



# MCS8140

Network USB Processor  
Preliminary Version

## 1. General Description

The MosChip MCS8140 is a highly integrated general purpose network processor that can be used in a variety of products that require network connectivity. The CPU subsystem of the MCS8140 contains a 170 MHz ARM926EJ-S, 32-bit RISC microprocessor delivering approximately 1.1 MIPS per MHz.

The MCS8140 network processor contains four high speed USB 2.0 ports. These ports have been designed to connect a wide range of USB-based devices to an Ethernet network (Internet or Intranet).

The 32-bit, 33MHz PCI host interface complies with the PCI 2.2 standard. The PCI controller can support up to two PCI devices. This allows the MCS8140 to connect to a variety of PCI devices such as 802.11x peripherals as well as audio, SATA, and IDE controllers.

The Ethernet controller in the MCS8140 contains an independent media access controller (MAC) and physical layer (PHY). The Ethernet interface can be connected directly to external magnetics, LED's and connectors. In addition, the MCS8140 provides an alternate Ethernet configuration that does not use the internal PHY. In this configuration all the MII pins are available on the 20-pin GPIO interface.

A robust Security Engine handles all IPsec functions including the DES, 3DES, AES, MD5, SHA-1, and SHA-256 algorithms.

The interface pins for the on-chip I<sup>2</sup>S audio controller are multiplexed with the GPIO pins and can be used for controlling an external I<sup>2</sup>S Codec. The MCS8140 also has a built-in serial emulator which can be used to connect to standard SPI EPROM's. It also provides a local bus for system expansion and support of 8-bit devices.

## 2. Features

### CPU

- 32-bit, 170 MHz ARM926EJS CPU with MMU
- 16Kbyte, 4-way associative I and D caches
- V5 instruction set

### USB Host

- Four high speed USB ports (USB2.0) with on-chip transceivers
- Single Enhanced Host Controller Interface (EHCI) controller
- Two Open Host Controller Interface (OHCI) controllers
- Compatible with bulk, interrupt and isochronous type USB devices
- OTG high speed/full speed peripheral support on one of the four USB ports
- On-chip OTG PHY

### Ethernet

- IEEE 802.3 compliant 10/100Mbps Ethernet MAC and PHY with full duplex operation
- MII interface option for connecting external PHY

### Memory Controller

- 32 MB, 100 MHz SDRAM Interface with x16 and x32 bit modes
- 8 MB, 8-bit parallel Flash Interface
- 8-bit Interface for local bus

### Security Engine

- AES and DES/3DES hardware encryption and decryption
- SHA1, SHA256 and MD5 authentication in hardware

### Other

- TOE (TCP / IP Offload Engine) and List processing
- 32bit, 33MHz PCI host support two PCI devices
- Standard UART supports up to 115200 bps
- I<sup>2</sup>S controller for interface to external I<sup>2</sup>S audio Codec
- 20-pin interrupt-capable GPIO interface
- SPI EEPROM interface
- JTAG interface for advanced debugging

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## 3. Block Diagram

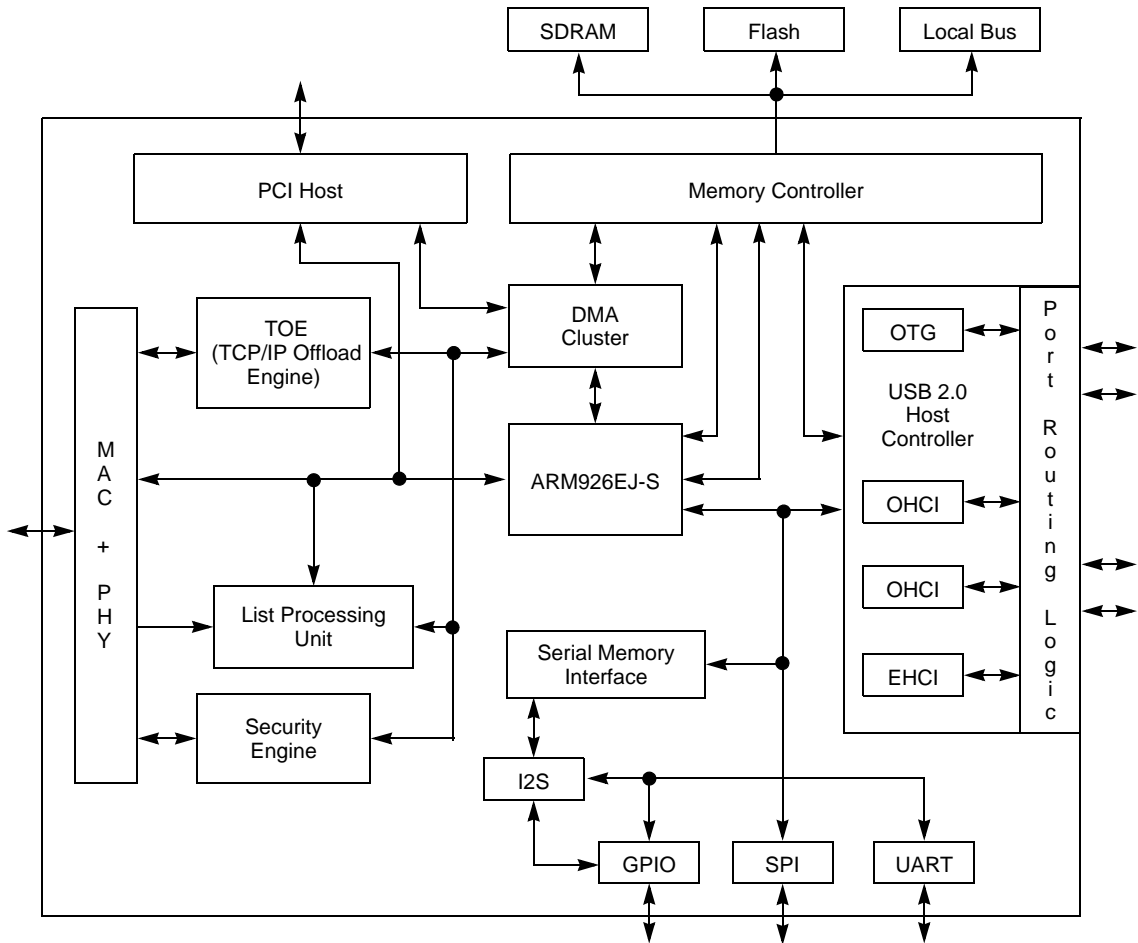


Figure 1. MCS8140 Block Diagram

## 4. Applications

The MCS8140 can be used in the following sample applications:

- Networked USB server/extended USB ports
- Networked USB print server
- Secure NAS (Network Attached Storage)
- WAP — Wireless Access Point / Gateway

### 4.1 Reference Schematics

MCS8140-SCH

### 4.2 Evaluation Board

MCS8140-EVB

Refer to the MCS8140 Evaluation Board document for more information.

## 5. Ordering Information

Commercial Grade (0 °C to +70 °C)		
MCS8140CV	256 Pin QFP	RoHS

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## 6. Pin Diagram

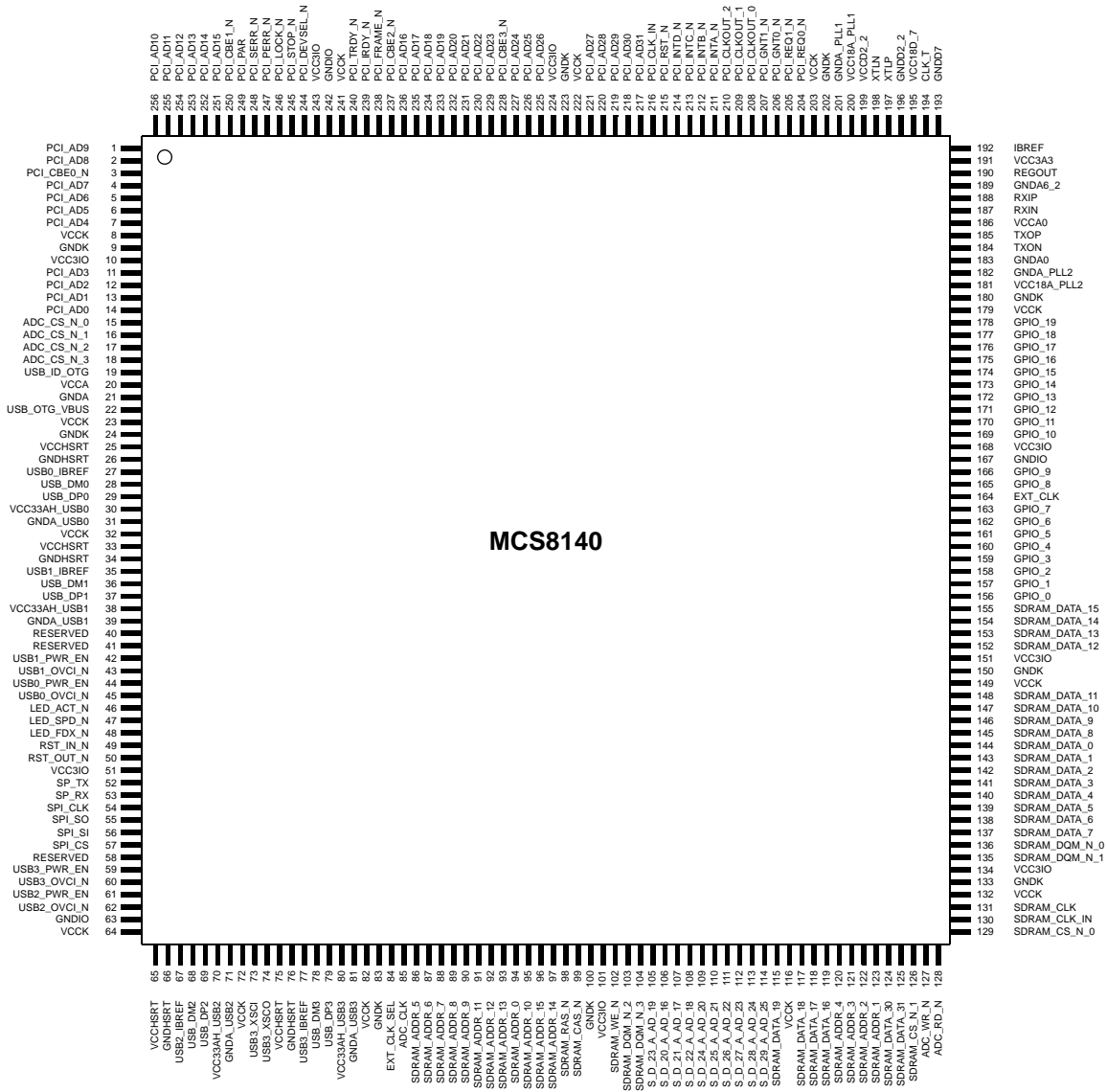


Figure 2. MCS8140 Pin Diagram