

**Features****● PCI Express**

- Single-lane (x1) PCI Express endpoint controller with integrated PHY
- Compliant with PCI Express base specification revision 1.1
- Compliant with PCI Express Card specifications
- Supports multiple DMA transactions
- Supports eight PCI Express functions
- Supports Message TLP (error) generation
- Supports both legacy and MSI Interrupt mechanism

**● USB**

- Four USB 2.0 Host Ports with on-chip transceivers, can handle High-speed (480Mbps), Full-speed (12Mbps) and Low-speed (1.5Mbps) transactions
- One of the USB 2.0 Host Port can support OTG Feature
- Four dedicated Enhanced Host Controller Interface (EHCI) controllers
- Four dedicated Companion Open Host Controller Interface (OHCI) controllers
- Compatible with Bulk, Interrupt and Isochronous type USB devices

**Product Brief**

- Simultaneous operation of multiple high-performance USB devices
- Supports USB Power Management
- As a peripheral, OTG supports High Speed (HS)/ Full Speed (FS) Operation
- As a peripheral, OTG supports the following endpoints
  - ◆ One control endpoint
  - ◆ One interrupt IN endpoint
  - ◆ Two Bulk IN endpoints
  - ◆ Two Bulk OUT endpoints

**● General Device Features**

- Device parameters configurable through EEPROM
- 24 GPIO lines
- Optionally GPIO lines are configurable to support ISA Interface
- JTAG Port for board level diagnostics
- Power Supply requirement : 1.2V for Core & 3.3V for IO's
- On-chip Voltage regulator for 3.3V to 1.2V
- Package : 128-Pin LQFP, RoHS
- Operating Temperature : 0 to +70°C or -40 to +85°C

**Product Description**

MCS9990 is a single lane multi function PCI Express to 4 dedicated USB2.0 host controllers, dedicated bandwidth per port, allowing 4 dedicated USB2.0 host controllers share 2.5Gbps wide PCI Express bus bandwidth. It supports two modes of operation - USB host mode and OTG mode, selectable through device mode select pins. The USB host mode supports four USB2.0 host ports with four dedicated USB host Controllers. The OTG mode supports two USB2.0 host ports, one USB OTG port and provision to select GPIO or ISA interface. The four USB2.0 host ports are integrated with on-chip transceivers and support four dedicated Enhanced Host Controller Interface (EHCI) and four dedicated Open Host Controller Interface (OHCI). The USB OTG port is integrated with OTG PHY and supports host and device operations. The provisional ISA interface supports up to four serial ports and/or up to two parallel ports. The provisional 24 GPIO pins are programmable as an input or output.

### Target Applications

- Extend the USB host/OTG ports on a PC or embedded systems
- Embedded applications for providing multiple USB ports
- Add-on I/O cards for serial port and parallel port through ISA interface
- PC/Server motherboard applications
- Digital Audio/Video applications
- NAS, Printer servers
- Video security monitoring applications

### Block Diagram

