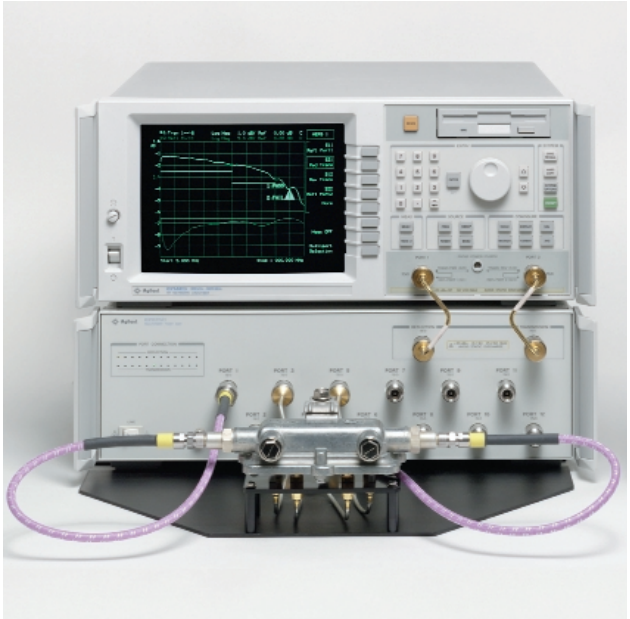
Agilent 87075C
75 Ohm Multiport Test Sets

Focus On Testing, Not Reconnecting!

Maximize production throughput of cable-TV multiport devices with Agilent Technologies' new multiport test system

Agilent Technologies
Innovating the HP Way

Boost production throughput of multiport devices



A complete multiport test system

The Agilent Technologies 87075C multiport test sets are designed to work with 8712ET/ES RF network analyzers to provide complete measurement systems for 75 ohm multiport devices.
These test systems offer fast measurement speed, high accuracy, and productivity features that will maximize your production throughput—all at an affordable price! They feature:

- specified performance to 1.3 GHz
- solid-state switches for fast, repeatable, and reliable switching between measurement paths
- 6 or 12 test ports to best match your devices and applications

There's no need to worry about the expense and space of an external computer, or the extra cost and time for developing calibration and control software. With an 8712E series analyzer, you can control the calibration and switching of the test system right from the front panel.

Fully characterize your devices with a single connection

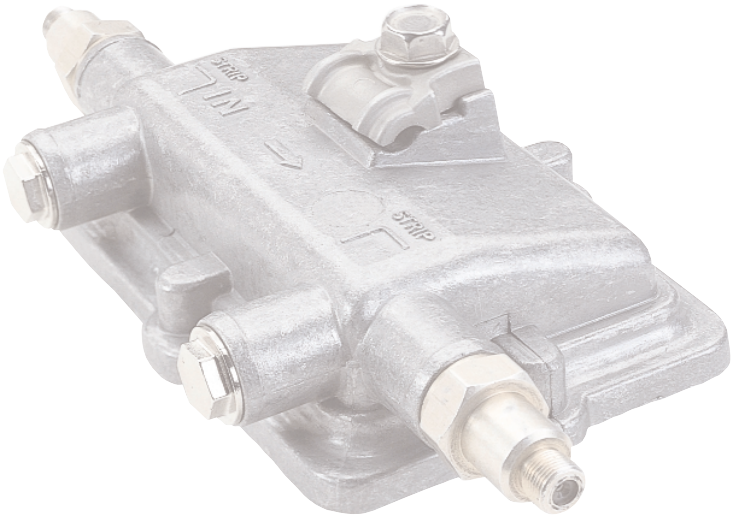
To simplify your high-volume tuning and testing of multiport devices, use a multiport test set between your device-under-test (DUT) and a standard two-port network analyzer. A single connection to each port of the DUT allows complete testing of all transmission paths and port reflection characteristics. Agilent multiport test systems eliminate time-consuming reconnections to the DUT, keeping your production costs down and your volumes up. By reducing the number of RF connections, you also:

- lower the risk of misconnections
- reduce operator fatigue
- minimize wear on cables, fixtures, connectors, and the DUT

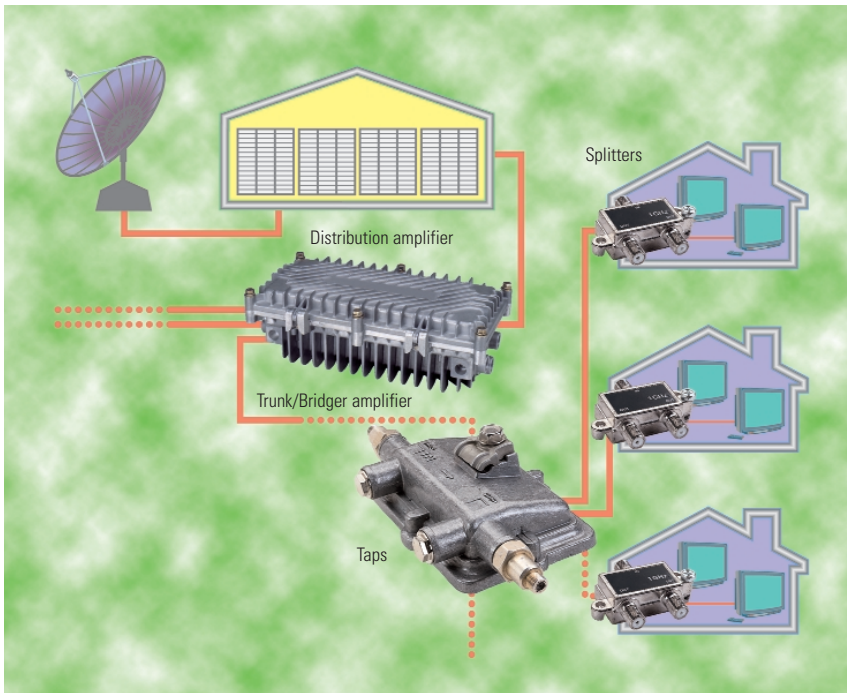
Improve your competitiveness with a fully specified test system

An 87075C test set coupled with an 8712ET/ES network analyzer is the only low-cost, multiport test system with fully specified performance at the actual test ports, whether you measure in a fixture or at the end of test cables. Specified performance means you can:

- get the same results no matter which test station you use to measure your DUT
- correlate test data from many DUTs across multiple test systems
- reduce measurement uncertainty to tighten your product specifications
- increase customer confidence in your products



A multiport test system designed for cable-TV manufacturing



This schematic of a cable-TV distribution system shows some of the devices that can be easily measured with an 87075C multiport test set and an 8712ET/ES network analyzer.

Increase production volume of taps and splitters

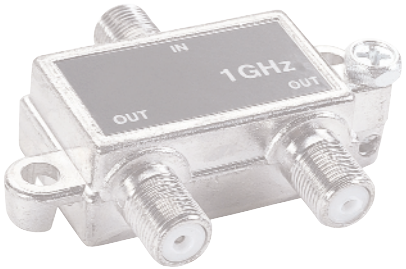
Use an 87075C-based multiport test system and a quick-connect test fixture for high-volume testing of cable-TV multi-taps and signal splitters. You can easily measure the frequency response and return loss of all ports, plus the isolation between ports.

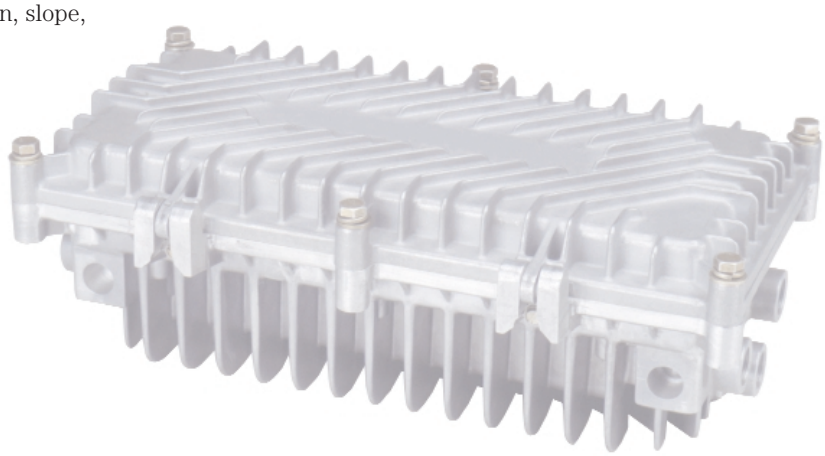
Optimize manufacturing of distribution, trunk, and bridger amplifiers

Amplifier measurements like forward and return-path frequency response, gain, slope, return loss, and port-to-port isolation are quickly and easily performed with an 87075C-based multiport test system. Use the built-in marker functions to automatically measure gain, slope, and flatness with the push of a single softkey.

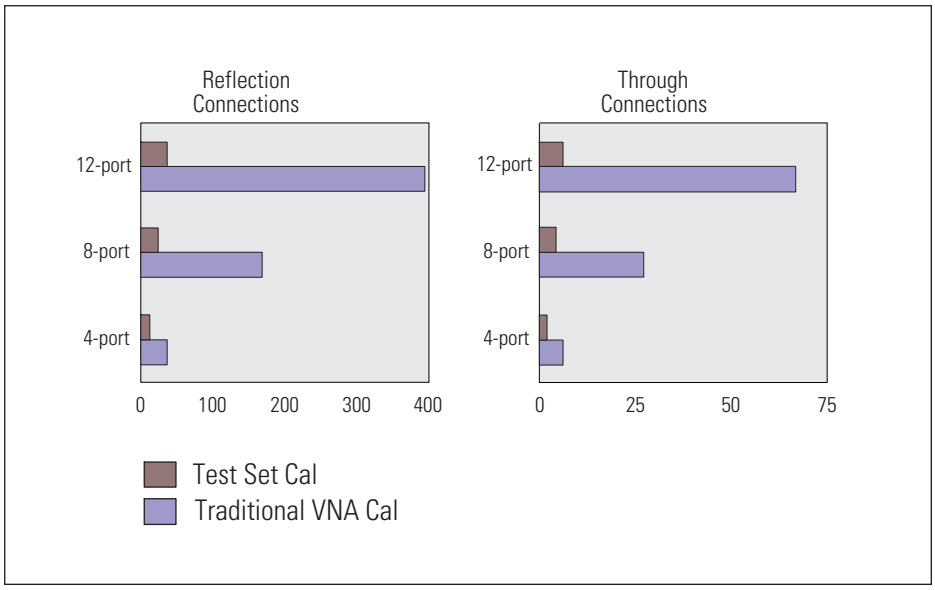
Test one device while connecting another

Increase the efficiency of a test station by using an 87075C multiport test set to multiplex two test setups with one network analyzer. For example, two four-way multi-tap test fixtures can be connected to a twelve-port test set. While one fixture is unloading and loading, the network analyzer can measure a device in the other fixture—and vice versa. This technique works well when part-handling and connection time is similar to measurement time. You can effectively double the overall throughput and efficiency of your network analyzer.





Innovative new calibration techniques save time and increase accuracy



Test Set Cal reduces the number of connections required to calibrate all possible measurement paths.

Test Set Cal eliminates redundant connection of calibration standards

Calibrating a multiport test set using two-port error correction and a traditional network analyzer requires a unique instrument state for each measurement path, forcing many redundant connections of calibration standards. As the number of ports increases, so does the number of connections required to calibrate all possible measurement paths. Full calibration of the Agilent 87075C multiport test system is quick and simple when performing a Test Set Cal:

- connect short, open, and load standards only once to each measurement port
- minimize the number of through standards required during calibration

SelfCal reduces the effects of test-system drift

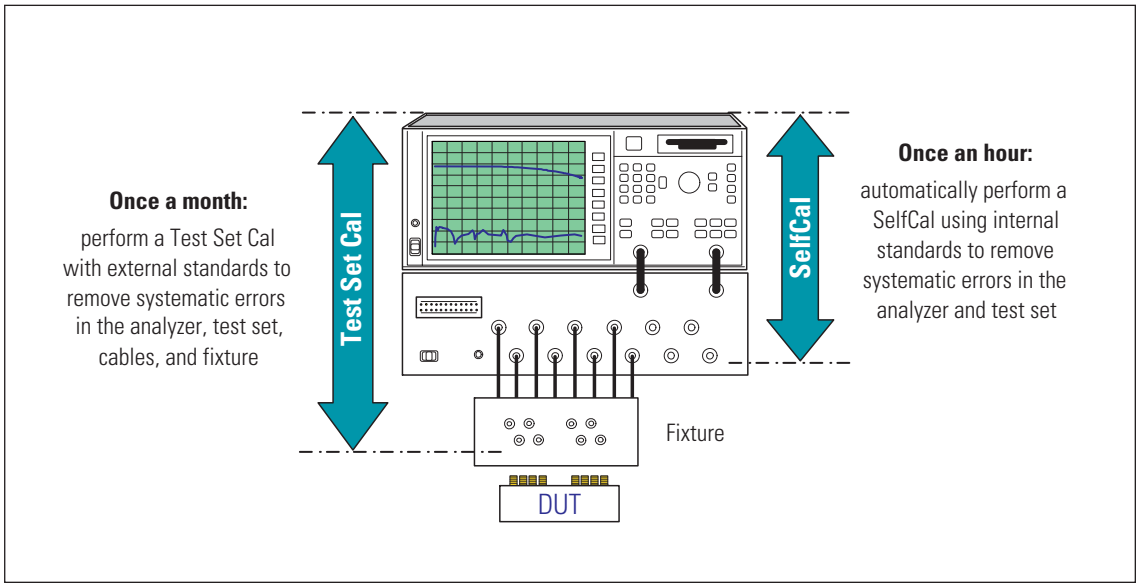
SelfCal is an internally automated calibration technique that uses solid-state switches to measure calibration standards located inside the test set. SelfCal executes automatically in just a few seconds (at an interval you define), so the impact to your test process is minimal.

Use SelfCal to:

- re-calibrate your multiport test system, returning it to the same measurement accuracy achieved immediately after performing a Test Set Cal
- reduce the effects of test-system drift, improving overall measurement accuracy between Test Set Cals

Since SelfCal does not correct for drift associated with interconnect elements between the test set and your DUT, it is essential to use high-quality test cables, adapters, and fixtures to ensure the best measurement accuracy.

Innovative new calibration techniques save time and increase accuracy



Test Set Cal and SelfCal can give you up to three extra days each month (per test station) for increased production.

Decrease calibration times and increase production throughput

With SelfCal, a Test Set Cal needs to be performed only about once per month, unlike other test systems that typically require calibration once or twice a day. So you'll spend more time measuring devices and less time measuring calibration standards. Instead of starting each shift with an hour-long calibration, SelfCal executes automatically as often as necessary (typically once an hour), taking just a few minutes per shift for calibration.

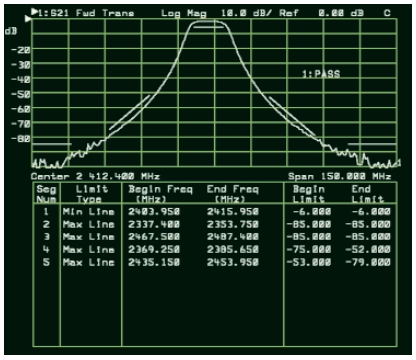
Using Test Set Cal and SelfCal, you can:

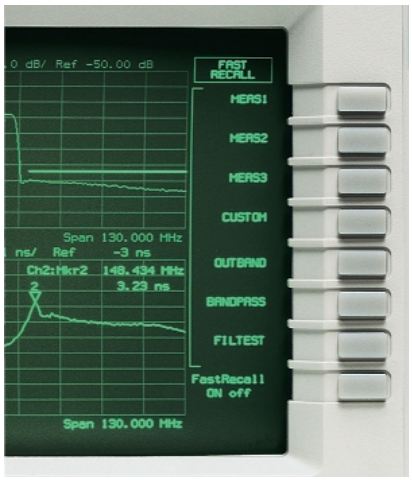
- easily reduce your overall calibration times by a factor of twenty or more
- increase the amount of time a test station can be used for measuring devices—typically, by three days per month

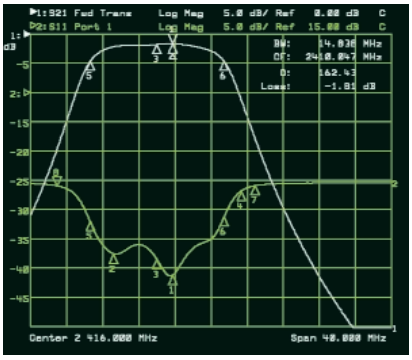
Improve measurement accuracy with two-port calibration

When using an 87075C multiport with an 8712ES S-parameter network analyzer, Test Set Cal and SelfCal support full two-port calibrations. Two-port error correction greatly improves the effective load match of the test system, providing excellent measurement accuracy.

Test-system features to speed and simplify your measurements







Automated pass/fail testing ensures consistency

Automated pass/fail testing eliminates the guesswork from your test processes and helps ensure that your components are aligned and tested to the same specifications at all test stations. Pass/fail testing is easily accomplished with user-defined limit lines, which let you quickly compare measured data to test limits. The pass/fail results are displayed clearly on the instrument screen or external monitor to minimize operator errors or misinterpretation.

Save time and reduce operator errors with recall states

Quickly switch between different manufacturing tests simply by recalling the appropriate instrument state. Saving and recalling states also eliminates operator errors that occur during repeated entry of instrument parameters. Each recall state contains all instrument parameters, such as start and stop frequencies, power level, number of trace points, IF bandwidth, markers, limit lines, and more.

With the “fast-recall” feature, any one of seven instrument states can be recalled with the touch of a single softkey. An optional foot switch allows hands-free switching during alignment or assembly operations.

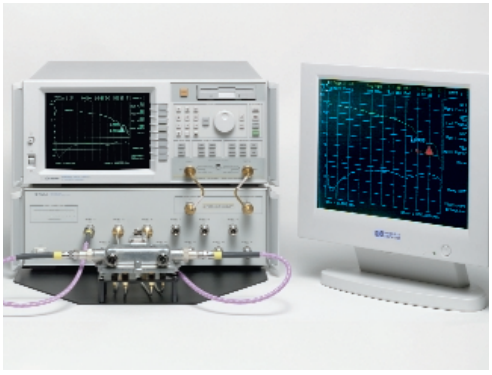
Multiple Test Set Cals can also be saved and recalled independently, giving you maximum flexibility between calibration resolution, measurement accuracy, and test times.

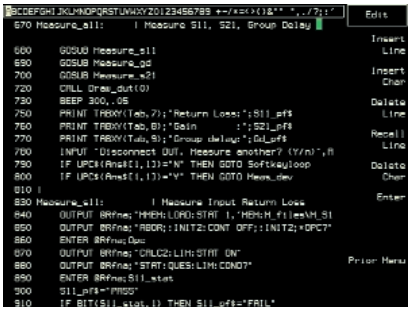
Powerful marker functions decrease test times

Speed up component test times by using the power of built-in data markers. Use the eight markers per channel to display data in absolute or relative terms. Or, perform automatic, real-time calculations of device characteristics such as:

- maximum/minimum
- center frequency
- 3-dB bandwidth, loss, and Q
- mean and standard deviation
- peak-to-peak excursion
- gain, slope and flatness

Test-system features to optimize your production processes





Enhance viewing with an external color monitor

To display information such as trace data and pass/fail indicators in color, simply plug in any standard VGA-compatible monitor. A larger screen also magnifies your test results, minimizing operator fatigue. Place the monitor near the operator, and keep the network analyzer close to the device under test or in another convenient position in the test station.

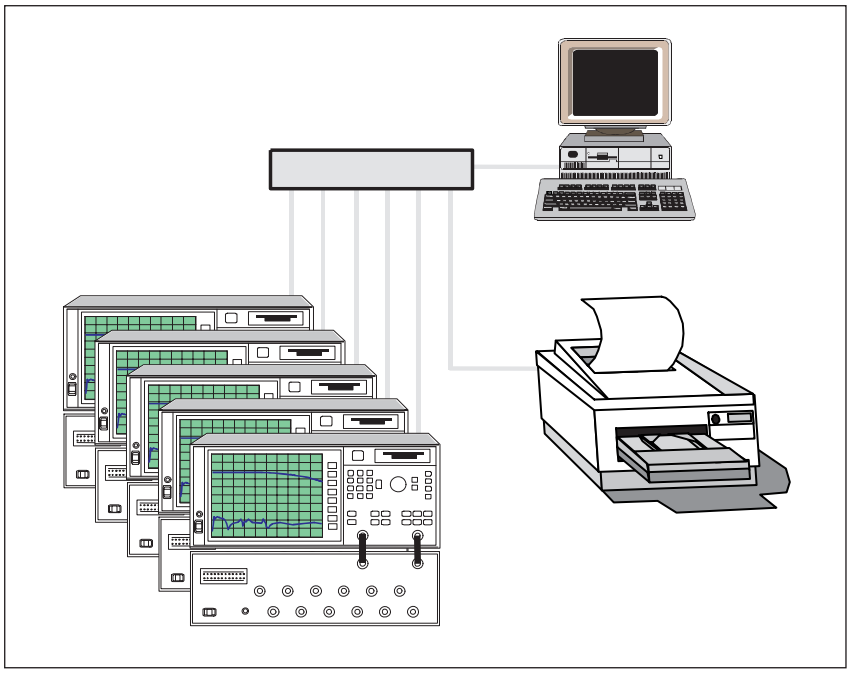
Simplify complicated measurements with IBASIC

As a standard feature, all 8712E series network analyzers come with the Instrument BASIC programming language (IBASIC). With IBASIC, you can easily create custom test applications that include:

- special softkey labels
- tailored user prompts
- graphical set-up diagrams
- barcode reading
- control of other test instruments

For simpler applications, even those without programming experience can use IBASIC as a keystroke recorder to easily automate manual measurements.

Streamline test processes with LAN interface



Communicate with a variety of standard protocols

The built-in LAN interface on the 8712E series network analyzers makes it easy to connect your multiport test system to a factory-wide Ethernet network. A network connection provides an efficient and reliable way to communicate with your test systems using a variety of standard protocols, including ftp, http, bootp, telnet, sockets, and network file system (NFS).

Easily transfer files to and from your test stations

Reconfiguring a test station for testing a new DUT is simple using the instrument's built-in ftp server:

- download new instrument states with different test parameters and limit lines to one or more test stations, from any computer on the network
- update all your automated test stations with the latest IBASIC program
- eliminate the use of cumbersome floppy disks
- use password protection for increased network security

Use NFS to easily save test data directly to a remote PC or Unix directory, eliminating the need for a remotely initiated ftp session

Import data directly into your PC applications

Screen images and trace data can be easily imported into word processors and spreadsheets that support file transfers over a LAN, like Microsoft® Word and Excel. With knowledge of your instrument's IP address, you can:

- insert images directly into test reports, lab notebooks, or product datasheets
- use a spreadsheet to analyze and plot your test data from multiple test stations

Share networked printers

With just a few keystrokes, a hardcopy of your test data—including markers, limit lines, and pass/fail indicators—can be sent to any printer on the network.

Built-in Web page supports remote troubleshooting

Using any standard Web browser, you can remotely troubleshoot test station problems from anywhere on the network, whether you're in a different building or even at a completely different site:

- view snapshot images of the network analyzer's screen
- control the analyzer with a mouse and a virtual front panel
- send SCPI commands from an active command line

Automate test processes via LAN

Most programming languages can communicate with a LAN interface, eliminating the need to add a GPIB card to your computer. The 8712E series network analyzers also support the Standard Instrument Control Library (SICL)/LAN protocol, so you can use Agilent's free VXIplug&play driver to communicate with your multiport test system over a LAN, without having to know a single SCPI command. For the latest VXIplug&play driver, please visit our web site at www.agilent.com/find/ena

Unleash the power of factory-wide connectivity

Use a LAN to collect, share and analyze your production-test data

A factory-wide LAN makes it easy for your R&D and manufacturing departments to collect, share and analyze production-test data to help improve the quality of your processes and designs.

In manufacturing...

When your manufacturing test engineers and managers use a LAN to connect to a shared production-test database, a new world of efficiency and understanding unfolds:

- analyze pass/fail trends by material lot number, test process, or test station
- identify stations that need adjustment or recalibration
- investigate productivity by any variable, such as shift, production line, or type of component
- create and distribute new test programs or limits to all stations throughout the factory
- get the "big picture" of overall manufacturing efficiency and test costs

And in R&D

When your R&D department has easy access to a production-test database, your designers can create better, more accurate designs:

- analyze production-test data for a better understanding of component performance and variation in the real world
- improve circuit and device models for use in simulation and modeling software such as Agilent's Advanced Design System suite of EDA tools
- optimize your designs for higher yields and tighter customer specifications
- reduce the number of design cycles to achieve a faster time-to-market
- acquire ISO 9000 certification more quickly and easily by enhancing understanding and control of your design and manufacturing processes

Compatibility

Agilent 87050E multiport test sets are designed to work with 8712ET/ES network analyzers. They are also compatible with 8712C analyzers, but some features are not supported (most notably, performing Test Set Cals and SelfCals with two-port error correction), and firmware and hardware upgrades may be required. In addition, tests to verify conformance to the published specifications can only be performed using 8712E series network analyzers. The test sets can also be used with other Agilent network analyzers, but test set control must be done with an external computer (via the parallel interface), and Test Set Cals and SelfCals are not available. If used with another Agilent network analyzer, we recommend contacting our Solution Services Division for multiport test software and application support.

Custom multiport test sets

Agilent can provide a wide range of multiport test sets that can be customized to your measurement applications, with frequency coverage to 3 GHz and beyond. Test sets are available in a variety of connector types and switching arrangements, and can include internal couplers, attenuators, or other signal-conditioning devices. For more information, please consult your local Agilent Technologies representative.

Literature

Agilent 87075C multiport test sets	**Literature number**
Data sheet	5968-4767E
Configuration guide	5968-4768E

Agilent 8712E series network analyzers	**Literature number**
Brochure	5967-6316E
Data sheet	5967-6314E
Configuration guide	5967-6315E

Key specifications

Frequency range	3 MHz - 1.3 GHz	
Number of test ports	6 or 12	
System performance with 2-port calibration (type-N)		
Directivity	40 dB	
Source match	30 dB	
Load match	30 dB	
Reflection tracking	±0.1 dB	
Transmission tracking	±0.1 dB	
Crosstalk	60 dB	
System performance, uncorrected		
Load match, test port unselected	20 dB	
Load match, test port selected	16 dB	
Test-set loss		
Reflection port to port-n	7 dB	
Transmission port to port-n	11 dB	
Maximum system output power	<1 GHz	>1 GHz
8712ET (standard)	6 dBm	3 dBm
8712ET (with attenuator option)	5 dBm	2 dBm
8712ES	3 dBm	0 dBm
Port-switching time, typical (medium-wide bandwidth, 201 points)		
No SelfCal needed	0.5 sec	
With full SelfCal		
Reflection cal	1 sec	
Transmission enhanced cal	2.5 sec	
2-port cal	5 sec	

Agilent Technologies' Test and Measurement Support, Services, and Assistance

Agilent Technologies aims to maximize the value you receive, while minimizing your risk and problems. We strive to ensure that you get the test and measurement capabilities you paid for and obtain the support you need. Our extensive support resources and services can help you choose the right Agilent products for your applications and apply them successfully. Every instrument and system we sell has a global warranty. Support is available for at least five years beyond the production life of the product. Two concepts underlie Agilent's overall support policy: "Our Promise" and "Your Advantage."

Our Promise

"Our Promise" means your Agilent test and measurement equipment will meet its advertised performance and functionality. When you are choosing new equipment, we will help you with product information, including realistic performance specifications and practical recommendations from experienced test engineers. When you use Agilent equipment, we can verify that it works properly, help with product operation, and provide basic measurement assistance for the use of specified capabilities, at no extra cost upon request. Many self-help tools are available.

Your Advantage

"Your Advantage" means that Agilent offers a wide range of additional expert test and measurement services, which you can purchase according to your unique technical and business needs. Solve problems efficiently and gain a competitive edge by contracting with us for calibration, extra-cost upgrades, out-of-warranty repairs, and on-site education and training, as well as design, system integration, project management, and other professional services. Experienced Agilent engineers and technicians worldwide can help you maximize your productivity, optimize the return on investment of your Agilent instruments and systems, and obtain dependable measurement accuracy for the life of those products.

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