

10/40G Ethernet MAC (XGM) IP

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.

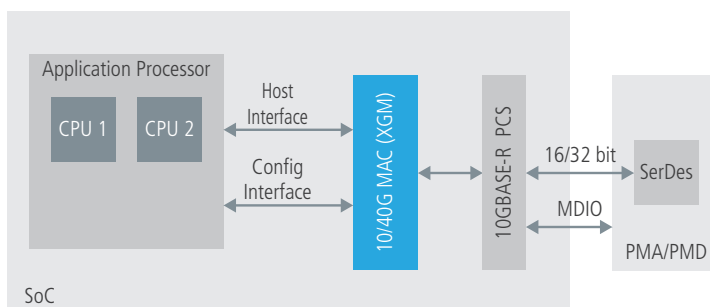


Figure 1: Example System Level Block Diagram

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

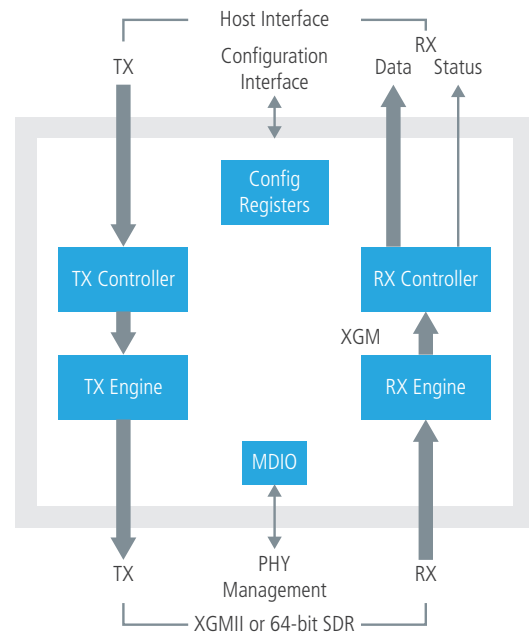


Figure 2: IP Level Block Diagram

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

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

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



Cadence Design Systems enables global electronic design innovation and plays an essential role in the creation of today's electronics. Customers use Cadence software, hardware, IP, and expertise to design and verify today's mobile, cloud, and connectivity applications. www.cadence.com