U8 Flash Memory Controller

U8

hyperstone®

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The Hyperstone U8 family of flash memory controllers together with provided application and Flash specific firmware offers an easy-to-use turnkey platform for industrial, high endurance robust Flash Memory cards or modules compatible to host systems with USB 2.0 interface.

- Designed to satisfy industrial requirements
- hyReliability™ Flash Management including superior wear leveling, read disturb management, and power fail management ensuring highest reliability and endurance
- hyMap® Flash Translation Layer and mapping offering second to none random write performance, minimal write amplification, and consequently highest endurance for random access heavy usage profiles (e.g. JEDEC Enterprise)
- Continuously updated Flash Memory chip support and long term availability
- Flexible 96-Bit/1K BCH ECC engine supporting all Flash Memory requirements
- Optimized 32-Bit RISC core, instruction set for Flash Memory handling
- High performance on-the-fly AES 128 and 256 encryption engine
- Custom features can be implemented with simple firmware upgrades
- Turnkey solution including firmware, manufacturing kit, test and development hardware, as well as reference schematics

Targeted Applications

- Industrial USB Flash Drive
- eUSB, embedded USB module
- Ultra durable Flash Drive
- Security Flash Drive
- Multi-Chip-Package (MCP)
- Disk-on-Board

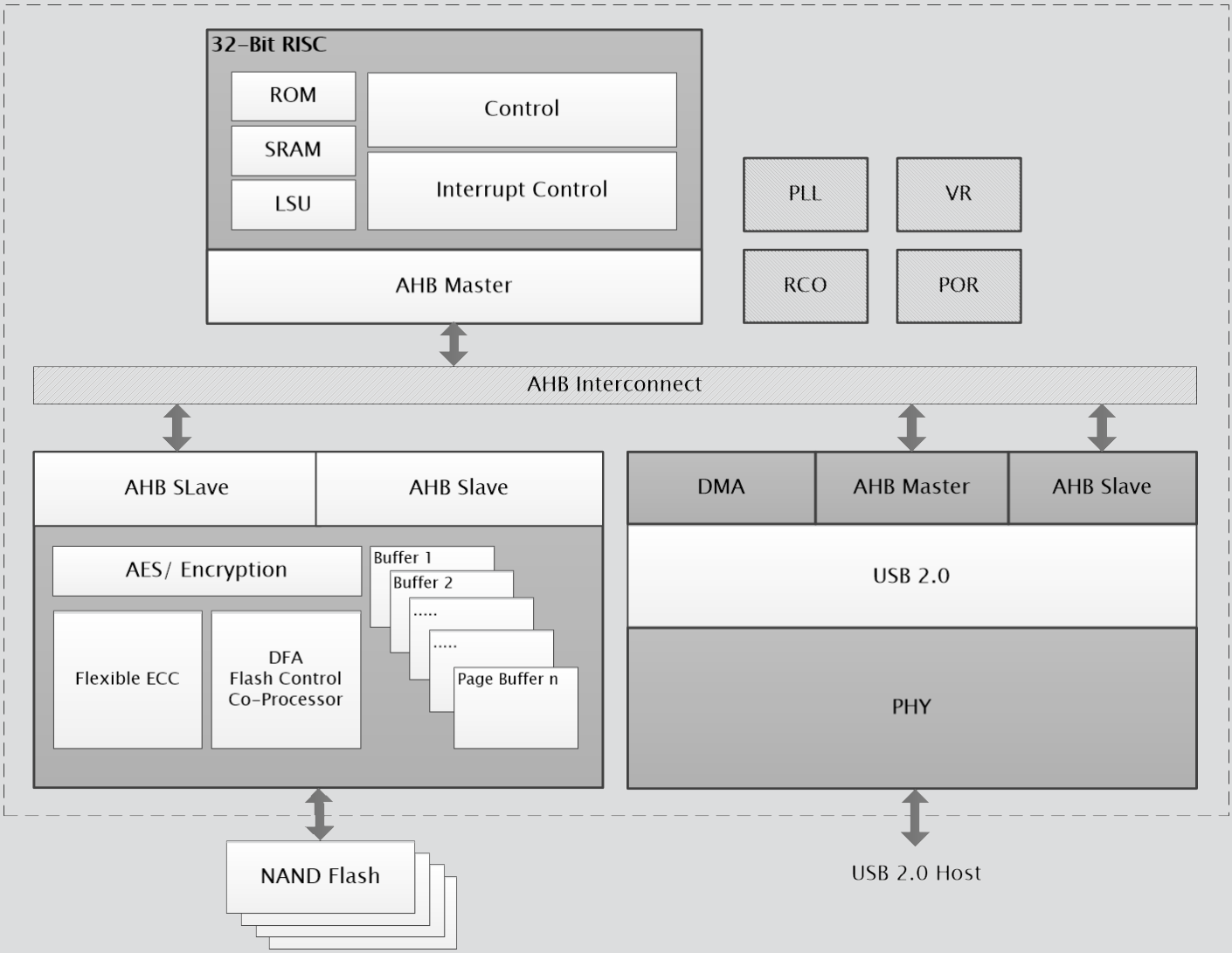
Order Information

- U8-RBQ03 (QFN 76, 9 x 9mm, 4 CEs, RoHS, -40 to +85 °C)
- U8-RB1Q03 (QFN 76, 9 x 9mm, 4 CEs, RoHS, -40 to +85 °C)

Compliance & Performance

- Fully compliant with USB 2.0 specifications
- USB mass storage device class (MSC)
- High-Speed, Full-Speed,
- Secure Erase support
- S.M.A.R.T feature support
- Host transfer rate of up to 480 MBit/s
- Sequential read and write up to 35 MB/s

U8 Block Diagram



Controller & CPU

- High performance 32-Bit Hyperstone RISC microprocessor
- Large internal RAM provides firmware flexibility
- Unique ID for security applications
- AES encryption engine 128 and 256-Bit
- High performance on-the-fly encryption/decryption
- Flexible clock frequency generation through internal
- PLL combined with clock multi divider.
- Automatic power-down mode during wait periods for host data or flash memory operation completion, automatic sleep mode during host inactivity periods
- Supply voltage 3.3V ± 5%
- Application Programming Interface (API) and Software Development Kit (SDK)

Host Interface & Compliance

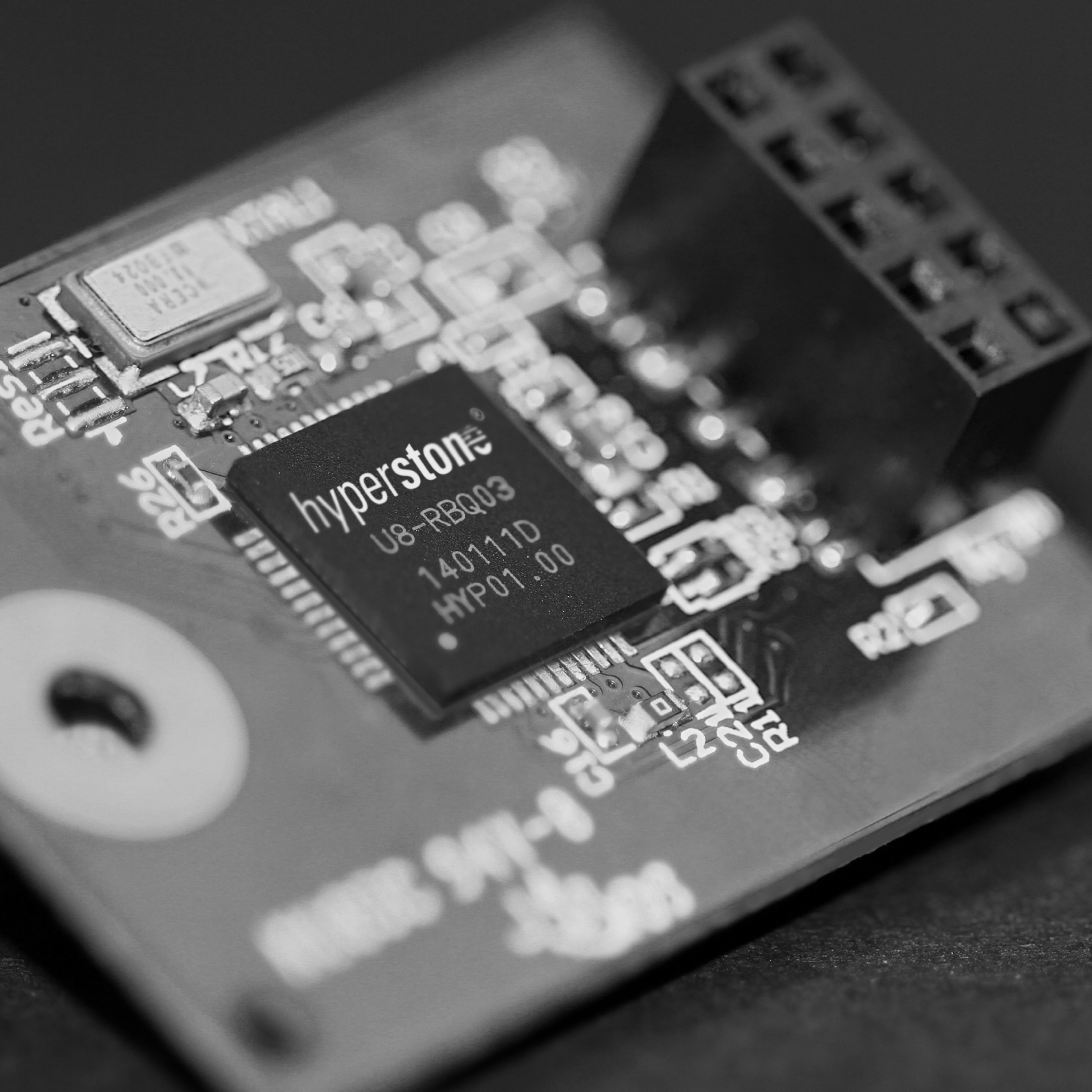
- Fully compliant with USB 2.0 specifications
- USB mass storage device class (MSC)
- USB human interface device class (HID) support is possible
- 4 configurable endpoints
- Hi-speed, Full speed, Low speed possible
- Bulk, isochronous, and interrupt transfer modes
- S.M.A.R.T., Sanitize, and Secure Erase support using ATA pass through command
- Configurable Early-Acknowledge to avoid any data loss
- during power fail.

Flash Memory Interface

- Direct Flash Memory Access (DFA) co-processor including page buffers and interleaving capability
- Synchronous DDR interface compliant with Toggle DDR and ONFI 2.3, compatible with all DDR Flash Memory devices
- Asynchronous SDR interface, ONFI 1.0 compliant, compatible with all legacy interface Flashes
- Data transfer rate to flash up to 200 MB/s
- Flexible 96-Bit/1K BCH ECC engine
- CRC for additional reliability
- Direct connection of up to 4 Flash Memory chip enables (CE)
- Flash Memory power down logic and write protect control
- Supporting all Flash technologies and all page sizes up to 16 KB
- On-chip voltage regulator for 1.8 V Flash Memory I/O power

Flash Memory Management

- hyReliability™ Flash Memory Management optimizing reliability, power fail safety, endurance, data retention and performance
- hyMap® Flash Translation Layer and mapping offering second to none random write performance, minimal write amplification, and consequently highest endurance for random access heavy usage profiles (e.g. JEDEC Enterprise)
- Optimized for fast boot-up times
- Bad Block Management
- Static and Global Wear leveling to maximize write endurance
- Inherent on-the-fly garbage collection
- Read Disturb Management, Dynamic Data Refresh to maximize data retention, and data refresh subject to read disturbance
- Management of sudden power-fails
- Interleaving, cache, and multi-plane programming
- Firmware is stored redundantly for recovery and refresh
- In-Field Firmware update without user data loss
- Customized firmware, optimizations and featureimplementations possible upon request.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