Microsemi

SYNCHRONOUS ETHERNET PRODUCTS

Synchronous Ethernet (SyncE) is a physical layer (PHY) based synchronization implementation for packet networks requiring frequency synchronization. Microsemi® provides SyncE only with an easy migration path to IEEE 1588™, or combined SyncE and IEEE 1588™ for both frequency and time alignment.

The market leader in SyncE timing devices, Microsemi was the first to introduce SyncE PLLs in 2006. Microsemi now offers the industry's most comprehensive portfolio of SyncE timing devices, providing G.8262 compliance and ultra-low jitter for 10G PHYs.
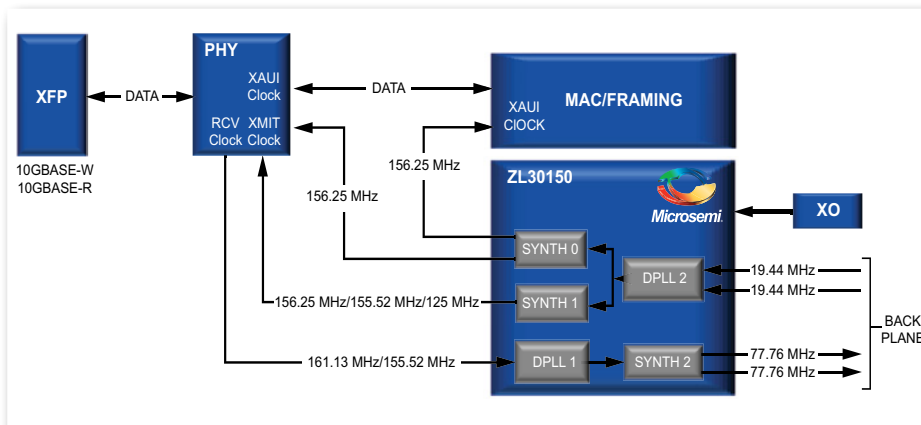
Features

Highly integrated feature-rich SyncE products from Microsemi allow manufacturers to create cost-effective network equipment designs that support accurate end-to-end transmission of voice, video, and data, over wired and wireless networks.

Timing Card Product Features

- Compliance with ITU-T G.8262, G.813, G.871, G.8261, G.823, and G.824
- Telcordia GR-1244 Stratum 3 and GR-253
- Low bandwidth loop filter from 0.1 mHz to 1 KHz
- Hitless reference switching up to 11 input references
- Holdover accuracy better than 1 ppb
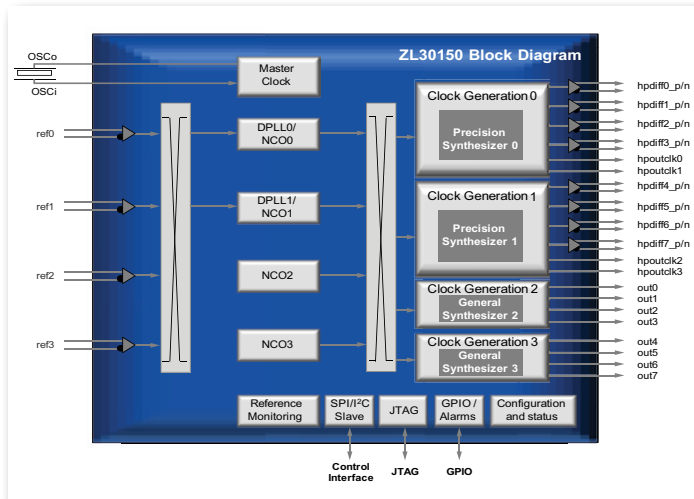- Accept and generate any frequency from 1 Hz to 750 MHz

Line Card Product Line Features

- Ultra low jitter as low as <400 fs RMS for line cards up to 100G
- Loop filter from 14 Hz to 896 Hz
- Hitless reference switching between up to 8 input references
- Frequency translation and jitter attenuation of any frequency between 1 Hz and 750 MHz
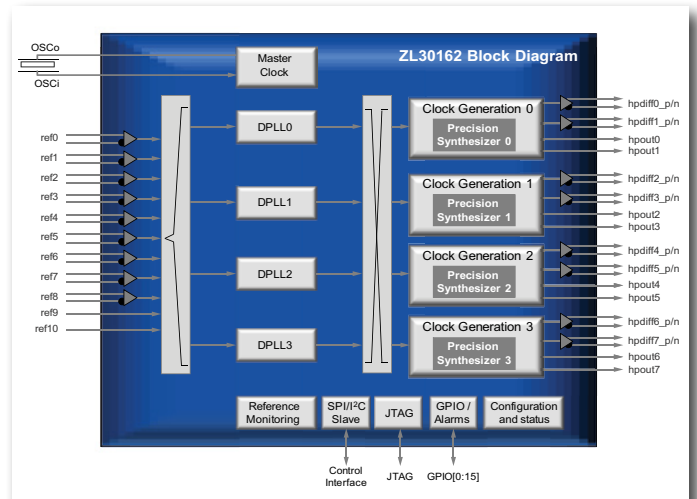- Numerically controlled oscillator (NCO) capability

Figure 1: 10G Carrier SyncE Card with Recovered Clock Rate Translation

Availability and Support

SyncE products are in volume production. To learn more about the timing and synchronization products of Microsemi, visit www.microsemi. com/timing-and-synchronization.

Applications

- **Core Routers, Edge Routers, Carrier Ethernet Switches**: Timing card and Line cards, which support up to 100 Gbps interfaces, line rate converters, and carrier grade timing cards, SONET/SDH, Fibre Channel, XAUI, SyncE, OTN, 10 GBASE-R, and 10 GBASE-W

- **Broadband equipment**: Including PON, DSLAM, and RT-DSLAM
- **Wireless Backhaul**: Integrated basestation reference clock for air interface for GSM, WCDMA, LTE and WiMAX macro, micro or femtocells, edge router, or access aggregation node

Microsemi

Featured Products

ZL30150 - Synchronous Ethernet Clock Generator

- Generates any Telecom or SyncE frequency independent of the input frequency rate
- Two precision synthesizers generate clocks with jitter below 0.7 pS RMS for 10G PHYs
- SyncE programmable digital phase-locked loops (DPLLs) synchronize to any Telecom (N * 8 KHz) or any SyncE frequency.
- Flexible two-stage architecture translates between arbitrary data rates, line coding rates, and FEC rates
- Digital PLLs filter jitter from 14 Hz, 28 Hz, 56 Hz, 112 Hz, 224 Hz, 448 Hz, or 896 Hz
- Four programmable NCOs available
- Automatic hitless reference switching and digital holdover on reference fail

ZL30162 Network Synchronization Clock Translator

- Fully compliant SEC (G.813) and EEC (G.8262) flexible rate conversion DPLL
- Four programmable DPLLs/NCOs
- Synchronize to any clock rate from 1 Hz to 750 MHz
- Four programmable synthesizers generate any clock rate from 1 Hz to 750 MHz with maximum jitter below 0.65ps rms
- Flexible two-stage architecture translates between arbitrary data rates, line coding rates, and FEC rates
- DPLLs filter jitter from 0.1 mHz up to 1 KHz
- Automatic hitless reference switching and digital holdover on reference fail
- Programmable DPLLs can synchronize to sync pulse and sync pulse/clock pair

ZL30150 Block Diagram

ZL30162 Block Diagram

SyncE Line Card Product Chart

Microsemi SyncE Timing Card Products	ZL30150	ZL30151	MAX24710
Number of PLLs	2	1	1
Number of Synthesizers	2 High Pefomance 2 General Purpose	1 ultra-low Jitter	2 High Performance
Clocks Accepted and Generated	SyncE and Telecom clocks Nx8kHz	1kHz - 650MHz inputs and <1Hz - 650 MHz output	2kHz to 750MHz

Timing Card Product Chart

Microsemi SyncE Timing Card Products	ZL30143	ZL30153	ZL30154	MAX24310	ZL30161	ZL30162	ZL30163	ZL30164
Number of PLLs	2	1	2	1	1	4	2	3
Accepts 1pps GPS Input Without Requiring Additional Clock Input	No	Yes	Yes	No	Yes	Yes	Yes	Yes
Number of Inputs	9	4	4	2	11	11	11	11
Alternative NCO	No	No	No	Yes	Yes	Yes	Yes	Yes
Sync Inputs	Yes	No	No	No	Yes	Yes	Yes	Yes