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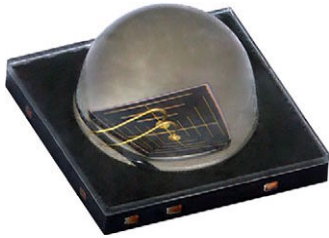
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## High Power Infrared Emitting Diode, 850 nm, Surface Emitter Technology



### 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](http://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) | $\phi$ (deg) | $\lambda_p$ (nm) | $t_r$ (ns) |
|--------------|---------------|--------------|------------------|------------|
| VSMY98545ADS | 630           | $\pm 45$     | 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              |

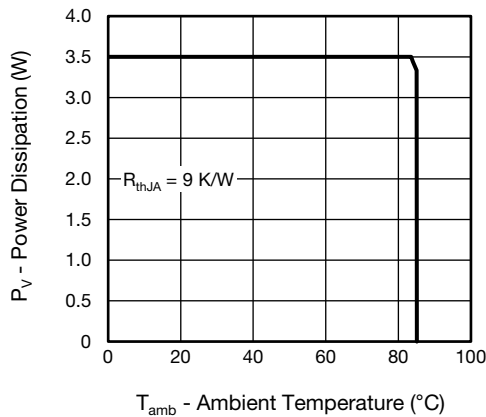


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

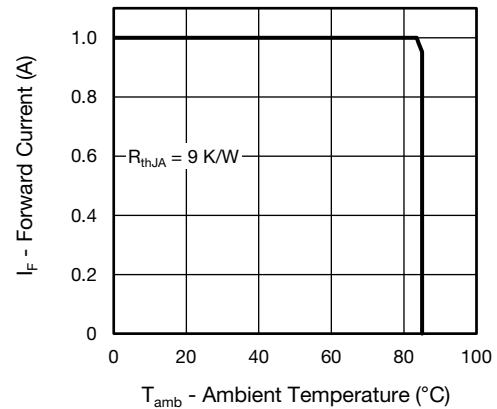


Fig. 2 - Forward Current Limit vs. Ambient Temperature

| <b>BASIC CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , 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   | $\mu\text{A}$ |
| 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   | $I_F = 1\text{ A}$ , $t_p = 20\text{ ms}$                        | $\phi_e$         | -    | 1340     | -    | mW            |
| Temperature coefficient of $\phi$   | $I_F = 1\text{ A}$ , $t_p = 20\text{ ms}$                        | $TK_{\phi}$      | -    | -0.3     | -    | %/K           |
| Angle of half intensity   |  | $\phi$           | -    | $\pm 45$ | -    | deg           |
| Peak wavelength   | $I_F = 1\text{ A}$   | $\lambda_p$      | 830  | 850      | 870  | nm            |
| Spectral bandwidth  | $I_F = 1\text{ A}$   | $\Delta\lambda$  | -    | 35       | -    | nm            |
| Temperature coefficient of $\lambda_p$  | $I_F = 1\text{ A}$ , $t_p = 20\text{ ms}$                        | $TK_{\lambda_p}$ | -    | 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            |

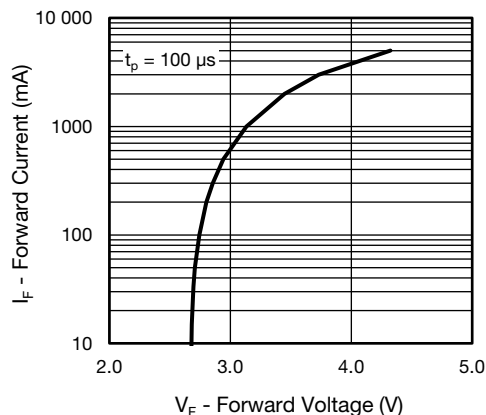
**BASIC CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)


Fig. 3 - Forward Current vs. Forward Voltage

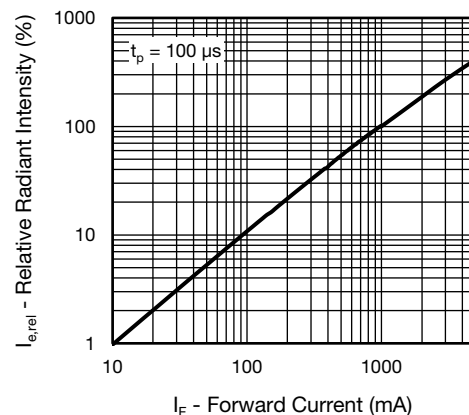


Fig. 4 - Relative Radiant Intensity vs. Forward Current

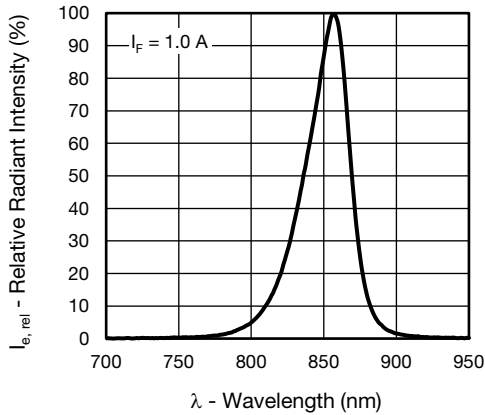


Fig. 5 - Relative Radiant Intensity vs. Wavelength

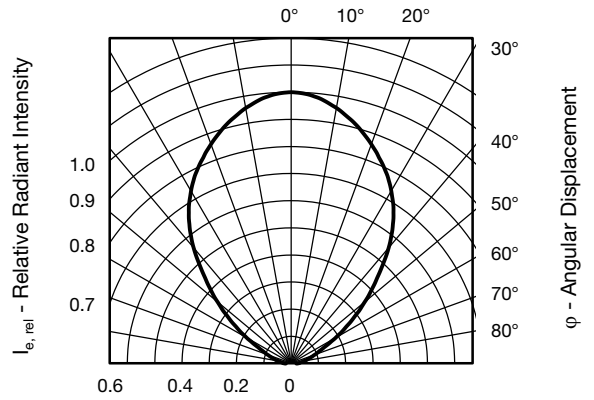
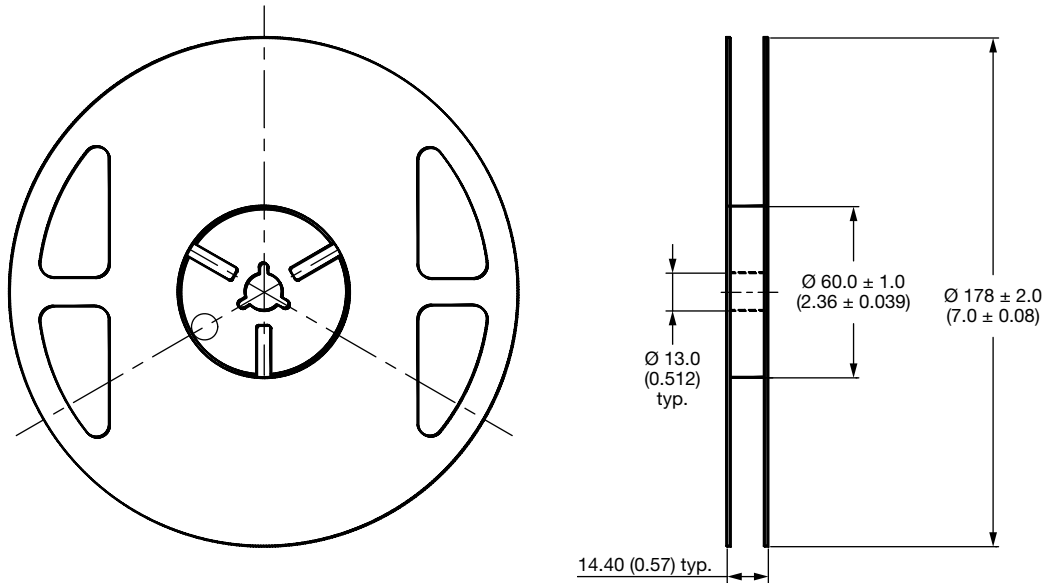


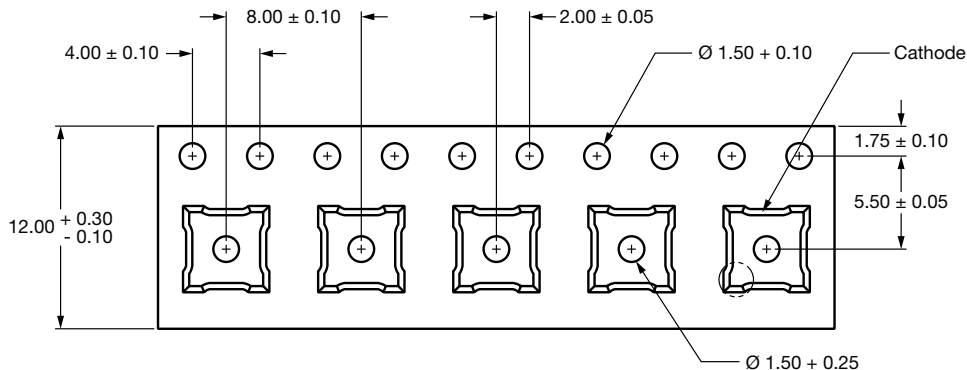
Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

**TAPING DIMENSIONS** in millimeters



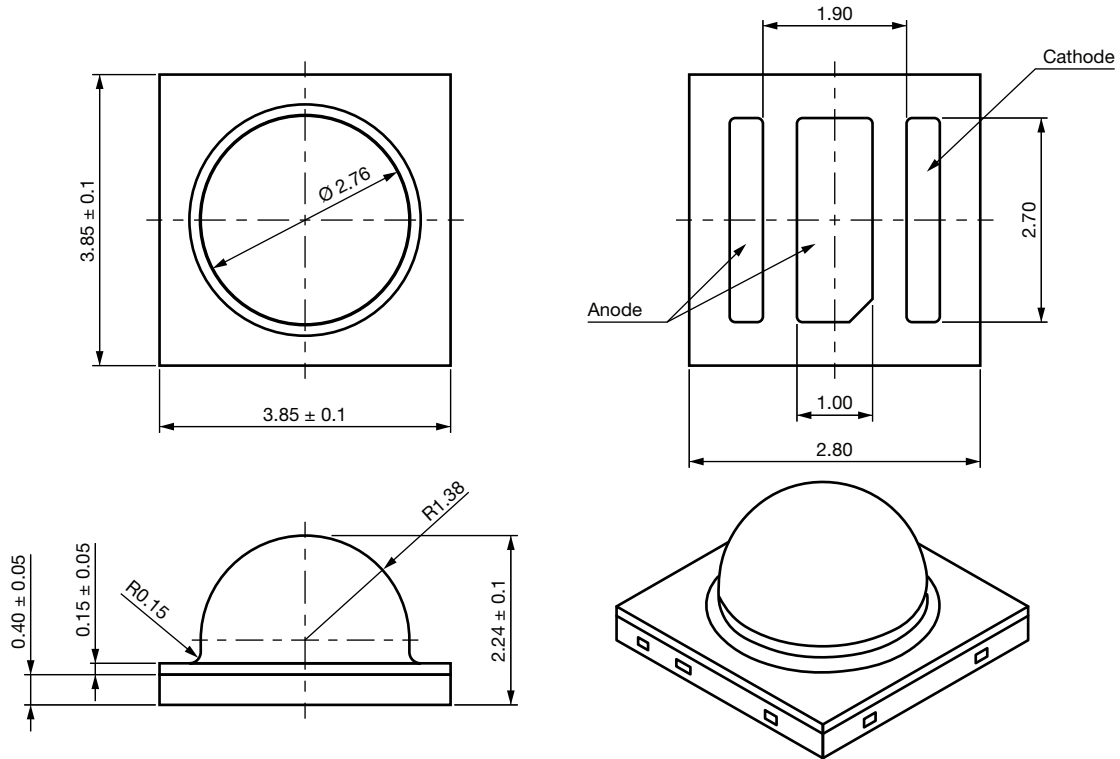
**Notes**

- 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.



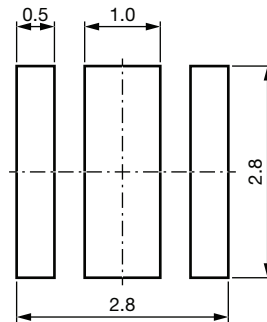


**PACKAGE DIMENSIONS** in millimeters



**Notes**

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



**SOLDER PROFILE**

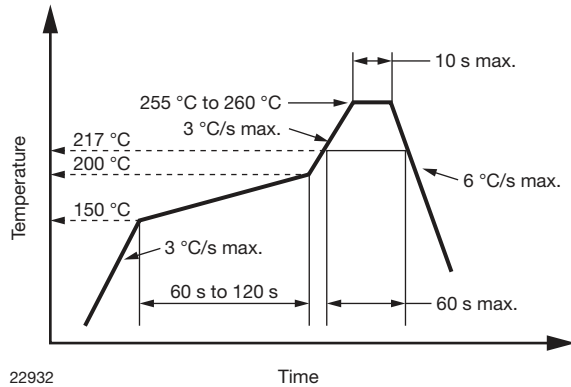


Fig. 7 - Lead (Pb)-free Reflow Solder Profile  
According to J-STD-020

**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 °C (+ 5 °C),  $RH < 5\%$ .



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