Overview
The converter is a device that converts several electrical interface types at a data rate of 9.9Gbit/s (SONET/SDH) and 10.7 Gbit/s (G.709) used in data transmission (telecommunications). The background is the need for flexibility with regard to upcoming trends and standards in optical transponder / transceiver technology.

Features
- Support of SFI-5s, SFI-4 and XFI interfaces
- 2-Channel bi-directional operation
- Inversion and reversal of data rails
- I²C compliant µP interface
- 2 x 8 GPIOs
- Jitter meets ITU-T / Sonet requirements
- JTAG (IEEE-1149.1)

Technology and Package
- 0.11 um CMOS Technology (0.095µm, Ldrawn)
- 1.2 V / 2.5 V power supply
- 625 pin FC-BGA
- Total power consumption < 4 W (2-Channel bi-directional operation)

Applications
- DWDM transmission equipment
- OTN networks
- Fiber optic terminators and test equipment

Product Applications
The converter device is used to convert SFI-4 "OIF-SFI4-01.0 OC-192 Serdes-Framer Interface " to 10Gb/s XFI "XFP MSA Group (http://www.xfmsa.org)". The conversion is done for the transmit (TX) and receive (RX) direction. The device includes two of these bi-directional channels. Additional the device contains a conversion path from either SFI-4 to SFI-5 "OIF-2001.145.10 Serdes Framer Interface Level5 (SFI-5)" (Serdes-Framer interface scalable).
For control and monitoring an I²C µP interface is used.

The device can operate in three different modes:
• SFI-4 to XFI
• SFI-5s to SFI-4
• SFI-5s to XFI
In all three modes the device operates bi-directional.

The supported data rates of the devices are:
• SONET / SDH   OC-192 / 10GbE(WAN-PHY) / STM-64 @ 9.9 Gbit/s
• G.709         OTU-2 @ 10.7 Gbit/s

To enhance the flexibility and to reduce system cost the device has the following additional features
• 2 independent channels (bi-directional)
• Data rates of channels can randomly selected
• Power down mode for unused channel

Application examples

Figure 1.  Mode XFI to SFI-4
Figure 2. Mode SFI4 to SFI5s

Figure 3. Mode XFI to SFI-5s
Supported Standards

- **OIF** SFI-4, SFI-5s
- **XFPMSA** XFI
- **IEEE-802.3ae** 10GbE (WAN-PHY) data rate
- **IEEE-1149.1** JTAG
- **ITU-T** G.707 data rate
- **ITU-T** G.709 data rate

Board Design Support

**XFI**
- Bit inversion (Data)

**SFI-4**
- Bus reversal (Data)
- Bit inversion (Data)

**SFI-5s**
- Bus reversal (Data)
- Bit inversion (Data, Deskew)
- Deskew alignment
- Supports bit-/bytestriping

Network Test Capabilities

- PRBS test pattern generator and analyzer for each channel
- Loop back switches

Interfaces

**Data Interface**

- **SFI-5s** Compliant to OIF2001-145.10
- **SFI-4** Compliant to OIF-SFI4-01.0
- **XFI** Compliant to XFPMSA

**Microcontroller Interface**

- **I²C** Standard mode = 100 Kb/s or Fast mode = 400 kb/s