

PRODUCT BRIEF

SF-1500 Enterprise SSD Processors

Features

- SSD Processor which enables commodity Flash memory to operate in enterprise storage environments
- DuraClass™ technology provides best-in-class endurance, performance, and low power
- DuraWrite™ technology enables enterprise SSD deployment using MLC flash without sacrificing performance
- Maintains the highest level of read and write performance (30K IOPS & 260MB/s) through the life of the SSD
- RAISE™ improves SSD PPM failure rates by up to 100x
- Highly intelligent block management & wear leveling optimizes SSD longevity
- Superior ECC data protection is up to 10x stronger than the best HDD
- Automatic encryption (AES-128) at the drive level ensures secure data protection
- Up to 512GB capacity
- 3Gb/s SATA v2.6 with NCQ (SAS/FC with a third-party bridge)
- Lowest BOM cost for any enterprise SSD

Overview

Solid State Drives (SSDs) are gaining significant momentum in the storage community as new technologies come to market. SandForce™ SF-1500 SSD Processors are revolutionary SoCs designed specifically to enable commodity Flash memory to reliably operate in enterprise storage applications. This is achieved with maximized read and write performance through the life of the SSD without requiring an additional DRAM cache, or other costly patches. SF-1500 addresses the very complex limitations of SLC and MLC flash memory to greatly extend the endurance and overall reliability of SSDs. With the 300x lower power per IOPS (vs. HDDs), SSDs with the SF-1500 can be used to greatly reduce the overall operational costs in IT. This functionality is made possible by the highly innovative DuraClass™ technology found only in SandForce SF-1500 SSD Processors.

Endurance and Longevity

As each generation of Flash memory evolves and the silicon geometries shrink, the endurance of the individual cells on the die is dropping at a very high rate. SLC memory today has typically 100K program/erase (P/E) cycles while MLC drops to only 10K P/E cycles. The memory of tomorrow will likely be even lower than that. DuraWrite™ technology optimizes writes to the flash memory over conventional controllers increasing the overall endurance and reliability of the complete SSD. Highly intelligent block management and wear leveling also extends the overall

endurance. With this technology, even MLC-based SSDs can operate in enterprise environments for 5+ years without daily write restrictions.

Performance

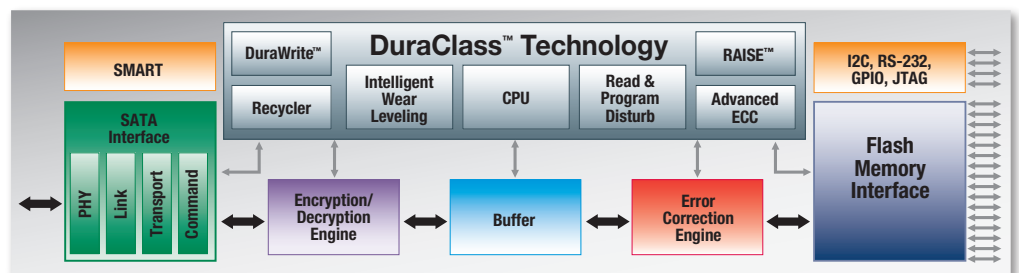
SSDs are technically capable of outperforming traditional rotating hard disk drives, but the limitations of flash memory often require a conventional flash controller to limit the write speed to improve the endurance. SF-1500 SSD Processors do not have this restriction. DuraClass technology enables the processor to maximize both the endurance and write performance for the life of the SSD fulfilling the promise of high speed flash memory.

Security

DuraClass technology automatically stores data in a highly secure, AES-128 encrypted format. This also prevents would-be thieves from extracting data directly from the flash memory should they ever have access to the drive.

Data Protection and Reliability

The SF-1500 SSD Processor provides up to 100x greater data protection than the best high-performance enterprise HDDs. This comes from a combination of superior ECC algorithms with up to 24 bytes protection and the unique RAISE™ (Redundant Array of Independent Silicon Elements) technology. RAISE provides the protection and reliability of RAID on a single drive without the 2x write overhead of parity.



SF-1500 Block Diagram

SF-1500 Enterprise SSD Processors

DuraClass™ Technology:	DuraWrite™ extends the endurance of SSDs Intelligent Block Management and Wear Leveling Intelligent Read Disturb Management Intelligent “Recycling” for advanced free space management RAISE™ (Redundant Array of Independent Silicon Elements) Intelligent Data Retention optimization Best-in-Class ECC protection for longest data retention and drive life
Host Interface:	SATA 2.6 Compliant, 3Gb/s and 1.5Gb/s support Native Command Queuing (up to 32 commands) SMART Command Transport
Max Capacity Supported:	512GB* (using 32Gb/die components)
Performance (sustained):	Sequential Read & Write Transfer: 260MB/s (@128K blocks) Random Read & Write IOPS: 30,000 (@4K blocks)
Flash Memory Support:	MLC & SLC
Power Consumption:	Typical: 950mW Sleep/Slumber: 50mW
Security:	Data Encryption: 128-bit AES-compliant, User Selectable Encryption Key
Protection:	ECC Recovery: Up to 24 bytes correctable per 512-byte sector Unrecoverable Read Errors: Less than 1 sector per 10 ¹⁷ bits read
Reliability:	MTTF: 10,000,000 operating hours Supports enterprise life cycle (5+ years)
Operating Temperature:	0°C to 70°C ambient
Package:	361-Pin TFBGA – 13x13mm, 0.65mm pitch
Compliance:	RoHS, Halogen-Free, Green

Ordering Information

Part Number:	Max Capacity:	Memory Type:	IOPS:
SF-1565TA2SBH	512GB*/(256GB*)	MLC/(SLC)	30,000
SF-1564TA2SBH	256GB*	SLC	30,000

* 1GB=1 billion bytes



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