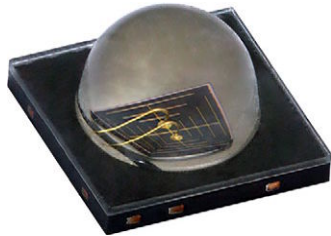




High Power Infrared Emitting Diode, 850 nm, Surface Emitter Technology



DESCRIPTION

As part of the SurfLight™ 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: $\lambda_p = 850$ 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: $R_{thJP} = 9$ 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



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) |
| 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 |

Note

- MOQ: minimum order quantity

| ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25^\circ\text{C}$, unless otherwise specified) | | | | |
|---------------------------------------------------------------------------------------|--------------------------------------|------------|-------------|------------------|
| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
| Reverse voltage | | V_R | 5 | V |
| Forward current | | I_F | 1 | A |
| Peak forward current | $t_p/T = 0.5, t_p = 100 \mu\text{s}$ | I_{FM} | 2 | A |
| Surge forward current | $t_p = 100 \mu\text{s}$ | I_{FSM} | 5 | A |
| Power dissipation | | P_V | 3.5 | W |
| Junction temperature | | T_j | 115 | $^\circ\text{C}$ |
| Operating temperature range | | T_{amb} | -40 to +85 | $^\circ\text{C}$ |
| Storage temperature range | | T_{stg} | -55 to +100 | $^\circ\text{C}$ |
| Soldering temperature | According to Fig. 7, J-STD-20 | T_{sd} | 260 | $^\circ\text{C}$ |
| Thermal resistance junction / pin | JESD 51 | R_{thJP} | 9 | K/W |

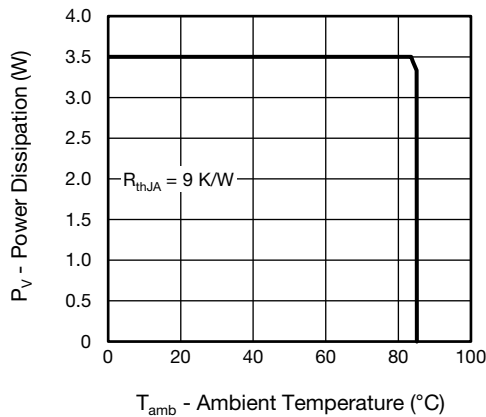


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

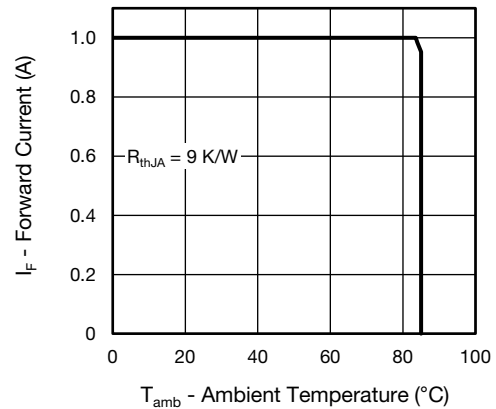


Fig. 2 - Forward Current Limit vs. Ambient Temperature

| BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, 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 | $I_F = 1\text{ A}$ | | - | -3 | - | mV/K |
| Reverse current | $V_R = 5\text{ V}$ | I_R | - | - | 10 | μA |
| Junction capacitance | $V_R = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0\text{ mW/cm}^2$ | C_J | - | 130 | - | pF |
| Radiant intensity | $I_F = 1\text{ A}$, $t_p = 20\text{ ms}$ | I_e | 400 | 630 | - | mW/sr |
| Radiant power | $I_F = 1\text{ A}$, $t_p = 20\text{ ms}$ | ϕ_e | - | 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 | $I_F = 1\text{ A}$ | λ_p | 830 | 850 | 870 | nm |
| Spectral bandwidth | $I_F = 1\text{ A}$ | $\Delta\lambda$ | - | 35 | - | nm |
| Temperature coefficient of λ_p | $I_F = 1\text{ A}$, $t_p = 20\text{ ms}$ | TK_{λ_p} | - | 0.3 | - | nm/K |
| Rise time | $I_F = 1\text{ A}$ | t_r | - | 14 | - | ns |
| Fall time | $I_F = 1\text{ A}$ | t_f | - | 17 | - | ns |

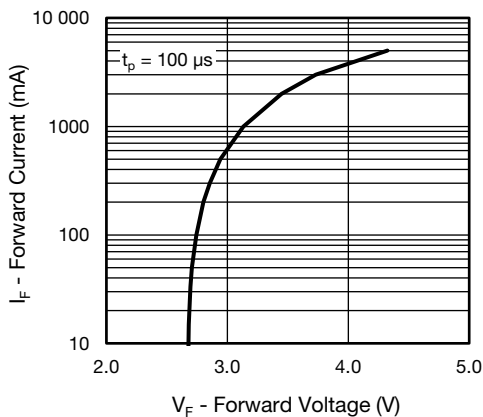
BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)


Fig. 3 - Forward Current vs. Forward Voltage

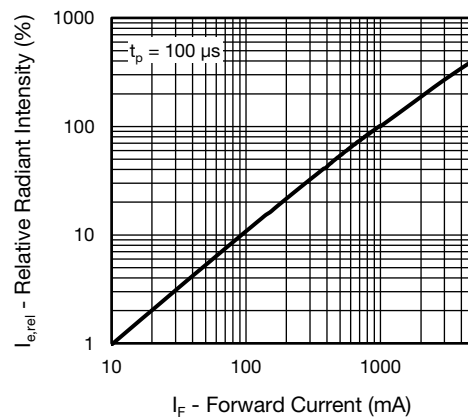


Fig. 4 - Relative Radiant Intensity vs. Forward Current

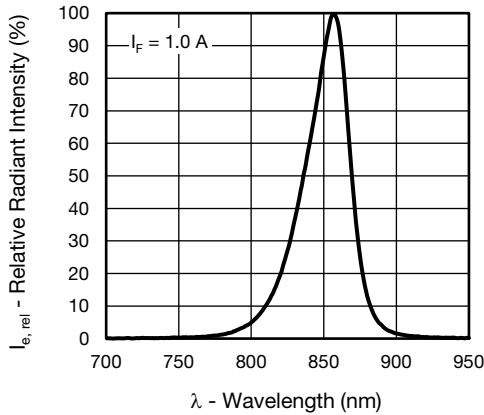


Fig. 5 - Relative Radiant Intensity vs. Wavelength

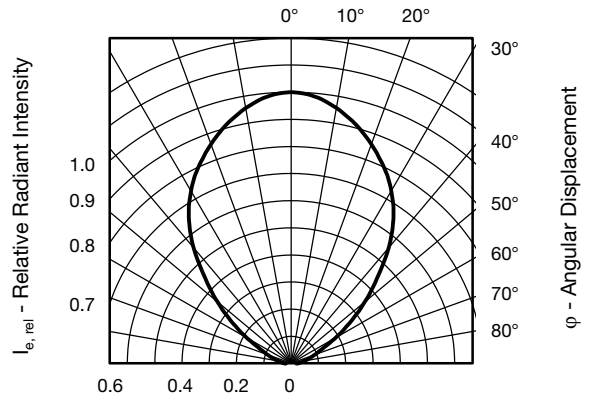
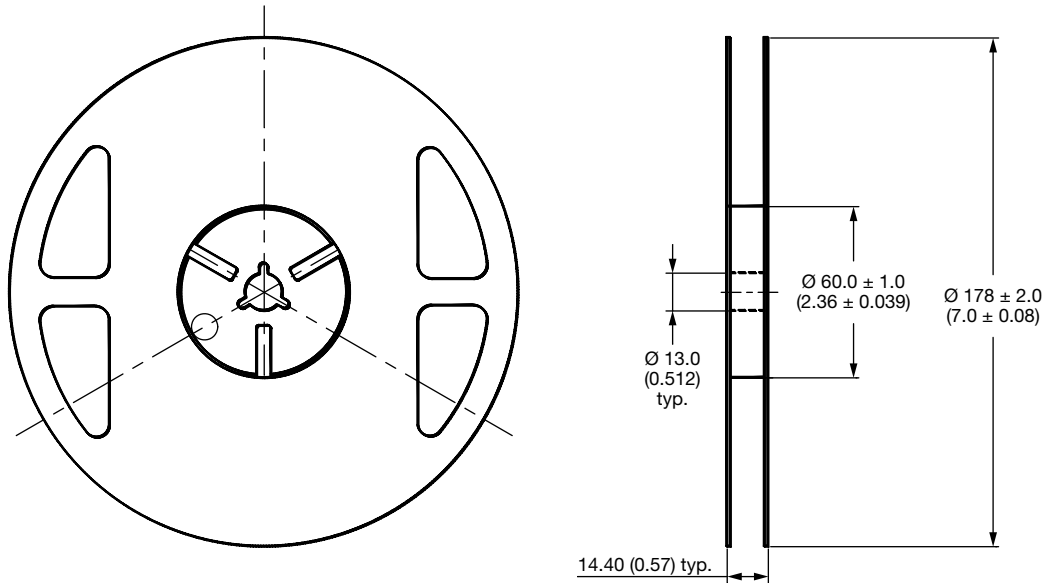


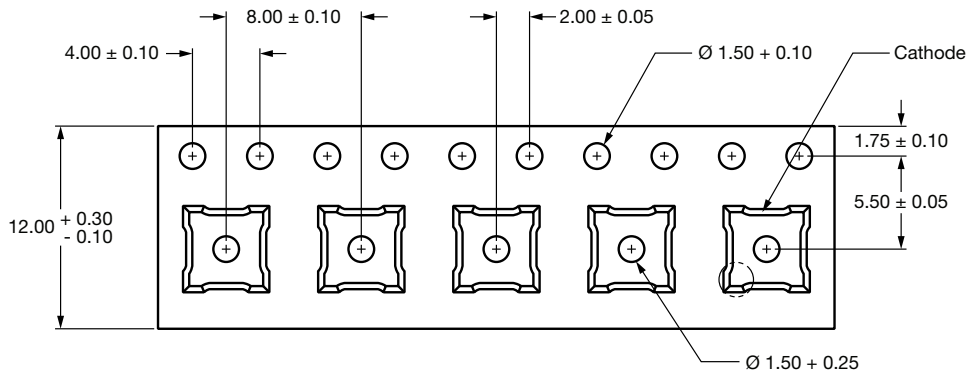
Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

TAPING DIMENSIONS in millimeters



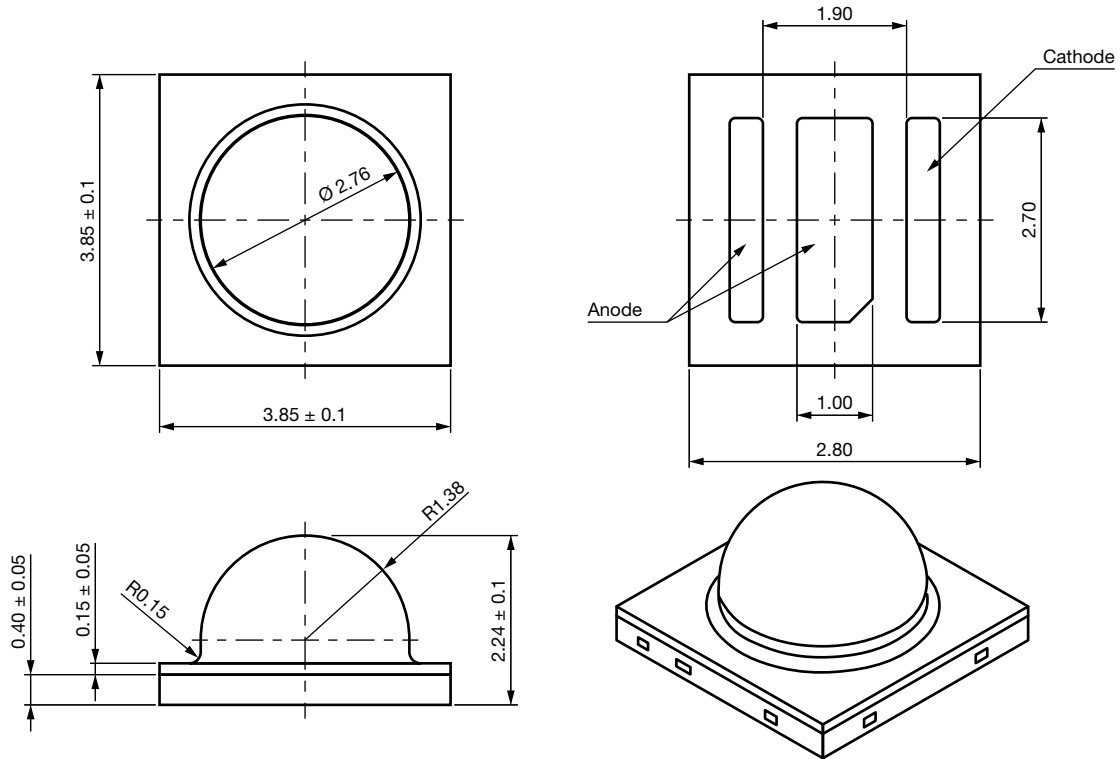
Notes

- 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.



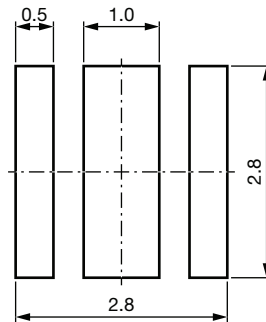


PACKAGE DIMENSIONS in millimeters



Notes

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



SOLDER PROFILE

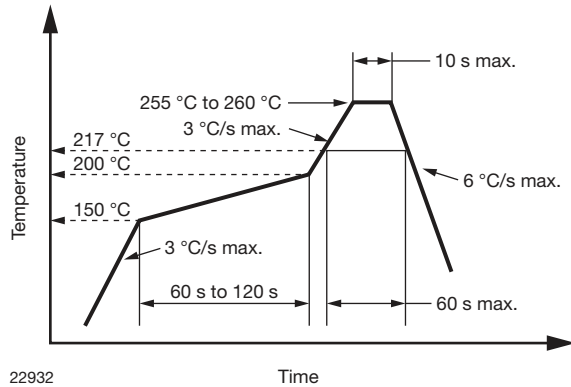


Fig. 7 - Lead (Pb)-free Reflow Solder Profile
According to J-STD-020

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: $T_{amb} < 30\text{ °C}$, $RH < 60\%$

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 $40\text{ °C} (+ 5\text{ °C})$, $RH < 5\%$.



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