



# CORTINA

## Product Brief

### Cortina Systems® IXF30009/30010/30011 Optical Transport Processors

#### Product Overview

The Cortina Systems® IXF30009/30010/30011 Optical Transport Processors are highly integrated devices designed to handle most Optical Transport Network (OTN) applications on a single chip. Developers can use these optoelectronic components to build optical network solutions to meet a variety of high-bandwidth requirements in SONET/SDH, Optical Transport Network or Ethernet networks. As successors to the Cortina Systems® IXF30001, IXF30003, IXF30005, and IXF30007 devices, the IXF30009/30010/30011 Optical Transport Processors build on the Cortina Systems, Inc. (Cortina™) framer and Forward Error Correction (FEC) design expertise and extend the product family.

The IXF30009/30010/30011 Optical Transport Processors provide strong FEC performance and support for networking standards such as OTN (G.709), SONET/SDH and 10 Gigabit Ethernet (10GigE). The devices feature SFI-4 compliant interfaces that can be configured to support either a single 10 Gbps signal or four 2.5 Gbps tributary signals. They can perform fully transparent asynchronous aggregation of 2.5 Gbps tributaries into a 10.7 Gbps (OTU2) signal. The devices support full duplex operations for all data paths, and all RX and TX ports can be configured independently. They can be used as SONET/SDH framers providing complete section and line termination for one OC-192/STM-64 or four OC-48/STM-16 signals.

The Optical Transport Processors can also be operated as bridge devices, transparently transporting any payload over a G.709-compliant network as network nodes operating with OTN signals on all interfaces, as gateways between asynchronous OTNs, or as strong FEC devices providing a net electrical coding gain of 10 dB in Ultra Long Haul (ULH) or submarine systems.

Both interfaces (system and line) are equipped with a G.709-compliant FEC codec (RS-255/239) providing a net coding gain of ~6 dB, allowing for a single-chip standard FEC regenerator. In addition, the line-side of the IXF30009/30011 Optical Transport Processors contain a very strong, proprietary FEC code with a maximum net coding gain of 10 dB supporting ULH and submarine applications. The FEC overhead information can be scaled to 4%, 7%, 15%, or 25% to

support the various requirements of a 10 GbE, Metropolitan Area Network (MAN), and ULH system respectively, while maintaining the G.709v2 frame format.

The flexibility of the configurable serial overhead port allows access to all transported client signals and management overhead data. FEC statistics are delivered to this port and can be used to control external compensation circuitries for optical impairments.

Compliance with OIF interface standards (SFI-4) enables the devices to be used in Multi Source Agreement (MSA) based systems. The single-chip integration support for multiple standards makes the IXF30009/30010/30011 Optical Transport Processors the ideal high integration solution for a wide range of applications including OTN networks, FEC regenerators, Multi Service Provisioning Platforms (MSPPs), SONET/SDH Add/Drop Multiplexers (ADMs), submarine and ULH FEC applications, low cost 10 Gbps metro and core networks, and 10 GbE LAN transport and monitoring.

The IX30009/30010/30011 Optical Transport Processors are available in three-pin and software-compatible versions:

- **IXF30009 – Full functionality:**
  - 4x2.5 G transparent aggregation into OxU2
  - Supports 4xOC-48/OxU1, OC-192, OxU2, 10 GE, Two G.709 compliant Reed Solomon FEC codecs
  - Strong FEC performance of up to 10 dB net electrical coding gain
  - Adjustable FEC overhead rates
  - Designed for Metro, Long Haul, ULH and Submarine networks
- **IXF30010 – OTN:**
  - Similar to IXF30009 without strong FEC support (only standard RS FEC).
- **IXF30011 – Strong FEC:**
  - Similar to IXF30009 without support for 2.5 G signals (excludes aggregation and OC-48/OxU1 processing).

## Features

- Fully transparent asynchronous aggregation of four 2.5 Gbps tributary signals into an O TU2/ODU2
- Specific networking capabilities for 10 GbE, SONET/SDH and OTN signals
- Strong, adjustable FEC
- High integration networking support for different payloads including 10 GbE and aggregation of multiple different signals
- Pin and software compatibility throughout the product family

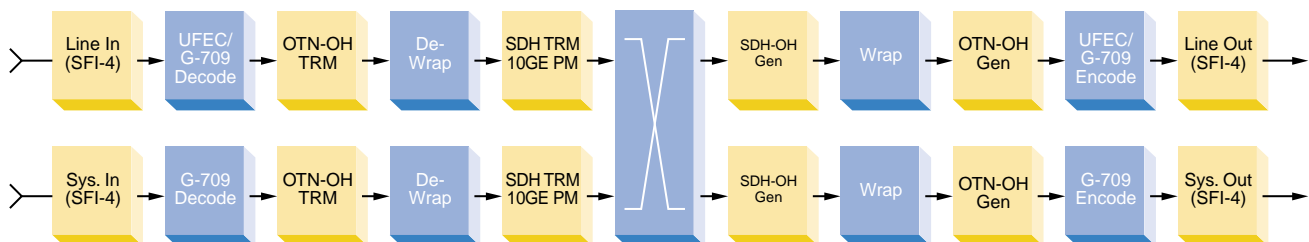
## Benefits

- Enables more efficient bandwidth usage, leading to lower investment cost for transport systems. Allows direct connection of asynchronous lower rate client signals in a transport system that can be fully transparent and invisible to the payload.
- Enables MSPPs capable of handling different client signals. The processor can be used as a full SONET/SDH framer for OC-48 or OC-192, monitoring 10 GbE or processing OTN signals.
- Provides superior coding gain and can be configured to meet the performance needs of a variety of platforms (Metro, LH, ULH, submarine). Enables denser packing of colors in a fiber to reduce equipment cost.
- Supports high density boards (for example, an 8-port OC-48 framer) with greater real estate savings. Service providers can directly transport and monitor 10 GbE payloads.
- One board can be reused with different platforms (from Metro to ULH), helping to reduce cost. One software development, quick adaptation of new features into an existing platform (i.e. aggregation).

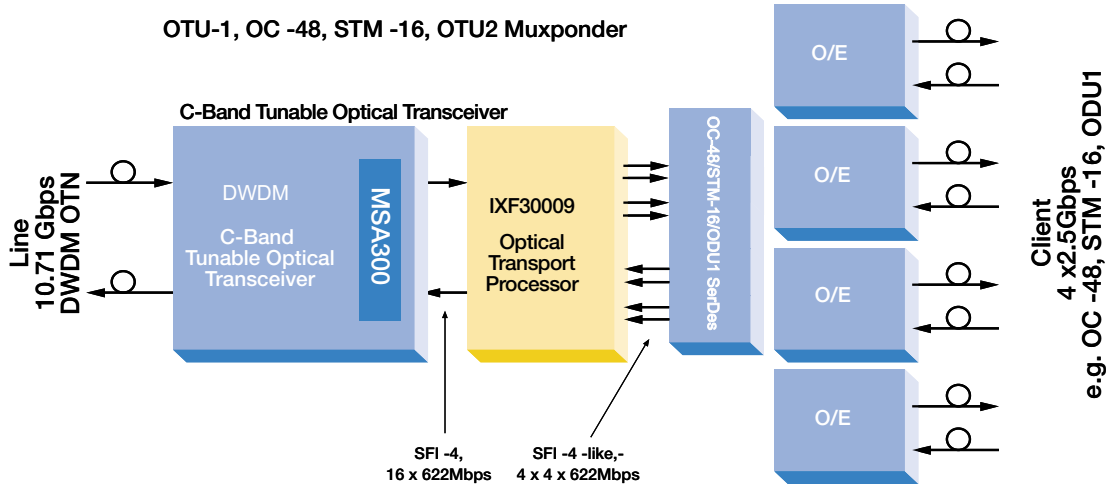
## Key Applications

- Optical Transport Networks (OTN)
- Forward Error Correction (FEC) regenerators
- Multi Service Provisioning Platforms (MSPPs)
- SONET/SDH Add/Drop Multiplexers (ADM)s
- Submarine and ULH FEC
- Low cost 10 G/2.5 G Metro and Core networks
- High density line cards for 2.5 G networks (4 bi-directional ports)
- 10 GbE LAN transport and monitoring

## Architecture Block Diagram

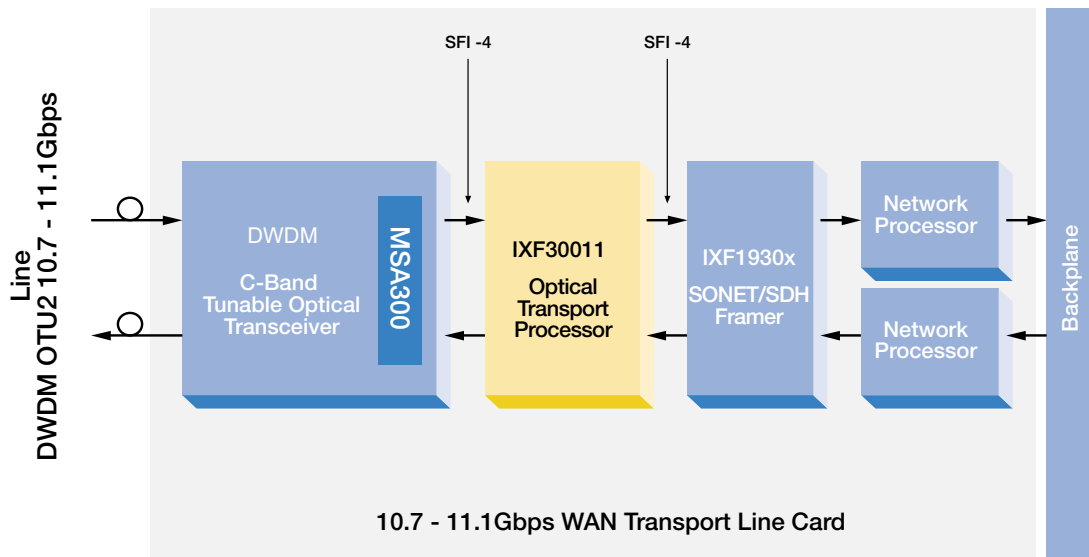


# 10 G Metro Muxponder Line Card for MSP and DWDM Systems



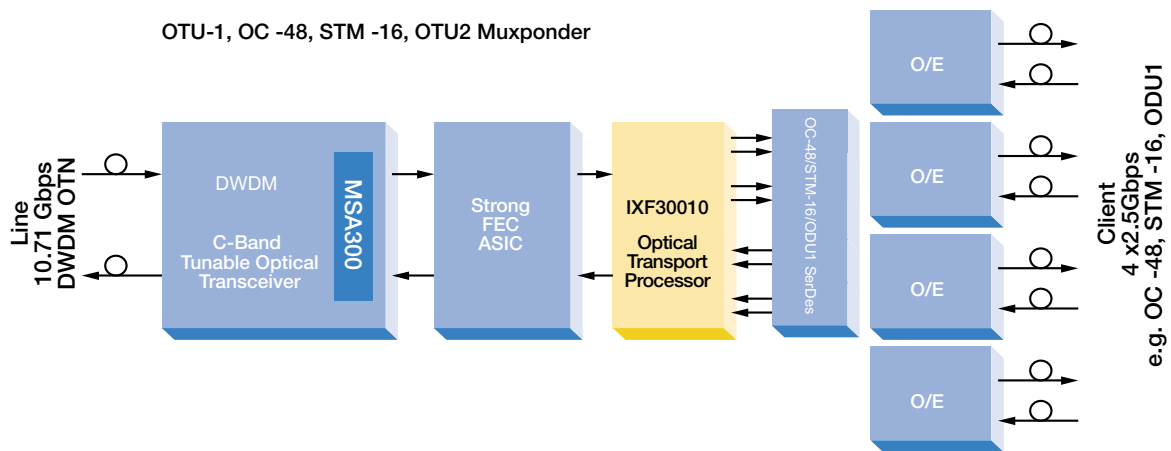
Single Framer Muxponder with Module

# OTN/SONET Router Line Card



10.7 - 11.1Gbps WAN Transport Line Card

## 10 G Metro Muxponder Line Card for MSP and DWDM



*Standalone FEC ASIC + IXF30009/30010 for transparent aggregation*

### Cortina Advantage

- The IXF30009 is a G.709 compliant Optical Transport Processor, which covers most OTN applications on a single chip. It is the successor of the IXF30001/3/5/7 devices and builds on this expertise. In addition to previous devices, the IXF30009 device supports fully transparent asynchronous aggregation of four 2.5 Gbps tributary signals into an ODU2 signal. It offers very strong proprietary enhanced FEC coding while maintaining the G.709v2 frame format. The FEC performance can be adjusted by changing the FEC overhead rate (for example, 4%, 7%, 15%, 25%) yielding a net electrical coding gain of up to 10 dB.
- The IXF30009 Optical Transport Processor offers complete SONET/SDH section and line termination on all incoming signals, either OC-48 or OC-192, and can perform monitoring on 10 GbE signals. The device I/Os are compliant to the OIF-standard SFI -4.
- The IXF30010 and IXF30011 devices are designed for 10 Gbps and Metro applications, respectively, and provide low cost solutions.

### Cortina in Communications

Cortina is a leading supplier of intelligent communication solutions through continuous innovations in advanced port processing and intelligent port connectivity to the Core, Metro, Access and Enterprise Market Segments. With our state-of-the-art high speed analog digital integration, we deliver a wide suite of products that address our customers'

performance, density and flexibility needs enabling faster time-to-market, longer time-in-market, and increased revenue opportunities. Working closely with our customers to understand their system requirements and anticipate their needs, we are creating the foundation ingredients for new generations of services.

\*Other names and brands may be claimed as the property of others.

