High Speed Infrared Emitting Diodes, 850 nm,
Surface Emitter Technology

DESCRIPTION
As part of the SurfLight™ portfolio, the VSMY1850 is an infrared, 850 nm emitting diode based on GaAlAs surface emitter chip technology with high radiant intensity, high optical power and high speed, molded in clear, untinted 0805 plastic package for surface mounting (SMD).

FEATURES
• Package type: surface mount
• Package form: 0805
• Dimensions (L x W x H in mm): 2 x 1.25 x 0.85
• Peak wavelength: $\lambda_p = 850$ nm
• High reliability
• High radiant power
• High radiant intensity
• High speed
• Angle of half sensitivity: $\phi = \pm 60^\circ$
• Suitable for high pulse current operation
• 0805 standard surface-mountable package
• 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
• IrDA compatible data transmission
• Miniature light barrier
• Photointerrupters
• Optical switch
• Emitter source for proximity sensors
• IR touch panels
• IR Flash
• IR illumination
• 3D TV

PRODUCT SUMMARY

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>$I_e$ (mW/sr)</th>
<th>$\phi$ (deg)</th>
<th>$\lambda_p$ (nm)</th>
<th>$t_r$ (ns)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VSMY1850</td>
<td>10</td>
<td>$\pm 60$</td>
<td>850</td>
<td>10</td>
</tr>
</tbody>
</table>

Note
• Test conditions see table “Basic Characteristics”

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>ORDERING CODE</th>
<th>PACKAGING</th>
<th>REMARKS</th>
<th>PACKAGE FORM</th>
</tr>
</thead>
<tbody>
<tr>
<td>VSMY1850</td>
<td>Tape and reel</td>
<td>MOQ: 3000 pcs, 3000 pcs/reel</td>
<td>0805</td>
</tr>
</tbody>
</table>

Note
• MOQ: minimum order quantity

For technical questions, contact: emittertechsupport@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE, THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?791000
### ABSOLUTE MAXIMUM RATINGS \((T_{\text{amb}} = 25 \, ^\circ\text{C}, \text{unless otherwise specified})\)

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>TEST CONDITION</th>
<th>SYMBOL</th>
<th>VALUE</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reverse voltage</td>
<td></td>
<td>(V_R)</td>
<td>5</td>
<td>V</td>
</tr>
<tr>
<td>Forward current</td>
<td></td>
<td>(I_F)</td>
<td>100</td>
<td>mA</td>
</tr>
<tr>
<td>Peak forward current (t_p/T = 0.5, t_p = 100 , \mu\text{s})</td>
<td></td>
<td>(I_{\text{FM}})</td>
<td>200</td>
<td>mA</td>
</tr>
<tr>
<td>Surge forward current (t_p = 100 , \mu\text{s})</td>
<td></td>
<td>(I_{\text{FSM}})</td>
<td>1</td>
<td>A</td>
</tr>
<tr>
<td>Power dissipation</td>
<td></td>
<td>(P_V)</td>
<td>190</td>
<td>mW</td>
</tr>
<tr>
<td>Junction temperature</td>
<td></td>
<td>(T_J)</td>
<td>100</td>
<td>°C</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td></td>
<td>(T_{\text{amb}})</td>
<td>-40 to +85</td>
<td>°C</td>
</tr>
<tr>
<td>Storage temperature range</td>
<td></td>
<td>(T_{\text{stg}})</td>
<td>-40 to +100</td>
<td>°C</td>
</tr>
<tr>
<td>Soldering temperature</td>
<td>According to Fig. 7, J-STD-020</td>
<td>(T_{\text{sd}})</td>
<td>260</td>
<td>°C</td>
</tr>
<tr>
<td>Thermal resistance junction / ambient</td>
<td>JESD 51</td>
<td>(R_{\text{thJA}})</td>
<td>270</td>
<td>K/W</td>
</tr>
</tbody>
</table>

#### Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

#### Fig. 2 - Forward Current Limit vs. Ambient Temperature

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

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>TEST CONDITION</th>
<th>SYMBOL</th>
<th>MIN.</th>
<th>TYP.</th>
<th>MAX.</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward voltage</td>
<td>(I_F = 100 , \text{mA}, , t_p = 20 , \text{ms})</td>
<td>(V_F)</td>
<td>-</td>
<td>1.65</td>
<td>1.9</td>
<td>V</td>
</tr>
<tr>
<td>Temperature coefficient of (V_F)</td>
<td>(I_F = 1 , \text{mA})</td>
<td>TK_{VF}</td>
<td>-</td>
<td>-1.4</td>
<td>-</td>
<td>mV/K</td>
</tr>
<tr>
<td>Reverse current</td>
<td></td>
<td>(I_R)</td>
<td>Not designed for reverse operation</td>
<td>µA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Junction capacitance</td>
<td>(V_R = 0 , \text{V}, , f = 1 , \text{MHz}, E = 0 , \text{mW/cm}^2)</td>
<td>(C_J)</td>
<td>-</td>
<td>125</td>
<td>-</td>
<td>pF</td>
</tr>
<tr>
<td>Radiant intensity</td>
<td>(I_F = 100 , \text{mA}, , t_p = 20 , \text{ms})</td>
<td>(I_e)</td>
<td>5</td>
<td>10</td>
<td>15</td>
<td>mW/sr</td>
</tr>
<tr>
<td>Radiant power</td>
<td>(I_F = 1 , \text{mA})</td>
<td>TK_{RF}</td>
<td>-</td>
<td>-1.18</td>
<td>-</td>
<td>mW/K</td>
</tr>
<tr>
<td>Temperature coefficient of radiant power</td>
<td>(I_F = 100 , \text{mA}, , t_p = 20 , \text{ms})</td>
<td>TK_{RF}</td>
<td>-</td>
<td>-0.35</td>
<td>-</td>
<td>%/K</td>
</tr>
<tr>
<td>Angle of half intensity</td>
<td></td>
<td>(\varphi)</td>
<td>-</td>
<td>± 60</td>
<td>-</td>
<td>deg</td>
</tr>
<tr>
<td>Peak wavelength</td>
<td>(I_F = 100 , \text{mA})</td>
<td>(\lambda_p)</td>
<td>840</td>
<td>850</td>
<td>870</td>
<td>nm</td>
</tr>
<tr>
<td>Spectral bandwidth</td>
<td>(I_F = 30 , \text{mA})</td>
<td>(\Delta\lambda)</td>
<td>-</td>
<td>30</td>
<td>-</td>
<td>nm</td>
</tr>
<tr>
<td>Temperature coefficient of (\lambda_p)</td>
<td>(I_F = 30 , \text{mA})</td>
<td>TK_{RF}</td>
<td>-</td>
<td>0.25</td>
<td>-</td>
<td>nm/K</td>
</tr>
<tr>
<td>Rise time</td>
<td>(I_F = 100 , \text{mA}, , 20 , % \text{to} , 80 , %)</td>
<td>(t_p)</td>
<td>-</td>
<td>10</td>
<td>-</td>
<td>ns</td>
</tr>
<tr>
<td>Fall time</td>
<td>(I_F = 100 , \text{mA}, , 20 , % \text{to} , 80 , %)</td>
<td>(t_f)</td>
<td>-</td>
<td>10</td>
<td>-</td>
<td>ns</td>
</tr>
<tr>
<td>Virtual source diameter</td>
<td></td>
<td>(d)</td>
<td>-</td>
<td>0.5</td>
<td>-</td>
<td>mm</td>
</tr>
</tbody>
</table>
BASIC CHARACTERISTICS \((T_{\text{amb}} = 25 \, ^\circ\text{C}, \text{unless otherwise specified})\)

**Fig. 3** - Forward Current vs. Forward Voltage

**Fig. 4** - Radiant Intensity vs. Forward Current

**Fig. 5** - Relative Radiant Power vs. Wavelength

**Fig. 6** - Relative Radiant Intensity vs. Angular Displacement

**REFLOW 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**

Time between soldering and removing from MBB must not exceed the time indicated in J-STD-020:

- Moisture sensitivity: level 3
- Floor life: 168 h
- Conditions: \(T_{\text{amb}} < 30 \, ^\circ\text{C}, \text{RH} < 60 \%\)

**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 %.
PACKAGE DIMENSIONS in millimeters

Cathode          Bottom view          Anode

1

Side View

2

0.85

0.6

0.6

Top View

1.25

0.82

0.85

Recommended solder pad footprint

1

1

0.6

Drawing-No.: 6.541-5083.01-4
Issue: 2; 10.09.2013
**BLISTER TAPE DIMENSIONS** in millimeters

![Blister Tape Dimensions Diagram]

**REEL DIMENSIONS** in millimeters

![Reel Dimensions Diagram]

Form of the leave open of the wheel is supplier specific.
Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, “Vishay”), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay’s knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer’s responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer’s technical experts. Product specifications do not expand or otherwise modify Vishay’s terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.