Frequency Doubler

Features
- Input 3 to 12 GHz
- Output 6 to 24 GHz
- Input Drive Level +13 dBm (nominal)
- Hermetically-Sealed Package

Description
The FDZ5013 is a passive bridge diode frequency doubler, designed for use in military, commercial and test equipment applications. The design utilizes Schottky bridge quad diodes and broadband soft dielectric and/or ferrite baluns to attain excellent performance. The use of high temperature solder assembly processes used internally makes it ideal for use in manual and semi-automated assembly. Environmental screening available to MIL-STD-883, MIL-STD-202, or MIL-DTL-28837, consult factory.

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDZ5013</td>
<td>Versapac</td>
</tr>
<tr>
<td>FDZ5013C</td>
<td>SMA Connectorized</td>
</tr>
</tbody>
</table>

Electrical Specifications: \( Z_0 = 50\Omega \) \( P_{in} = +13 \text{ dBm} \)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Test Conditions</th>
<th>Units</th>
<th>Typical</th>
<th>Guaranteed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>+25°C</td>
<td>-54° to +85°C</td>
</tr>
<tr>
<td>SSB Conversion Loss (max)</td>
<td>( f_i = 3 \text{ to } 12 \text{ GHz} )</td>
<td>dB</td>
<td>12</td>
<td>14.5</td>
</tr>
<tr>
<td></td>
<td>( f_o = 5 \text{ to } 8 \text{ GHz} )</td>
<td>dB</td>
<td>15.0</td>
<td>11.0</td>
</tr>
<tr>
<td></td>
<td>( f_o = 3 \text{ to } 9 \text{ GHz} )</td>
<td>dB</td>
<td>13.0</td>
<td>9.5</td>
</tr>
<tr>
<td></td>
<td>( f_o = 3 \text{ to } 12 \text{ GHz} )</td>
<td>dB</td>
<td>11.0</td>
<td>8.0</td>
</tr>
<tr>
<td>Fundamental Suppression (min)</td>
<td></td>
<td>dBc</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>( f_i = 3.0 \text{ to } 5.0 \text{ GHz} )</td>
<td>dBc</td>
<td>25</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>( f_i = 5.0 \text{ to } 8.5 \text{ GHz} )</td>
<td>dBc</td>
<td>22</td>
<td>17</td>
</tr>
<tr>
<td>Third Harmonic Suppression</td>
<td></td>
<td>dBc</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input VSWR</td>
<td>( f_i = 5 \text{ to } 10 \text{ GHz} )</td>
<td></td>
<td>1.7:1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>( f_i = 3 \text{ to } 12 \text{ GHz} )</td>
<td></td>
<td>2.0:1</td>
<td></td>
</tr>
</tbody>
</table>
FDZ5013 / FDZ5013C

Frequency Doubler

Typical Performance Curves

**VSWR vs. Frequency**

- **Input Frequency (GHz)**
  - **2**
  - **4**
  - **6**
  - **8**
  - **10**
  - **12**
  - **14**

- **VSWR**
  - **1.0**
  - **1.5**
  - **2.0**
  - **2.5**

- **Power Input**
  - **P_{in} = +10 dBm**
  - **P_{in} = +12 dBm**

**Conversion Loss vs. Frequency**

- **Conversion Loss (dB)**
  - **10**
  - **11**
  - **12**
  - **13**
  - **14**
  - **15**

- **Power Input**
  - **P_{in} = +11 dBm**
  - **P_{in} = +15 dBm**

**Fundamental Suppression vs. Frequency**

- **Fundamental Suppression (dB)**
  - **0**
  - **5**
  - **10**
  - **15**
  - **20**

- **Power Input**
  - **P_{in} = +11 dBm**
  - **P_{in} = +15 dBm**

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# FDZ5013 / FDZ5013C

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### Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Absolute Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature</td>
<td>-54°C to +100°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-65°C to +100°C</td>
</tr>
<tr>
<td>Peak Input Power</td>
<td>+23 dBm max @ +25°C, +20 dBm max @ +100°C</td>
</tr>
<tr>
<td>Peak Input Current</td>
<td>50 mA DC</td>
</tr>
</tbody>
</table>

### 3rd Harmonic Suppression vs. Frequency

* Dimensions are inches (millimeters) ±0.015 (0.38) unless otherwise specified.

## Outline Drawing: Versapac *

Weight: 4 grams (0.14 oz.) max

## Outline Drawing: SMA Connectorized *

Weight: 13 grams (0.46 oz.) max

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