

APPLICATION NOTE 1113

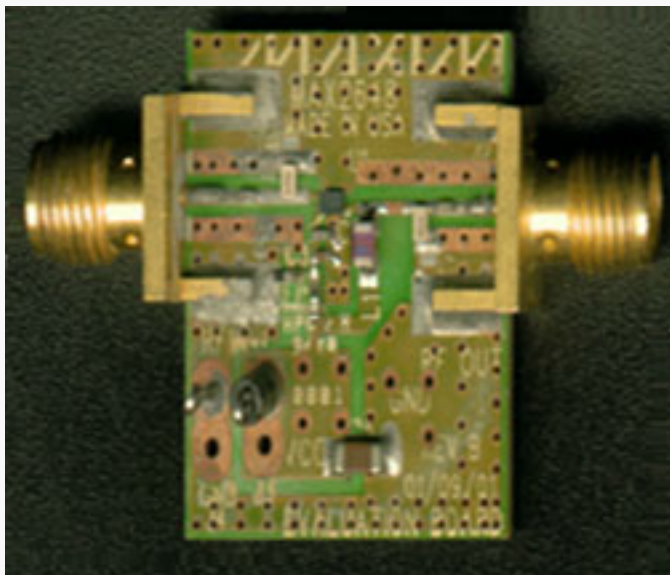
## REP038: The MAX2648 for 5GHz WLAN

*Abstract: Presents design layout used to implement a 5GHz low-noise amplifier (LNA) based on the MAX2648. Low cost FR-4 PCB material is used.*

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 MAX2648](#)
- [Applications Technical Support](#)
- [MAX2828/9 802.11a/b/g World-Band Transceiver ICs](#)
- A WLAN 802.11a/b/g World-Band reference design using MAX2828/9 is currently available. Please contact the factory for more information.



The MAX2648 is a high-linearity, silicon-germanium (SiGe) low-noise amplifier (LNA) designed for 5GHz wireless LAN systems based on 802.11a and HiperLAN2 standards. In order to achieve a low cost design, the device can be replicated using a FR4 type substrate with coplanar waveguide traces rather than the microstrip on Duroid used in the MAX2648 EV Kit. Agilent™ ADS was utilized to model the EV Board topology into the new coplanar format.

## PCB Specifications

RF Substrate Height	3.9mils
Overall Board Height	62mils nominal
Transmission Line Configurations	Grounded Coplanar Wave Guide (CPWG)
Width	7.2mils
Gap	10mils

## Recommended Input Network Line Lengths

**All distances are from center to center of component mounting pads**

C10 to C11	75mils
C11 to U1	90mils

## Recommended Output Network Line Lengths

**All distances are from center to center of component mounting pads except where noted**

U1 to L1	45mils (center of U1 output pad to edge of L1 pad)
L1 to C13	154mils
C13 to C15	21mils

While the measured performance of the MAX2648 on a low-cost substrate is nearly equivalent to the performance of the MAX2648 EVKit, there is a slight degradation of the noise figure due to the higher loss of FR4 material:

Measured loss of EV Kit PCB using Roger's 4350	0.5dB
Measured loss of PCB using FR4	1.2dB

The MAX2648 provides high gain, low noise and high linearity performance. This allows the device to be used as a first-stage LNA, and LO buffer, or a transmitter driver amplifier. It provides 17dB gain, 1.8dB noise figure, and 0dBm input 3rd order intercept point (IIP3) while consuming only 12mA. It is packaged in a tiny 2 × 3 chip-scale package with 6 solder bumps, measuring 1.0mm × 1.5mm.

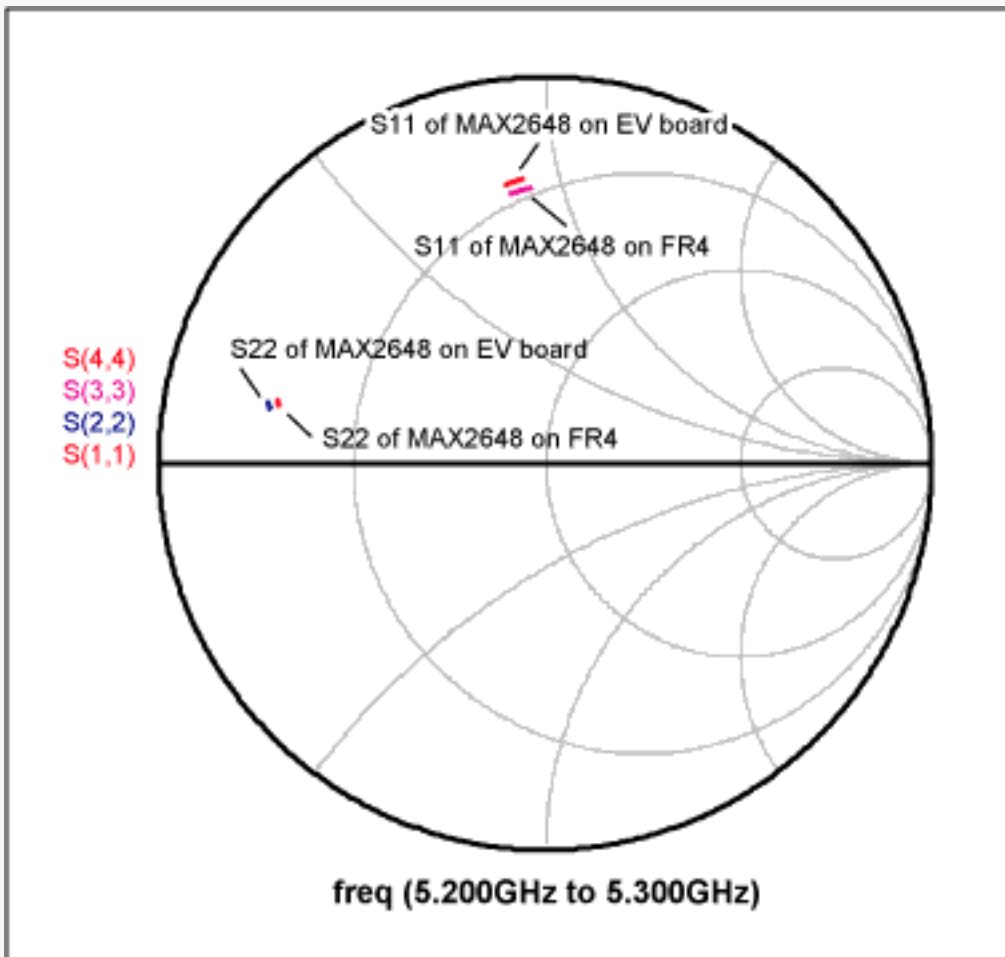


Figure 1.

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Application note 1113: [www.maxim-ic.com/an1113](http://www.maxim-ic.com/an1113)

#### More Information

For technical support: [www.maxim-ic.com/support](http://www.maxim-ic.com/support)

For samples: [www.maxim-ic.com/samples](http://www.maxim-ic.com/samples)

Other questions and comments: [www.maxim-ic.com/contact](http://www.maxim-ic.com/contact)

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#### Related Parts

MAX2648: [QuickView](#) -- [Full \(PDF\) Data Sheet](#)

AN1113, AN 1113, APP1113, Appnote1113, Appnote 1113

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