4-Port 4.25 Gbit/s FC-AL Cut-Through Switch and Retimer

The PM8375 CTS 4x4G is a 4 port 4.25 Gbit/s FC-AL cut-through switch for backend storage applications requiring lower latency and higher performance. The CTS 4x4G can reside at the ingress/egress point of an enclosure to provide retiming and determine if an incoming frame is destined for a drive within that enclosure. After determining which port is associated with the frames recipient, a cut through operation to that port is performed thereby significantly reducing system latency and improving performance.

Additionally, the CTS 4x4G can be used solely as a retimer for 4.25 Gbit/s Fibre Channel applications where signals and links need to meet FC jitter specifications.

The CTS 4x4G provides unique disk isolation features that significantly increase total system availability, reliability, and serviceability.

FEATURES

GENERAL

- Rate selectable 1.0625, 2.125, or 4.25 Gbit/s physical interfaces.
- Pin, software and register compatible with PM8372 PBC 4x2G and PM8377 PBC 4x4G.
- Compliant to FC jitter specifications on a per-port basis.
- Supports single-ended or differential 106.25 MHz reference clock.
- Per port monitoring and diagnostics:
  - LPSM Monitoring on each port.
  - Disk isolation and per port serial loopback.
  - Configurable Digital Loss of Link: analog LOS Detect, 8B/10B disparity errors/error rate, CRC errors/error rate, word synchronization error/error rate, and compliant frequency of comma patterns detected (configurable thresholds for each with corresponding pin interrupts).
- Supports hardware-only mode with dedicated programmable pins for applications that have no CPU/MPU.
- Built-in self test capability with FC Frame Generator/Comparator.

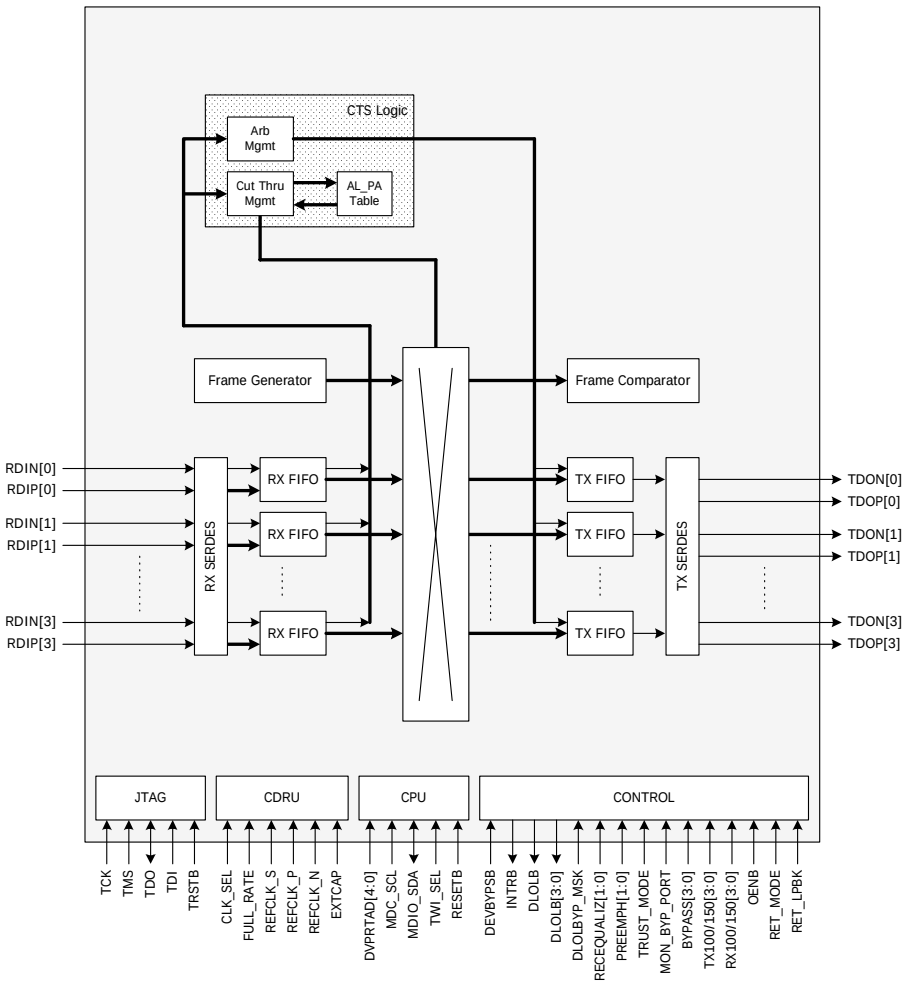
CUT-THROUGH SWITCHING

- Integrated cut-through switching and arbitration management enables up to 75% improvement in EDR and IOPS.
- Parallel arbitration supported with arbitration priority and access fairness preserved.
- Automatic or CPU controlled initialization of AL_PA table.
- Supports dynamic half-duplex, half/full duplex operation, LPSM transfer state, multicast/broadcast, any login BB_credit value.

HIGH-SPEED INTERFACE

- Independent per-channel selectable high-speed outputs support 8 levels of programmable pre-emphasis and 8 levels of output swing. Selectable pre-emphasis counteracts dielectric losses and allow maximum reach on printed circuit boards.
- Independent per-channel selectable high-speed inputs support 30 levels of programmable receive equalization for improved signal integrity.
- Integrated 100 Ω differential termination for improved signal integrity, smaller solution footprint, and lower component count.

BLOCK DIAGRAM



4-Port 4.25 Gbit/s FC-AL Cut-Through Switch and Retimer

TEST AND CONTROL

- Supports optional 2-pin serial management interface using selectable Two-Wire Interface (TWI) protocol for configuration and diagnostic access.
- For retimer mode of operation, a management interface is not required.
- External control pins can be overridden by registers.
- Digital Loss of Link (DLOLB) detect outputs for monitoring individual or multiple links. DLOLB can be programmed to indicate excessive 8B/10B code error rate, loss of synchronization, loss of signal, CRC32 errors, or comma density.
- Interrupt output to flag changes in bypass state and DLOLB error conditions.
- Supports built-in self-test (BIST) via internal Fibre Channel pattern generation and checking.
- Supports internal serial loop back modes for each port for testing and debugging.
- Provides a standard 5-signal IEEE 1149.1 JTAG test port for boundary scan board testing purposes.

PHYSICAL

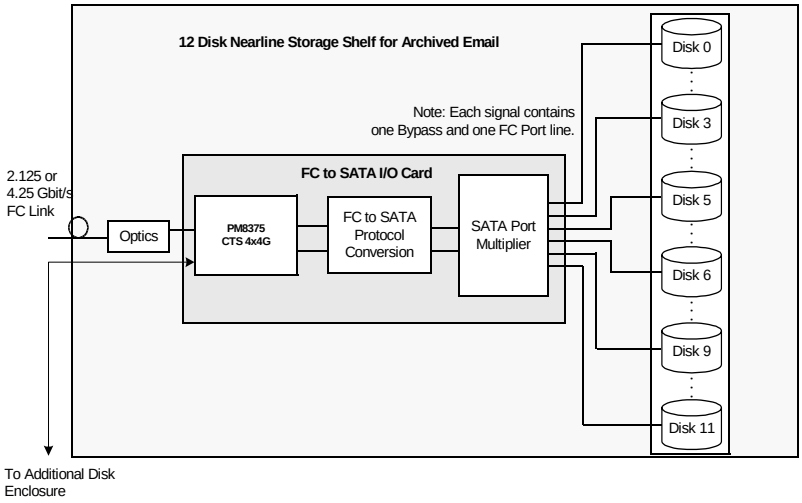
- 0.13 µm (1.2 V Core and 3.3 V I/O supply) CMOS technology.
- 15 mm x 15 mm footprint, 196-pin CABGA with 1 mm ball pitch.
- Pin compatible with PM8372 PBC 4x2G and PM8377 PBC 4x4G.
- Ultra-low operating power.

APPLICATIONS

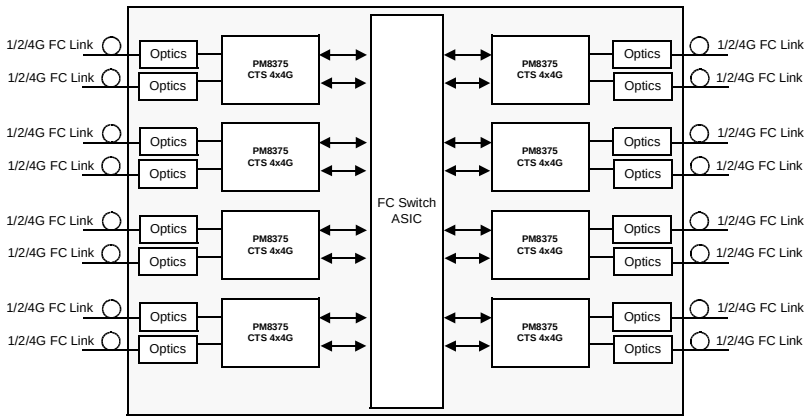
- FC to SATA Storage Systems.
- 1.0625, 2.125, and 4.25 Gbit/s Backplanes.
- FC Switches
- SBOD Storage Systems.
- MBOD Storage Systems.
- RAID Storage Systems.
- JBOD Storage Systems.
- FC-AL Nodes.
- Fibre Channel Hubs.

TYPICAL APPLICATIONS

FC to SATA Nearline Storage



Entry Level Small Medium Enterprise Fibre Channel Switch



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