Silicon Labs Tackles High-Speed Transceiver Clocking with New High-Performance Oscillators

-- Si54x Ultra Series™ I2C-Programmable XOs Provide Superior Jitter Performance and Frequency Flexibility for 100/200/400G Applications --
-- Expands Portfolio with New Package Sizes for Si54x, Si59x and Si51x Families --

AUSTIN, Texas, Dec. 11, 2017 /PRNewswire/ -- Silicon Labs (NASDAQ: SLAB) has introduced a new family of high-performance I2C-programmable crystal oscillators (XOs) delivering best-in-class jitter performance and frequency flexibility. With typical jitter performance as low as 95 femtoseconds (fs), the Si544/Si549 Ultra Series™ programmable XOs maximize jitter margin for clocking high-speed 28 Gbps and 56 Gbps transceivers used in 100/200/400G communications and data center applications. The devices are capable of generating any frequency from 200 kHz to 1.5 GHz with no frequency gaps and 4 parts-per-trillion (ppt) tuning resolution, enabling a single device to be used across a broad spectrum of applications.

"Optical networks, hyperscale data centers and mobile fronthaul/backhaul networks are moving to higher speeds, increasing the need for ultra-low-jitter timing solutions," said James Wilson, Senior Marketing Director for Silicon Labs' timing products. "By choosing Silicon Labs' I2C-configurable Si54x Ultra Series oscillators, system designers will have peace of mind knowing that they are using the industry's most frequency flexible programmable XOs while maximizing SNR headroom, de-risking development and helping to ensure first-pass design success."

The Si544/Si549 XOs support up to four preset, pin-selectable start-up frequencies. After power-up, the device operating frequency can easily be changed via an I2C interface. This configuration flexibility enables a single oscillator to replace multiple single, dual and quad-frequency XOs and multiplexer (mux) devices with a single oscillator. The device can be powered from a single 1.8, 2.5 or 3.3 V supply, eliminating the need for different XO part numbers for different supply voltages. The Si54x XO's I2C interface supports update rates as high as 1 MHz (Fast-mode Plus), maximizing compatibility with a broad range of ASSPs, ASICs, SoCs and FPGAs.

The Si544/Si549 XOs are available in 3.2 mm x 5 mm and 5 x 7 mm packages, providing superior frequency flexibility in the same footprint as a standard, fixed-frequency XO. This compatibility enables hardware designers to prototype with an I2C-programmable XO and easily migrate to a single-frequency XO when the design transitions to production.

The Si54x XOs are purpose-built for 56 Gbps transceiver designs. These designs rely on pulse-amplitude modulation (PAM4) signaling for serial data transmission. PAM4 uses four-level signaling to increase the bit rate per channel while keeping the bandwidth constant. This tradeoff makes the design inherently more susceptible to noise. Using an ultra-low-jitter reference clock such as the Si544/Si549 devices maximizes signal-to-noise ratio (SNR) headroom, helps prevent bit-errors and helps maintain signal integrity.

The Si544/Si549 oscillators use Silicon Labs' advanced fourth-generation DSPLL® technology to provide an ultra-low-jitter clock source at any output frequency. The devices are programmable to any frequency from 200 kHz to 1.5 GHz with 4 ppt resolution. On-chip power supply regulation provides power supply noise rejection, enabling consistent, reliable low-jitter operation in noisy environments often found in high-speed networking and data centers. The Si544/Si549 XOs also provide flexible, reliable drop-in replacements for low-jitter surface acoustic wave (SAW)-based oscillators while offering superior frequency tolerance and temperature stability. The Si544/Si549 oscillators support all popular output formats including LVDS, LVPECL, HCSL, CML, CMOS and Dual CMOS.

In addition to the Si544/Si549 family, Silicon Labs is significantly expanding its XO/VCXO portfolio to include a broader array of package options. These complementary products include Si54x Ultra Series XOs in the industry-standard 5 mm x 7 mm package, Si59x general-purpose XO/VCXOs (3.2 mm x 5 mm) and Si51x general-purpose XO/VCXOs (2.5 mm x 3.2 mm). With this expanded product lineup, Silicon Labs can provide customers with a one-stop shop for high-performance oscillators.

Pricing and Availability
Samples and production quantities of the Si544/Si549 Ultra Series oscillators are available now. Silicon Labs offers two pricing levels for the Si54x family depending on the designer's jitter requirements. Pricing in 10,000 unit quantities begins at $8.36 (USD) for Si549 XOs (95 fs rms jitter) and at $6.69 (USD) for Si544 XOs (150 fs rms jitter). Silicon Labs' new Si5xxUC-EVB universal evaluation board, priced at $95 (USD MSRP), provides flexible, easy device evaluation. For more information about the Si54x Ultra Series family or to order samples and evaluation boards, visit www.silabs.com/ultra-series.

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Connect with Silicon Labs
Silicon Labs PR Contact: Dale Weisman +1-512-532-5871, dale.weisman@silabs.com
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