VSMY98145DS



Vishay Semiconductors

High Power Infrared Emitting Diode, 810 nm, Surface Emitter Technology



DESCRIPTION

As part of the <u>SurfLight</u>^{IM} portfolio, the VSMY98145DS is an infrared, 810 nm emitting diode based on surface emitter technology with high radiant power and high speed, molded in low thermal resistance SMD package with lens. A 42 mil chip provides outstanding radiant intensity and allows DC operation of the device up to 1 A. Superior ESD characteristics are ensured by an integrated Zener diode.

FEATURES

- Package type: surface mount
- Double stack technology
- Package form: high power QFN with lens
- Dimensions (L x W x H in mm): 3.85 x 3.85 x 2.24
- Peak wavelength: $\lambda_p = 810 \text{ nm}$
- Zener diode for ESD protection up to 2 kV
- High radiant power
- · High radiant intensity
- Angle of half intensity: $\phi = \pm 45^{\circ}$
- Designed for high drive currents: up to 1 A (DC) and up to 5 A pulses
- Low thermal resistance: R_{thJA} = 10 K/W
- Floor life: 168 h, MSL 3, according to J-STD-020
- Lead (Pb)-free reflow soldering
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

APPLICATIONS

- Infrared illumination for CMOS cameras (CCTV)
- Iris scan
- Machine vision

PRODUCT SUMMARY					
COMPONENT	I _e (mW/sr)	φ (deg)	λ _p (nm)	t _r (ns)	
VSMY98145DS	500	± 45	810	30	

Note

Test conditions see table "Basic Characteristics"

ORDERING INFORMATI	ON		
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VSMY98145DS	Tape and reel	MOQ: 600 pcs, 600 pcs/reel	High power with lens

Note

• MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25 \text{ °C}$, unless otherwise specified)					
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT	
Reverse voltage		V _R	5	V	
Forward current		I _F	1	A	
Surge forward current	t _p = 10 μs	I _{FSM}	5	А	
Power dissipation		Pv	3.8	W	
Junction temperature		Tj	115	°C	
Operating temperature range		T _{amb}	-40 to +85	°C	
Storage temperature range		T _{stg}	-55 to +100	°C	
Soldering temperature	According to fig. 7, J-STD-20	T _{sd}	260	°C	
Thermal resistance junction / pin	JESD51	R _{thJP}	10	K/W	

1 For technical questions, contact: <u>emittertechsupport@vishay.com</u> Document Number: 84368

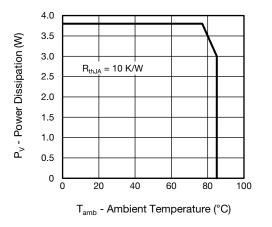




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Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

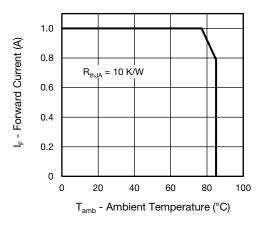


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_{F} = 1 \text{ A}, t_{p} = 100 \ \mu \text{s}$	V _F	-	3.3	3.8	V
Torward voltage	$I_F = 2 \text{ A}, t_p = 100 \ \mu \text{s}$	V _F	-	3.5	-	V
Reverse current	V _R = 5 V	I _R	-	-	10	μA
Dealiant interaction	$I_{F} = 1 \text{ A}, t_{p} = 100 \ \mu \text{s}$	l _e	350	500	-	mW/sr
Radiant intensity	$I_F = 2 \text{ A}, t_p = 100 \ \mu \text{s}$	۱ _e	-	950	-	mW/sr
Radiant power	$I_F = 1 \text{ A}, t_p = 20 \text{ ms}$	\$e	-	1000	-	mW
Angle of half intensity		φ	-	± 45	-	deg
Peak wavelength	I _F = 1 A	λ _p	-	810	-	nm
Spectral bandwidth	I _F = 1 A	Δλ	-	50	-	nm
Rise time	I _F = 1 A	t _r	-	30	-	ns
Fall time	I _F = 1 A	t _f	-	30	-	ns

BASIC CHARACTERISTICS (Tamb = 25 °C, unless otherwise specified)

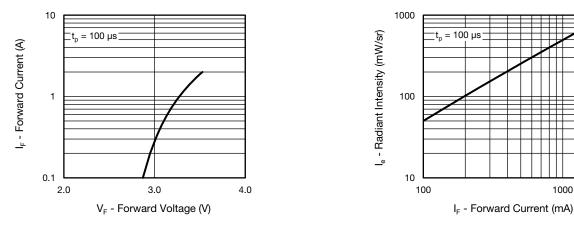




Fig. 4 - Radiant Intensity vs. Forward Current

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20°

30°

40°

50°

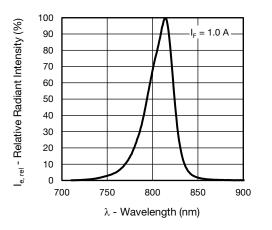
60°

70°

80°

φ - Angular Displacement

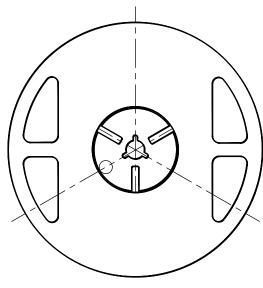
10°



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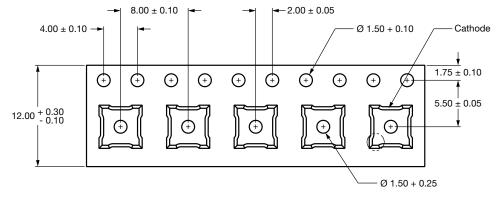
Fig. 5 - Relative Radiant Intensity vs. Wavelength





Notes

- Empty component pockets sealed with top cover tape.
- 7 inch reel 600 pieces per reel.
- The maximum number of consecutive missing lamps is two.
- In accordance with ANSI / EIA 481-1-A-1994 specifications.



Rev. 1.0, 17-May-16

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Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

0.2 0

l_{e, rel} - Relative Radiant Intensity

1.0

0.9

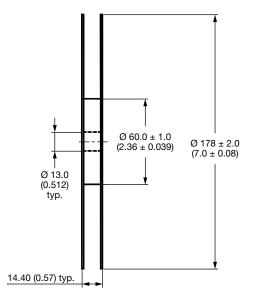
0.8

0.7

0.6

0.4

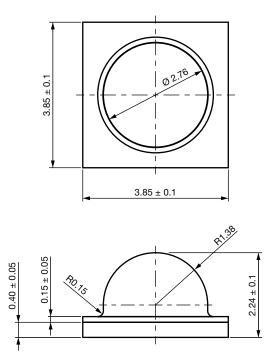
0°

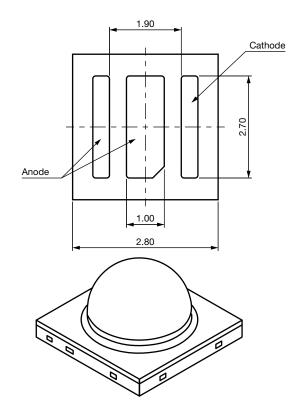


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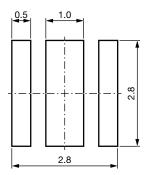
PACKAGE DIMENSIONS in millimeters



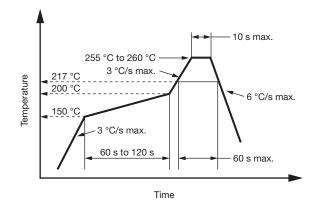


Notes

- Tolerance is \pm 0.10 mm (0.004") unless otherwise noted.
- Specifications are subject to change without notice.



SOLDER PROFILE



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Fig. 7 - 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-020B

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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