

## **300MHz to 6GHz Dual Wideband Mixer with Programmable Gain Amplifiers Enables 5G Wireless Access**

MILPITAS, CA – February 1, 2017 – Linear Technology introduces the [LTC5566](#), a new wideband, high dynamic range dual channel mixer with integrated programmable variable gain IF amplifiers. This dual mixer has a very wide, 300MHz to 6GHz input frequency range, specifically optimized and with extensive characterization at the emerging 3.6GHz and 4.5GHz 5G bands, as well as the established 4G bands. Moreover, the device supports bandwidths up to 400MHz to meet the needs of the growing sub-6GHz 5G wireless access equipment. This dual mixer has outstanding dynamic range, with Input P1dB of +11.5dBm and Input IP3 of +25.5dBm at 3.6GHz. At higher frequencies, up to 5.8GHz, its IIP3 sustains more than +24dBm. The device's integrated IF amplifier boosts the overall power conversion gain to a maximum of 12dB. The gain of each channel is independently programmed in precise 0.5dB steps via the on-chip SPI bus. So, with each channel driving an A/D converter, the fine gain control provides a simple means to balance the gain of the two channels and calibrate to the optimum level with minimal external components.

The LTC5566 is ideal for use in 5G wireless multichannel RRH (remote radio head) wireless access equipment that requires better performance and wider bandwidths at higher frequencies. Moreover, the device's high level of integration enables high channel counts to be packed into a small enclosure. Other suitable applications include 4G LTE-Advanced, diversity receivers, distributed antenna systems and software-defined radio.

The LTC5566 is built on an active, double-balanced mixer core with no conversion loss and with excellent port-to-port isolation, reducing external RF filtering requirements. Each mixer input includes an integrated wideband balun transformer, allowing a simple single-ended interface. Using the SPI or parallel pins, the mixer inputs can be digitally tuned for optimum return loss over several wide, overlapping frequency bands, ranging from 1.3GHz to 5.3GHz, ensuring flexibility for use in software-defined radio applications without extra external components. The lower 450MHz, 700MHz and 900MHz bands are also supported by the

addition of a single external shunt inductor for proper matching, yielding superb dynamic range performance. Higher frequencies above 5.3GHz, such as 5.8GHz, can be achieved using a simple external matching circuit.

The LTC5566 has outstanding 50dB channel-to-channel isolation up to 3.6GHz. At 4.5GHz, the channel isolation is still 40dB. Both channels exhibit very low phase shift over the full 15.5dB attenuation range, critical for MIMO receiver applications.

The LTC5566 operates from a single 3.3V supply. With both channels on, the device draws a nominal supply current of 384mA. Each mixer can be turned on or off independently with separate control lines. Additionally, a low power mode is available, ensuring operation at a reduced supply current of 294mA, although with a slight decrease in IP3 performance. The product is rated for -40°C to 105°C case temperature operation and is offered in a 5mm x 5mm 32-lead plastic QFN package. The LTC5566 is priced starting at \$9.45 each in 1,000-piece quantities, and is available immediately in production quantities. For more information, visit [www.linear.com/product/LTC5566](http://www.linear.com/product/LTC5566).

**Photo Caption:** 300MHz to 6GHz Dual Wideband Mixer with Programmable Gain Amplifiers

### Summary of Features: LTC5566


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|--|-----------------------------|
| • Wide Operating Frequency Range       | 300MHz to 6GHz              |
| • Excellent High Band Performance      | 2.6GHz, 3.6GHz & 4.5GHz     |
| • Maximum Conversion Power Gain        | 12dB                        |
| • SPI Programmable Gain in 0.5dB Steps | -3.5dB to 12dB (Power Gain) |
| • High Input IIP3 at 3.6GHz            | +25.5dBm                    |
| • IF Bandwidth                         | 400MHz                      |

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### About Linear Technology

Linear Technology Corporation, a member of the S&P 500, has been designing, manufacturing and marketing a broad line of high performance analog integrated circuits for major companies worldwide for over three decades. The Company's products provide an essential bridge between our analog world and the digital electronics in communications, networking, industrial, automotive, computer, medical, instrumentation, consumer, and military and aerospace systems. Linear Technology produces power management, data conversion, signal conditioning, RF and

interface ICs,  $\mu$ Module<sup>®</sup> subsystems and wireless sensor network products. For more information, visit [www.linear.com](http://www.linear.com)

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