Surf ec e Mount Schottky Barrier Rectifiers

**FEATURES**
- Very low profile - typical height of 0.65 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available
  - Automotive ordering code: base P/NHM3
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

**TYPICAL APPLICATIONS**
For use in low voltage high frequency inverters, freewheeling, DC/DC converters, and polarity protection applications.

**MECHANICAL DATA**
- Case: MicroSMP
- Molding compound meets UL 94 V-0 flammability rating
- Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade
- Base P/NHM3 - halogen-free, RoHS-compliant, and AEC-Q101 qualified
- Base P/NHM3_X - halogen-free, RoHS-compliant, and AEC-Q101 qualified
  - ("_X" denotes revision code e.g. A, B,...)
- Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
  - M3 suffix meets JESD 201 class 2 whisker test, HM3 suffix meets JESD 201 class 2 whisker test
- Polarity: color band denotes the cathode end

**MAXIMUM RATINGS** (T_A = 25 °C unless otherwise noted)

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>SYMBOL</th>
<th>MSS1P3</th>
<th>MSS1P4</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device marking code</td>
<td></td>
<td>13</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Maximum repetitive peak reverse voltage</td>
<td>V_{RRM}</td>
<td>30 V</td>
<td>40 V</td>
<td>V</td>
</tr>
<tr>
<td>Maximum average forward rectified current (fig. 1)</td>
<td>I_{F(AV)}</td>
<td>1.0 A</td>
<td></td>
<td>A</td>
</tr>
<tr>
<td>Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load</td>
<td>I_{FSM}</td>
<td>25 A</td>
<td></td>
<td>A</td>
</tr>
<tr>
<td>Operating junction and storage temperature range</td>
<td>T_{J, TSTG}</td>
<td>-55 to +150 °C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Revision: 03-May-2018
Document Number: 89019

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**ELECTRICAL CHARACTERISTICS** \((T_A = 25 \, ^\circ\text{C} \text{ unless otherwise noted})\)

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>TEST CONDITIONS</th>
<th>SYMBOL</th>
<th>TYP.</th>
<th>MAX.</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum instantaneous forward voltage</td>
<td>(I_F = 0.5 , \text{A}) (T_J = 25 , ^\circ\text{C})</td>
<td>(V_F) ((1))</td>
<td>0.41</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td>(I_F = 1.0 , \text{A}) (T_J = 125 , ^\circ\text{C})</td>
<td></td>
<td>0.48</td>
<td>0.55</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(I_F = 0.5 , \text{A}) (T_J = 125 , ^\circ\text{C})</td>
<td></td>
<td>0.32</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(I_F = 1.0 , \text{A}) (T_J = 125 , ^\circ\text{C})</td>
<td></td>
<td>0.41</td>
<td>0.46</td>
<td></td>
</tr>
<tr>
<td>Maximum reverse current</td>
<td>Rated (V_R) (T_J = 25 , ^\circ\text{C})</td>
<td>(I_R) ((2))</td>
<td>8.5</td>
<td>200</td>
<td>(\mu\text{A})</td>
</tr>
<tr>
<td></td>
<td>(T_J = 125 , ^\circ\text{C})</td>
<td></td>
<td>4.5</td>
<td>15</td>
<td>mA</td>
</tr>
<tr>
<td>Typical junction capacitance</td>
<td>4.0 V, 1 MHz</td>
<td>(C_J)</td>
<td>50</td>
<td>-</td>
<td>pF</td>
</tr>
</tbody>
</table>

**Notes**

(1) Pulse test: 300 \(\mu\text{s}\) pulse width, 1 % duty cycle
(2) Pulse test: Pulse width \(\leq\) 40 ms

**THERMAL CHARACTERISTICS** \((T_A = 25 \, ^\circ\text{C} \text{ unless otherwise noted})\)

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>SYMBOL</th>
<th>MSS1P3</th>
<th>MSS1P4</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical thermal resistance</td>
<td>(R_{JA}) ((1))</td>
<td>125</td>
<td></td>
<td>°C/W</td>
</tr>
<tr>
<td></td>
<td>(R_{JC}) ((1))</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(R_{JA}) ((1))</td>
<td>40</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note**

(1) Thermal resistance from junction to ambient and junction to lead mounted on PCB with 6.0 mm x 6.0 mm copper pad areas \(R_{JA}\) is measured at the terminal of cathode band. \(R_{JC}\) is measured at the top center of the body

**ORDERING INFORMATION** (Example)

<table>
<thead>
<tr>
<th>PREFERRED P/N</th>
<th>UNIT WEIGHT (g)</th>
<th>PREFERRED PACKAGE CODE</th>
<th>BASE QUANTITY</th>
<th>DELIVERY MODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSS1P4-M3/89A</td>
<td>0.006</td>
<td>89A</td>
<td>4500</td>
<td>7” diameter plastic tape and reel</td>
</tr>
<tr>
<td>MSS1P4HM3/89A ((1))</td>
<td>0.006</td>
<td>89A</td>
<td>4500</td>
<td>7” diameter plastic tape and reel</td>
</tr>
<tr>
<td>MSS1P4HM3_A/H ((1))</td>
<td>0.006</td>
<td>H</td>
<td>4500</td>
<td>7” diameter plastic tape and reel</td>
</tr>
</tbody>
</table>

**Note**

(1) AEC-Q101 qualified

**RATINGS AND CHARACTERISTICS CURVES** \((T_A = 25 \, ^\circ\text{C} \text{ unless otherwise noted})\)

- **Fig. 1 - Maximum Forward Current Derating Curve**
- **Fig. 2 - Forward Power Loss Characteristics**
Fig. 3 - Typical Instantaneous Forward Characteristics

Fig. 4 - Typical Reverse Characteristics

Fig. 5 - Typical Junction Capacitance

Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

MicroSMP (DO-219AD)

Cathode Band

0.055 (1.40)
0.047 (1.20)

0.091 (2.30)
0.083 (2.10)
0.106 (2.70)
0.091 (2.30)

0.039 (0.98)
0.031 (0.78)

0.059 (1.50)
0.043 (1.10)
0.030 (0.75)
0.022 (0.55)

Mounting Pad Layout

0.029 (0.73)
0.025 (0.63)

0.011 (0.27)
0.005 (0.12)

0.079 (2.00)

0.043 (1.10)

0.020 (0.50)
0.032 (0.80)
0.032 (0.80)
0.032 (0.80)
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