PM5336 ARROW 2488
High-Capacity Single-Chip Add/Drop Multiplexer

Released Product Brief

PMC

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 CHESS 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
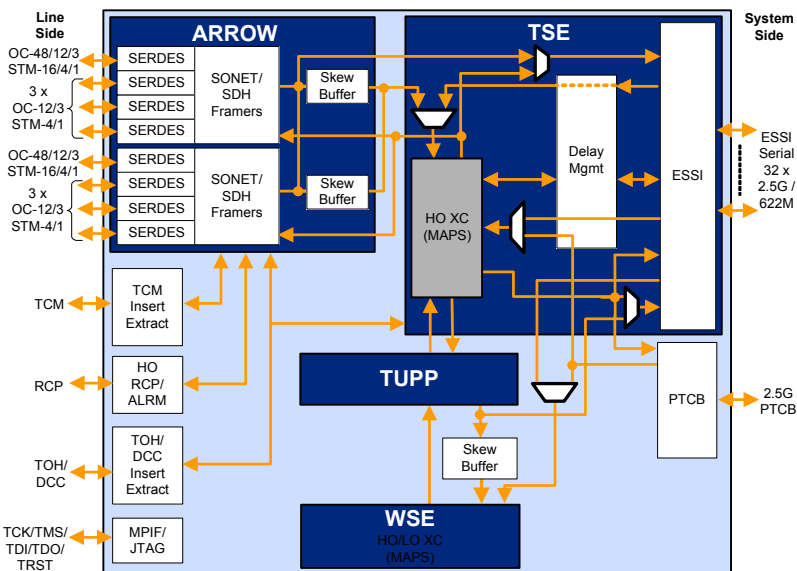
SONET/SDH Tributary Unit Payload Processor (TUPP)

- 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

PMC (Nasdaq:PMCS) is the semiconductor innovator transforming networks that connect, move and store digital content. Building on a track record of technology leadership, we are driving innovation across storage, optical and mobile networks. Our highly integrated solutions increase performance and enable next generation services to accelerate the network transformation. For more information visit www.pmcs.com.

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/MSSPRing Rings
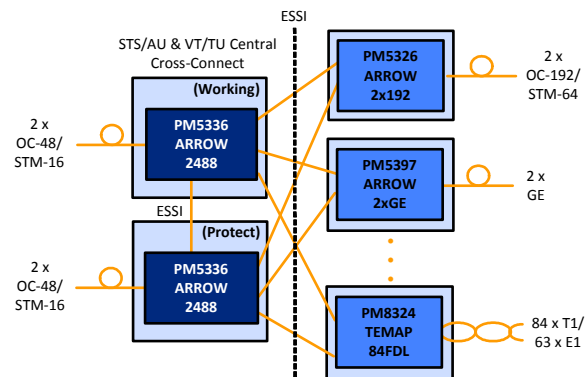
Optimized Multi-rate Compact MSPP For UPSR/SNCP Rings
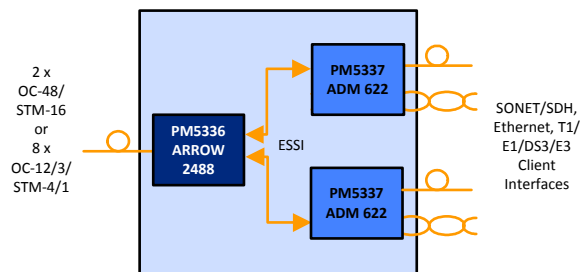
High Fan-In Packet MSPP Line Card with Ring Closure