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A 200MHz to 6GHz Direct Conversion I/Q Modulator Achieves 30.9dBm Output Third-Order Intercept

MILPITAS, CA – September 14, 2010 – Linear Technology introduces the [LTC5588-1](#), a new generation ultra-high linearity direct conversion I/Q modulator that operates over a wide frequency range from 200MHz to 6GHz. The new modulator offers best-in-class linearity performance of 30.9dBm OIP3 (Output Third-Order Intercept) at 2.14GHz – without calibration. The device also has the unique capability for simple calibration by a single-pin adjustment with a DC input voltage that further optimizes its OIP3 up to 35.1dBm. The LTC5588-1's linearity performance is complemented with a noise floor of -160.6dBm/Hz at 6MHz offset, enabling transmitters to achieve unprecedented dynamic range performance.

The LTC5588-1 offers image suppression of -56.6dBc at 2.14GHz. In addition, its carrier leakage is -39.6dBm while delivering 5dBm signal power to its output without calibration. Over the operating temperature range from -40°C to 85°C, both parameters exhibit stable behavior, varying only about +/-3dB. Its performance satisfies the system requirements of the most demanding broadband wireless 4G basestations, including LTE, WiMAX, multi-carrier GSM/EDGE, W-CDMA, TD-SCDMA, CDMA-2000 and CDMA, as well as other high performance wireless applications.

The LTC5588-1's I and Q inputs are biased to a 0.5V DC common-mode voltage that is directly compatible with commercially available D/A converters that have similar DC common-mode voltage. The I and Q inputs support signal bandwidth greater than 400MHz.

The LTC5588-1 is powered from a single 3.3V supply with an operating current of 300mA. The device has an Enable pin, allowing the chip to power down completely. In shutdown mode, the device draws a sleep current of less than 900uA. The modulator has fast turn-on and turn-off time, at 15ns and 5ns, respectively, supporting TDD (Time Division Duplexing) mode of operation. The LTC5588-1 comes in a compact 4mm x 4mm 24-pin QFN package and is available immediately from stock, priced starting at \$5.70 each in 1,000 piece quantities. For more information, visit www.linear.com/5588.


Photo Caption: 200MHz to 6GHz Direct Quadrature Modulator with Ultrahigh OIP3

Summary of Features: LTC5588-1

• Operating Frequency Range	200MHz to 6GHz
• Output IP3 at 900MHz	31.3 dBm
• at 900MHz (Optimized)	35.1 dBm
• Output IP3 at 2.14GHz	30.9 dBm
• at 2.14GHz (Optimized)	35.1 dBm
• Output IP2 at 2.14GHz	58.5 dBm
• Easy Single-Pin Calibration To Optimize OIP3	
• Noise Floor at 6MHz Offset	-160dBm/Hz
• Image Suppression at 2.14GHz	-56.6 dBc (uncalibrated)
• Carrier Leakage ($P_{OUT} = 5\text{dBm}$)	-39.6 dBm
• Low Power Consumption	Single 3.3V, 300mA
• Small Package	4mm x 4mm QFN

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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