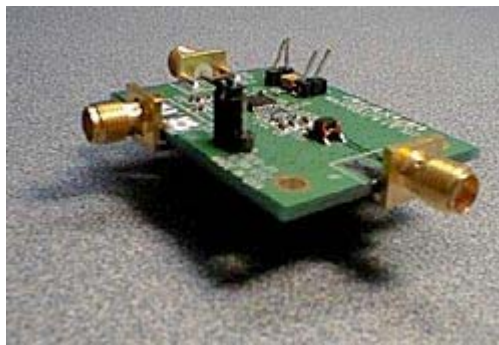


REP023: 3.5GHz Upconverter from 350MHz Achieves 9dB Gain and 1.3dBm IIP3

Rapid Engineering Prototypes are real circuits that Maxim application engineers have built and measured in our labs. They can provide a starting point for new RF designs. They are not available as Evaluation Kits.

Additional Information: [Wireless Product Line Page](#)
[Quick View Data Sheet for the MAX2683/MAX2684](#)
[Applications Technical Support](#)



Objective: To develop a circuit that applies this downconverter IC as an upconverter.

Characterized as an upconverter, the MAX2683 was tested for performance converting from a 350MHz IF input band (via the RF input pin), using a 2.0GHz LO and observing the 3.55GHz output (from the differential IF out pins). A balun was used to transform the output to a 50-ohm line. An upconversion gain of almost 9dB was achieved, with linearity of +1.3dBm IIP3. A set of S-parameters is available as well to support design of matching networks. The application is considered a complete success.

The MAX2683 is a high-performance low-powered downconverter intended for operating in the receive path of 3.5GHz wireless data transceivers. It offers 6dB conversion gain with variable IIP3 up to 11dBm, from between 100MHz and 400MHz IF, converting to 3.5GHz and using a low-side LO (approximately 2.7GHz LO). The MAX2683 features an LO doubler for 1/2 frequency local oscillator input, which can be toggled between fundamental mode and doubler mode. It operates from as low as 2.7VDC and is available in a 16-pin TSSOP package.

[Schematic for Upconverter Application](#) (PDF, 34K)

[PCB Layout Plots](#)

[Bill of Materials](#)

[Measurement Test Setup](#)

[S11 LOG MAG of RF IN Input Match Results with Vcc = 3.3V](#)

[S11 LOG MAG of RF LO Input Match Results with Vcc = 3.3V](#)

[S11 LOG MAG of Mixer's Differential Output Matching Results with Vcc = 3.3V](#)

[S11 LOG MAG of RF IN Input Match Results with Vcc = 5.0V](#)

[S11 LOG MAG of RF LO Input Match Results with Vcc = 5.0V](#)

[S11 LOG MAG of Mixer's Differential Output Matching Results with Vcc = 5.0V](#)

REPPC18Q300, November 2000