Overview

Cadence IP Factory delivers custom, synthesizable IP to support specific design requirements.

The Cadence 10/40G Ethernet MAC IP provides the logic required to integrate a 10/40 Gigabit Ethernet MAC (XGM) into any system on chip (SoC).

Compliant with IEEE Standard 802.3, the Cadence 10/40G Ethernet MAC IP has a rich feature set with many configurable features and programmable input parameters to customize the MAC for the specific needs of any application. Support for IEEE 802.3az Energy-Efficient Ethernet, and also for remote network monitoring (RMON), is included.

The Cadence 10/40G Ethernet MAC IP is architected to quickly and easily integrate into any SoC, and to connect seamlessly to a Cadence, or third-party, PHY through XGMII, XAUI, 10GBASE-R and 40GBASE-R10 IP, available as separate components. Host layer access to the XGM is through a 64-bit or optional 128-bit industry-standard AXI3™ interface with DMA support, or through an external FIFO interface. A separate 32-bit interface allows the host application to configure the Cadence 10/40G Ethernet MAC IP.

The Cadence 10/40G Ethernet MAC IP is based on our silicon proven MAC IP, which has been extensively validated with multiple hardware platforms.

Cadence IP Factory offers a comprehensive IP solution that is in volume production, and has been successfully implemented in dozens of applications.

Key Features

- Compatible with IEEE standard 802.3
- Jumbo frames up to 10240 bytes
- Supports 40Gb/s operation in accordance with IEEE 802.3ba
- 64-bit FIFO interface to Host layer
- Support for IEEE 802.3az Energy-Efficient Ethernet
- Optional 64- or 128-bit AXI-based DMA interface
- Support for IEEE 802.1Q VLAN tagging and priority tagged frames
- 32-bit DDR XGMII or 64-bit SDR interface to PHY layer
- Support for 802.1Qbb priority-based flow control
- Support for IEEE 802.1AS and IEEE 1588 precision clock synchronization protocol
- PHY management through MDIO interface
- Filtering for eight addresses and four type IDs
- Statistics counter registers for RMON/SNMP
- Supports internal and external address matching
Product Details

The Cadence 10/40G Ethernet MAC IP supports full-duplex operation at 10Gb/s and 40Gb/s data rates.

10/40 Gigabit Ethernet MAC (XGM)

The Cadence 10/40G Ethernet MAC IP is configurable with optional automatic preamble, pad and CRC generation on transmitted frames, and non-standard preamble compatibility on transmitted and received frames. Flow control in full-duplex mode supports pause frames in the receive path and hardware generated pause frames in the transmit path.

The Cadence 10/40G Ethernet MAC IP supports virtual LANs by IEEE 802.1Q VLAN tagging with recognition of incoming VLAN and priority-tagged frames. Support for IEEE 802.1Qbb priority-based flow control is also available.

The 10/40G Ethernet MAC IP provides address checking logic for eight specific Ethernet (MAC) addresses, four type IDs, promiscuous mode, external address checking, and hash matching of unicast and multi-cast destination addresses. The Cadence 10/40G Ethernet MAC IP is configurable for jumbo frames up to 10240 bytes.

The Cadence 10/40G Ethernet MAC IP recognizes IEEE 1588 and 802.1AS PTP frames.

PHY Interface

The Cadence 10/40G Ethernet MAC IP supports an XGMII (32-bit DDR), or a 64-bit SDR interface to the PHY. An MDIO interface for PHY management is also included.

Benefits

- Low Risk solutions – Silicon proven design
- Ease of Use – Customizable with easy integration
- Designed by an industry leader – Cadence is an active contributor to the 802.3 standards working groups

Related Products

- Cadence® Verification IP for Ethernet
- 10GBASE-R PCS for Ethernet
- 40GBASE-R10 PCS for Ethernet

Cadence IP Factory

Cadence IP Factory can deliver various configurations of Ethernet MACs to meet your design requirements.

For more information, visit www.cadence.com/ip

Deliverables

- Verilog HDL
- Cadence® Encounter® RTL Compiler synthesis scripts
- User guide with full programming interface, parameterization instructions, and synthesis instructions
- Verilog testbench

Available Products

- 10/40G Ethernet MAC IP
- 10/40G Ethernet PHY IP