Integer-N frequency synthesizers deliver -103dBc spurious output

Linear Technology announces the LTC6946, the first device in a family of high performance integer-N frequency synthesizers with integrated VCO, delivering -226dBc/Hz normalized closed-loop in-band phase noise, superior -274dBc/Hz normalized in-band 1/f noise, and best-in-class -103dBc spurious output. In a typical 900MHz application, these performance attributes help to achieve a closed-loop phase noise of -100dBc/Hz at 1kHz offset. The device is available in three frequency options: the LTC6946-1 tunes from 2.240GHz to 3.740GHz; the LTC6946-2 from 3.080GHz to 4.910GHz; and the LTC6946-3 covers 3.840GHz to 5.790GHz. In addition, each part has an on-chip output divider that is programmable from 1 through 6 to extend frequency coverage to as low as 373MHz.

This family of devices integrates a low noise 5.7GHz phase-locked loop (PLL), which includes a reference divider, phase-frequency detector (PFD) with phase-locked indicator, ultralow noise charge pump, and integer feedback divider to attain very low noise PLL operation. The PLL circuit is tightly coupled to a low noise VCO as well as internal self-calibration to ensure optimum VCO resonator tuning for best phase noise performance. The VCO requires no external components. The on-chip SPI compatible bidirectional serial port allows frequency tuning and control, and read back of register and loop status information.

The low phase noise and spurious capabilities of this family of frequency synthesizers enhance the performance of multiband basestations supporting LTE, W-CDMA, UMTS, CDMA, GSM and WiMAX standards. Its high frequency capability also supports
point-to-point broadband wireless access, military, avionics, and high performance

test and measurement applications.

The PLLWizard comprehensive PC-based design tool software is available to facilitate interactive control and interface with the LTC6946's evaluation board. Designers can perform simulations and optimization with the PLLWizard software, and then interactively verify their designs on the actual demonstration circuit. The PLLWizard design tool software is available for download free of charge from the Linear Technology website at www.linear.com/synthesizers.

All versions of the LTC6946 are specified over the full case temperature range from -40°C to 105°C. The products are available in a 4mm x 5mm, 28-lead plastic QFN package. Prices start at $5.75 each in 1,000-piece quantities and are available immediately from stock. For more information visit, www.linear.com/product/LTC6946.

Summary of Features: LTC6946

• Outstanding In-Band Phase Noise:
-226dBc/Hz (Closed-Loop, Normalized)
• Best-In-Class In-Band 1/f Noise:
-274dBc/Hz (Closed-Loop, Normalized)
• -157dBc/Hz Wideband Output Phase Noise Floor
• Very Low Spurious Output: -103dBc
• Temperature Stabilized VCO with
Self-Calibration
• Programmable Charge Pump Up to 11.2mA Output Current
• PLLWizard Design Tool Software Support
• On-Chip Output Divider Providing Wide Tuning Frequency Range up to 5.79GHz

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