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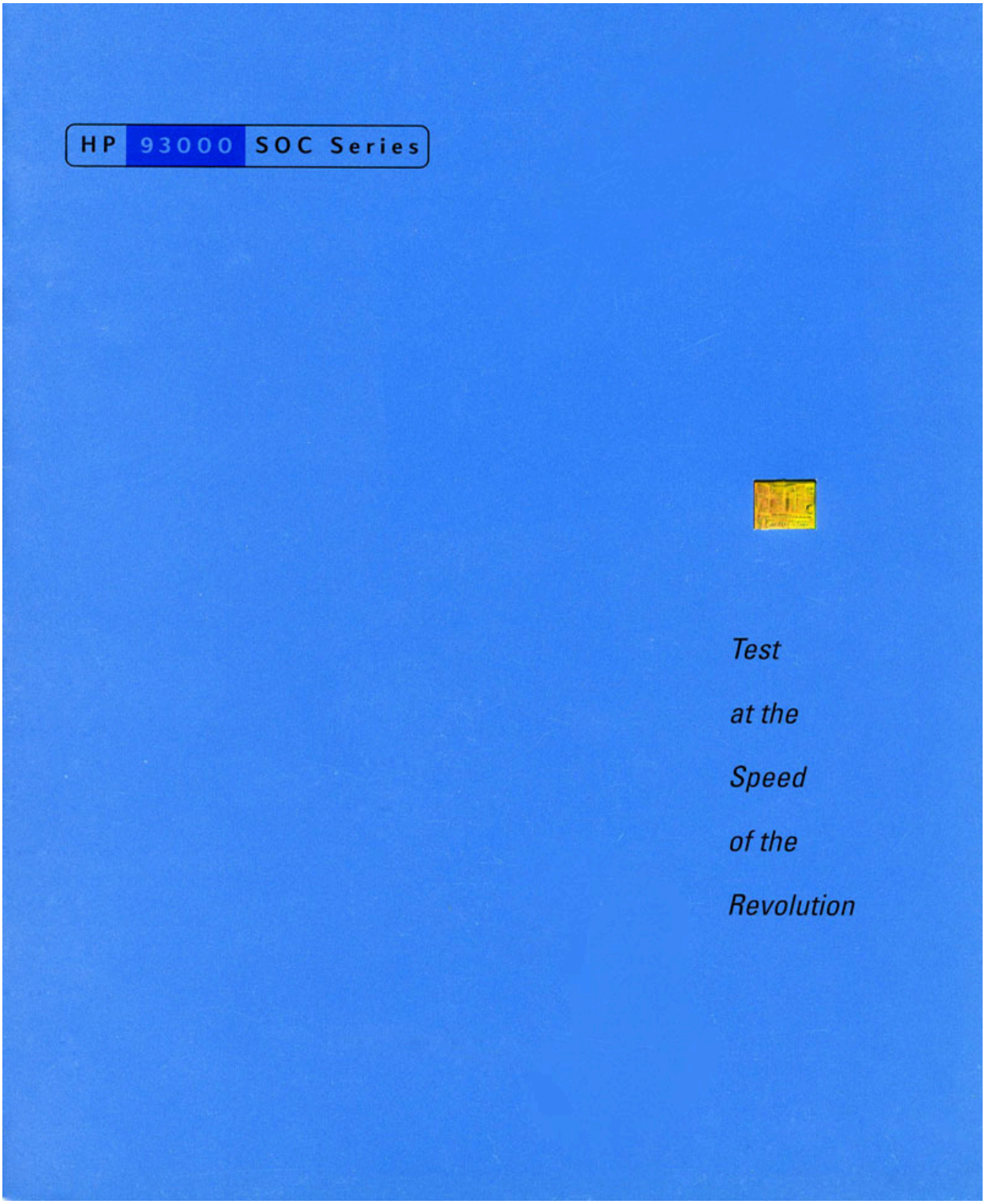
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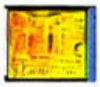
HP 93000 Systems-on-a-chip Series





The Revolution

There is a revolution going on – a rapidly expanding global revolution that affects the way all of us communicate, access information, and use computers. The revolution is being largely driven by two main factors: the seemingly insatiable demand for computing, communications and entertainment appliances that are faster, smaller, more powerful, and more mobile; and the demand for communications infrastructure devices to keep pace with the explosive growth of the internet.



The trend towards smaller, faster and more sophisticated consumer products is forcing higher levels of system integration for both appliances and infrastructures – system integration that will be enabled by rapidly evolving System-on-a-Chip technology. This revolution is driving the need to integrate more and more IP core functions on a single SOC device. Testing these devices requires Automatic Test Equipment (ATE) technology that is just as revolutionary and highly integrated – the technology found in the HP 93000 SOC Series. The technology required to testsystems-on-a-Chip is a highly integrated Tester-on-a-Chip.

Today's world of semiconductor manufacturing and test is being driven, not only by the accelerating need for system integration, but at the same time by extreme pressure to reduce costs and improve time-to-market as a result of the competitive consumer product demands. Effectively testing SOC devices means having the flexibility, functionality and foresight to test all the functional components of an SOC – Memory, Analog, Communications, High-speed busses and Digital, on a single scalable platform – from low cost to high-performance.

System-on-a-Chip Testing
Applications integrated on to SOCs

In aviation, MACH-1 represents the speed of sound; MACH-2 twice the speed of sound. In SOC test, MACH-D represents the ability to effectively and comprehensively test all required functional components of SOC devices – FAST. At the same time, it means breaking the "sound barrier" and SOC test barriers with the lowest noise-floor for highest integrated SOC applications.

In this  quickly evolving yet unpredictable environment, it's also being prepared for the future – having a solution with enough flexibility, functionality and foresight to keep pace with the speed of tomorrow's revolution.

The HP 93000 SOC Series is the solution to test it.

Memory

Embedded:
DRAM
Flash
SRAM

Analog

Audio/Video
Comm:
ADCs
DACs
CODECs
PLLs
RAMDAC

Communi-cations

Fire Wire
Fibre Channel
Ethernet
SONET
Cable modems
ATM
DSL
RF

High-speed Busses

RAC

APG-4X
LVDS
SCSI
Panel-link
Rambus
DDRAM

Digital

Embedded:
MPUs

MPEG
encoders/
decoders

PC-on-a-Chip
PCI core
DSP

Graphics
Accelerators/
Controllers

The trend in SOC test is to higher levels of integrations on a single device

Flexibility, Functionality and Foresight enabled by Gigabit Technology



The technology to test Systems-on-a-Chip
is a highly integrated Tester-on-a-Chip

Flexibility

Solutions for Minimized Cost-of-Test – Throughput in a Single Scalable Platform

Flexibility means being able to meet the technical needs and business needs of System-on-a-Chip testing at the same time and on the same platform.

Cost Driven Solutions:

The SOC revolution is being driven, in part, by the need to reduce costs – especially in the consumer products market. This trend is exerting increasing pressure on reducing the manufacturing costs of SOC devices. Test cost is a significant portion of manufacturing cost and semiconductor manufacturers need to select SOC test solutions based on minimizing this cost.

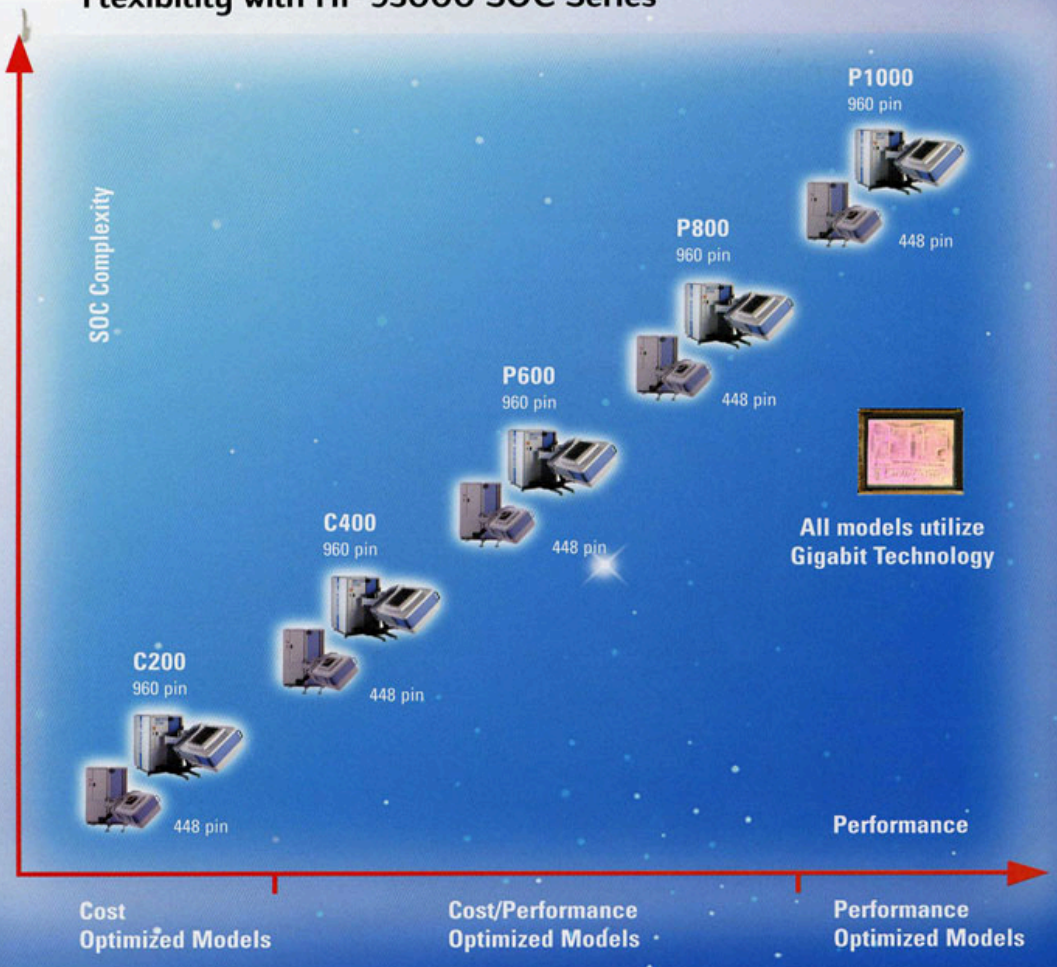


Performance Driven Solutions:

The scalability of the system allows it to be upgraded when needed, minimizing the initial investment. Minimizing test costs means having a flexible yet scalable system, but that alone is not enough. Throughput is key to keeping test cost under control, and the HP 93000 SOC Series addresses this with significant technical advantages such as local data storage, eliminating communications overhead, multiple clock domains and virtually unlimited scan widths, which significantly minimize test times.

The HP 93000 SOC Series has the right architecture and the right system models to meet the various price/performance requirements within the SOC market. In addition to minimizing the initial investment, the system's high throughput, accuracy and reliability help reduce the ongoing cost-of-test while bringing products to market faster. In addition, the flexibility of testing all MACH-D component areas of SOCs ensures highest levels of system utilization.

Flexibility with HP 93000 SOC Series

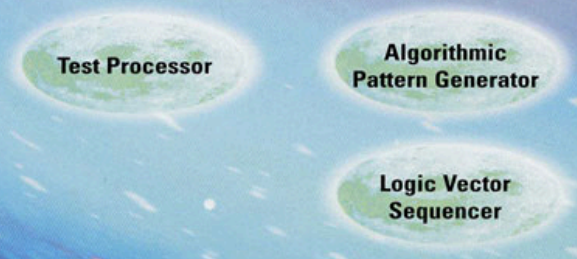


Functionality

It takes an SOC to test an SOC

At the heart of the HP 93000 SOC Series is a single chip – a Tester-on-a-Chip developed and manufactured by HP using advanced SOC design methodologies and processes. Features such as processor-per-pin architecture and lowest noise-floor at gigabit performance level enable unparalleled speed and accuracy, with testing of up to 32 SOC devices in parallel for full, fast and effective testing of all components integrated into SOC devices.





More technology on less silicon real estate describes the highly integrated core of the HP 93000 SOC Series. Developed and manufactured by HP, this highly compact "Tester-on-a-Chip" integrates all architectural elements and control functions on 2 x 3 cm multi-chip module.

It's been designed and manufactured with advanced SOC design methodologies and processes – because it has to test similar devices.



Formatter

Timing Generators

Pin-Electronic Driver

Per-Pin PMU

Error/Failure Processing

Level Generation

Dual-Level Comparator

Test Period Generation

Active Load

Clamp Circuit

Test Processor-per-pin Architecture is the SOC Foundation enabling MACH-D

Functionality means comprehensively and effectively testing all components integrated into SOC devices, and maintaining highest accuracy and reliability levels.

The SOC revolution will add an unprecedented level of product-mix complexity to semiconductor manufacturing and test, making system utilization an even bigger issue than it is today. More than ever, manufacturers will struggle to forecast test requirements and have sufficient test capability for a broad array of different devices.

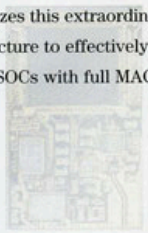
Traditional logic or mixed-signal testsystems will not be able to meet the challenge effectively. These systems are specialized for particular applications, and have significant limitations when called upon to test all functional components integrated into today's SOCs.

Fundamentally, the SOC revolution calls for a different type of architecture, one that offers support for and meets today's SOC testing needs:

- Test virtually any type of device
- High accuracy
- High pin-counts
- Highest throughput
- Highest system utilization
- Maximum uptime

Test Processor-per-pin is the architecture to meet SOC test needs. Every pin in the Test Processor-per-pin architecture is its own tester. All resources are allocated on a per-pin basis, giving the system the highest level of flexibility while offering significant technical advantages.

The HP 93000 SOC Series utilizes this extraordinary Test Processor-per-pin architecture to effectively and comprehensively test today's SOCs with full MACH-D coverage.



Lowest Noise-Floor breaks the "Sound Barrier" and SOC Test Barriers for highest integrated SOC Applications.

MACH-D testing of SOC devices means simultaneously performing analog measurements with a resolution of a few micro-volts in a system where more than 500 digital signals, with data rates up to 1 Gbit/s are active.

The SOC revolution requires a solution with the lowest level noise-floor. HP's SOC test architecture reduces noise to the absolute minimum. With Test Processor-per-pin, each digital channel acts as an independent unit and all system busses stay quiet during test execution. This translates directly into higher accuracy and a low noise-floor to which is suitable for SOC applications. This means better repeatability and better yields. The end result is more profit.

Gigabit Technology makes it FAST!

For speed in System-on-a-Chip testing, the HP 93000 SOC Series has no equal. The SOC Series today offers data rates of up to 1 Gbit/sec, without pin multiplexing. The system can test up to 32 SOC devices in parallel, which provides higher throughput with full MACH-D test coverage.

And, because the HP 93000 SOC Series is quickly and easily integrated into handler and prober test cells on the production floor, it dramatically speeds time-to-market.

Foresight

Leveraging the Best from HP 83000 and HP 94000 enables the HP 93000 SOC Series

Foresight means preparing for the future while maintaining continuity in order to leverage the best technology and at the same time protect investments.

Hewlett-Packard is proud of its very successful family of testsystems. Since its introduction in 1994, the HP 83000 has had the fastest growing installed base within the VLSI market worldwide. The HP 83000 is known for its superb digital test capabilities as well as high speed and throughput, accuracy and reliability.

The HP 94000 is a leader in mixed-signal testing. With the introduction of multisite test in 1994, the HP 94000 became the highest throughput mixed-signal testing system and continues to successfully maintain that position in benchmarks against other ATE systems. Recently, the HP 94000 has established a lead in CMOS Imaging testsystems with high throughput and low price.

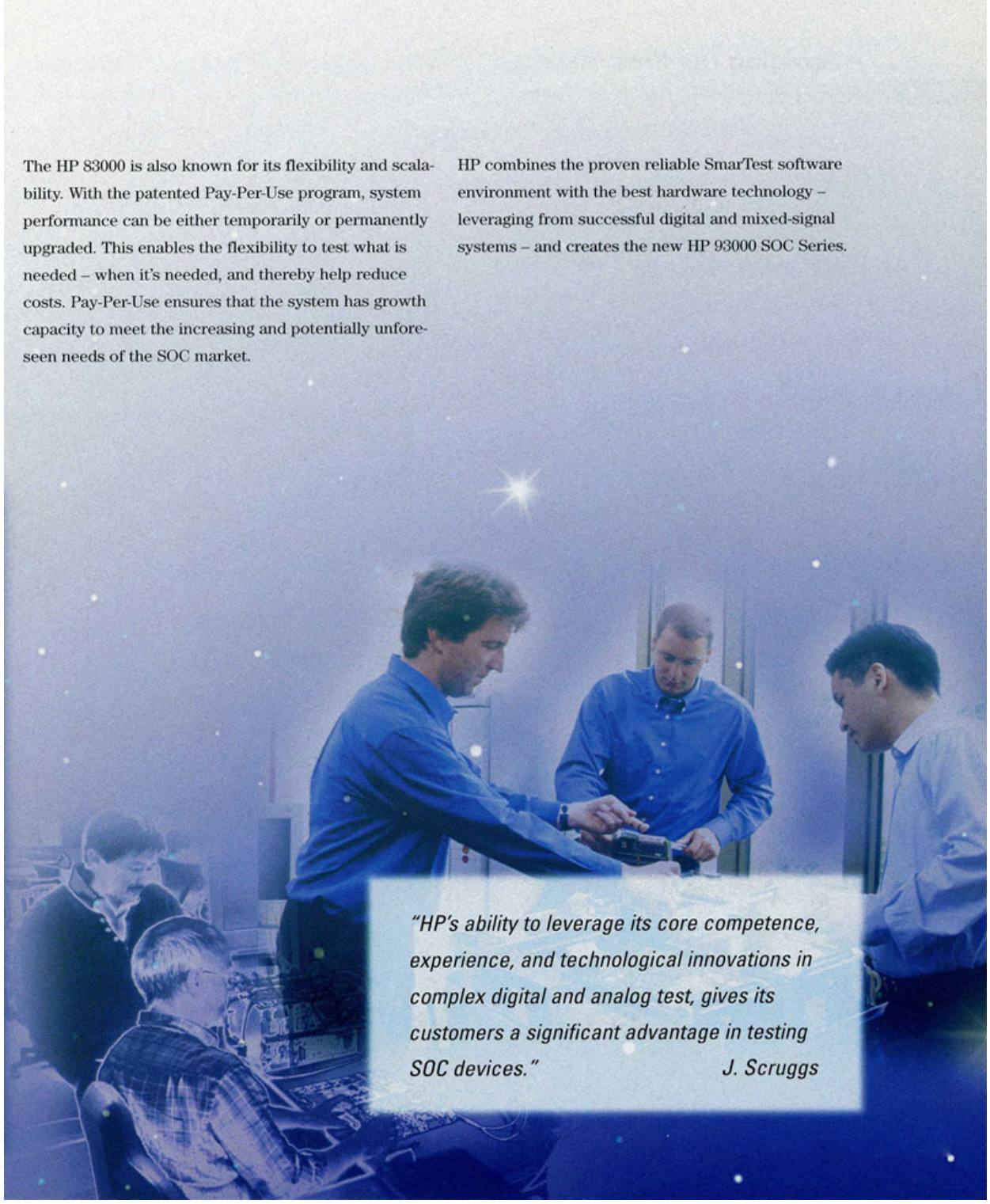
With this broad range of experience in the individual areas of MACH-D testing, HP now leverages the technology and infrastructure, and combines it into the new SOC Series with even higher levels of performance. Performance where it counts: the ability to effectively and comprehensively test all of the MACH-D component areas of SOCs, FAST.

The HP 83000 systems were the pioneers for the Test Processor-per-pin technology. Originally designed and built onto two multi-chip modules (MCMs), the Test Processor-per-pin architecture has now been advanced to a single "tester-on-a-chip" for the HP 93000 SOC Series. The best performance and technical advantages which made the HP 83000 family so successful in the market were leveraged and improved to offer even higher levels of speed, accuracy, reliability and throughput.



The HP 83000 is also known for its flexibility and scalability. With the patented Pay-Per-Use program, system performance can be either temporarily or permanently upgraded. This enables the flexibility to test what is needed – when it's needed, and thereby help reduce costs. Pay-Per-Use ensures that the system has growth capacity to meet the increasing and potentially unforeseen needs of the SOC market.

HP combines the proven reliable SmarTest software environment with the best hardware technology – leveraging from successful digital and mixed-signal systems – and creates the new HP 93000 SOC Series.



"HP's ability to leverage its core competence, experience, and technological innovations in complex digital and analog test, gives its customers a significant advantage in testing SOC devices." *J. Scruggs*

Test at the Speed of the Revolution

There is a revolution going on.

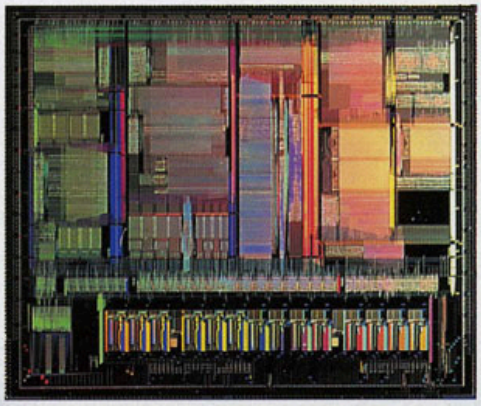
The revolution is driving the emergence of increasingly sophisticated SOC devices and…

The right testsystem is required in order to survive.

The HP 93000 SOC Series effectively tests all functional components of SOC devices with MACH-D, fast, and breaks the "sound barrier" and SOC test barriers with lowest noise-floor for highest integrated SOC applications. The system employs revolutionary technology to provide unsurpassed performance, accuracy, reliability and throughput.

This single scalable platform helps minimize cost-of-test while ensuring the flexibility, functionality and foresight required now and in the future.

Test at the speed of the revolution –
the HP 93000 SOC Series.



Hewlett-Packard Innovates for the Future

Hewlett-Packard has a well established reputation. Not only is HP a proven leader in the development, manufacture and marketing of some of the world's most technically advanced and superior quality products, but the name stands for innovation in management style and willingness to adapt to the ever-changing global business environment.

In this spirit of leadership, innovation and responsiveness, HP is realigning in order to better meet customers' needs. The company is being divided into two new organizations. One will focus on the computing and imaging solutions and services, the other on measurement solutions and services.

The new measurement organization will be one of the world's premier technology-based companies. Through increased focus on customer needs and greater responsiveness, this dedicated company is better positioned to serve the needs of the semiconductor test market.

At your side – worldwide

The quality of HP Service and Support is yet another reason to choose the HP 93000 SOC Series as your SOC test solution.

HP has more than 3,500 semiconductor test systems operating in high-volume manufacturing environments worldwide. And to back them up, HP has established a worldwide force of locally based test experts to provide a full range of service and support to meet each customer's specific needs.

The HP 93000 SOC Series is unmatched in its technology and SOC testing capability, but HP offers even more:

Consulting and training
Experienced systems and applications engineers provide support for general test processes or complex custom solutions. Customer education covers applications, software and hardware maintenance, and operations.

On-site system repair
HP customer engineers assigned to your company provide multiple levels of support.

Software update service
HP's software update service ensures that you receive the latest software and documentation as soon as it becomes available.

Response Center
HP specialists at our Response Center can isolate problems quickly, minimizing downtime.

Warranty extension
Several different Warranty Extension plans are available.

Technology financing
Lease, rental, and installment plans are designed to make new technology available immediately on terms that suit your needs and budget.



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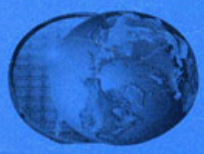
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