



## DC689A DEMO BOARD QUICK START GUIDE

### *Description:*

The DC689A demo circuit board is intended to demonstrate the capabilities of the LT<sup>®</sup>5522 high-signal-level downconverting mixer IC for wireless infrastructure applications.

The LT<sup>®</sup>5522 (Figure 1) is a broadband high signal level active mixer optimized for high linearity downconverter applications including cable (CATV) and wireless infrastructure. The IC includes a high-speed differential LO buffer amplifier driving a double-balanced mixer. The LO buffer is internally 50ohm-matched for wideband, single-ended operation with no external components.

The LT5522 IC's RF input port incorporates an integrated transformer and is internally matched to 50ohms over the 1.2GHz to 2.3GHz frequency range. The RF input match can be shifted down to 600MHz, or up to 2.7GHz, with a single shunt capacitor or inductor, respectively. The high level of integration minimizes the total solution cost, board space and system-level variation.

The LT5522 delivers high performance and small size without excessive power consumption.

The DC689A demo board allows evaluation of the LT5522 downconverting mixer IC for wireless infrastructure applications with RF input frequencies between 1.2GHz to 2.3GHz. The IF output frequency is 140MHz. The corresponding range of LO frequencies is 1060MHz to 2160MHz (low side injection), or 1340MHz to 2440MHz (high side injection).

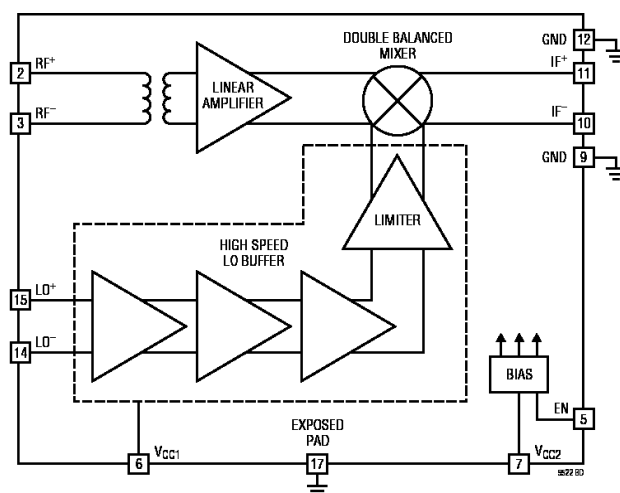


Figure 1. LT5522 IC Block Diagram

## LT5522 Downconverting Mixer Single-Tone Measurements for PCS Band.

1. Connect all test equipment as shown in Figure 2.
2. Set the Power Supply voltage to 5V, and set the current limit to 100mA.
3. Connect TP1 (EN) to the 5V power supply; the mixer is enabled (on).
4. Set the Signal Generator #1 to provide a 1760MHz, -5dBm CW signal to the demo board LOin port.
5. Set the Signal Generator #2 to provide a 1900MHz, -7dBm CW signal to the demo board RFin port.
6. Set the Spectrum Analyzer center frequency to 140MHz. Perform mixer conversion gain, and 1dB compression measurements.
7. Set the Spectrum Analyzer center frequency to 1760MHz. Perform the mixer LO to IF leakage measurement.

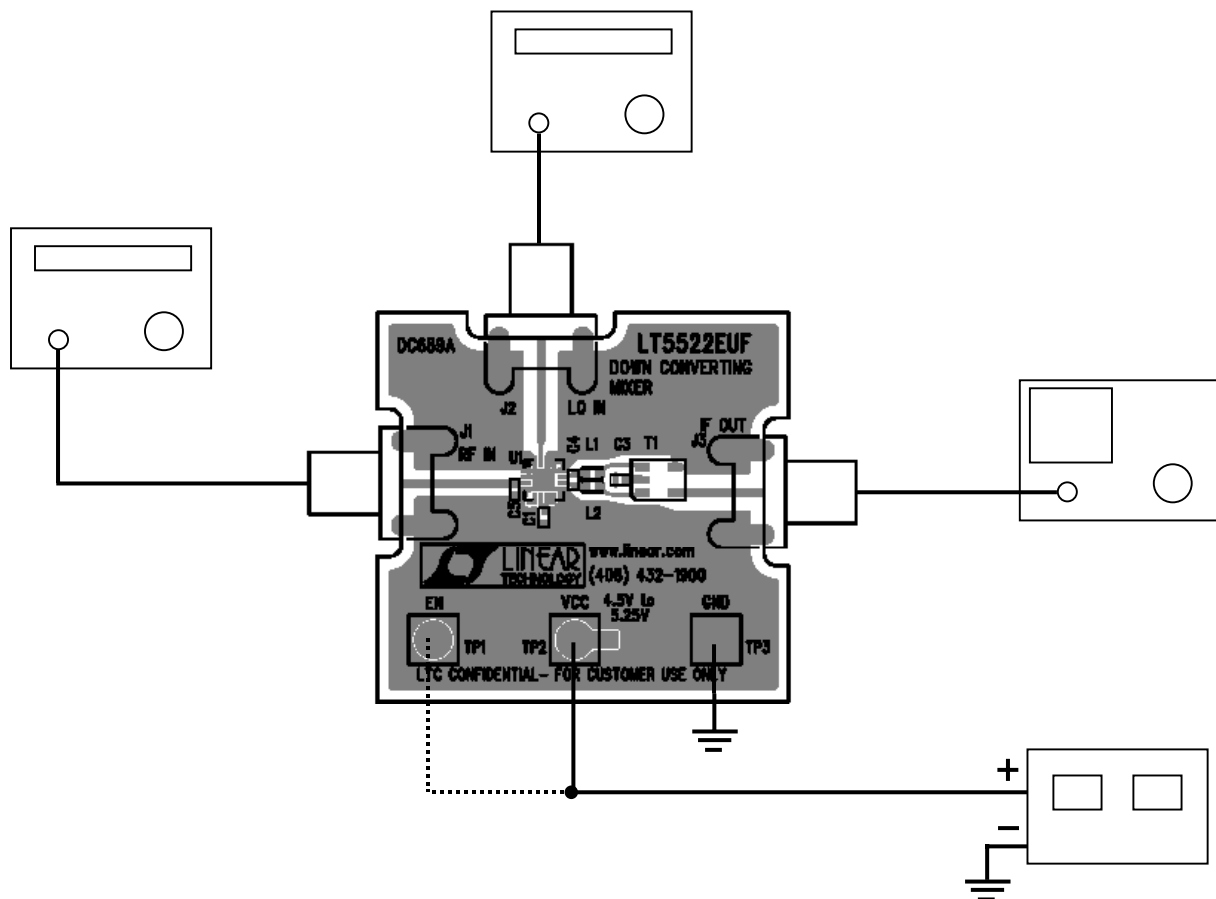


Figure 2. Test Set-Up for Mixer Single-Tone Measurements.

## LT5522 Downconverting Mixer Two-Tone Measurements for PCS Band.

1. Connect all test equipment as shown in Figure 3.
  - 1). Use high quality signal generators with low harmonic output for this measurement. Otherwise, low-pass filters should be used to suppress harmonics.
  - 2). A high quality combiner that provides 50ohm termination on all ports and has good port-to-port isolation should be used.
  - 3). The two 3dB attenuators on the inputs of the combiner are used to further improve source isolation.
2. Set the Power Supply voltage to 5V, and set the current limit to 100mA.
3. Connect TP1 (EN) to the 5V power supply; the mixer is enabled (on).
4. Set the Signal Generator #1 to provide a 1760MHz, -5dBm, CW signal to the demo board LOin port.
5. Set the Signal Generator #2 and #3 to provide two -7dBm CW signals to the demo board RFin port—one at 1900MHz, and the other at 1901MHz.
6. Set the Spectrum Analyzer center frequency to 140MHz. Perform the input 3<sup>rd</sup> order distortion measurement. ( $IIP3 = P_1 + (P_1 - P_3) / 2 - G_c$ , where  $P_1$  is the lowest power level of the two desired output tones at either 140MHz or 141MHz,  $P_3$  is the largest 3<sup>rd</sup> order product at either 139MHz or 142MHz, and  $G_c$  is conversion gain.  $P_1$  and  $P_3$  are in units of dBm, and  $G_c$  is in dB).

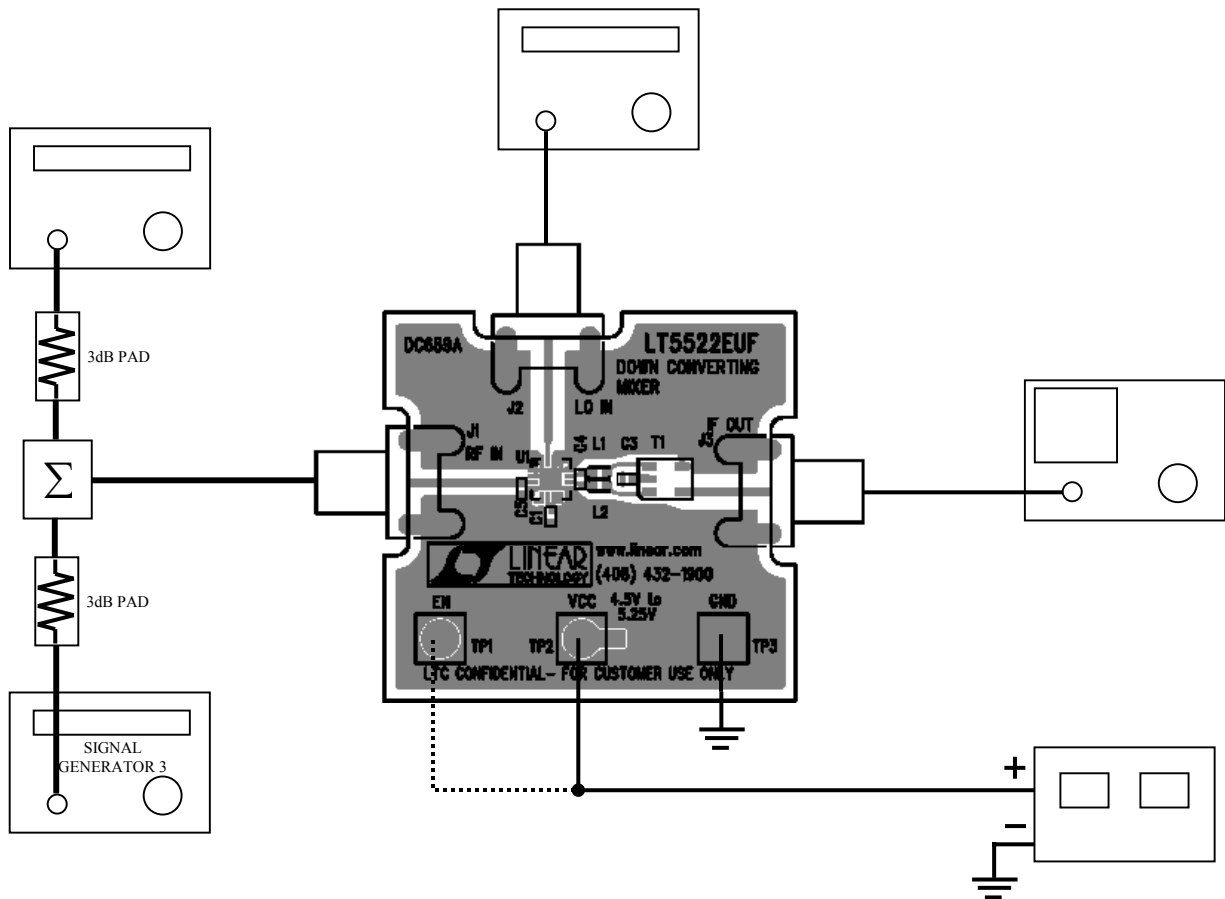
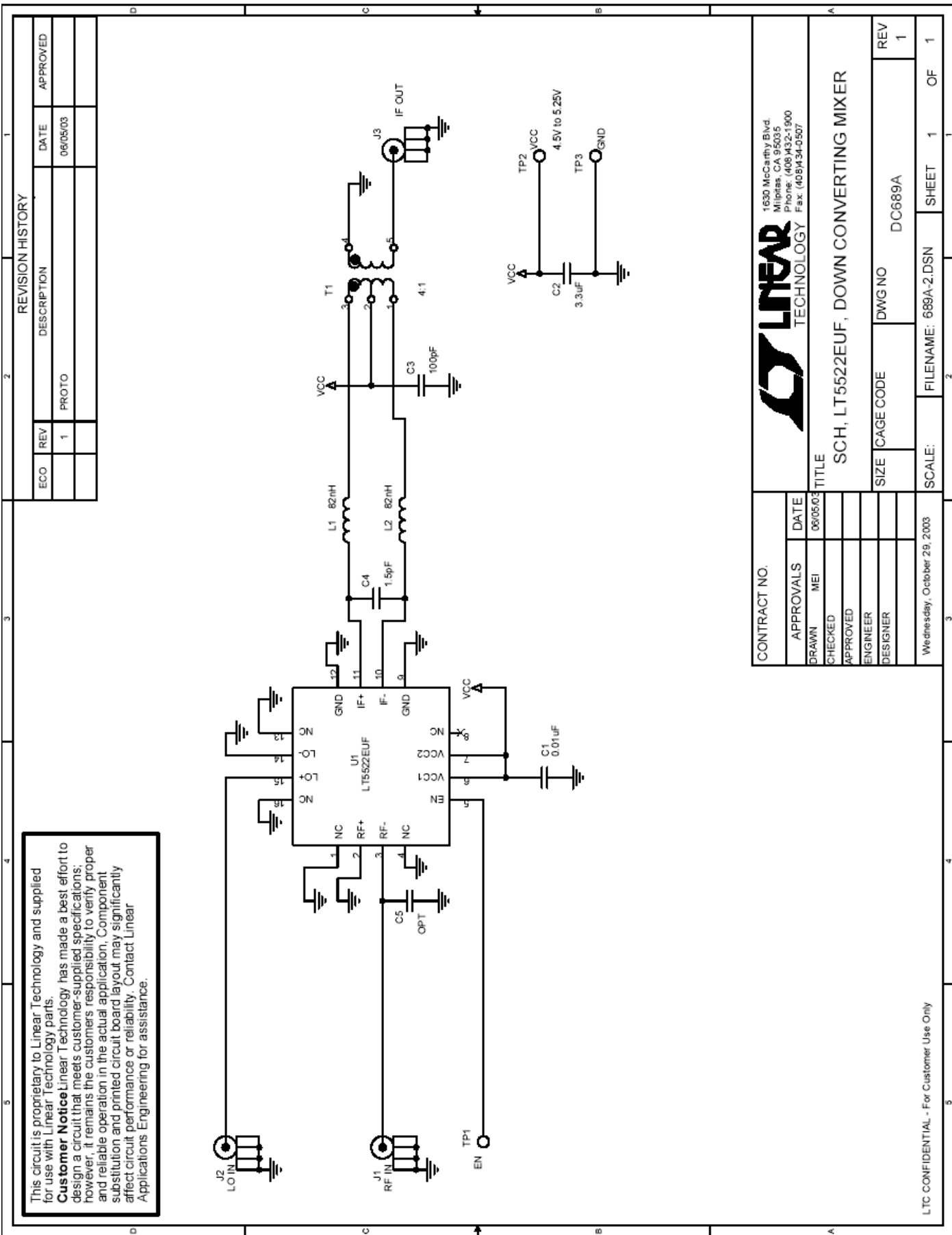


Figure 3. Test Set-Up for Mixer Two-Tone Measurements.



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