

MAC

Fast Ethernet Media Access Controller

MAJOR FEATURES

- ◆ IEEE 802.3 CSMA/CD standard compliance enables 10/100 Mbps Ethernet modes
- ◆ Support for half- and full-duplex Ethernet links
- ◆ Compatible with the following PHY interfaces - MII, RMII
- ◆ Internal OCP socket with AMBA® AHB and generic PPCI wrappers for system bus interface
- ◆ Advanced mechanism for flexible address filtering against physical addresses and/or hash table
- ◆ Scatter-gather DMA controller with a configurable 8/16/32/64-bit data bus length
- ◆ Descriptor/buffer architecture for data storage
- ◆ Configurable transmit/receive FIFOs with programmable threshold levels and "store and forward" functionality
- ◆ Fully-automated MII Serial Management data framing for integration with an external PHY
- ◆ Low power capabilities

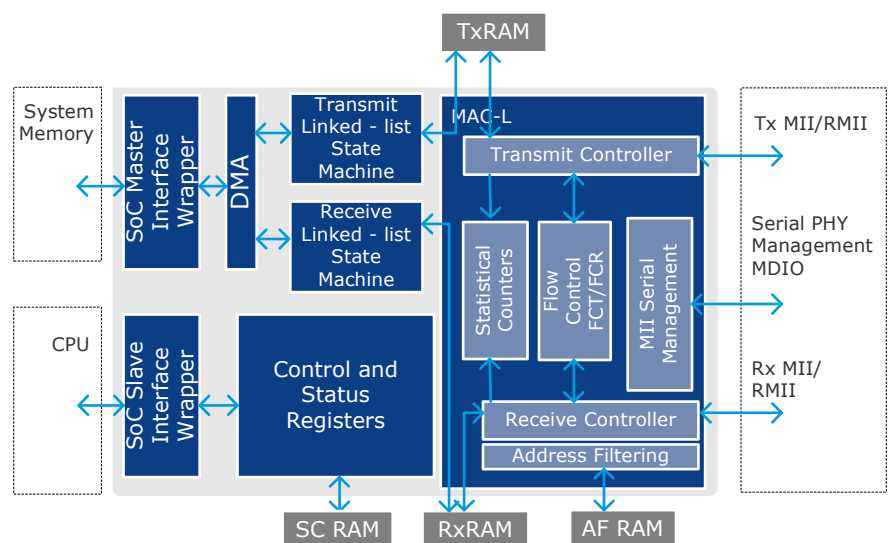
OVERVIEW

The **MAC** Ethernet Controller implements Carrier Sense Multiple Access with Collision Detection (CSMA/CD) algorithms defined by IEEE 802.3 for media access control over the 10/100 Mbps Ethernet.

The controller is available with most popular Ethernet PHY interfaces and the OCP socket for straightforward implementation of any system bus interface. AMBA® AHB and generic PPCI interface wrappers and test benches are available off-the-shelf and may be delivered upon request.

The **MAC** controller is a fully user-configurable IP, with the size-optimized Lite version available. The Lite version implements full 802.3 CSMA/CD standard 10/100 Mbps Ethernet operation modes. It uses simplified FIFO interface and operates directly on input/output signals instead of instantiating a DMA controller and CSRs, respectively.

BLOCK DIAGRAM



MAC

BENEFITS

- ◆ High configurability level together with various host interfaces make the IP suitable for a large scope of SoC applications
- ◆ Advanced DMA Controller provides effective data transfers
- ◆ Compatibility with most popular PHY interfaces gives excellent support for different market solutions

CONFIGURABILITY

The following parameters allow adjusting the **MAC** core to requirements of target application or technology:

- ◆ Host interface
- ◆ PHY interface
- ◆ Host bus interface width
- ◆ Transmit/receive FIFO size
- ◆ Statistical counters
- ◆ Flow control
- ◆ MII serial management
- ◆ Single/advanced address filtering
- ◆ Interrupt mitigation

APPLICATIONS

- ◆ Communication systems
- ◆ Ethernet switches and routers
- ◆ VoIP devices
- ◆ Computer systems
- ◆ Network Interface Cards
- ◆ Video web servers
- ◆ Backbone networks

RELATED PRODUCTS

MAC-PCI - a combination of the **MAC/MAC-1G** controller and the 32-bit 33 MHz Master/Slave PCI Host Interface core. The solution simplifies development of Ethernet networking functionality in PCI-based systems and applications.

MAC-PCI Linux Driver - a Linux-optimized driver for the **MAC-PCI** controller.

STANDARD DELIVERABLES

- ◆ VHDL/Verilog source code
- ◆ Synthesis support for Synopsys® and Cadence® tools with a set of synthesis scripts
- ◆ Simulation support for Mentor Graphics® and Cadence® tools with a set of scripts and macros
- ◆ Extensive test bench
- ◆ Documentation:
 - ▶ Design Specification
 - ▶ Verification Specification
 - ▶ Test Plan
 - ▶ Integration Manual
- ◆ 30 days of technical support
- ◆ 90 days of warranty against defects

DELIVERY OPTIONS

- ◆ EDIF netlist for FPGA and low volume production
- ◆ One-year maintenance
- ◆ On-site support and training



For more information on our IP portfolio visit www.evatronix-ip.com



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