

LTC5599

30MHz to 1300MHz Low Power

Direct Quadrature Modulator

FEATURES

- Frequency Range: 30MHz to 1300MHz
- Low Power: 2.7V to 3.6V Supply; 28mA
- Low LO Carrier Leakage: -51.5dBm at 500MHz
- Side-Band Suppression: -52.6dBc at 500MHz
- Output IP3: 20.8dBm at 500MHz
- Low RF Output Noise Floor: -156dBm/Hz at 6MHz Offset, $P_{RF} = 3\text{dBm}$
- Sine Wave or Square Wave LO Drive
- SPI Control:
 - Adjustable Gain: -19dB to 0dB in 1dB Steps
 - Effecting Supply Current from 8mA to 35mA
 - I/Q Offset Adjust: -65dBm LO Carrier Leakage
 - I/Q Gain/Phase Adjust: -60dBc Side-Band Suppressed
- 24-Lead QFN 4mm × 4mm Package

APPLICATIONS

- Wireless Microphones
- Battery Powered Radios
- Ad-Hoc Wireless Infrastructure Networks
- “White-Space” Transmitters
- Software Defined Radios (SDR)
- Military Radios

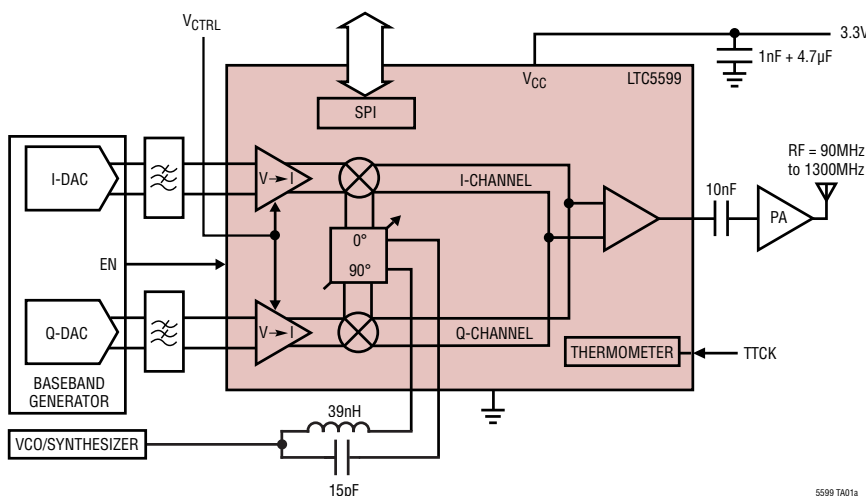
DESCRIPTION

The LTC[®]5599 is a direct conversion I/Q modulator designed for low power wireless applications that enable direct modulation of differential baseband I and Q signals on an RF carrier. Single side-band modulation or side-band suppressed upconversion can be achieved by applying 90° phase-shifted signals to the I and Q inputs. The I/Q baseband input ports can be either AC or DC coupled to a source with a common mode voltage level of about 1.4V. The SPI interface controls the supply current, modulator gain, and allows optimization of the LO carrier feedthrough and side-band suppression, with sine wave or square wave LO drive. A fixed LC network on the LO and RF ports covers a continuous 90MHz to 1300MHz operation. An on-chip thermometer can be activated to compensate for gain-temperature variations. More accurate temperature measurements can be made using an on-chip diode. In addition, a continuous analog gain control (V_{CTRL}) pin can be used for fast power control.

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TYPICAL APPLICATION

90MHz to 1300MHz Direct Conversion Transmitter Application



EVM and Noise Floor vs RF Output Power and Digital Gain Setting with 1Ms/s 16-QAM Signal

