General Description:

The ISP1582 is a cost-optimized and feature-optimized Hi-Speed Universal Serial Bus (USB) peripheral controller. It fully complies with Ref. 1 "Universal Serial Bus Specification Rev. 2.0", supporting data transfer at high-speed (480 Mbit/s) and full-speed (12 Mbit/s).

The ISP1582 provides high-speed USB communication capacity to systems based on microcontrollers or microprocessors. It communicates with a microcontroller or microprocessor of a system through a high-speed general-purpose parallel interface.

The ISP1582 supports automatic detection of Hi-Speed USB system operation. Original USB fall-back mode allows the device to remain operational under full-speed conditions. It is designed as a generic USB peripheral controller so that it can fit into all existing device classes, such as imaging class, mass storage devices, communication devices, printing devices and human interface devices.

The internal generic Direct Memory Access (DMA) block allows easy integration into data streaming applications.

The modular approach to implementing a USB peripheral controller allows the designer to select the optimum system microcontroller from the wide variety available. The ability to reuse existing architecture and firmware shortens the development time, eliminates risk and reduces cost. The result is fast and efficient development of the most cost-effective USB peripheral solution.

The ISP1582 also incorporates features such as SoftConnect™, a reduced frequency crystal oscillator, and integrated termination resistors. These features allow significant cost savings in system design and easy implementation of advanced USB functionality into PC peripherals.

Key Features:

Complies fully with:

- Ref. 1 "Universal Serial Bus Specification Rev. 2.0"
- Most device class specifications
- ACPI, OnNow and USB power management requirements
• Supports data transfer at high-speed (480 Mbit/s) and full-speed (12 Mbit/s)
• High performance USB peripheral controller with integrated Serial Interface Engine (SIE), Parallel Interface Engine (PIE), FIFO memory and data transceiver
• Automatic Hi-Speed USB mode detection and Original USB fall-back mode
• Supports sharing mode
• Supports $V_{bus}$ sensing
• Supports Generic DMA (GDMA) slave mode
• High-speed DMA interface
• Fully autonomous and multi-configuration DMA operation
• Seven IN endpoints, seven OUT endpoints, and a fixed control IN and OUT endpoint
• Integrated physical 8 kbyte of multi-configuration FIFO memory
• Endpoints with double buffering to increase throughput and ease real-time data transfer
• Bus-independent interface with most microcontrollers and microprocessors
• 12 MHz crystal oscillator with integrated PLL for low EMI
• Software-controlled connection to the USB bus (SoftConnect)
• Low-power consumption in operation and power-down modes; suitable for use in bus-powered USB devices
• Supports Session Request Protocol (SRP) that adheres to Ref. 2 "On-The-Go Supplement to the USB Specification Rev. 1.3"
• Internal power-on and low-voltage reset circuits; also supports software reset
• Operation over the extended USB bus voltage range (DP, DM and $V_{bus}$)
• 5 V tolerant I/O pads
• Operating temperature range from –40 °C to +85 °C

**Connection Diagram:**

- Portable storage
- Digital video camera
- ISP1582
- ISP1583
- Digital still camera
- MP3 player
- PDA