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5MHz to 1.6GHz High Linearity Direct Quadrature Modulator Extends Dynamic Range Performance of Wireless Transmitters

MILPITAS, CA – May 4, 2009 – A new low frequency direct conversion quadrature modulator from Linear Technology Corporation offers superior linearity performance and low noise to enhance the dynamic range performance of basestation transmitters. The LTC5598 offers best-in-class +27.7 dBm OIP3 (Output 3rd Order Intercept) and +74 dBm OIP2 (Output 2nd Order Intercept) performance. In addition, the device has an exceptionally low noise floor of -160 dBm/Hz at a +5 dBm output level. Moreover, the LTC5598 provides -50.4 dBc image rejection and a carrier leakage of -55 dBm. It consumes 20% less power compared to its closest competitor. The combination of function and performance enables design of compact, high performance transmitters for wireless infrastructure equipment.

The LTC5598 has outstanding dynamic range performance, from low frequency to above 1GHz, making it ideal for point-to-point broadband microwave links, 450MHz and 700MHz LTE basestation transmitters, 800MHz GSM / 900MHz EDGE basestation transmitters, 880MHz CDMA2000 basestations, video and cable broadband modulators, multiband military radios, 900MHz multiprotocol RFID readers and satellite transmitters. It is also uniquely capable of operating down to 5MHz, enabling many very low-frequency applications such as 13.56MHz RFID and contactless readers, telemetry, military communications and medical instrumentation.

The LTC5598 integrates two matched, high linearity double-balanced mixers and a broadband precision quadrature phase-shifter with buffered LO. The phase-shifter maintains an accurate 90° phase relationship between the I and the Q mixers' LO inputs to provide excellent image rejection over a wide frequency range. The I and Q input bandwidth of over 400MHz

supports virtually all broadband digital transmission requirements. For ease of use, the two mixer outputs are summed into a single-ended, 50-Ohm terminated RF output.

The LTC5598 operates from a single 5V supply. It runs on a quiescent current of 168mA, consuming 20% less power than other comparable modulators. The LTC5598 provides a power-down feature with turn-on and turn-off time of 75ns and 10ns, respectively, supporting TDD (Time Division Duplex) type transmitters. When the chip is disabled with a logic LOW applied to its ENABLE input pin, the device draws a typical shutdown current of 43uA. The LTC5598 comes in a 24-lead, 4mm x 4mm QFN surface mount package. Pricing starts at \$5.19 each in 1,000-piece quantities. The LTC5598 is available immediately from stock. For more information, visit www.linear.com.

Photo Caption: High Linearity Direct I/Q Modulator


Summary of Features: LTC5598

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|--------------------------------|---------------------------------------|
| • Operating Frequency Range: | 5 MHz to 1.6 GHz |
| • Ultrahigh Output IP3: | +27.7 dBm at 140 MHz |
| • Very Low Output Noise Floor: | -160 dBm/Hz @P _{OUT} = +5dBm |
| • Image Rejection: | -50.4 dBc |
| • Carrier (LO) Leakage: | -55 dBm |

About Linear Technology

Linear Technology Corporation, a manufacturer of high performance linear integrated circuits, was founded in 1981, became a public company in 1986 and joined the S&P 500 index of major public companies in 2000. Linear Technology products include high performance amplifiers, comparators, voltage references, monolithic filters, linear regulators, DC-DC converters, battery chargers, data converters, communications interface circuits, RF signal conditioning circuits, uModule™ products, and many other analog functions. Applications for Linear Technology's high performance circuits include telecommunications, cellular telephones, networking products

such as optical switches, notebook and desktop computers, computer peripherals, video/multimedia, industrial instrumentation, security monitoring devices, high-end consumer products such as digital cameras and MP3 players, complex medical devices, automotive electronics, factory automation, process control, and military and space systems.

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