ZL30365

IEEE 1588 and Synchronous Ethernet Quad Clock Line Card Translator

Short Form Data Sheet

May 2013

Features

- Four independent clock channels
- Frequency and Phase Sync over Packet Networks
  - Frequency accuracy performance for WCDMA-FDD, GSM, LTE-FDD and femtocell applications
  - Frequency performance for ITU-T G.823 and G.824 synchronization interface, as well as G.8261 PNT PEC and CES interfaces
  - Phase Synchronization performance for WCDMA-TDD, Mobile WiMAX, TD-SCDMA and CDMA2000 applications
  - Client holdover and reference switching between multiple Servers
- Any input clock rate from 1 kHz to 750 MHz
- Automatic hitless reference switching and digital holdover on reference fail
- Digital PLLs filter jitter at 5.2 Hz, 14 Hz, 28 Hz, 56 Hz, 112 Hz, 224 Hz, 448 Hz or 896 Hz
- Operates from a single crystal resonator or clock oscillator

Ordering Information:

ZL30365GDG2 144 Pin LBGA Trays

Pb Free Tin/Silver/Copper

-40°C to +85°C

Package size: 13 x 13 mm

- Electrical phase alignment to input 1 Hz frame pulse with associated reference clock (ref/sync pairing)
- Programmable synthesizers
  - Any output clock rate from 1 Hz to 750 MHz
  - Output jitter of 0.62 ps RMS
  - Eight LVPECL outputs and eight LVCMOS outputs
- Field configurable via SPI/I^2C interface

Applications

- OTN muxponders and transponders
- 10 Gigabit line cards
- Synchronous Ethernet, SONET/SDH, Fibre Channel, XAUI

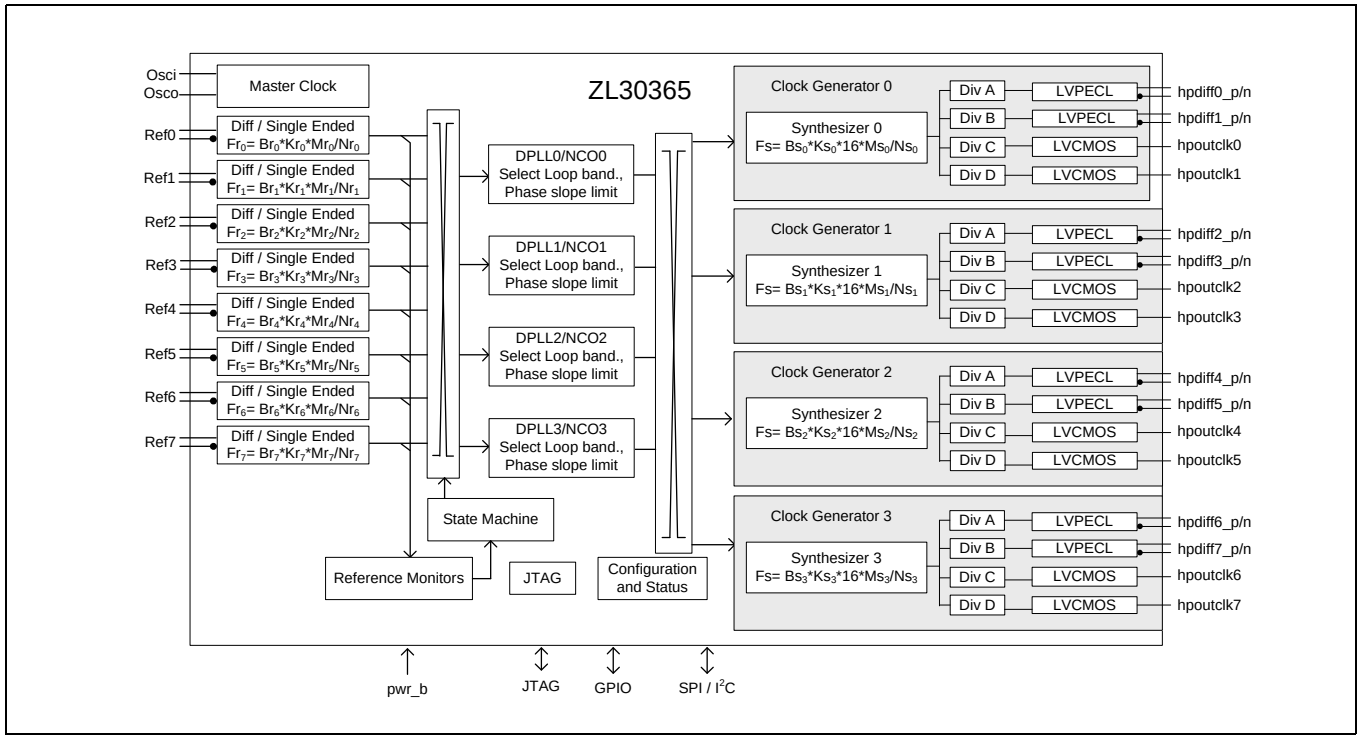

Figure 1 - Functional Block Diagram

Detailed Features

General

- Four independent clock channels
- Operates from a single crystal resonator or clock oscillator
- Configurable via its SPI/I^2C interface

Time Synchronization Algorithm

- External algorithm controls software digital PLL to adjust frequency and phase alignment
- Frequency, Phase and Time Synchronization over IP, MPLS and Ethernet Packet Networks
- Frequency accuracy performance for WCDMA-FDD, GSM, LTE-FDD and femtocell applications, with target performance less than ± 15 ppb.
- Frequency performance for ITU-T G.823 and G.824 synchronization interface, as well as G.8261 PNT EEC, PNT PEC and CES interface specifications.
- Phase Synchronization performance for WCDMA-TDD, Mobile WiMAX, TD-SCDMA and CDMA2000 applications with target performance less than ± 1 µs phase alignment.
- Time Synchronization for UTC-traceability and GPS replacement.
- Client reference switching between multiple Servers
- Client holdover when Server packet connectivity is lost

Electrical Clock Inputs

- Eight input references configurable as single ended or differential
- Synchronize to any clock rate from 1 kHz to 750 MHz on differential inputs
- Synchronize to any clock rate from 1 kHz to 177.75 MHz on singled-ended inputs
- Synchronize to clock or sync pulse and clock pair
- Any input reference can be fed with sync (frame pulse) or clock.
- Flexible input reference monitoring automatically disqualifies references based on frequency and phase irregularities
  - LOS
  - Single cycle monitor
  - Precise frequency monitor
  - Coarse frequency monitor
  - Guard soak timer
- Per input clock delay compensation

Electrical Clock Engine

- Flexible two-stage architecture translates between arbitrary data rates, line coding rates and FEC rates
- Internal state machine automatically controls mode of operation (free-run, locked, holdover)
- Automatic hitless reference switching and digital holdover on reference fail
  - Physical-to-physical reference switching
  - Physical-to-packet reference switching

  - Packet-to-physical reference switching
  - Packet-to-packet reference switching
- Selectable phase slope limiting
- Supports ITU-T G.823, G.824 and G.8261 for 2048 kbit/s and 1544 kbit/s interfaces

Electrical Clock Generation

- Four programmable synthesizers
- Eight LVPECL outputs
  - Two LVPECL outputs per synthesizer
  - Generate any clock rate from 1 Hz to 750 MHz
  - Low jitter of 0.62 ps RMS
  - Meets OC-192, STM-64, 1 GbE and 10 GbE interface jitter requirements
- Eight LVCMOS outputs
  - Two LVCMOS outputs per synthesizer
  - Generate any clock rate from 1 Hz to 177.75 MHz
  - Maximum jitter below 1 ps rms
- Programmable output advancement/delay to accommodate trace delays or compensate for system routing paths
- Outputs may be disabled to save power

API Software

- Interfaces to 1588-capable PHY and switches with integrated timestamping
- Abstraction layer for independence from OS and CPU, from embedded SoC to home-grown
- Fits into centralized, highly integrated pizza box architectures as well as distributed architectures with multiple line cards and timing cards

For more information about all Microsemi products visit our website at www.microsemi.com/timing-and-synchronization

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