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Silicon Labs Reduces Cost and Complexity of Timing Technology for Coherent Optical Market

Single-Chip Si534xH Clock Family Provides High-Performance, Frequency-Flexible Timing Solution for 100G/400G Transceivers

AUSTIN, Texas--(BUSINESS WIRE)-- Silicon Labs (NASDAQ: SLAB) has introduced a family of jitter-attenuating clocks that simplifies 100G/400G coherent optical line card and module design by providing a high-frequency, flexible clocking solution that significantly reduces system-level cost and complexity. Silicon Labs' new Si534xH coherent optical clocks replace discrete timing solutions that rely on expensive, large-footprint voltage-controlled SAW oscillators (VCSOs) to provide low-jitter reference timing for data converters. Unlike VCSOs that support single, fixed frequencies, the new Si534xH clocks operate over a wide frequency range, supporting frequencies up to 2.7 GHz without the need to change bill-of-material (BOM) components.

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Silicon Labs Si534xH Clock Family: High-Performance Timing Solution for Coherent Optical Networks (Photo: Business Wire)

The Si5344H and Si5342H clocks combine best-in-class frequency flexibility with unparalleled jitter performance of 50 fs RMS. The devices simplify component sourcing, replacing multiple custom, long-lead time VCSOs with a clock IC solution available with short, two-week lead times. Featuring a jitter-attenuating PLL, high-frequency output drivers, fractional frequency synthesis and digitally controlled oscillator (DCO) technology, the Si534xH family provides all the clocking functions required for coherent optical transceiver applications while enabling 40 percent smaller footprint and 40 percent lower power than competing solutions.

Get all the details about Silicon Labs' Si534xH coherent optical clocks including data sheets, supporting documentation and development tools at www.silabs.com/timing.

One of the largest growth drivers in the communications market is the industry's transition from 10G to 100G in metro area networks and data center interconnect (DCI). Coherent optics is an enabling technology for 100G and 400G applications because it allows service providers to send more data over existing optical fiber, minimizing the cost and complexity of network upgrades for bandwidth expansion. Current timing solutions for coherent optics are not optimized for cost or size, requiring a diverse mix of VCSOs, clock generators and discrete components.

Silicon Labs' Si534xH clocks are purpose-built to address the timing requirements of 100G/400G coherent optics. In addition to supporting the ultra-high frequency synthesis necessary for clocking optical transceiver data converters, the Si534xH clocks combine Silicon Labs' proven DSPLL® jitter attenuation technology and MultiSynth low-jitter fractional frequency synthesis technology to deliver an elegant, easy-to-use, single-chip solution. All 100G/400G transmitter or receiver clocks can be generated by a single device, minimizing BOM cost and complexity by eliminating the need for numerous discrete components.

"To meet demands for increasing bandwidth, service providers require 100G/400G coherent designs that enable higher line card port density and lower cost-per-bit than legacy solutions," said James Wilson, senior marketing director for timing products at Silicon Labs. "Silicon Labs' Si534xH clocks provide the high-frequency clock synthesis, jitter attenuation and stringent phase noise required by coherent optical applications at significantly smaller footprint and lower power than traditional VCSO-based solutions."

Silicon Labs supports coherent clock development with ClockBuilder Pro, an easy-to-use software tool that simplifies clock tree design, device configuration and detailed performance evaluation. The tool can be used in standalone mode to generate device configuration files or to directly control a Si534xH device on an evaluation board. ClockBuilder Pro can also be used to create factory-customized versions of Silicon Labs' jitter attenuators and clock generators individually tailored to meet each customer's unique timing requirements.

Si534xH Coherent Optical Clock Product Highlights

- Ultra-high-performance jitter-attenuating PLL designed for transmitter and receiver clocking
- High-speed driver for data converter clocking of up to 2.7 GHz with ultra-low phase noise
- Typical jitter performance of 50 fs RMS (1 MHz to 40 MHz)
- MultiSynth fractional frequency synthesis for generating any frequency up to 712.5 MHz
- Integrated loop filter with user-programmable PLL bandwidth for flexible jitter attenuation
- High-speed, digitally tunable DCO mode: 0.001 ppb resolution with 1 MHz SPI update rate
- Module-friendly size and power consumption
- Simple, easy-to-use ClockBuilder Pro software

Pricing and Availability

Samples of the Si5344H and Si5342H coherent optical clocks are available now in 7 mm x 7 mm 44QFN packages, and production quantities are planned for May. Pricing begins at $27 (USD) in 10,000-unit quantities. Standard and custom devices are available with short lead times (two weeks for samples and four weeks for production orders), simplifying procurement for prototyping and production quantities. The Si5344H-EVB and Si5342H-EVB evaluation boards, priced at $199 each (USD MSRP), are available to simplify device evaluation and system-level timing design. To order clock samples and evaluation boards, visit www.silabs.com/timing.

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