

ACS Integrated Test Systems

Configurable systems for semiconductor characterization
at the device, wafer, and cassette level

KEITHLEY

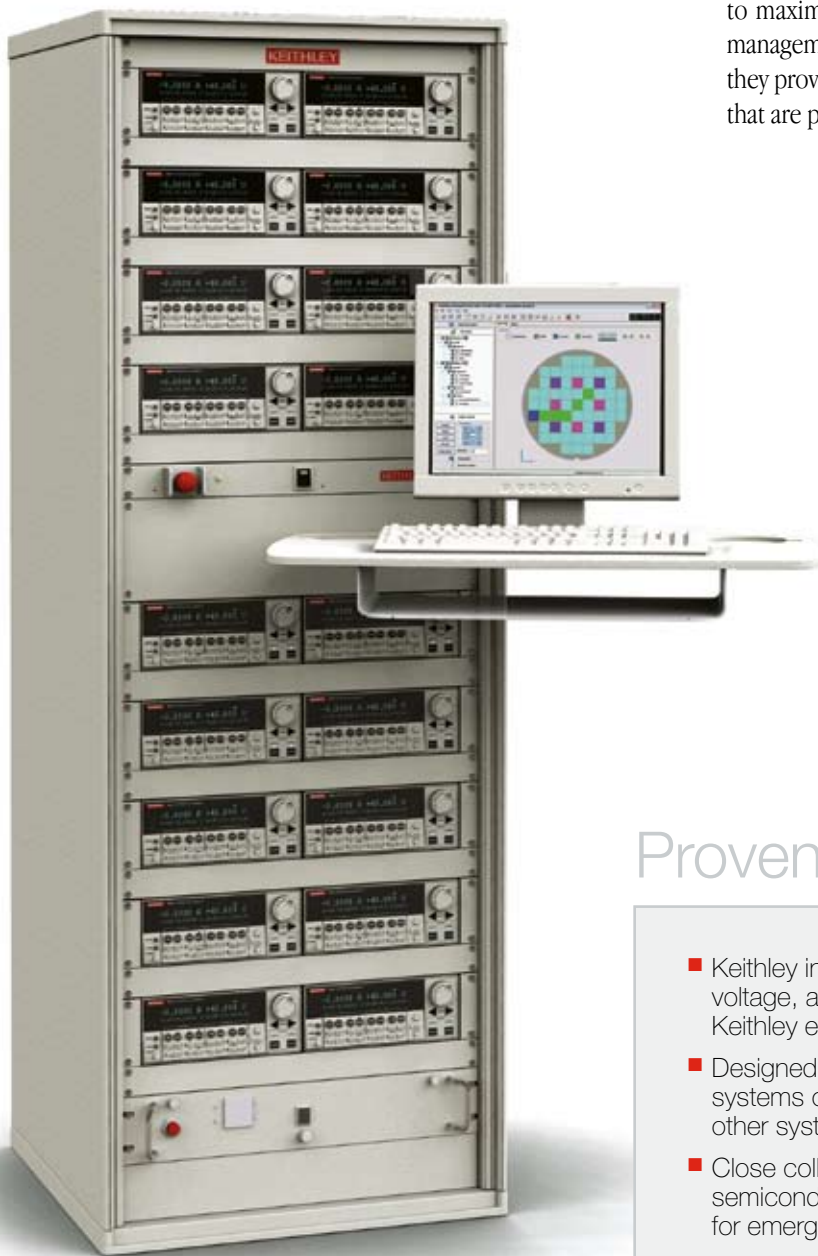
A GREATER MEASURE OF CONFIDENCE

Applications experience and flexibility that only Keithley can deliver

Through collaborations with semiconductor industry leaders, expertise in systems and software, and world-class R&D, Keithley Instruments brings you integrated test systems with Automated Characterization Suite (ACS). Utilizing Keithley's proven instrumentation and measurements at their core, ACS test systems offer a flexible, user-friendly software environment configured and integrated with applications experience that only Keithley can deliver.

These exclusive ACS test systems optimize performance by providing a secure, long-term investment that ensures you reap the benefits for years to come. Nothing symbolizes this better than Keithley. With our long-standing tradition of delivering the highest quality of customer service in our industry, Keithley is committed to helping you maximize your success throughout your entire instrument ownership experience.

ACS test systems incorporate leading technological innovations to maximize performance and minimize time and manpower management. With automated functions and unique capabilities, they provide advanced semiconductor characterization outcomes that are proven, productive, and precise.



Proven. Productive. Precise.

- Keithley instrumentation is so accurate in measuring current, voltage, and resistance that metrology labs worldwide use Keithley equipment to calibrate their systems.
- Designed to excel in semiconductor test applications, ACS test systems offer a wealth of advanced features not offered in any other system in their class.
- Close collaboration with customers enables depth of semiconductor test applications, resulting in immediate solutions for emerging measurement challenges.



Versatile solutions with the highest level of product and service

ACS integrated test systems are highly configurable, instrument-based systems for semiconductor characterization at the device, wafer, or cassette level. Built on proven Keithley instrumentation, ACS test systems provide innovative measurement features and system flexibility, scalable to your needs. Their unique measurement capability, combined with powerful and flexible automation-oriented software, delivers a comprehensive range of applications and features not offered on other comparable systems on the market.

A Keithley-exclusive, ACS test systems have a single, uniform user interface and are suitable for automated characterization, reliability test, parametric test, and even simple functional test or wafer sort operations. What's more, Keithley service capacity and expertise deliver a full range of innovative services on which you can depend. Keithley will work with you to develop comprehensive solutions from its base instrumentation and incorporate your individual needs and applications to ensure consistent, high quality results.

Delivering
customized, value-
focused solutions

- Assessment of individual application needs for customization
- Proposal of integrated system configuration
- Installation and system user support
- Management of system-out cabling and probe card adaptation
- Implement training, test code development, applications services
- Assurance of turnkey solution for future applications

A suite of applications for a wide range of configuration possibilities

ACS integrated test systems are designed around three standard Keithley principles: Configuration, Integration, and Customization. What this means to you is that you will receive a comprehensive test system for semiconductor characterization with both industry-leading Keithley hardware and highly-configurable ACS software applications that include device characterization, reliability/WLR, parametric, and component functional. All are designed with maximum user flexibility and efficiency.

Flexible and user-friendly software environment

- Logical and customizable GUI, macros, scripts in test routines
- Automated and intuitive workflow for improved productivity
- Powerful tools and time-saving features

ACS test systems enable customers to develop their own test modules and sequences.

Each comprehensive ACS test system includes advanced components and productivity features to make workflow smooth and easy. ACS application software is designed to perform complex functions: wafer description, test setup, probe control, automation, and summary report generator. The user has maximum flexibility for performing applications – easily switching between lab use (manual) and production (full auto) using the same test plan.

Additionally, the integrated test plan and wafer description function allows for the user to set up single or multiple test plans on one wafer, and selectively execute them later, either manually or automatically.

Controlled wafer level device characterization

ACS is a test plan development and execution platform centered around wafer-level device characterization. The test plan manager and wafer map are tightly integrated together, and ACS application software can control most semi-automatic and fully-automatic probers. It can also support many external instruments controlled via GPIB.

Unique parallel test execution using embedded script capability

ACS test systems can perform parallel tests with multiple Series 2600 SourceMeter® instruments—a unique advantage exclusive to Keithley instrumentation—enabling maximum user flexibility.

Flexible test setup and data display

With Keithley's Test Script Processor (TSP™), users can exploit test scripts within an interactive test module or perform more complicated tests using the test script module as a base for writing customized test scripts in TSP.

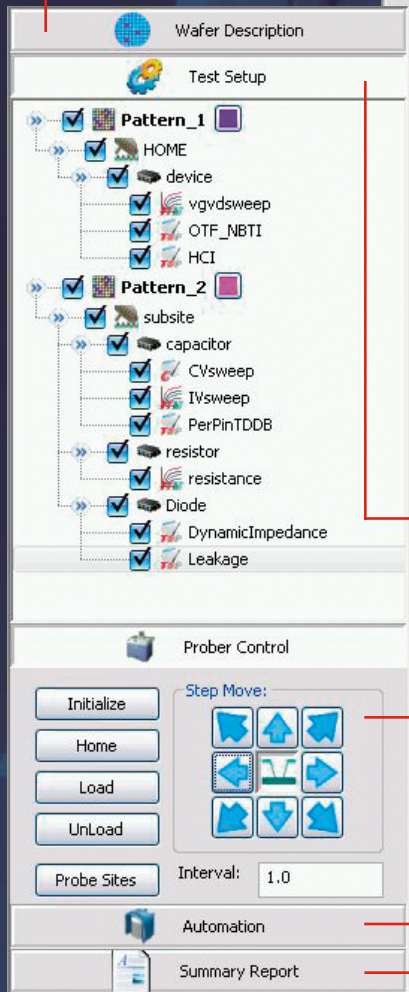
Automation for simplification at the cassette level

Seamless integration of test plan manager allows for fully-automatic, cassette level test with automatic probers in only a few simple mouse clicks. Pass/fail information is displayed on the wafer map in real time. An html-based summary report can then be generated. Easily click on the hyperlink to toggle between parameter statistics and raw data.

Technological Benefits

- Achieves a higher level of automation –
 - Enables system operation with semi and fully automatic probers
 - Capable of cassette level fully automatic operation
- Supports more complex or demanding test requirements
- Meets more demanding data requirements
- Dedicated wafer map and description utility allows for multiple test plans patterns
- Increased efficiency through a single, logical software interface for entire system
- Remarkable flexibility allows users to add new test plans, test libraries, and hardware as needed

Define wafer layout, reference die, test die, and choose from multiple test patterns via **Wafer Description**.



Test Setup provides an intuitive environment for test development of complex sequences, as well as parallel execution.

Prober control provides an interactive environment for both prober control and manual test execution.

Automate an entire cassette of wafers or just a single wafer.

Summary report offers both a top level statistical analysis and ability to further scrutinize data for statistical variations.

The power of choice to optimize your results

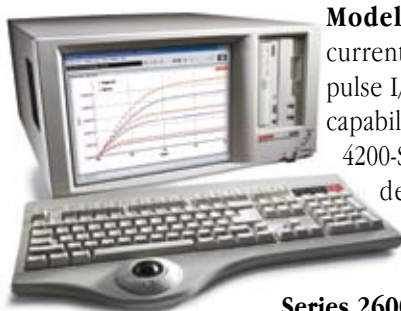


The instrumentation advantage

Powerful, yet flexible, Keithley instrumentation is integral to ACS test systems. At the core of any ACS integrated test system is the strong foundation of instruments from Keithley that makes unique measurements. Designed from a broad line of Keithley products, ACS test systems can vary depending on the specific application. You can be confident that Keithley has an ACS test system configuration to meet your semiconductor characterization needs.

Flexible system configurations starting with source-measure (I/V) instrumentation

ACS test systems can be smaller in scale and can even sit on a lab bench. Alternatively, Keithley offers full-height rack-integrated system configurations. Whatever your application might be, systems centering around Keithley's broad source-measure (I/V) product lines will deliver optimal performance.



Model 4200-SCS: Leveraging low-level current measurements, pulse generation, pulse I/V measurements, and other unique capabilities of the industry-leading Model 4200-SCS, ACS system applications include device characterization and level reliability (WLR) with semi- or fully-automatic prober systems.

Series 2600: Embedded TSP enables fast testing as well as advanced sweeps or test algorithms. Additionally, TSP-Link™ means multiple Series 2600 instruments can be used for unmatched parallel test throughput. These advantages, unique to ACS test systems, are ideal for applications such as component test, wafer sort, and WLR.

Series 2400: ACS test systems can address unique high-power applications such as power MOSFETs and display drivers.

Unique pulse, Pulse I/V (PIV), and switching

Ideal for memory characterization, charge pumping, single-pulse PIV (charge trap analysis), PIV sweeps (self-heating avoidance), and AC stress (WLR) applications.

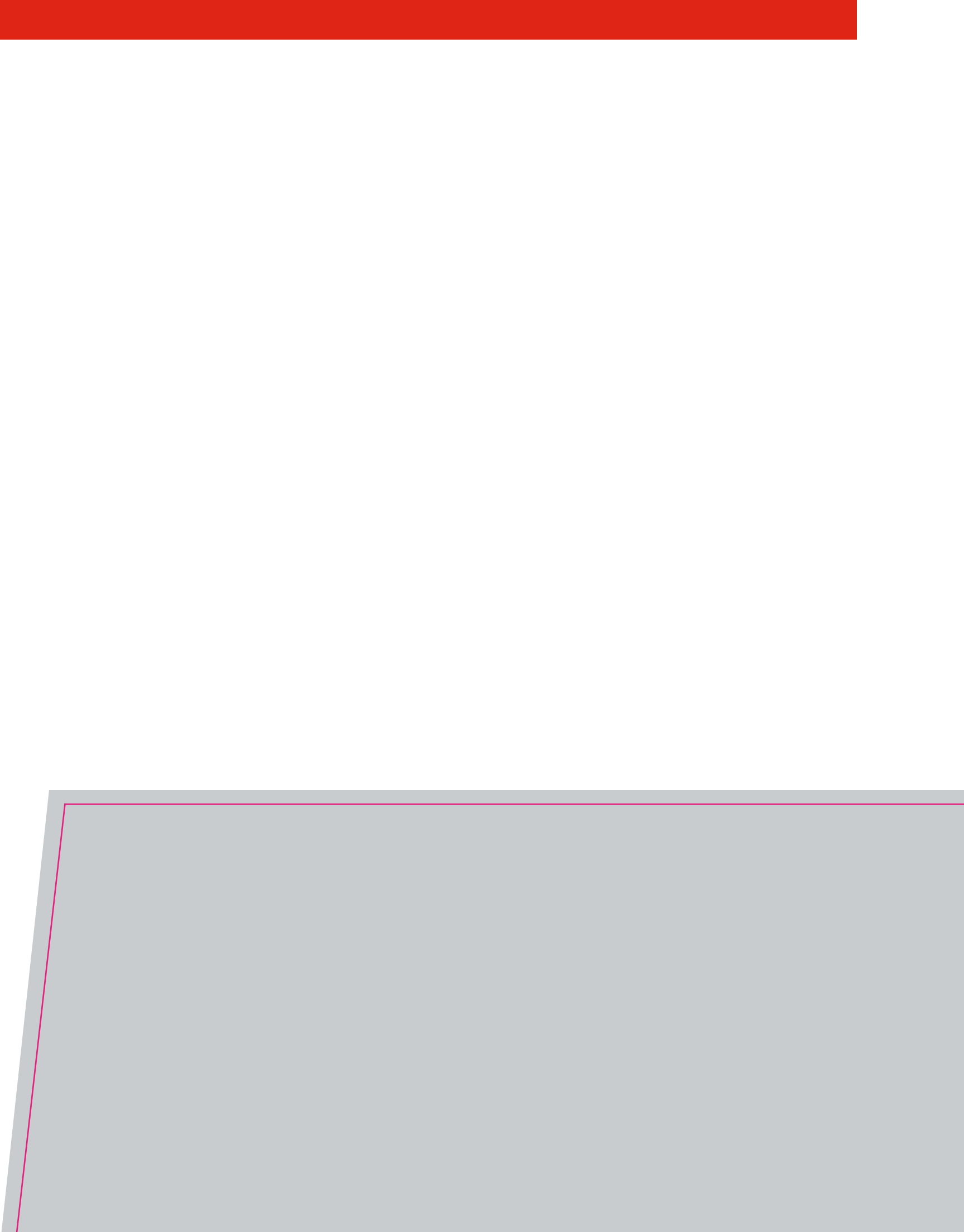
Model 4200-PIV: ACS test systems with fully integrated pulse sourcing and measure are ideal for characterizing leading-edge devices. Alternatively, you may utilize simply the pulse generator, providing ultimate results in pulse programmability and tight integration with the on-board Model 4200-PIV source-measure (I/V) cards.



Series 3400: These single or dual channel pulse pattern generators feature programmable pulse parameters including rise/fall times and pulse widths down to 3nsec.

Switching: Keithley's broad line of switching products enables a variety of ACS system applications. The Models 707A and 708A provide outstanding low-current matrix capability and other matrix choices for applications such as semiconductor device characterization, wafer level reliability, and parallel test.





The foundation for ACS innovation

Keithley Instruments is your partner in the pursuit of turnkey solutions and high performance for instrumentation and measurement. Working closely with customers worldwide, we have developed the comprehensive ACS technology to help improve outcomes, manage resources, and reduce costs.

Loaded with powerful tools and time-saving features, ACS is a comprehensive, yet flexible, integrated test system, rich in applications and scalable to your needs.

As your partner in instrumentation and measurement, Keithley strives to support you with versatile solutions and the highest level of product and service.

A Greater Measure of Confidence

With more than 60 years of expertise in making demanding measurements, Keithley offers you a greater measure of confidence in production testing, process monitoring, product development, and research. For more information on how

Keithley test solutions can help you keep pace with changing technologies, call your local Keithley representative or visit our website. Our applications engineers are also available to assist you, both before and after the sale.

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