# Rate Conversion/Jitter Attenuation Products

System clock trees are becoming more complex often requiring rate conversion with jitter attenuation at very low bandwidth frequencies and distribution of several clock frequencies to multiple loads. Rate conversion/jitter attenuation devices from Microsemi® can lock to input clock signals and filter jitter starting at 30 mHz. These devices lower bill of material costs, simplify design, and improve performance by replacing external components traditionally used to build timing clock trees with a fully integrated single chip-solution.
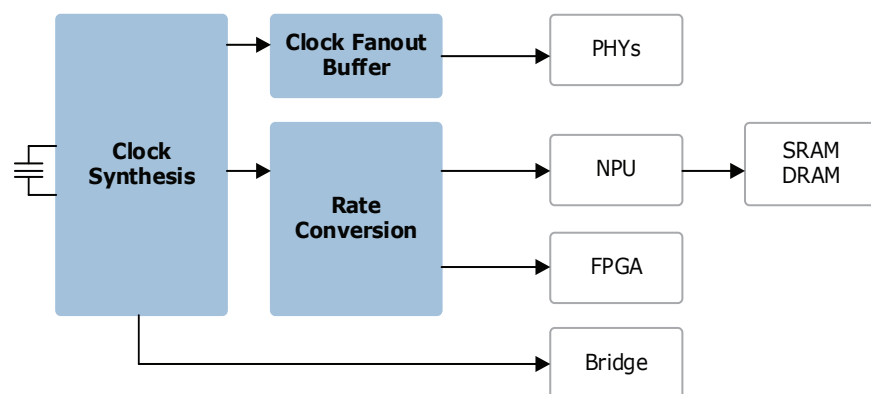
Applications

- Timing generation for enterprise routers and switches, storage area network equipment, servers, communications equipment. and broadcast video applications
- Processor, processor bus, SDRAM, and DDR clocks
- Timing for 10 Gigabit CDRs, Rapid-IO, PCIe, Serial MII, Star Fabric, Fibre Channel, XAUI

Availability and Support

Microsemi Clock Management products are in volume production. To learn more about Microsemi's clock products, visit www.microsemi.com/products/timing-and-synchronization/frequency-conversion. Full information, including complete data sheets and design manuals, is available to registered MyMicrosemi customers. To register for a MyMicrosemi account, visit www.microsemi.com/create-an-account.

Clock Rate Conversion Solutions Address Key Customer Pains

- Providing spec-compliant timing for multi-gigabit PHYs is difficult
- Adding external jitter cleaning circuitry to provide PHYs with spec-compliant timing is costly and complex

High Integration

- Up to 2 independent programmable synthesizers replace competing multi-chip single channel solutions
- Integrated fanout buffers with up to 20 output clock signals in two frequency families

Industry Leading Ultra-low Jitter

- Ultra-low 160 fs jitter on all outputs
- Low bandwidth jitter filtering on input clock signals starting at 30 mHz

Wide Frequency Range

- Output clock frequencies from <1 Hz to 1035 MHz
- Fractional synthesizers support any-to-any clock synthesis

Highly Programmable Outputs

- Control of each output clock's signal format, voltage, drive strength, frequency divider, and phase
- Replace external support components such as fanout buffers and format converters
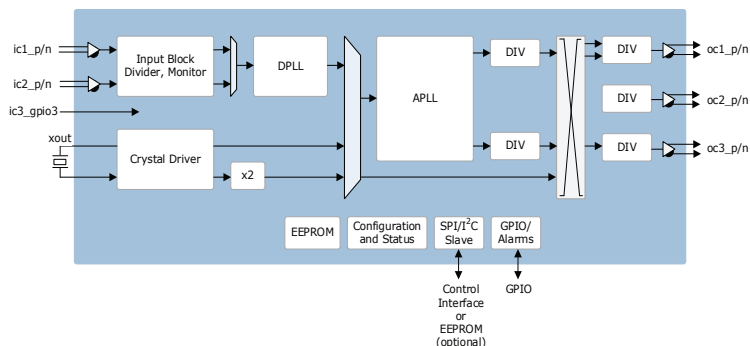
Custom Configuration

- Clock signals available at power-up with integrated EEPROM; easily configurable with hardware pins
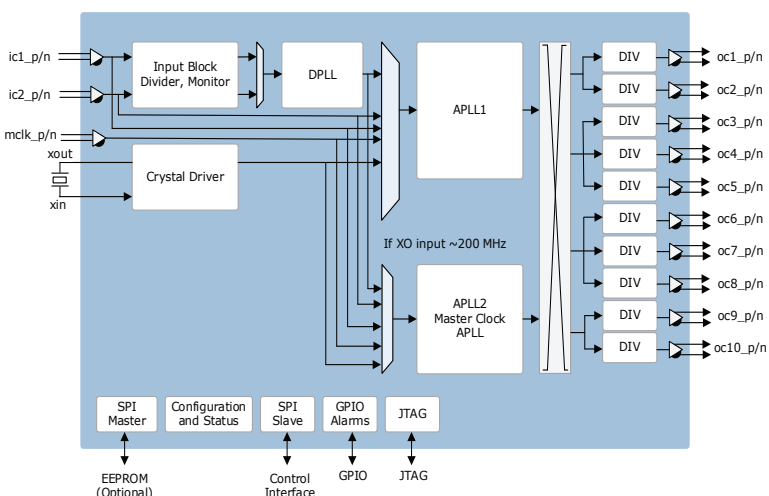
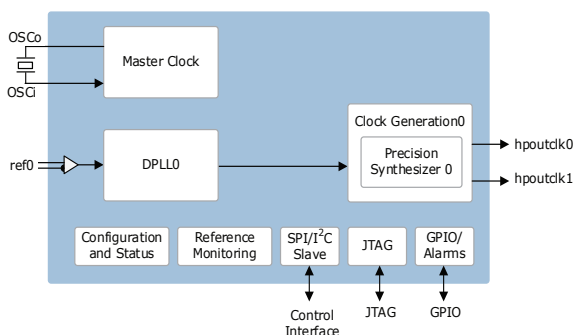# Rate Conversion/Jitter Attenuation Products

Featured Products

ZL30253

MAX24610

ZL30159

ZL30252, ZL30253, and ZL30254

- Ultra-low jitter provides spec-compliant timing for multi-gigabit interfaces
  - Any-to-any frequency conversion / jitter attenuation. Output frequencies from <1 Hz to 1035 MHz with ultra-low 160 fs RMS jitter
- Low-bandwidth DPLL
  - 14 Hz to 500 Hz programmable bandwidth, attenuates low frequency jitter
- Universal Outputs
  - Up to 6 output clock signals
  - Control over each output clock's signal format, voltage, and drive strength
  - Frequency divider and phase adjustment per output
- Numerically Controlled Oscillator mode
- Spread Spectrum mode PCIe® compliant
- Small 5 mm × 5 mm QFN

MAX24605 and MAX24610

- Ultra-low jitter provides spec-compliant timing for multi-gigabit interfaces
  - Any-to-any frequency conversion / jitter attenuation. Output frequencies from <1Hz to 750 MHz with ultra-low 180 fs RMS jitter
- Low-bandwidth DPLL
  - 4 Hz to 400 Hz programmable bandwidth, attenuates low frequency jitter
- On-chip fanout buffers with flexible output configuration
  - Up to 20 output clock signals in two frequency families
  - Control over each output clock's signal format, voltage, and drive strength
  - Frequency divider and phase adjustment per output
- 10 mm × 10 mm CSBGA

ZL30159

- Precision synthesizer generates any clock rate from 1 Hz to 177.5 MHz with jitter below 1 ps
- Programmable digital PLL synchronizes to any clock rate from 1 Hz to 750 MHz Flexible output configuration
  - 30 mHz to 896 Hz programmable bandwidth, attenuates low frequency jitter
- Two LVCMOS outputs
- 9 mm × 9 mm LBGA

Microsemi Corporation (Nasdaq: MSCC) offers a comprehensive portfolio of semiconductor and system solutions for aerospace & defense, communications, data center and industrial markets. Products include high-performance and radiation-hardened analog mixed-signal integrated circuits, FPGAs, SoCs and ASICs; power management products; timing and synchronization devices and precise time solutions, setting the world's standard for time; voice processing devices; RF solutions; discrete components; enterprise storage and communication solutions, security technologies and scalable anti-tamper products; Ethernet solutions; Power-over-Ethernet ICs and midspans; as well as custom design capabilities and services. Microsemi is headquartered in Aliso Viejo, California and has approximately 4,800 employees globally. Learn more at www.microsemi.com.

MSCC-0105-PB-01001-1.00-0118