

# MSP8510

## Multi-Service Processor

www.DataSheet4U.com

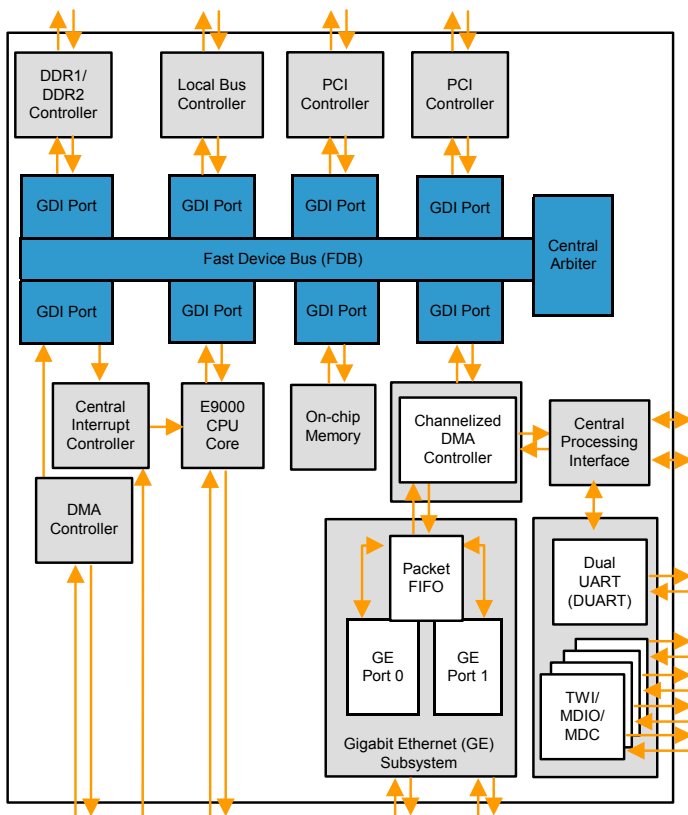
Released  
Product Brief

### PRODUCT OVERVIEW

PMC-Sierra's MSP8500 Series multi-service processor products are designed to meet the needs of networking, storage, office automation, industrial control and high-end consumer applications.

The MSP8510 Multi-Service processor is a highly-integrated, feature-rich product that incorporates PMC-Sierra's high performance E9000 microprocessor core. The MSP8510 uses the Fast Device Bus (FDB) as the system bus to interconnect all the on-chip devices to each other and to the E9000 microprocessor using the Generic Device Interface (GDI). All MSP8500 Series products provide a variety of interfaces including PCI, Ethernet, and ROM, Flash, Compact Flash, SRAM, and other low-speed peripheral interfaces.

### BLOCK DIAGRAM



### PRODUCT HIGHLIGHTS

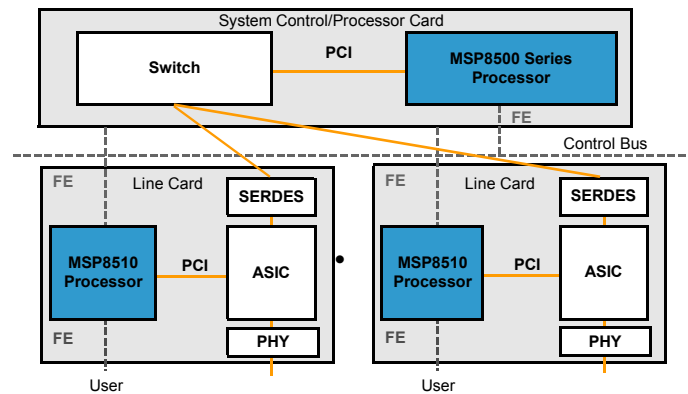
- E9000 microprocessor core:
  - 600 MHz to 1 GHz operation
  - Dual-issue superscalar 7-stage pipeline
  - 16 Kbyte L1 Instruction and Data caches with parity and a 256-Kbyte L2 cache with ECC support
  - 8K entry branch prediction table
  - Multiple reads with out-of-order return
  - MMU with 128 total TLB entries, page size range: 4 Kbytes to 256 Mbytes.
  - High-performance Floating Point Unit (IEEE 754)
  - Fixed-point DSP instructions
- 400 MHz Fast Device Bus (FDB) system interconnect:
  - Multiple master, shared, on-chip bus
  - Bus performance monitoring
  - Connects the E9000 CPU and other peripherals to memory and I/O interfaces
- 167 – 200 MHz DDR1/DDR2 SDRAM memory controller with 64-bit data interface:
  - Supports Class I and Class II SSTL drive strengths
  - Supports maximum addressing up to 4 Gbytes
  - Provides DDR2 single-ended DQS signaling so that DDR2 RAMs may be supported and operated in DDR1 mode
  - DDR1 supports device densities of 64, 128, 256, 512 Mbits and 1 Gbit. DDR2 supports densities of 256 Mbits, 512 Mbits and 1 Gbit
  - DDR2 supports device widths of 8 and 16 bits. DDR1 additionally supports 32-bit widths
  - Supports unbuffered and registered DIMMs
- 2 PCI ports, 32 bits each:
  - Compliant with PCI 2.3 standard
  - Supports 0 to 66 MHz frequencies
  - Supports on-line insertion and removal
- Local Bus controller providing glueless ROM, Flash, Compact Flash, SRAM, external USB 2.0 devices, and Variable-Latency I/O (VLIO) support:
  - 6 independent chip selects

- 2 Ethernet MAC or Generic Packet Interfaces (GE Subsystem + Generic Device Interface XDMA Controller):
  - Ethernet MAC interfaces support industry-standard TBI (1000 Mbit/s), GMII (1000 Mbit/s), and MII (10/100 Mbit/s, full and half duplex) interface modes
- Integrated DMA support for GE subsystem:
  - Up to 16 logical channels for each receive and transmit direction
  - Receive and transmit are independent
  - 32-Kbyte scalable packet FIFO:
    - 24 Kbytes for the receive direction. Configurable sizing
- Support for Ethernet pause flow control
- 2 integrated 16550 UART ports
- 32 Kbytes of on-chip memory (ECC)
- 64 general-purpose I/O pins with integrated de-bounce on 8 pins
- Integrated watchdog timer and 4 general-purpose timers
- Up to 4 ports of Two-Wire interface (TWI) with support for Small Form Factor Plug-able (SFP) or up to 4 ports of MDIO/MDC interface protocol through the general-purpose I/O pins
- Integrated DMA engine, which supports 4 independently configured and controlled channels
- Support for 256 vectored interrupts:
  - In-band interrupt sources from all on-chip GDI devices
- Flexible mapping of interrupt vectors to E9000 CPU interrupt lines
- Integrated on-chip EJTAG debug circuitry:
  - A dedicated debug module on the E9000 core
  - Watch exceptions, interrupt and exception debuggers, performance counters, and 64-entry trace buffers
- 896-pin FCBGA package, 31 mm x 31 mm
  - Pin compatible with the MSP8520 Multi-service Security Processor

## APPLICATIONS

- Low-end/Mid-range Enterprise Switches & Routers
- Storage Networking
- Office-in-a-box Gateway
- Control Plane Processing
- SMB Network Attached Storage (NAS)
- Imaging systems: Color Laser Printers/MFPs
- Embedded Computing
- Industrial and General Purpose Control
- Media Networked Server

## DISTRIBUTED ROUTER AND MULTI-SERVICE SWITCH



## SUPPORT

### OPERATING SYSTEMS

- Open Source Linux versions 2.4 and 2.6
- VxWorks 5.5 from Wind River
- Neutrino from QNX Software Systems

### EJTAG EMULATORS

- Wind River
- Corelis

### EVALUATION BOARDS

- PMC-Sierra PM2330-KIT reference kit
- ATX form-factor evaluation board

### COMPANION CHIPS

- Wide range of companion chips available to interface with the PCI bus

## FURTHER RESOURCES

### MSP8520 MULTI-SERVICE SECURITY PROCESSOR

[www.pmc-sierra.com/products/details/msp8520/](http://www.pmc-sierra.com/products/details/msp8520/)

### VOIP NETWORK PROCESSOR CHIP FAMILY

[www.pmc-sierra.com/voip-network-processor/](http://www.pmc-sierra.com/voip-network-processor/)

### TECHNICAL DOCUMENTATION

[www.pmc-sierra.com/documentation/](http://www.pmc-sierra.com/documentation/)

Corporate Head Office:  
 PMC-Sierra, Inc.  
 Mission Towers One  
 3975 Freedom Circle  
 Santa Clara, CA, 95054, U.S.A.  
 Tel: 1.408.239.8000  
 Fax: 1.408.492.1157

Operations Head Office:  
 PMC-Sierra, Inc.  
 100-2700 Production Way  
 Burnaby, BC V5A 4X1 Canada  
 Tel: 1.604.415.6000  
 Fax: 1.604.415.6200

PMC-2031171 [R4] © Copyright PMC-Sierra, Inc. 2006. All rights reserved. For a complete list of PMC-Sierra's trademarks, visit [www.pmc-sierra.com/legal/](http://www.pmc-sierra.com/legal/). Other product and company names mentioned herein may be the trademarks of their respective owners. For corporate information, send email to: [info@pmc-sierra.com](mailto:info@pmc-sierra.com). All product documentation is available on our web site at: [www.pmc-sierra.com](http://www.pmc-sierra.com).