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Vishay Semiconductors

High Power Infrared Emitting Diode, 850 nm, **Surface Emitter Technology**



DESCRIPTION

As part of the SurfLight^{IM} portfolio, the VSMY98545ADS is an infrared, 850 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: power QFN
- Dimensions (L x W x H in mm): 3.85 x 3.85 x 2.24
- Peak wavelength: λ_p = 850 nm
- · Zener diode for ESD protection up to 2 kV
- High radiant power
- · High radiant intensity
- Angle of half intensity: $\varphi = \pm 45^{\circ}$
- Designed for high drive currents: up to 1 A (DC) and up to 5 A pulses
- Low thermal resistance: R_{thJP} = 9 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 www.vishav.com/doc?99912



- Infrared illumination for CMOS cameras (CCTV)
- Illumination for cameras (3D gaming)
- · Machine vision

PRODUCT SUMMARY					
COMPONENT	I _e (mW/sr)	φ (deg)	$\lambda_{\mathbf{p}}$ (nm)	t _r (ns)	
VSMY98545ADS	630	± 45	850	14	

Note

· Test conditions see table "Basic Characteristics"

ORDERING INFORMATION					
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM		
VSMY98545ADS	Tape and reel	MOQ: 600 pcs, 600 pcs/reel	High power with lens		

· 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	1	А	
Peak forward current	$t_p/T = 0.5, t_p = 100 \mu s$	I _{FM}	2	Α	
Surge forward current	t _p = 100 μs	I _{FSM}	5	А	
Power dissipation		P _V	3.5	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	JESD 51	R _{thJP}	9	K/W	



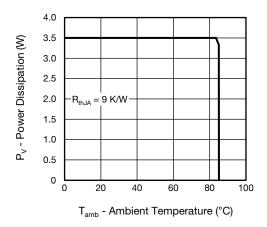


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

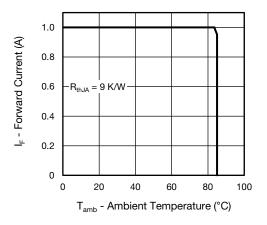


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 1 \text{ A}, t_p = 20 \text{ ms}$	V _F	-	3.1	3.5	V
Temperature coefficient of V _F	I _F = 1 A		-	-3	-	mV/K
Reverse current	V _R = 5 V	I _R	-	-	10	μΑ
Junction capacitance	$V_R = 0 \text{ V, f} = 1 \text{ MHz, E} = 0 \text{ mW/cm}^2$	CJ	-	130	-	pF
Radiant intensity	$I_F = 1 \text{ A}, t_p = 20 \text{ ms}$	I _e	400	630	-	mW/sr
Radiant power	$I_F = 1 \text{ A}, t_p = 20 \text{ ms}$	фe	-	1340	-	mW
Temperature coefficient of φ	$I_F = 1 \text{ A}, t_p = 20 \text{ ms}$	TK_{ϕ}	-	-0.3	-	%/K
Angle of half intensity		φ	-	± 45	-	deg
Peak wavelength	I _F = 1 A	λ_{p}	830	850	870	nm
Spectral bandwidth	I _F = 1 A	Δλ	-	35	-	nm
Temperature coefficient of λ_p	$I_F = 1 \text{ A}, t_p = 20 \text{ ms}$	TK_{\lambdap}	-	0.3	-	nm/K
Rise time	I _F = 1 A	t _r	-	14	-	ns
Fall time	I _F = 1 A	t _f	-	17	-	ns

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

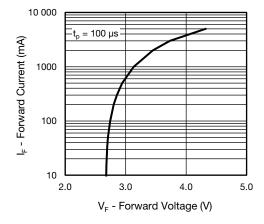


Fig. 3 - Forward Current vs. Forward Voltage

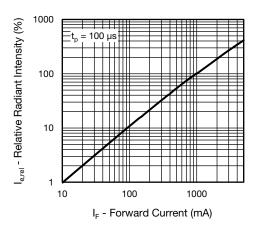
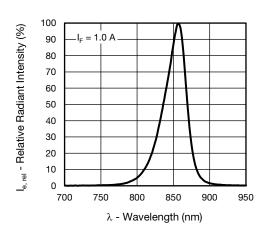


Fig. 4 - Relative Radiant Intensity vs. Forward Current

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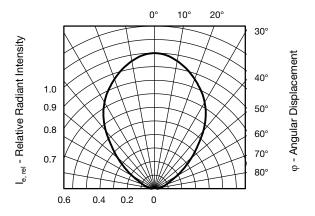
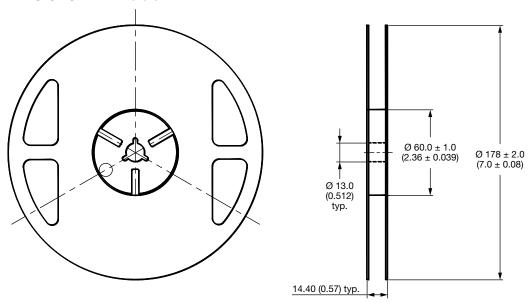


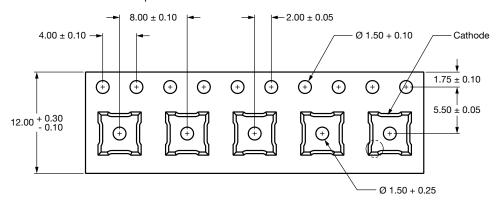
Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

TAPING DIMENSIONS in millimeters



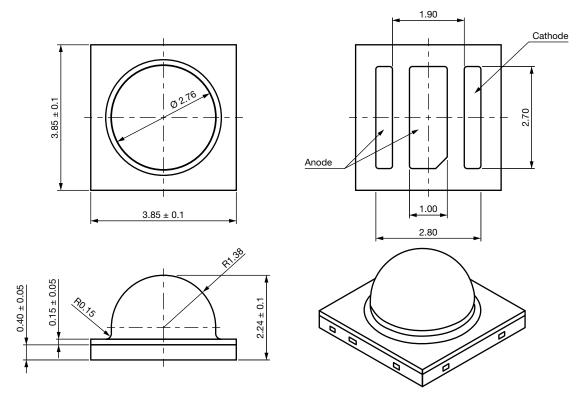
Notes

- 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.



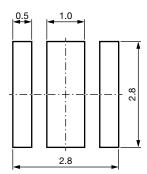
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PACKAGE DIMENSIONS in millimeters



Notes

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





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SOLDER PROFILE

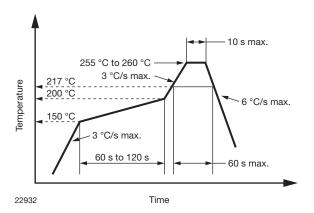


Fig. 7 - Lead (Pb)-free Reflow Solder Profile According to J-STD-020

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 $^{\circ}$ C (+ 5 $^{\circ}$ C), RH < 5 $^{\circ}$ M.



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