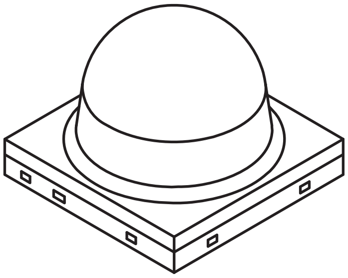
High Power Infrared Emitting Diode, 850 nm, Surface Emitter Technology



DESCRIPTION

As part of the SurfLight™ portfolio, the VSMY98525DS 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 3.00
- 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 = ± 25°
- 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.vishay.com/doc?99912

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

APPLICATIONS

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

PRODUCT SUMMARY

COMPONENT	I_e (mW/sr)	φ (deg)	λ_p (nm)	t_r (ns)
VSMY98525DS	1000	± 25	850	14

Note

- Test conditions see table “Basic Characteristics”

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
VSMY98525DS	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	3.5	W
Junction temperature		T_j	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-to-pin	JESD 51	R_{thJP}	9	K/W

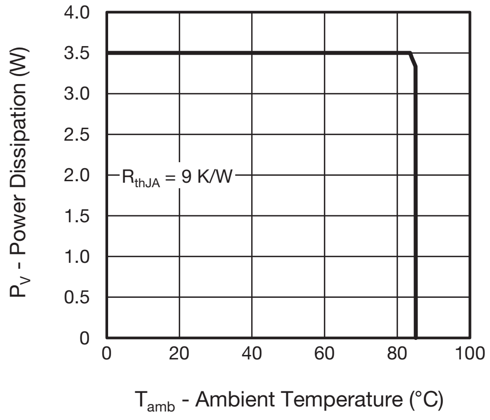


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

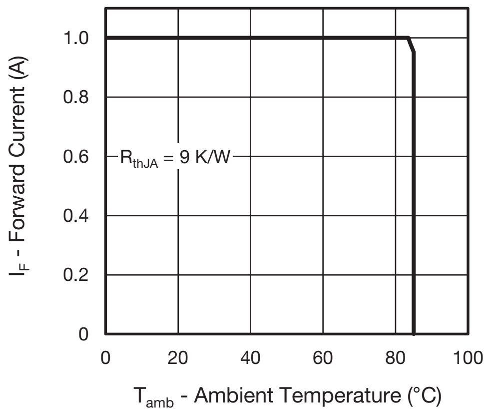


Fig. 2 - Forward Current Limit vs. Ambient Temperature

BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Forward voltage	I_F = 1 A, t_p = 20 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	μA
Junction capacitance	V_R = 0 V, f = 1 MHz, E = 0 mW/cm^2	C_J	-	130	-	pF
Radiant intensity	I_F = 1 A, t_p = 20 ms	I_e	800	1000	1600	mW/sr
Radiant power	I_F = 1 A, t_p = 20 ms	ϕ_e	-	1300	-	mW
Temperature coefficient of ϕ	I_F = 1 A, t_p = 20 ms	TK_ϕ	-	-0.3	-	%/K
Angle of half intensity		φ	-	± 25	-	deg
Peak wavelength	I_F = 1 A	λ_p	830	850	870	nm
Spectral bandwidth	I_F = 1 A	$\Delta\lambda$	-	35	-	nm
Temperature coefficient of λ_p	I_F = 1 A, t_p = 20 ms	$TK_{\lambda p}$	-	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)

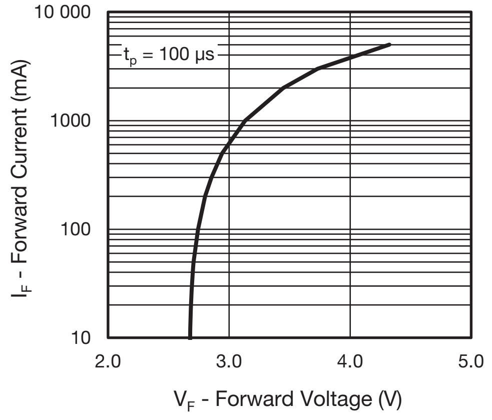


Fig. 3 - Forward Current vs. Forward Voltage

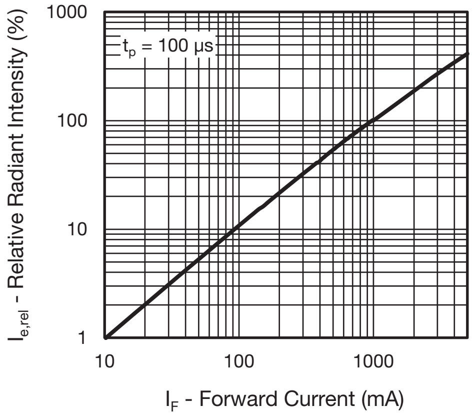


Fig. 4 - Relative Radiant Intensity vs. Forward Current

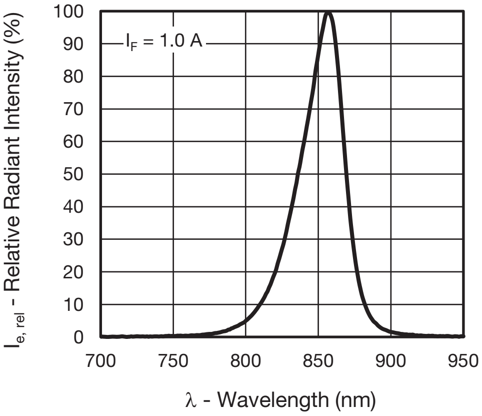


Fig. 5 - Relative Radiant Intensity vs. Wavelength

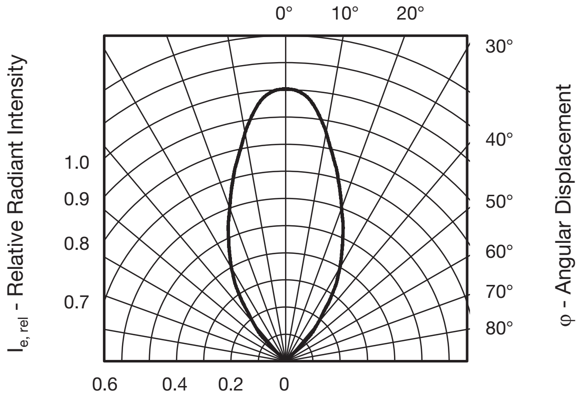
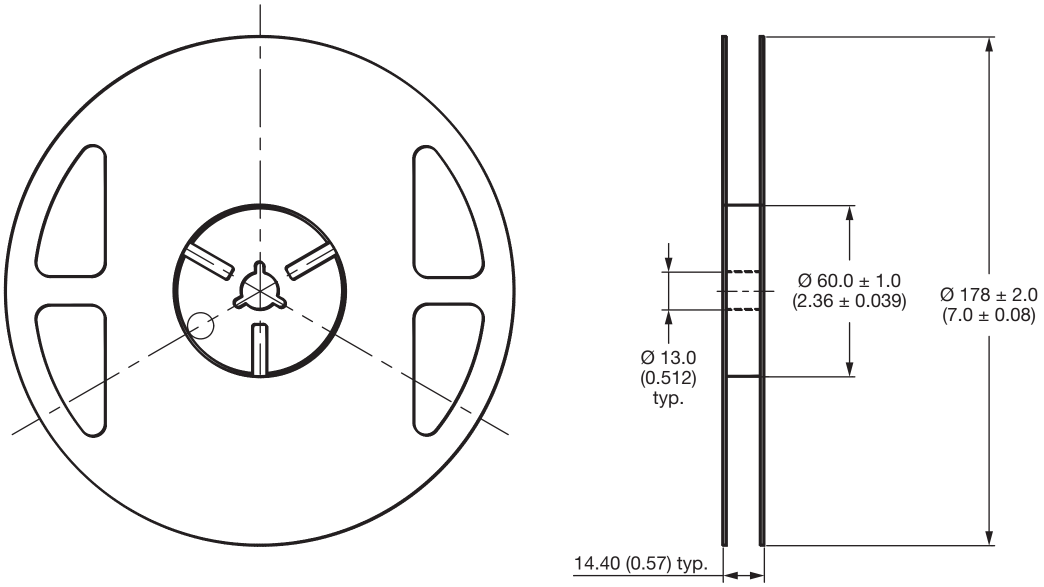


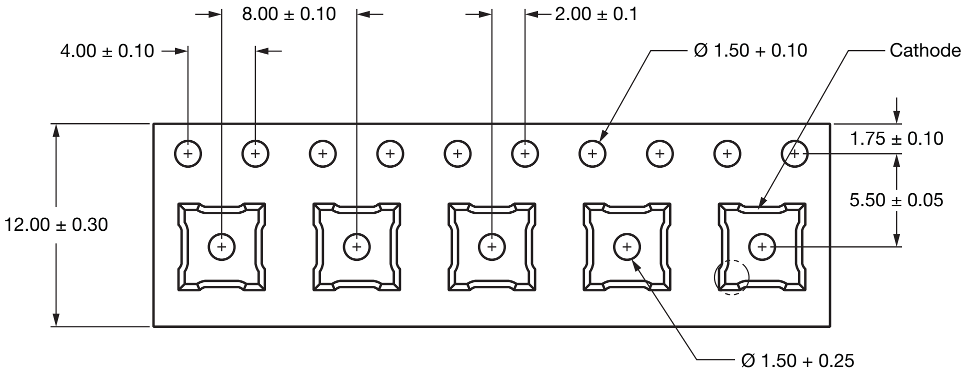
Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

TAPING DIMENSIONS in millimeters

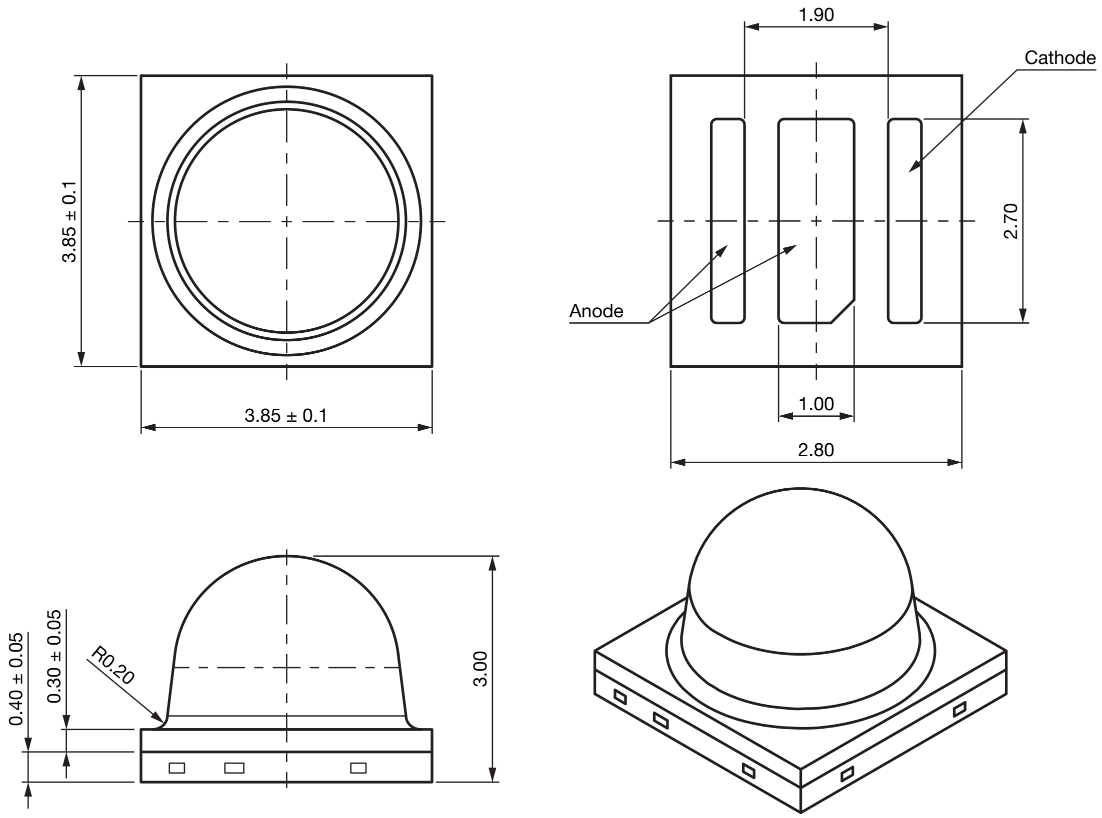


Notes

- 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

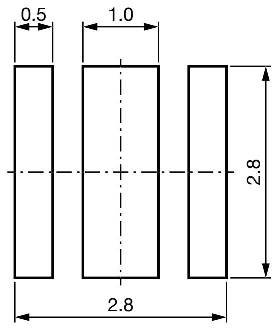


PACKAGE DIMENSIONS in millimeters



Notes

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



SOLDER PROFILE

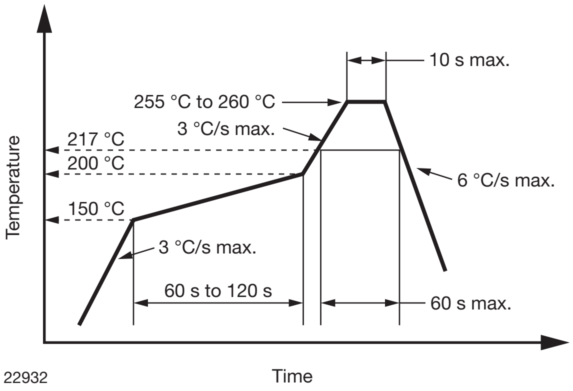


Fig. 7 - Lead (Pb)-free Reflow Solder Profile According to J-STD-020

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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