Medium Barrier Silicon Schottky Diodes

Features
- \( V_F \), \( R_D \) and \( C_J \) Matching Options
- Chip, Beam Lead and Packaged Devices
- Hi-Rel Screening per MIL-PRF-19500 and MIL-PRF-38534 Available

Description
The MSS40-xxx-x Series of Schottky diodes are fabricated on N-Type epitaxial substrates using proprietary processes that yield the highest FCOs in the industry. Optimum mixer performance is obtained with LO power of 0 dBm to +6 dBm per diode.

Chip
Electrical Specifications: \( T_A = 25^\circ C \)

<table>
<thead>
<tr>
<th>Model</th>
<th>Configuration</th>
<th>( V_F ) Typ. V</th>
<th>( V_{BR} ) Min. V</th>
<th>( C_J ) Typ. / Max. pF</th>
<th>( R_S ) Typ. ( \Omega )</th>
<th>( R_D ) Max. ( \Omega )</th>
<th>( F_{CO} ) Typ. GHz</th>
<th>Outline</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSS40-045-C15</td>
<td>Single Junction</td>
<td>0.42</td>
<td>3</td>
<td>0.09 / 0.12</td>
<td>7</td>
<td>15</td>
<td>253</td>
<td>C15</td>
</tr>
<tr>
<td>MSS40-048-C15</td>
<td>Single Junction</td>
<td>0.40</td>
<td>3</td>
<td>0.12 / 0.15</td>
<td>7</td>
<td>15</td>
<td>190</td>
<td>C15</td>
</tr>
<tr>
<td>Test Conditions</td>
<td>I(_F) = 1 mA</td>
<td>( I_R) = 10 ( \mu A )</td>
<td>( V_R = 0 ) V</td>
<td>( F = 1 ) MHz</td>
<td>I = 5 mA</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Beam Lead
Electrical Specifications: \( T_A = 25^\circ C \)

<table>
<thead>
<tr>
<th>Model</th>
<th>Configuration</th>
<th>( V_F ) Typ. V</th>
<th>( V_{BR} ) Min. V</th>
<th>( C_J ) Typ. / Max. pF</th>
<th>( R_S ) Typ. ( \Omega )</th>
<th>( R_D ) Max. ( \Omega )</th>
<th>( F_{CO} ) Typ. GHz</th>
<th>Outline</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSS40-141-B10B</td>
<td>Single Junction</td>
<td>0.42</td>
<td>3</td>
<td>0.06 / 0.10</td>
<td>10</td>
<td>22</td>
<td>265</td>
<td>B10B</td>
</tr>
<tr>
<td>MSS40-148-B10B</td>
<td>Single Junction</td>
<td>0.40</td>
<td>3</td>
<td>0.12 / 0.15</td>
<td>7</td>
<td>17</td>
<td>190</td>
<td>B10B</td>
</tr>
<tr>
<td>MSS40-155-B10B</td>
<td>Single Junction</td>
<td>0.38</td>
<td>3</td>
<td>0.25 / 0.30</td>
<td>5</td>
<td>13</td>
<td>127</td>
<td>B10B</td>
</tr>
<tr>
<td>MSS40-244-B20</td>
<td>Series Tee</td>
<td>0.44</td>
<td>3</td>
<td>0.08 / 0.12</td>
<td>19</td>
<td>22</td>
<td>105</td>
<td>B20</td>
</tr>
<tr>
<td>MSS40-248-B20</td>
<td>Series Tee</td>
<td>0.44</td>
<td>3</td>
<td>0.12 / 0.15</td>
<td>10</td>
<td>17</td>
<td>133</td>
<td>B20</td>
</tr>
<tr>
<td>MSS40-255-B20</td>
<td>Series Tee</td>
<td>0.38</td>
<td>3</td>
<td>0.25 / 0.30</td>
<td>5</td>
<td>15</td>
<td>127</td>
<td>B20</td>
</tr>
<tr>
<td>MSS40-448-B41</td>
<td>Ring Quad</td>
<td>0.40</td>
<td>3</td>
<td>0.12 / 0.15</td>
<td>7</td>
<td>17</td>
<td>190</td>
<td>B41</td>
</tr>
<tr>
<td>MSS40-455-B40</td>
<td>Ring Quad</td>
<td>0.38</td>
<td>3</td>
<td>0.25 / 0.30</td>
<td>5</td>
<td>17</td>
<td>127</td>
<td>B40</td>
</tr>
<tr>
<td>Test Conditions</td>
<td>I(_F) = 1 mA</td>
<td>( I_R) = 10 ( \mu A )</td>
<td>( V_R = 0 ) V</td>
<td>( F = 1 ) MHz</td>
<td>I = 5 mA</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Continued next page)
## MSS40-xxx-x Series

Medium Barrier Silicon Schottky Diodes

Rev. V1

**MSS40-045-P55**
- Single Junction
- $V_F$ Typ.: 0.42 V
- $V_{BR}$ Min.: 3 V
- $C_J$ Typ./Max.: 0.21/0.27 pF
- $R_S$ Typ.: 7 $\Omega$
- $R_D$ Max.: 253 $\Omega$
- Outline: P55

**MSS40-045-P86**
- Single Junction
- $V_F$ Typ.: 0.42 V
- $V_{BR}$ Min.: 3 V
- $C_J$ Typ./Max.: 0.24/0.30 pF
- $R_S$ Typ.: 7 $\Omega$
- $R_D$ Max.: 253 $\Omega$
- Outline: P86

**MSS40-048-P55**
- Single Junction
- $V_F$ Typ.: 0.40 V
- $V_{BR}$ Min.: 3 V
- $C_J$ Typ./Max.: 0.24/0.30 pF
- $R_S$ Typ.: 7 $\Omega$
- $R_D$ Max.: 190 $\Omega$
- Outline: P55

**MSS40-048-P86**
- Single Junction
- $V_F$ Typ.: 0.40 V
- $V_{BR}$ Min.: 3 V
- $C_J$ Typ./Max.: 0.27/0.33 pF
- $R_S$ Typ.: 7 $\Omega$
- $R_D$ Max.: 190 $\Omega$
- Outline: P86

**MSS40-141-E25**
- Single Junction
- $V_F$ Typ.: 0.42 V
- $V_{BR}$ Min.: 3 V
- $C_J$ Typ./Max.: 0.16/0.22 pF
- $R_S$ Typ.: 10 $\Omega$
- $R_D$ Max.: 265 $\Omega$
- Outline: E25

**MSS40-141-H20**
- Single Junction
- $V_F$ Typ.: 0.42 V
- $V_{BR}$ Min.: 3 V
- $C_J$ Typ./Max.: 0.24/0.30 pF
- $R_S$ Typ.: 10 $\Omega$
- $R_D$ Max.: 265 $\Omega$
- Outline: H20

**MSS40-148-E25**
- Single Junction
- $V_F$ Typ.: 0.40 V
- $V_{BR}$ Min.: 3 V
- $C_J$ Typ./Max.: 0.22/0.28 pF
- $R_S$ Typ.: 7 $\Omega$
- $R_D$ Max.: 190 $\Omega$
- Outline: E25

**MSS40-148-H20**
- Single Junction
- $V_F$ Typ.: 0.40 V
- $V_{BR}$ Min.: 3 V
- $C_J$ Typ./Max.: 0.30/0.36 pF
- $R_S$ Typ.: 7 $\Omega$
- $R_D$ Max.: 190 $\Omega$
- Outline: H20

**MSS40-155-E25**
- Single Junction
- $V_F$ Typ.: 0.38 V
- $V_{BR}$ Min.: 3 V
- $C_J$ Typ./Max.: 0.35/0.41 pF
- $R_S$ Typ.: 5 $\Omega$
- $R_D$ Max.: 127 $\Omega$
- Outline: E25

**MSS40-155-H20**
- Single Junction
- $V_F$ Typ.: 0.38 V
- $V_{BR}$ Min.: 3 V
- $C_J$ Typ./Max.: 0.43/0.50 pF
- $R_S$ Typ.: 5 $\Omega$
- $R_D$ Max.: 127 $\Omega$
- Outline: H20

**MSS40-244-E35**
- Series Tee
- $V_F$ Typ.: 0.44 V
- $V_{BR}$ Min.: 3 V
- $C_J$ Typ./Max.: 0.18/0.24 pF
- $R_S$ Typ.: 19 $\Omega$
- $R_D$ Max.: 105 $\Omega$
- Outline: E35

**MSS40-248-E35**
- Series Tee
- $V_F$ Typ.: 0.44 V
- $V_{BR}$ Min.: 3 V
- $C_J$ Typ./Max.: 0.22/0.28 pF
- $R_S$ Typ.: 10 $\Omega$
- $R_D$ Max.: 133 $\Omega$
- Outline: E35

**MSS40-255-E35**
- Series Tee
- $V_F$ Typ.: 0.38 V
- $V_{BR}$ Min.: 3 V
- $C_J$ Typ./Max.: 0.35/0.41 pF
- $R_S$ Typ.: 5 $\Omega$
- $R_D$ Max.: 127 $\Omega$
- Outline: E35

**MSS40-448-E45**
- Ring Quad
- $V_F$ Typ.: 0.40 V
- $V_{BR}$ Min.: 3 V
- $C_J$ Typ./Max.: 0.24/0.30 pF
- $R_S$ Typ.: 7 $\Omega$
- $R_D$ Max.: 190 $\Omega$
- Outline: E45

**MSS40-455-E45**
- Ring Quad
- $V_F$ Typ.: 0.38 V
- $V_{BR}$ Min.: 3 V
- $C_J$ Typ./Max.: 0.32/0.38 pF
- $R_S$ Typ.: 5 $\Omega$
- $R_D$ Max.: 127 $\Omega$
- Outline: E45

**MSS40-455-H40**
- Ring Quad
- $V_F$ Typ.: 0.38 V
- $V_{BR}$ Min.: 3 V
- $C_J$ Typ./Max.: 0.42/0.48 pF
- $R_S$ Typ.: 5 $\Omega$
- $R_D$ Max.: 127 $\Omega$
- Outline: H40

| Test Conditions | $I_F = 1$ mA | $I_R = 10$ $\mu$A | $V_R = 0$ V | $F = 1$ MHz | $I = 5$ mA |

## Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reverse Voltage</td>
<td>Rated $V_{BR}$</td>
</tr>
<tr>
<td>Forward Current</td>
<td>50 mA</td>
</tr>
<tr>
<td>Power Dissipation</td>
<td>100 mW, per junction @ $T_A = 25$°C, derate linearly to 0 @ $T_A = +150$°C</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-65°C to +150°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-65°C to +150°C</td>
</tr>
<tr>
<td>Soldering Temperature (packaged)</td>
<td>+230°C for 5 seconds</td>
</tr>
<tr>
<td>Beam Lead Pull Strength</td>
<td>4 G minimum</td>
</tr>
</tbody>
</table>

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Typical Performance Curves: $T_A = 25^\circ C$
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