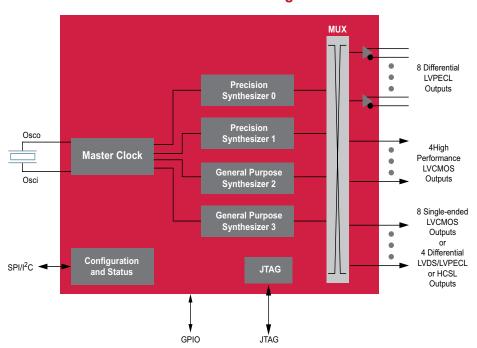# ZL30230

FOUR-CHANNEL UNIVERSAL CLOCK GENERATOR

The ZL30230 Four Channel Universal Clock Generator, part of Microsemi's ClockCenter platform of Free Run Clock devices, delivers industry-leading synchronization performance for a range of free-run applications. The free-run synchronization solution allows designers to replace multiple, costly components with a highly integrated, single-chip solution.

The ZL30230 device generates up to 20 clocks from a single crystal, allowing designers to replace numerous oscillators traditionally used to provide timing for various components with one chip.

ZL30230 Block Diagram

Availability and Support

Clock Generator is in volume production. To learn more about Microsemi's new ClockCenter platform, visit http://www. zarlink.com/zarlink/hs/timing_Clock-Center.htm. Full information, including complete data sheets and design manuals, is available to registered MyZarlink customers. To register for a MyZarlink account, visit http://www.zarlink.com/zarlink/hs/login.htm.

Single-Chip Solution for Complex, High-Speed Applications

The industry's highest performance, most integrated family of timing products for free run applications

Reduces design complexity and cost

- Operates from a single crystal resonator, clock scillator or voltage controlled oscillator to help reduce component cost

Highest Performance Solution Available

- Four independently programmable clock synthesizers generate any clock rate from 1 kHz to 720 MHz
- Precision synthesizers generate clocks with jitter below 0.7ps RMS for 10G PHYs
- General purpose synthesizers generate a wide range of digital bus clocks
- Eight LVPECL outputs; max rate 720 MHz
- Four LVCMOS outputs; max rate 160 MHz
- Eight outputs configurable as LVCMOS at 3.3/2.5/1.8 or 1.5 V, max rate160 MHz; or LVDS/LVPECL/HCSL, max rate 350 MHz

Fully Programmable

- Supports programmable frequency offsets for clock margining or for use as a digitally controlled oscillator
- Dynamically configurable via SPI/I2C interface

Applications

- Timing for NPUs, FPGAs, Ethernet switches and PCIe switches
- Timing for 10Gigabit CDRs, Rapid-I/O, PCIe, Serial MII, Star Fabric, Fibre Channel, XAUI
- Processor clock, Processor bus clock, SDRAM clock, DDR clock

Microsemi

ZL30230

Integrated Device Replaces Multiple Oscillators with Single Chip

The ClockCenter ZL30230 Four Channel Universal Clock Generator help lower bill of material costs, reduce board space requirements, simplify design complexity and improve performance reliability by replacing multiple external components traditionally used to time processors, memory chips, PHY chips and more with a fully integrated single-chip solution.
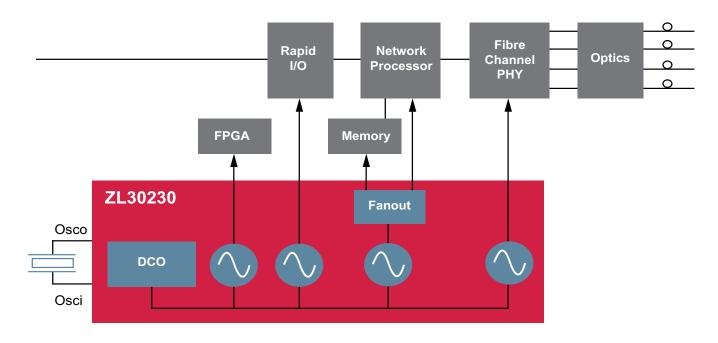
The single-chip device integrates four independent synthesizers and generates up to 20 clocks. Independent synthesizers enable generation of frequencies which are completely unrelated from one another. Eight low jitter differential LVPECL clocks can be programmed to any frequency from 1 kHz to 720 MHz and four high performance LVCMOS clocks can be programmed to any frequency from 1 kHz to 160 MHz. Eight configurable outputs can be configured as single-ended LVCMOS clocks from 1 Khz to 160 MHz or as four differential LVDS/LVPECL or HCSL clocks from 1 kHz to 350 MHz.

The application diagram below illustrates how the ClockCenter ZL30230 can be implemented as a single-chip solution to supply all the clocks necessary for different components on a PCB and replace multiple discrete oscillators.

In this application, a single ZL30230 device is implemented to supply timing to a Fibre Channel PHY device, network processor, memory, FPGA and a RapidIO Bridge. The Fibre Channel PHY clock is generated from one synthesizer while a second synthesizer is used in combination with the device's integrated fanout capability and flexible clock programming to generate clocks for the network processor and memory. A third synthesizer supplies timing to the RapidIO Bridge, while the last synthesizer provides timing to the FPGA.

The ZL30230 silicon solution provides additional benefits compared to oscillators, including a frequency margining capability that simplifies and speeds system validation. Traditional designs require the frequency ranges for onboard clock oscillators to be tested by populating oscillators with known frequency offsets or substituting an external programmable clock. This is a time consuming task requiring special set-ups. The ClockCenter ZL30230's programmable clock frequencies can be digitally adjusted under software control to perform this validation task much faster.

Other ZL30230 benefits include improved reliability by replacing multiple oscillators which have inferior failure in time performance compared to silicon. A single frequency source with fine programmable control over every frequency makes crosstalk and board noise issues easier to manage compared to multiple discrete oscillators. The integrated fanout capability reduces cost and simplifies jitter budgeting. The overall timing solution reduces cost and simplifies sourcing by replacing multiple discrete oscillators with a single integrated chip.

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