

PM5336 ARROW 2488

High-Capacity Single-Chip Add/Drop Multiplexer

Released Product Brief



Product Overview

The PM5336 ARROW 2488 device is a feature-rich, high capacity single-chip solution that enables optimized compact MSPPs and highly integrated central cross-connects or high fan-in tributary cards for chassis-based MSPPs, packet MSPPs, and ROADMs. The ARROW 2488 enables low chip count and power-efficient equipment designs with unprecedented scalability and carrier-grade reliability.

The ARROW 2488 consists of a SONET/SDH network interface and framer with integrated SERDES including full section, line, and high-order path processors, 70 Gbit/s of non-blocking memory-based high-order STS/AU cross-connect, 10 Gbit/s of low-order VT/TU path processors, 10 Gbit/s of non-blocking memory-based high/low-order cross-connect, and a large number of expansion interfaces (both ESSI serial links and a Parallel TelecomBus interface). The SONET/SDH framer, low-order and high-order cross-connect support Message Assisted Protection Switching (MAPS), a mechanism that allows standards-based protection switching without software intervention.

Benefits

- Optimizes compact multi-port OC-48/STM-16 architectures, while allowing scalability to multi-port OC-192/STM-64 applications
- Integrates field-proven CHESSTM intellectual property, reducing development cycles through reuse of CHES software base
- Exceeds the requirement for 50 msec protection switching for up to 5376 tributaries using a fully hardware-based APS algorithm (MAPS)

Product Highlights

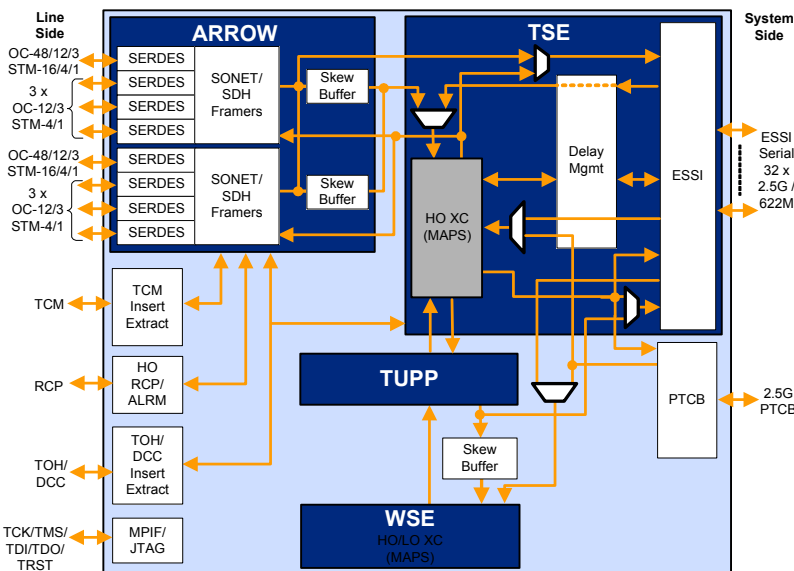
SONET/SDH Network Interface and Framer (ARROW)

- Two groups of four SONET/SDH interfaces, each supporting two modes of operation:
 - Quad OC-12/3/STM-4/1 mode (four interfaces operating at 622.08 Mbit/s or 155.52 Mbit/s, selectable per port)
 - Single OC-48/STM-16 mode (one interface operating at 2488.32 Mbit/s)
- CML compatible serial interfaces to connect to optical transceivers
- Framing, high order pointer processing, alarm processing and overhead processing on all received network streams
- Dedicated pins to extract/insert IEC code and N1 path overhead byte for Tandem Connection Monitoring
- Per-framer connection ID message, allowing verification of high order path connectivity across single or multistage fabrics
- BLSR and MSSPRing protection switching with alarm processing, K-byte express, automatic payload configuration, and other features
- Insertion/extraction of transport overhead (TO) bytes from the line side interface

STS/AU Intelligent Cross-connect (TSE)

- Memory-based, HO cross-connect capable of switching 70 Gbit/s at STS-1/AU-3 granularity
- 12.5 Gbit/s of floating delay management
- One 32-bit or four 8-bit 77.76 MHz TelecomBus interfaces connecting to parallel TelecomBus framers and mappers
- Cross-connect implements HO MAPS algorithm to extract, filter and interpret line status code on a per STS-1 basis
- TSE subsystem provides the TOH byte insertion and extraction on 24 ports (99 TOH bytes per port)
- Support for a set of active and standby configuration memory pages, permitting new switch settings to be updated in one page while the TSE operates from the control settings of the other page
- 2.5 Gbit/s to/from 622 Mbit/s interleaving/de-interleaving
- Muxing scheme enables different port asset allocations for different applications

Block Diagram



SONET/SDH Tributary Unit Payload Processor (TUPP)

- Configurable, multi-channel, payload processor that aligns and monitors performance of the SONET virtual tributaries (VTs) or the SDH tributary units (TUs)
- Optional monitoring and termination of path overhead of any legal mix of HO payloads in a SONET/SDH stream
- Remaps the incoming transport frame, payload frame and tributary multi-frame alignment on the Receive side to the VT/TU Cross-Connect (WSE) frame and multi-frame alignments through low order pointer processing
- Drop/Add path of TUPP supports multiple SDH payload conversions

VT/TU Intelligent Cross-connect (WSE)

- Memory-based, LO cross-connect capable of switching 20 Gbit/s ingress and 10 Gbit/s egress VT/TU granularity
- Accepts and switches SONET VT and SDH TU streams:
 - All SONET virtual tributary types (VT1.5, VT2, VT3, and VT6)
 - All LO SDH tributary unit types (TU11, TU12, TU2, and TU3)
- Support for a set of active and standby configuration memory pages, permitting new switch settings to be updated in one page while the WSE operates from the control settings of the other page
- Cross connect implements the Low Order MAPS algorithm to extract, filter, and interpret the line status code on a per VT/TU basis

Package

- 35x35 mm 1152-balls FCBGA

Interfaces

- 32 ESSI links:
 - Operate at 2.488 Gbit/s or 622 Mbit/s (selectable per link)
 - ESSI slicing and de-slicing for byte, nibble, di-bit, and bit modes
- SONET/SDH path overhead interface for Tandem Connection Monitoring
- SONET/SDH HO (STS/AU) transport overhead interface
- SONET/SDH ring control/alarm port
- Parallel TelecomBus interface with two functional modes:
 - Single STS-48/STM-16 mode supporting a 77.76 MHz 32-bit TelecomBus interface
 - Quad STS-12/STM-4 mode supporting four independent 77.76 MHz 8-bit TelecomBus interfaces
- Standard P1149.1 JTAG test port for boundary scan
- 32-bit microprocessor interface for status monitoring and configuration

About PMC

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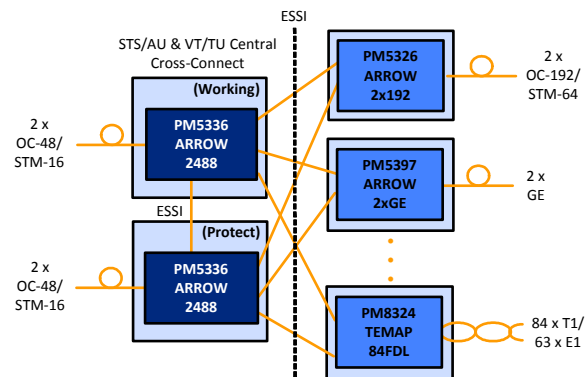
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Applications

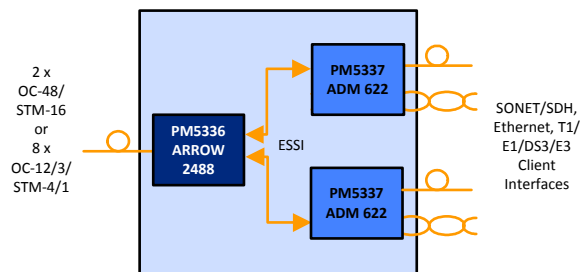
- Multi-port OC-48/STM-16 single-chip solution for compact MSPPs
- High fan-in, multi-rate SONET/SDH front-end for line cards for MSPPs, packet MSPPs, and ROADMs
- Centralized high-order and/or low-order cross-connect and pointer processor (with optional network interfaces) for chassis-based optical platforms
- One-armed low-order cross-connect and pointer processor for MSPPs

Typical Applications

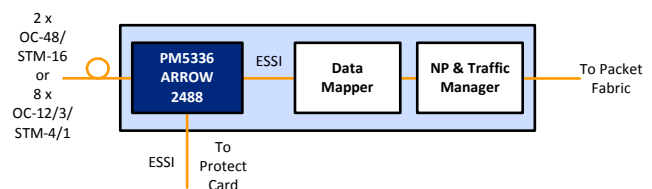
Chassis-based MSPP for UPSR/SNCP & BLSR/MSSP Ring Rings



Optimized Multi-rate Compact MSPP For UPSR/SNCP Rings



High Fan-In Packet MSPP Line Card with Ring Closure



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