APPLICATION NOTE 890

Silicon Germanium (SiGe) Downconverter Tuned for GPS Receivers

May 01, 2002

Abstract: The RF input for a global positioning system (GPS) receiver is 1575MHz. Assuming an IF of 85MHz, and low-side LO injection (f_LO = 1490MHz), the MAX2682 achieves +12.0dB of gain, has a noise figure of 9.2dB, an input third-order intercept point (IIP3) of +1.8dBm and draws 14.7mA of supply current from a +3.0V supply.

Additional Information
- Wireless Product Line Page
- Quick View Data Sheet for the MAX2682/MAX2681/MAX2682 Downconverters
- Applications Technical Support

The MAX2682 is one of a family of Silicon Germanium (SiGe) downconverters designed for low-voltage, low-current operation, and is ideal for portable communications equipment. The MAX2682 can be used with input radio frequencies (RFs) between 400MHz and 2500MHz, to downconvert to intermediate frequencies (IFs) between 10MHz to 500MHz. The RF input for a global positioning system (GPS) receiver is 1575MHz. Assuming an IF of 85MHz, and low-side LO injection (f_LO = 1490MHz), the MAX2682 achieves +12.0dB of gain, has a noise figure of 9.2dB, an input third-order intercept point (IIP3) of +1.8dBm and draws 14.7mA of supply current from a +3.0V supply. See Figure 1 for component values and the schematic. For application of the MAX2682 at 900MHz, 1950MHz of 2450MHz, or for further device information, consult the MAX2680/MAX2681/MAX2682 Silicon Germanium (SiGe) Downconverters data sheet.
Figure 1. MAX2682 Silicon Germanium (SiGe) downconverter mixer for GPS applications.

Table 1. MAX2682 SiGe Downconverter GPS Performance
VCC = +3.0V, fRF1 = 1575MHz, fRF2 = 1576MHz, fLO = 1490MHz, PLO = -5dBm, fIF = 85MHz

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Measured Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conversion Gain</td>
<td>+12.0dB</td>
</tr>
<tr>
<td>Noise Figure</td>
<td>9.2dB</td>
</tr>
<tr>
<td>Input Third-Order Intercept Point</td>
<td>+1.8dBm</td>
</tr>
<tr>
<td>RF Input Return Loss</td>
<td>-35dB</td>
</tr>
<tr>
<td>IF Output Return Loss</td>
<td>-23dB</td>
</tr>
<tr>
<td>Supply Current</td>
<td>14.7mA</td>
</tr>
</tbody>
</table>

Related Parts

MAX2682 400MHz to 2.5GHz, Low-Noise, SiGe Downconverter Mixers Free Samples

More Information
For Technical Support: http://www.maximintegrated.com/support
For Samples: http://www.maximintegrated.com/samples
Other Questions and Comments: http://www.maximintegrated.com/contact

Application Note 890: http://www.maximintegrated.com/an890
APPLICATION NOTE 890, AN890, AN 890, APP890, Appnote890, Appnote 890
Copyright © by Maxim Integrated Products
Additional Legal Notices: http://www.maximintegrated.com/legal