hyperstone

F2-16X

Flash Memory Controller

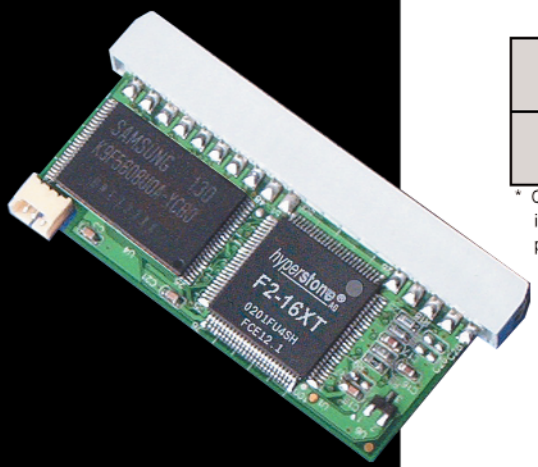
Hyperstone's F2-16XN™ and F2-16XT™ flash memory controller offer the highest power efficiency and compatibility. With the F2-16X you are ready for mass production of flash memory solutions for imaging, multimedia, communications or mobile applications.

- Integrated on-chip components
- Optimized pre-formatting & testing procedure
- Re-programmable Firmware
- 32-bit RISC core
- 16-bit interface
- Power-down mode
- 0.25µm
- More...

→ Highest power efficiency
→ Superior performance
→ Lowest total system cost
→ Speedy mass production
→ Industry leading compatibility
→ Flexibility to integrate additional features

Options

- F2-16XN™: 128 pin LQFP, 14x14x1.4mm, directly connects up to 16 memory chips, applications include ATA cards or embedded solutions
- F2-16XT™: 100 pin TQFP, 14x14x1.0 mm, directly connects up to 10 memory chips, optimized for CompactFlash® (CF) cards
- Reference design (Hyperflash™ cards) including schematics and all necessary files you need to manufacture CF or ATA cards
- CF card manufacturing kit for mass production
- Advanced system features can be integrated into your custom design



Performance Data

The Hyperstone F2-16X achieves up to 20 Mbytes/sec transfer rates. The MTBF is more than 1 million hours. Typical performance results* (PIO 4 in TRUE-IDE mode):

	Sequential		Random		Weighted Average
	Read	Write	Read	Write	
Access Time (ms)	0.11	0.07	0.18	7.92	1.21 **
Transfer Rate (KB/sec)	10206	7277	9823	7947	8855 ***

* QBENCH™, V.1.3, (Quantum Corp.), Samsung K9F1G16; interleaved mode, at 20 MHz, firmware release 031011; performance may vary using other flash chips

** Average data access time is 1.2 ms

*** Average data transfer rate is 8850 KB/sec

Targeted Applications

The F2-16X is optimized for applications that need non-volatile, low power-consuming and high-speed access to memory at the lowest manufacturing cost. includes:

- Portable devices, PDAs, personal communicators, digital cameras, MP3 players, voice recorders, etc.
- Embedded applications such as flash disk drives, disk-on-module, etc.

Key Features

Highly-Compatible Flash Memory Interface

- Supports all control signals for serial type flash memory connection
- Connects up to 16 flash chips
- Operation of up to 4 chips simultaneously
- Supports multi-die chips
- Compatible with: NAND chips (Samsung, Toshiba, AMD etc.), AND chips (Hitachi, Mitsubishi etc.), NROM chips (Ingentix)
- On-chip voltage regulator for 3.3V and 1.8V flash memory and 2.5V processor core power supply
- Flash memory power down logic
- Re-programmable firmware: Operating system and controller specific firmware stored in boot ROM, memory specific firmware is stored in flash memory and loaded into internal RAM during boot up
- Integration of security or copy protection features possible even after production
- Error Correction Code (ECC) capable of correcting 6 bytes in a 512 byte sector, no overhead for write and read operations
- Flash memory write protect control

High-Performance Controller Core

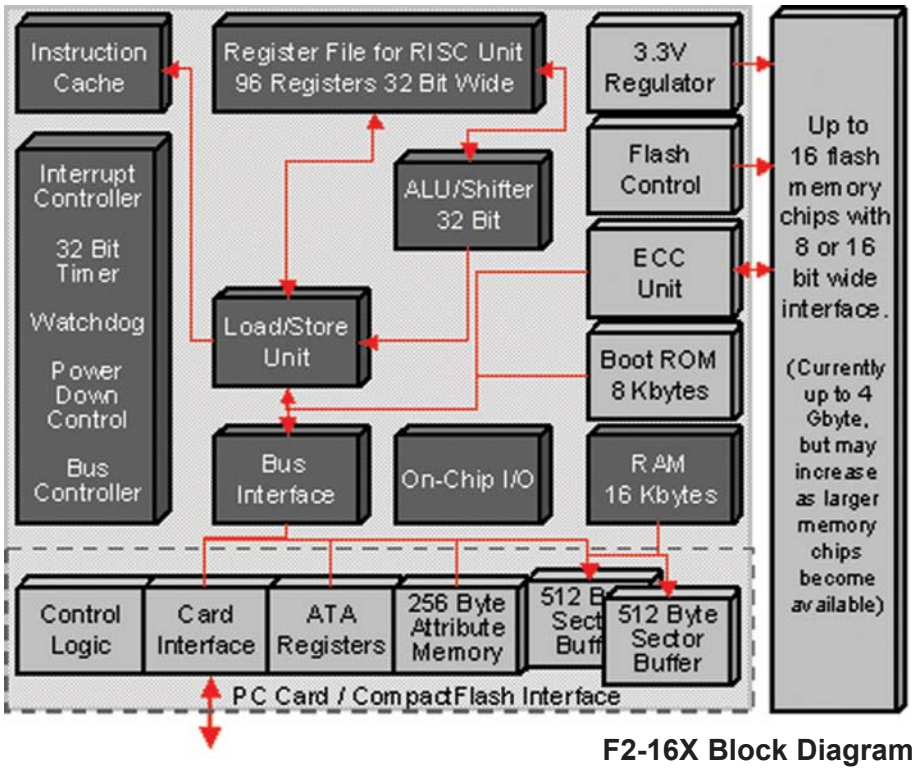
- 16-bit interface to host device, compliant with ATA and PCMCIA 2.1 standard, can be used for DOM, disk-on-chip (DOC) and flash disk applications with virtually unlimited capacity
- Memory mapped or I/O operation
- Automatic recognition of PCMCIA or True-IDE mode
- Fast ATA host-to-buffer transfer rates supporting PIO 4 in True-IDE mode
- Dual-integrated 512 byte PCMCIA sector buffers and 256 byte PCMCIA attribute memory
- PCMCIA configuration option register, card configuration and status register, and pin replacement register support

Selectable Host Interface

- Based on the Hyperstone 32-bit RISC microprocessor core
- 20 to 50 MHz clock frequency using R-C oscillator, no external crystal required
- 8 Kbytes internal boot ROM, 16 Kbytes internal RAM
- Automatic power-down mode (power consumption < 100µA) during wait periods for host data or completion of flash memory operation
- 0.25 µm CMOS technology
- 5.0V or 3.3V supply voltage
- Patented wear-leveling software algorithm executed in RISC core equalizes usage of all memory locations to maximize card's life

Service and Support

Hyperstone offers technical support and design services for embedded systems, boards, ASICs, ASSPs and software customization. You benefit from short design cycles, short time to market and a superior cost/performance ratio.



F2-16X Block Diagram

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