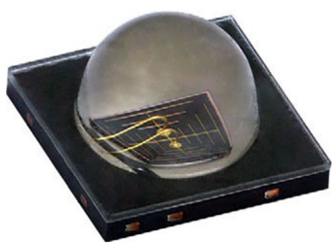
High Power Infrared Emitting Diode, 850 nm, Surface Emitter Technology



FEATURES

- Package type: surface-mount
- Double stack technology
- Package form: high power SMD with lens
- 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: φ = ± 45°
- Designed for high drive currents: up to 1 A (DC) and up to 5 A pulses
- Low thermal resistance: R_{thJP} = 10 K/W
- Floor life: 168 h, MSL 3, acc. J-STD-020
- Lead (Pb)-free reflow soldering
- 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 VSMY98545DS 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.

APPLICATIONS

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

PRODUCT SUMMARY

COMPONENT	I_e (mW/sr)	φ (°)	λ_p (nm)	t_r (ns)
VSMY98545DS	600	± 45	850	30

Note
- Test conditions see table "Basic Characteristics"

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VSMY98545DS	Tape and reel	MOQ: 600 pcs, 600 pcs/reel	High power with lens

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	1	A
Peak forward current	t_p/T = 0.5, t_p = 100 μs	I_{FM}	2	A
Surge forward current	t_p = 100 μs	I_{FSM}	5	A
Power dissipation		P_V	3.6	W
Junction temperature		T_j	125	°C
Operating temperature range		T_{amb}	-40 to +110	°C
Storage temperature range		T_{stg}	-40 to +125	°C
Soldering temperature	According to Fig. 10, J-STD-20	T_{sd}	260	°C
Thermal resistance junction-to-pin	According to J-STD-051, soldered on PCB	R_{thJP}	10	K/W

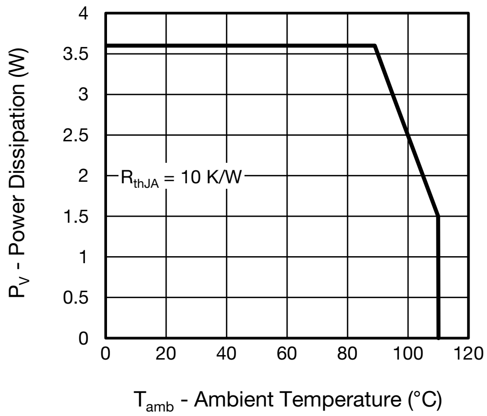


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

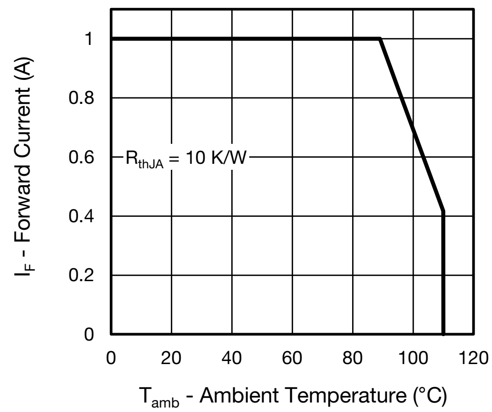


Fig. 2 - Forward Current Limit vs. Ambient Temperature

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

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	I_F = 1 A, t_p = 20 ms	V_F	-	3.2	3.6	V
	I_F = 5 A, t_p = 100 μs	V_F	-	4.6	-	V
Temperature coefficient of V_F	I_F = 1 A	TK_{VF}	-	-2.2	-	mV/K
Reverse current	V_R = 5 V	I_R	-	-	10	μA
Radiant intensity	I_F = 1 A, t_p = 20 ms	I_e	300	600	900	mW/sr
	I_F = 5 A, t_p = 100 μs	I_e	-	2800	-	mW/sr
Radiant power	I_F = 1 A, t_p = 20 ms	ϕ_e	-	1070	-	mW
Temperature coefficient of ϕ_e	I_F = 1 A	$TK\phi_e$	-	-	-	%/K
Angle of half intensity		φ	-	± 45	-	°
Peak wavelength	I_F = 1 A	λ_p	830	850	870	nm
Spectral bandwidth	I_F = 1 A	$\Delta\lambda$	-	50	-	nm
Temperature coefficient of λ_p	I_F = 1 A	$TK\lambda_p$	-	0.3	-	nm/K
Rise time	I_F = 1 A	t_r	-	30	-	ns
Fall time	I_F = 1 A	t_f	-	30	-	ns

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

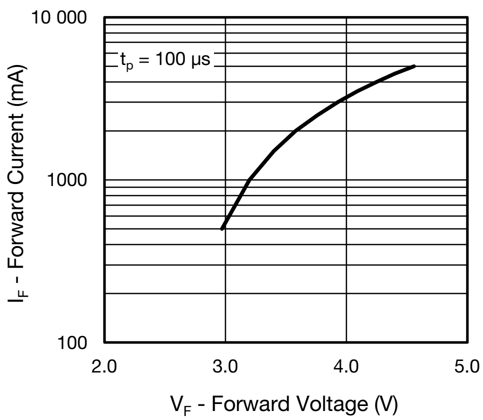


Fig. 3 - Forward Current vs. Forward Voltage

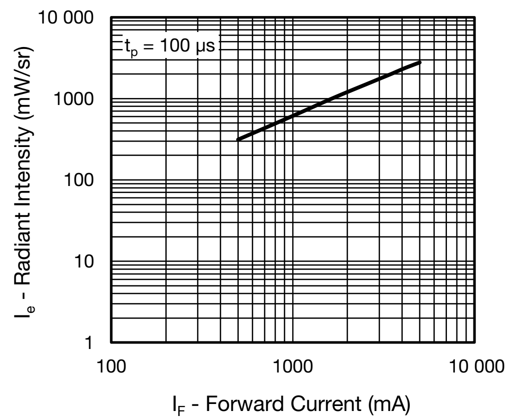


Fig. 6 - Radiant Intensity vs. Forward Current

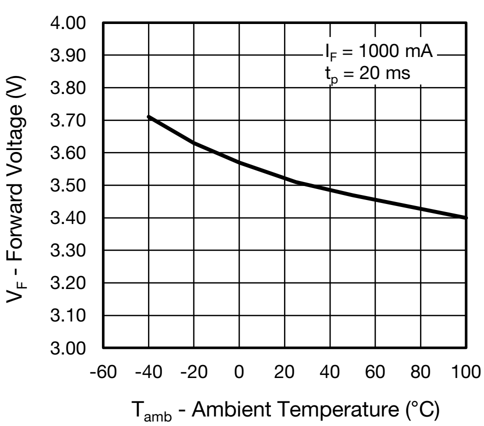


Fig. 4 - Forward Voltage vs. Ambient Temperature

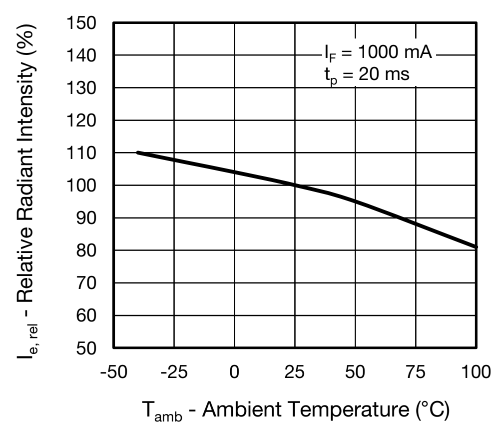


Fig. 7 - Relative Radiant Intensity vs. Ambient Temperature

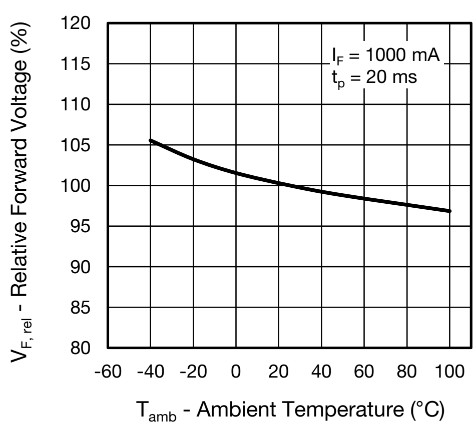


Fig. 5 - Relative Forward Voltage vs. Ambient Temperature

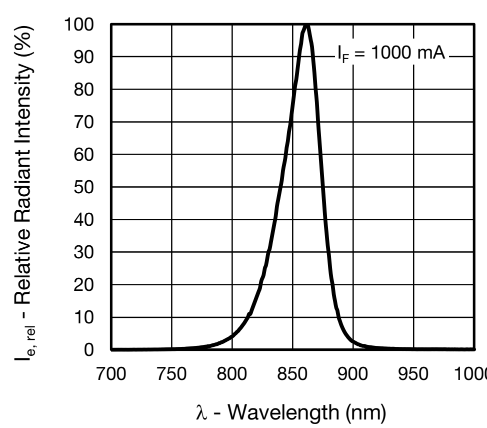


Fig. 8 - Relative Radiant Intensity vs. Wavelength

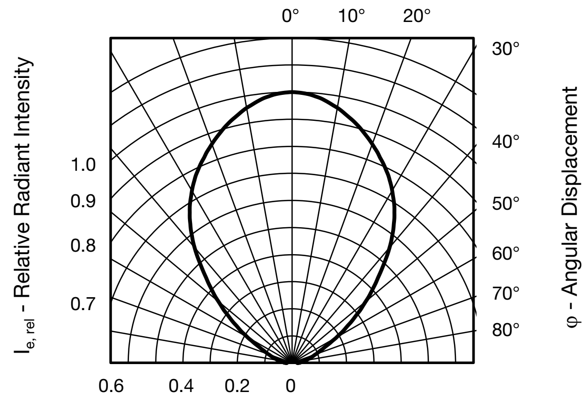
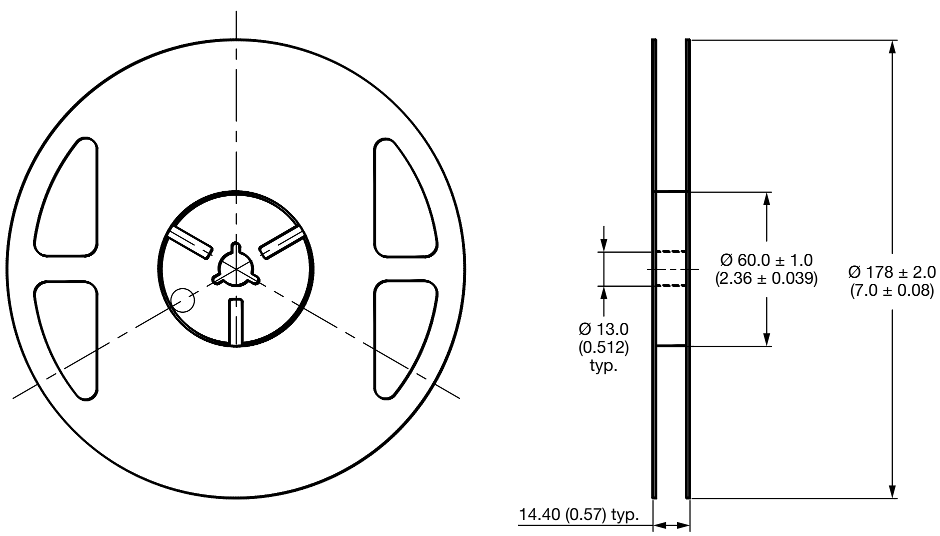


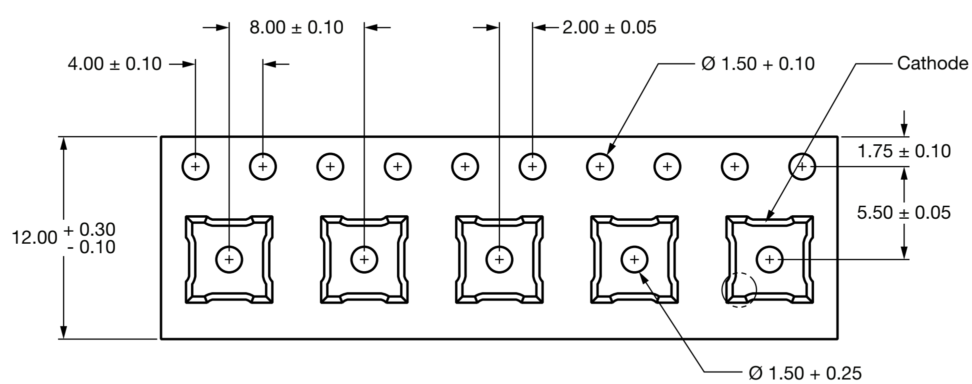
Fig. 9 - Relative Radiant Intensity vs. Angular Displacement

TAPING DIMENSIONS in millimeters

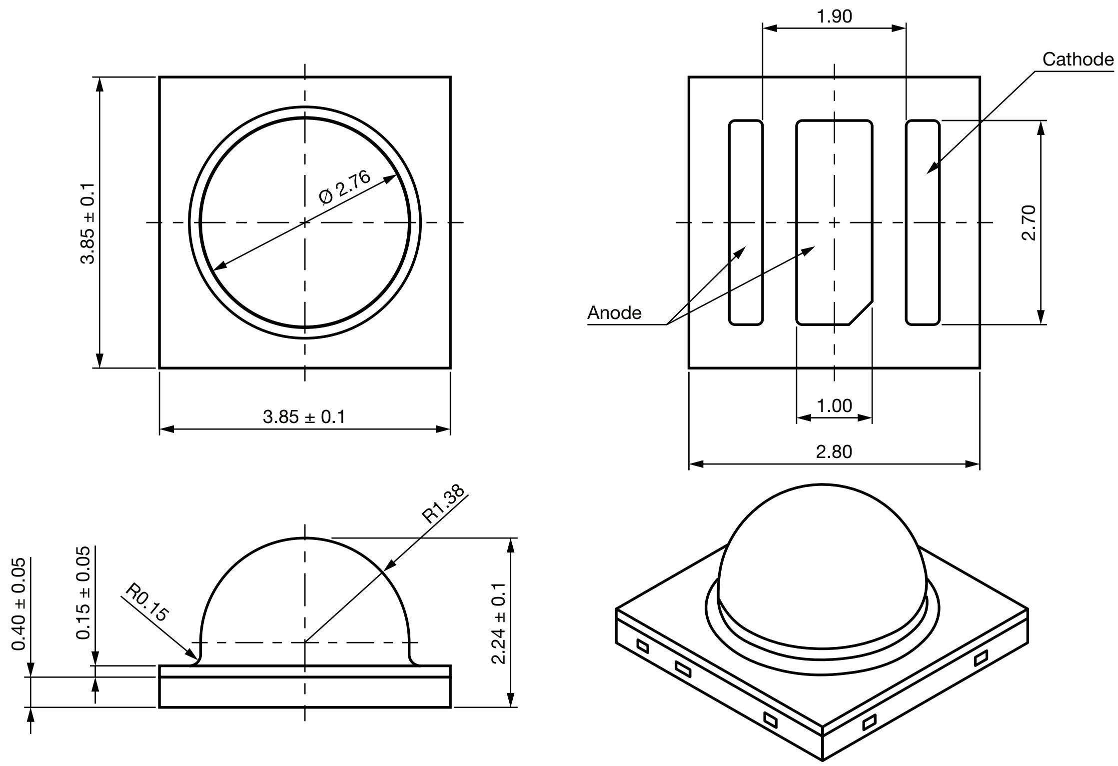


Notes

- 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.

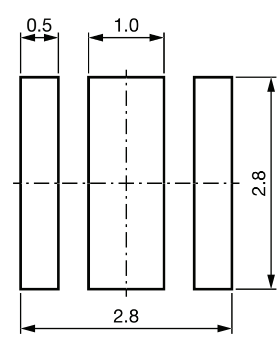


PACKAGE DIMENSIONS in millimeters



Notes

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



SOLDER PROFILE

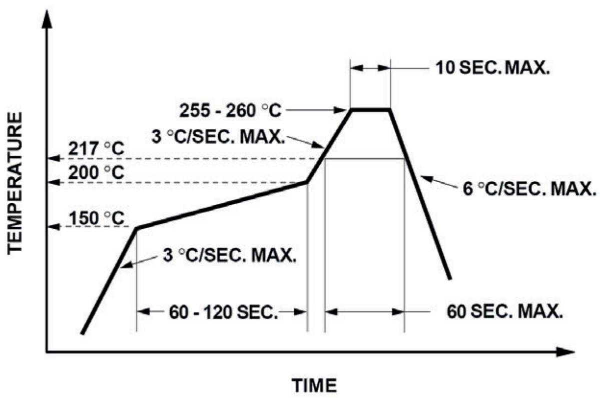


Fig. 10 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020

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, acc. 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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