

Clock Translators for Optical Transport Networks

Optical Transport Network (OTN) has emerged as the physical layer interface protocol of choice, enabling carriers to bridge the transition from circuit-switched to internet protocol (IP), legacy transmission of voice over optical fiber or packet-switched transmission of data over optical fiber. Due to the variety of services and provisions, OTN timing solutions must be flexible and easily programmable to support multiple unique and independent channel frequencies.

Microsemi offers the widest portfolio of single-chip devices delivering "any rate, any port, all the time" performance for OTN.

For OTN equipment, Microsemi phase locked loops (PLLs) are used for line card timing including:

- Clock rate translation from line to client rates
- One PLL path per client port
- Clock rate programmability per client port

Features

Highly-integrated and programmable solution provides translation from any input reference frequency to any output clock frequency with jitter performance for interfaces 10G, 40G, and 100G coherent.

The single, dual, triple, and quad channel devices with independent digital PLLs accept and generate any frequency from 1 kHz to 1.25 GHz to support any communication service over optical networks.

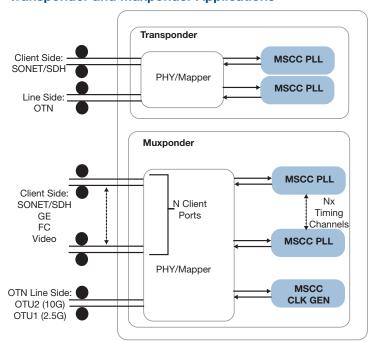
OTN Requirements

- Multiple clock frequencies to support multiple services
- Dynamic rate conversion for forward error correction (FEC)
- Independent timing paths to support multiple transmit and receive services
- Stringent low jitter generation

Product Solutions

- Single-chip solutions compliant to the telecom timing standards
- Meeting OTN multi-service requirements
- Highly-integrated to support multiple OTN frequencies and channels
- Output jitter of 0.25 ps RMS

Transponder and Muxponder Applications



Microsemi makes no warranty, representation, or guarantee regarding the information contained herein or the suitability of its products and services for any particular purpose, nor does Microsemi assume any liability whatsoever arising out of the application or use of any product or circuit. The products sold hereunder and any other products sold by Microsemi have been subject to limited testing and should not be used in conjunction with mission-critical equipment or applications. Any performance specifications are believed to be reliable but are not verified, and Buyer must conduct and complete all performance and other testing of the products, alone and together with, or installed in, any end-products. Buyer shall not rely on any data and performance specifications or parameters provided by Microsemi. It is the Buyer's responsibility to independently determine suitability of any products and to test and verify the same. The information provided by Microsemi hereinder is provided "as is, where is" and with all faults, and the entire risk associated with such information is entirely with the Buyer. Microsemi does not grant, explicitly or implicitly, to any party any patent rights, licenses, or any other IP rights, whether with regard to such information is entirely by the mission. Information in this document is proprietary to Microsemi, and Microsemi reserves the right to make any changes to the information in this document or to any products and services at any time without notice.



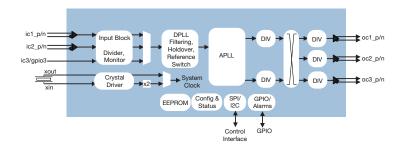
Clock Translators for Optical Transport Networks

Featured Products

ZL30169: 3-Input, 3-Output Clock Translator for OTN

- Any input frequency from 1 kHz to 1.25 GHz
- · Continuous input clock quality monitoring
- Hitless reference switching on loss of input
- Programmable bandwidth: 14 Hz to 500 Hz
- Output jitter typically 0.16 ps RMS (APLL only. Output jitter for other modes: 0.25 ps RMS)
- Small package: 5 mm x 5 mm

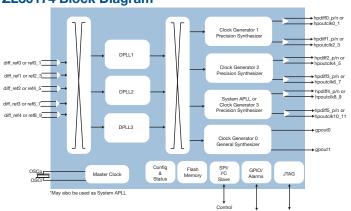
ZL30169 Block Diagram



ZL30174: Triple Channel Precision Clock Translator

- 3 independent OTN de-synchronizers
- Excellent jitter performance of 180 fs RMS in 12 kHz to 20 MHz band meets jitter requirements of 10G/40G and 100G **PHYs**
- 3 programmable ultra-low jitter synthesizers generate any frequency from 1 Hz to 900 MHz
- 6 differential (CML) or 12 single-ended (CMOS) ultra-low jitter outputs, plus 2 general purpose CMOS outputs
- Accepts up to 10 LVPECL/LVDS/HCSL/LVCMOS inputs
- Automatic hitless reference switching and digital holdover on reference fail with initial holdover accuracy better than 10 ppb

ZL30174 Block Diagram



OTN Product Chart

	ZL30152	ZL30155	ZL30157	ZL30160	MAX24705 MAX24710	/1 3/11hu	ZL30182	ZL30174	ZL30614
PLL Channels	1	2	2	4	1	1	2	3	4
Synthesizers	1 precision	2 precision	1 precision 1 general	2 precision 2 general	2 precision	1 precision	2 precision	3 precision 1 general	3 precision 1 general
Any Clock Rate	1 KHz- 750 MHz	1 KHz- 750 MHz	1 KHz- 750 MHz	1 KHz- 750 MHz	1 KHz- 750 MHz	1 Hz- 1035 MHz	1 Hz- 1035 MHz	1 Hz- 900 MHz	0.5 Hz- 900 MHz
Jitter	700 fs	700 fs	700 fs	700 fs	350 fs	250 fs	250 fs	180 fs	180 fs



Microsemi Corporate Headquarters

One Enterprise, Aliso Viejo, CA 92656 USA Within the USA: +1 (800) 713-4113 Outside the USA: +1 (949) 380-6100 Fax: +1 (949) 215-4996 Email: sales.support@microsemi.com www.microsemi.com

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.