

## **SYM53C770**

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### **Single-Chip High-Performance Ultra SCSI (Fast-20) I/O Processor**



- Designed for use in multi-user systems including network file servers, multitasking mid-range computers, supercomputers, and minicomputers.
- Ultra SCSI (Fast-20) technology doubles the I/O bandwidth up to 40 MB/s Builds upon proven technology—a pin-for-pin replacement for the SYM53C720 Provides new features for enhanced performance and flexibility.

The SYM53C770 includes all of the features of the SYM53C720 with added support for Ultra SCSI (Fast-20) transfers, enabling the chip to transfer SCSI data at up to 20 MB/s on an 8-bit bus and up to 40 MB/s on a 16-bit bus. Fast-20 is an extension of the SCSI-3 standard that expands the bandwidth of the SCSI bus and allows faster synchronous SCSI transfer rates. When enabled, Fast-20 effectively doubles the synchronous transfer rates of Fast SCSI-2.

The SYM53C770 allows easy firmware upgrades and is SCRIPTS™ -compatible (the Symbios™ -developed SCSI programming language) with the SYM53C7XX and SYM53C8XX families. The device provides full SCSI-2 capabilities and features Symbios TolerANT™ SCSI driver and receiver technology for reliable operation in all cabling environments.

Performance enhancements of the SYM53C770 include an additional 4 KB of internal RAM for SCRIPTS instruction storage, which reduces system bus bandwidth requirements, and allows tailored SCSI sequences to be executed locally--saving the system bandwidth for other tasks. A 96-byte DMA FIFO provides more efficient throughput from/to the host to/from the SCSI bus during high latency DMA bus requests. Other new features include:

- An increase in the maximum synchronous SCSI offset from 8 to 16 levels--allowing better speed matching during Fast-20 transfers
- A SCSI clock doubler allows the use of a 40/50 MHz oscillator, which is doubled internally to provide the correct frequency for Fast-20 transfer modes

- Expanded handshake-to-handshake and general purpose timers to include a scale factor to increase the length of time before these timers expire

## **Features and Benefits**

### **Performance**

- Performs SCSI Fast-20 data transfers up to:
  - 40 MB/s synchronous (16-bit)
  - 20 MB/s synchronous (8-bit)
- Functions as full 32-bit DMA bus master
- Additional 4 KB SCRIPTS internal RAM
- 96-byte DMA FIFO for improved throughput between the host and SCSI bus
- SCSI offset increased to 16 transfers
- 32 additional scratchpad registers for user-defined functions

### **Ease-Of-Use**

- Pin-for-pin replacement for SYM53C720
- Minimal software and hardware modifications required for Fast-20 support
- Allows migration of existing SYM53C7XX SCRIPTS
- Handshake-to-handshake and general purpose timers include a scale factor to increase amount of time before timers expire

### **Flexibility**

- Internal SCSI clock doubler allows use of a 40/50MHz oscillator with Fast-20 transfer modes
- SCSI Selected as ID Register
- High-level programming interface (SCSI SCRIPTS)
- Allows tailored SCSI sequences to be executed from main memory
- Accommodates changes in the logical I/O interface definition

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