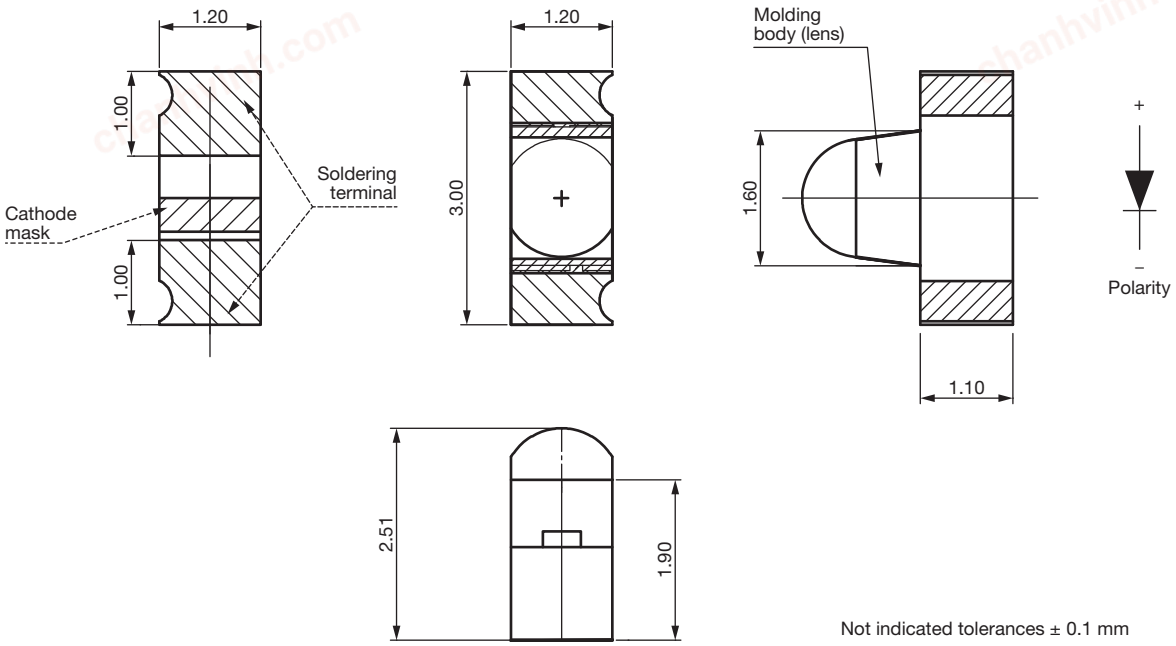
DRYING

In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-020 or label. Devices taped on reel dry using recommended conditions 192 h at 40 °C (+ 5 °C), RH < 5 %.

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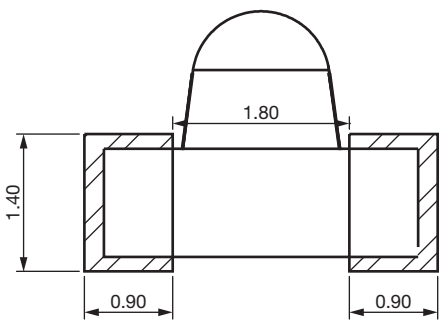
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PACKAGE DIMENSIONS in millimeters: **VSMY14940**



Not indicated tolerances ± 0.1 mm

Recommended Solder Pad

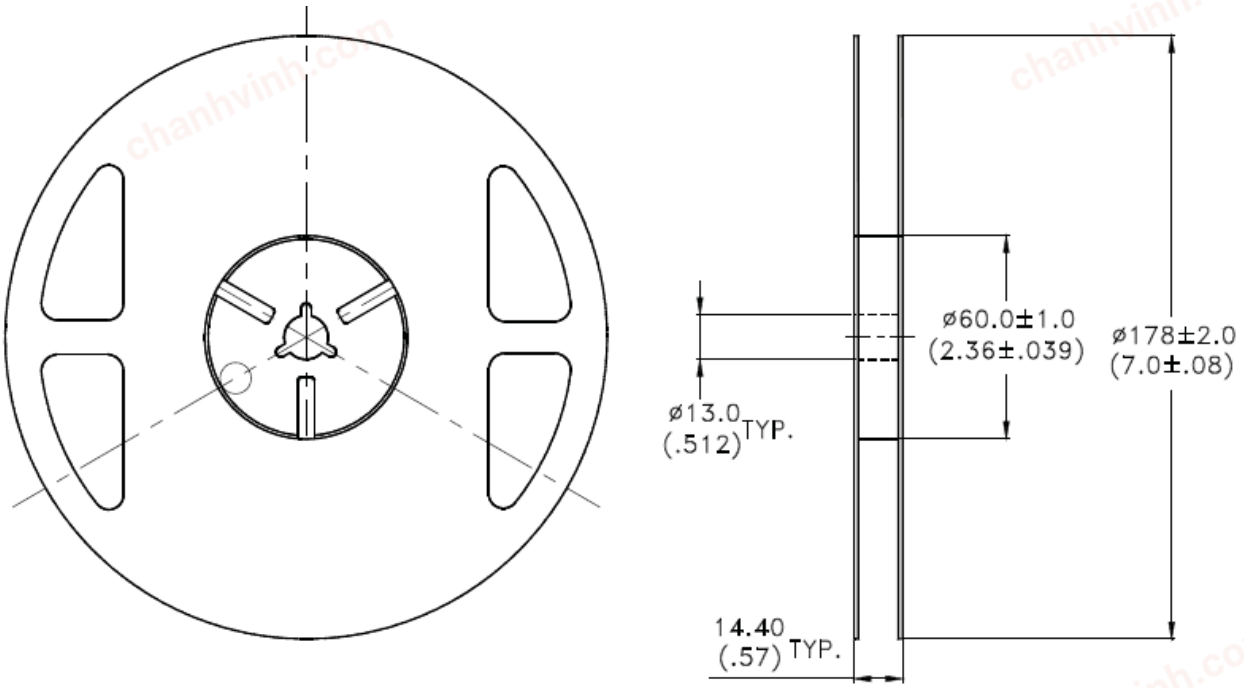


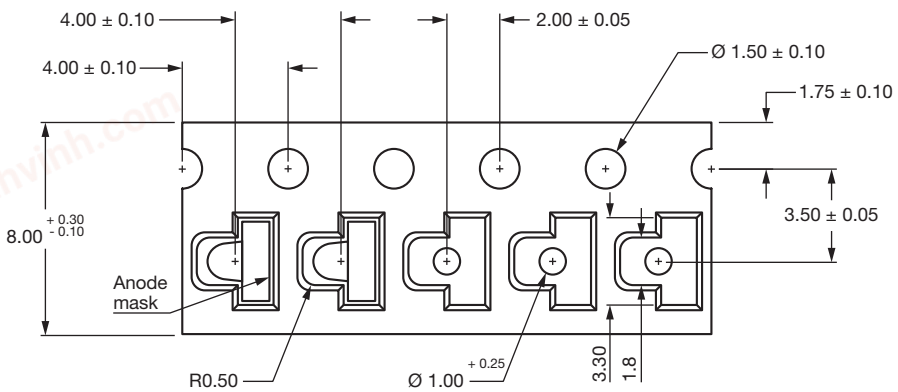
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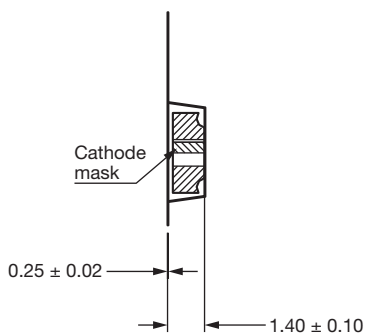
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TAPING AND REEL DIMENSIONS in millimeters: **VSMY14940**







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