Verigy V93000 HSM HSM3G

Product Overview

Economical at-speed mass production test solution for DDR3, DDR4 and beyond with 10-year system lifetime for multiple device generations

Industry Challenges

High-end workstation, desktop and laptop PCs, computer servers, performance graphics cards, dynamic game consoles, high-end video/HDTV, computer networking and a variety of consumer electronics all depend on performance-oriented Dynamic RAM (DRAM) memory types – DDR3, GDDR5 and XDR – to deliver the latest performance and functionality over a range of selling prices.

The accelerating rate of technological advancement of these market leading electronics drives an increasingly complex set of cost, performance, power and bandwidth requirements. As a fundamental component, Dynamic RAM memory technologies must continuously evolve to match application demands by providing increased data transfer rates (doubling every three to four years) and lower costs per bit.

Increasing memory data transfer rates have forced constant production process geometry shrinks, which cause new failure mechanisms that require thorough

at-speed test of the memory I/O and the memory core. Further, in order to enable data rates in the multi-gigabit per second range, memory devices have been adopting advanced architectural features from SOC devices, such as forwarded clock architectures and extensive device trainings. These I/O-features raise test requirements that are well known in the high-speed SOC test arena, but are new to conventional memory test systems. Requirements typical for memory test, such as massive multi-site implementations, remain present for high-speed memory devices.

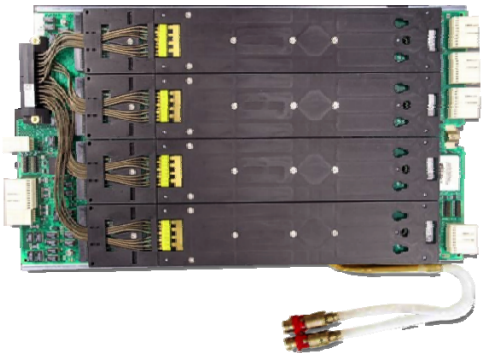
The combination of higher test speeds, growing feature-set requirements and the persistent pressure on lowering test costs results in significant challenges for memory ATE. This traditionally has forced DRAM manufacturers to purchase a new test system for every new generation of memory technology, i.e. every 3-4 years.

Memory manufacturers seek an ATE solution that delivers the performance, functionality and economical requirements of testing high-speed memories - offering best lifetime value and investment protection beyond a single memory device generation.

Product Summary

Economical at-speed mass production test solution for DDR3, DDR4 and beyond with 10-year system lifetime for multiple device generations

The Verigy V93000 HSM3G is the only test solution available today for low-cost volume production of DDR3, DDR4 and beyond. HSM3G offers highly accurate at-speed testing and is scalable to 2.9Gbps.



HSM3G Memory Test Card

A multi-generation growth path via economical upgrades up to 6.8Gbps date rate provides a unique lifetime value and outstanding return of investment.

Lowest cost of test for mainstream DDR3 & DDR4 up to 2.9Gbps

HSM3G provides highly accurate at-speed I/O and at-speed core access test scalable up to 2.9Gbps, covering the entire DDR3 generation and at least the first two future mainstream speed bins that are expected for DDR4, which are 2.133 Gbps and 2.667 Gbps.

HSM3G achieves native 2.9Gbps data rate, without pin-muxing or double clocking, which guarantees true 256-sites parallel test over the entire speed range without test-time penalties and without compromises to accuracy, functionality, test coverage or yield.

Due to its inherently superior memory ATE per-pin throughput, the V93000 HSM3G provides test-time savings of up to 20 percent. It delivers fully parallel pattern execution, as well as fully parallel DC tests and eye-width measurements, which enables the industry's best multi-site efficiency. Combined with a competitive price point, the V93000 HSM3G test system provides lowest cost of test for the targeted DRAM speed classes.

Multi-generation test platform with 10 year lifetime via economical upgrades

A unique benefit of the V93000 HSM3G is its future-ready upgradeability to HSM4000 and HSM6800, which gives access to data rates even beyond those of the DDR3/4 generation, featuring investment protection for DDR3, DDR4 and future mainstream DRAM technologies. This ensures more than 10 years of cutting-edge lifetime value over at least three mainstream DRAM device generations and unmatched long-term test economics for outstanding return on investment.

The V93000 HSM platform is future-ready in terms of speed and functionality, offering the most complete feature-set available on the high-speed memory test market. Its programmable at-speed APG per-pin with support for data bus inversion (DBI) and

cyclic redundancy check (CRC) data generation enables to test the advanced memory technology features, ensuring best test quality and yield even for the future DDR4 main memory standard.

Integrated test-cell maximizes productivity

HSM Manufacturing Test Cell

The V93000 HSM Series comes with an integrated volume manufacturing test-cell, which ensures reliable operation and high uptime as well as efficient one-person operation, comprising tester-to-handler docking, test fixture exchange and test fixture buffer storage within the test-cell for maximized productivity.

- Optimized tester-to-handler docking repeatability
- Flexible floor-plan layout options with small footprint
- Lowest handler index time and cycle time overhead for highest throughput efficiency
- Best temperature accuracy of +/- 1.5°C or better for best production yields

Characterization up to 12.8Gbps with best engineering tool-set

Proven in R&D & validation labs worldwide, the V93000 HSM Series provides the industry's most advanced high-speed memory test capabilities in a cost-effective, small footprint tester, making it a perfect fit for engineering, design verification & characterization.

Due to the scalability of the V93000 HSM platform, the new generation V93000 HSM memory test cards, HSM6800, HSM4000 and HSM3G, are plug-and-play extensions and can be easily combined with already available memory test cards, such as HSM3600 and HSM HX.

The ability to upgrade existing engineering test systems with latest generation high-speed technology provides flexible access to higher performance and enhanced high-speed test functionality at lowest capital spending.

- Best in industry high-speed performance scalable up to 12.8Gbps with the market proven HSM HX
- Easy to expand capabilities with new generation memory test cards retaining full compatibility
- Compact Test Head, fully compatible to HVM: same hardware, same software, same DUT boards, same ability to use future platform enhancements
- Easy test program transfer and correlation from engineering to production
- Unique Flexibility, addressing DDR3/4, GDDR5 and XDR within one system

Best engineering tool-set: Jitter Injection & Measurement, Pattern controlled DC test, Bitmap, Timing Diagram, Real-time Source-Synchronous, Signal Equalization (and more)

Features and Benefits

FEATURE	BENEFIT
True 2.9Gbps APG and I/O Data Rate on 256-sites DDR3 at single pass	Addresses within one system: • all mainstream DDR3 speed bins • AND high-end Gamer DDR3 • AND first two mainstream DDR4 volume bins Avoids “double clocking” or “pin muxing” for best throughput, test coverage and yield
Three performance options available via flexible license upgrade: • 2.3Gbps • 2.5Gbps • 2.9Gbps	Flexibility and scalability in performance and cost, tailor-made to meet test requirements. Attractive entry price and low upgrade cost
Upgradeable to HSM4000 and HSM6800 via ASIC exchange (upgrade of key speed-binned test-processor components) Unique 10-year lifetime through cost efficient upgrades covering three device generations, DDR3, DDR4 and future mainstream technologies.	Unique 10-year lifetime through cost efficient upgrades covering three device generations, DDR3, DDR4 and future mainstream technologies. Safest investment: directly upgradable to 6.8Gbps today
Memory ATE per pin • Per pin APG • Per pin pattern memory • Per pin PMU	Fully parallel pattern execution, DC tests and eye-width measurements with best multi-site efficiency. Up to 20% throughput advantage resulting in lowest cost-of-test
Simultaneous Bi-directional (SBD)	At-speed test of I/O pins on a single transmission line without data bus collisions. Full at-speed test coverage, shortest test-times (no padding), lowest cost-of test.
Programmable at-speed APG per-pin • CRC Data Generation • ABI / DBI Support	Enables most complex memory test patterns for any fault algorithm to ensure required test quality and fast yield learning Ready to test advanced I/O capabilities of current and next generation memory architectures

Key Specifications

SPECIFICATION	VALUE
Maximum Test Speed:	2.3/2.5/2.9Gbps (options)
Example parallelism:	64-sites GDDR5 256-sites DDR3
Special Functions:	• Simultaneous Bi-directional (SBD) • Real-Time Strobe Adaptation • Embedded Search Support • Programmable Signal Equalization • Jitter Injection & Measurement • CRC Data Generation • ABI / DBI Support

V93000HSM System Components / Options

- System Infrastructure: V93000 Infrastructure
- Test-Head Options:
  - V93000 Large (64-slot) Test Head
  - V93000 Compact (16-slot) Test Head
- Memory Test Cards:
  - HSM6800
  - HSM4000
  - HSM3G
- High-Speed Extension Card: HSM HX
- Device Power Supplies: DC Scale DPS32 and MS-DPS cards
- System Controller: High Performance HP-LX Workstation
- Software: HSM Memory Test Software Bundle

Related Information

For more information about the V93000 HSM6800, please visit the following website:
www.verigy.com/go/HSM

Contact Information

For more information about the V93000 Direct-Probe Solution, please contact your local Verigy sales representative. **www.verigy.com/go/contactus**

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