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Agilent 8712ET/ES, 8714ET/ES
RF Economy Network Analyzers

Product Overview

8712ET and 8712ES, 300 kHz to 1.3 GHz
8714ET and 8714ES, 300 kHz to 3 GHz



Agilent Technologies
Innovating the HP Way

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Reduce test times, increase throughput, and lower your cost per component

Designed for high-volume manufacturing

Agilent Technologies' RF economy network analyzers deliver the best combination of speed, accuracy, productivity features, and low cost. These analyzers help reduce tune and test times, increase throughput, and lower your overall cost per component. They offer all the critical performance and features needed to test typical RF components such as:

- Filters
- Amplifiers
- Antennas
- Cables
- Mixers
- CATV taps and distribution amplifiers

The 1.3 GHz 8712ET and ES models and the 3 GHz 8714ET and ES models are available in both 50-ohm and 75-ohm versions. While perfectly suited for manual manufacturing operations, Agilent RF economy network analyzers are also fully programmable for automated-test environments. The new ET and ES models are code compatible with earlier models in this family, so you can reuse all your existing test software.

New S-parameter capability

With the addition of S-parameter measurement capability, the Agilent RF economy network analyzer family has evolved to meet today's test demands of higher-performance components. This capability brings new levels of accuracy, convenience, and affordability for testing RF components. S-parameter network analyzers let you measure the forward *and* reverse characteristics of your components without having to disconnect, turn around, and reconnect them to the analyzer. They also provide full two-port calibration to give you the best measurement accuracy possible. Depending upon your application, you can choose the optimum performance level of an S-parameter analyzer (ES models) or the lower cost of a transmission/reflection analyzer (ET models). All models are loaded with powerful features including:

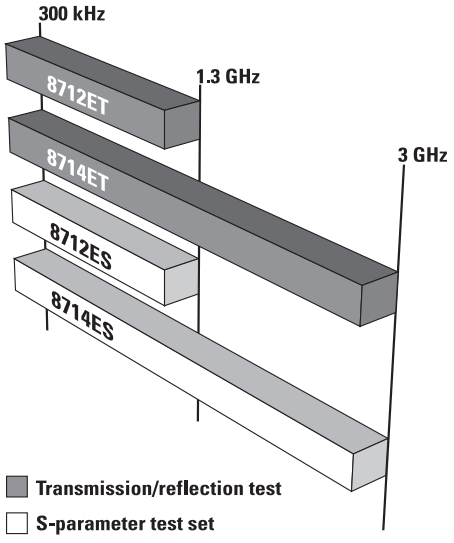
- Synthesized source
- High-dynamic-range narrowband and broadband receivers
- Advanced vector-error correction
- Large display
- Internal disk drive
- Instrument BASIC (IBASIC)
- LAN capability

Complete RF characterization

With both frequency and power sweeps, Agilent RF economy network analyzers let you quickly and accurately characterize the linear and nonlinear performance of your RF components.

Measurement capabilities include:

- Gain/Insertion loss
- Isolation
- Insertion phase
- Electrical length
- Linear group delay
- Return loss
- SWR
- Reflection coefficient
- Impedance
- Gain compression
- AM-to-PM conversion
- Absolute power
- S-parameters (ES models only)

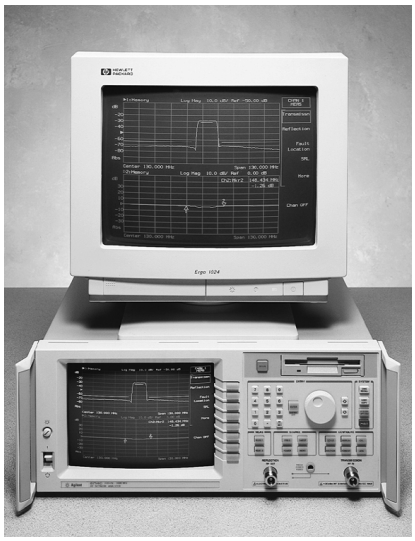


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Productivity features to speed and simplify your measurements

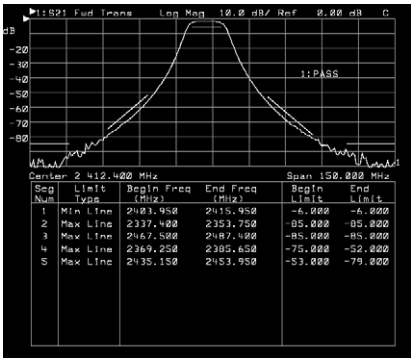
External color monitor enhances viewing

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, helping to minimize operator fatigue. You can 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.



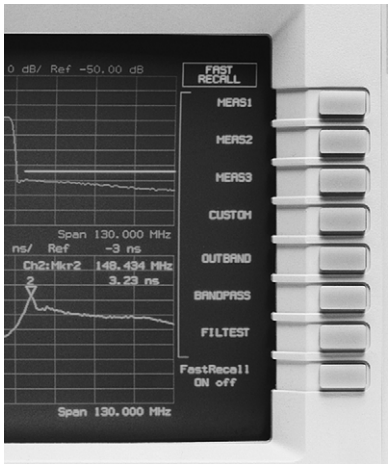
Automated pass/fail testing

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 and consistently 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

You can 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, calibration data, markers, limit lines, and more. The new E-models feature twice as much memory as older C-models, giving you more room than ever for storing instrument states (or IBASIC programs) internally. Or, you can use floppy disks to save an unlimited number of states. With Agilent's "fast-recall" feature, any one of seven instrument states can be recalled with the touch of a single softkey, or with an optional foot switch for hands-free switching during alignment or assembly operations.

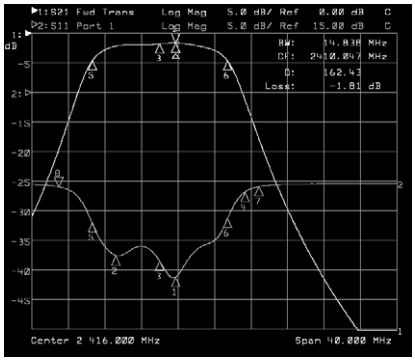


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Powerful marker functions

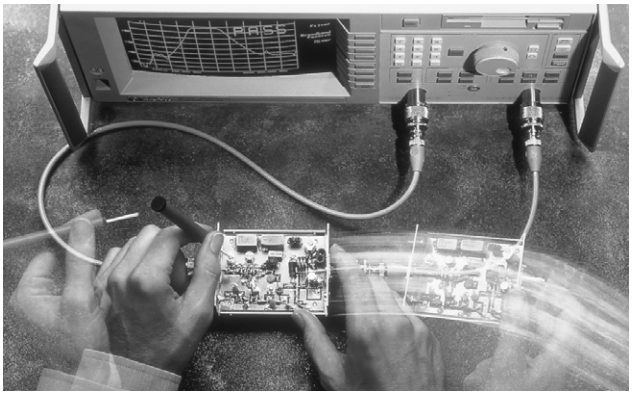
Speed up component test times by using the power of built-in data markers. Use the eight markers per channel to display data in absolute or relative terms. Or, perform automatic, real-time calculations of device characteristics such as:

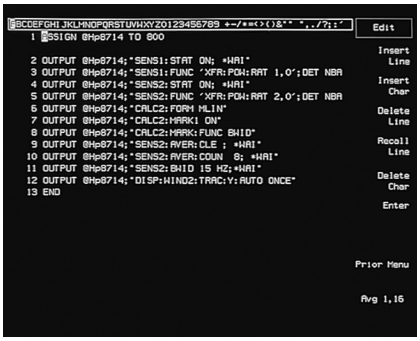
- Maximum/Minimum
- Center frequency
- 3-dB bandwidth, loss, and Q
- Mean and standard deviation
- Peak-to-peak excursion
- Gain slope and flatness



All the speed you need for tuning

Agilent's RF economy network analyzers provide high trace-update rates to provide the real-time feedback you need to efficiently align RF components such as filters, tuners, and isolators.





Simplify complicated measurements with IBASIC

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

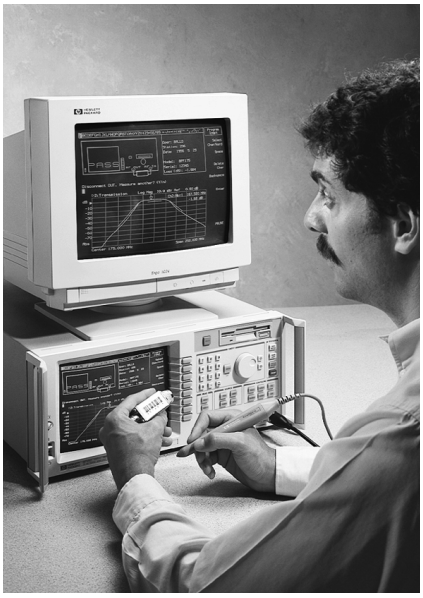
- Special softkey labels
- Tailored user prompts
- Graphical setup diagrams
- Barcode-reading capability
- Control of other test instruments

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

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Track the performance of every component you make

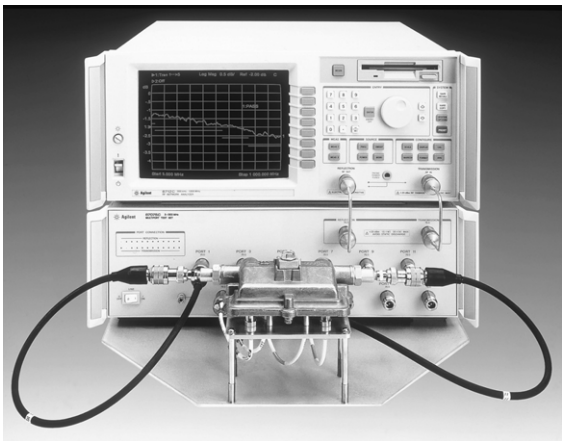
Using IBASIC and a standard DIN-compatible barcode reader, you can efficiently track and document individual component performance. This performance history is ideal for correlating test data with operator and test-station identification, and for providing superior post-sales customer support.



Increase throughput for multiport components

Agilent offers a wide variety of standard and custom 50- and 75-ohm multiport test sets to complement the RF economy network analyzer family. Because the device under test (DUT) only needs to be connected once to test multiple signal paths, there are numerous advantages, including:

- Dramatic reduction in overall tune and test times
- Less operator fatigue
- Less chance of connection to the wrong port
- Reduced wear on cables, fixtures, and DUTs
- Big savings in system calibration time (typically reduce monthly calibration times by a factor of twenty!)

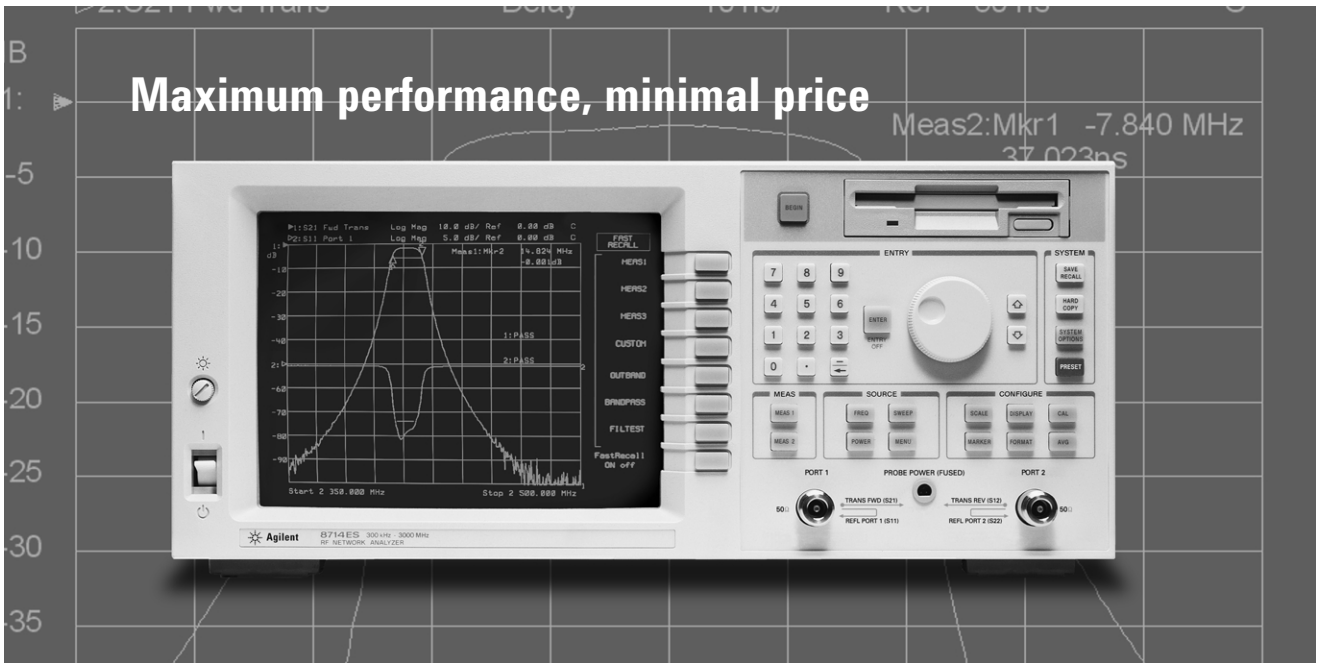


Characterize cables with fault location/SRL option

Option 100 adds fault-location and structural-return-loss (SRL) measurement capability for characterizing 50-ohm or 75-ohm cables that are still on a spool in a warehouse, or already installed on a cellular tower. Agilent's fault-location option is easy to use and has many advantages over traditional time-domain reflectometry (TDR) techniques. You can also use the option to easily characterize the loss and velocity factors of your cables, and to accurately check the effect of cable damage by measuring SRL. Option 101 combines Option 100 with a rugged transport case to protect your instrument in the field during transport and operation.



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1-Hz synthesized source

The internal synthesized source provides a fast, stable, high-resolution (1 Hz) stimulus for accurate measurements on a variety of RF components. Two sweep modes are available: swept mode for the fastest sweeps, and stepped mode for the best frequency accuracy while measuring very narrowband components.

For a wide range of output power levels for testing active devices and components, a built-in step attenuator extends the lower end of the output power range to –60 dBm. This attenuator is standard on the S-parameter (ES) models, and optional on the transmission/reflection (ET) models.

Flexible, sensitive receivers

All instruments in the family contain three independent, sensitive receivers. You can choose between narrowband or broadband detection, depending on the type of component you are testing. Broadband detection allows scalar characterization of frequency-translating devices (measuring mixer conversion loss, for example), while narrowband detection provides more than 100 dB of dynamic range for vector measurements of high-rejection, narrowband devices such as mobile-communications channel filters.

Large display

A large, internal, 9-inch (23 cm) display lets you clearly view measurement data, softkey selections, IBASIC programs, pass/fail indicators, markers, and many other instrument parameters.

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Independent measurement channels

To speed the tuning and testing of components, two measurement channels let you display transmission and reflection measurements simultaneously. Each channel can have independent measurement parameters such as frequency range, IF bandwidth, display format, and number of points. View your data in a variety of formats including:

- Linear and log magnitude
- Phase and group delay
- SWR
- Polar
- Smith chart
- Real and imaginary
- dBW, dBm, dBµW, dBV, dBmV, dBµV

Beside the many productivity features that speed and simplify your measurements, Agilent RF economy network analyzers provide solid RF performance that you would expect only from network analyzers that cost considerably more. This combination of performance, features, and low cost gives you unbeatable value for your RF component manufacturing needs.

IntuiLink compatible

An Agilent RF economy network analyzer captures key measurement data; Agilent IntuiLink software allows that data to be put to work easily. IntuiLink provides easy access to measurement data and images from within your standard PC applications. You work in a familiar environment at all times, using PC applications such as Microsoft Excel® or Word® to transfer, display, print, and document the data you get from the network analyzer. The IntuiLink application toolbar makes it easy, providing an easy way to download data and screenshots into a spreadsheet or document. Programmers can use ActiveX to control instruments directly using high-level toolbar functions. IntuiLink brings the barriers down, simplifying the way you do your job. For additional information, go to: www.agilent.com/find/IntuiLink

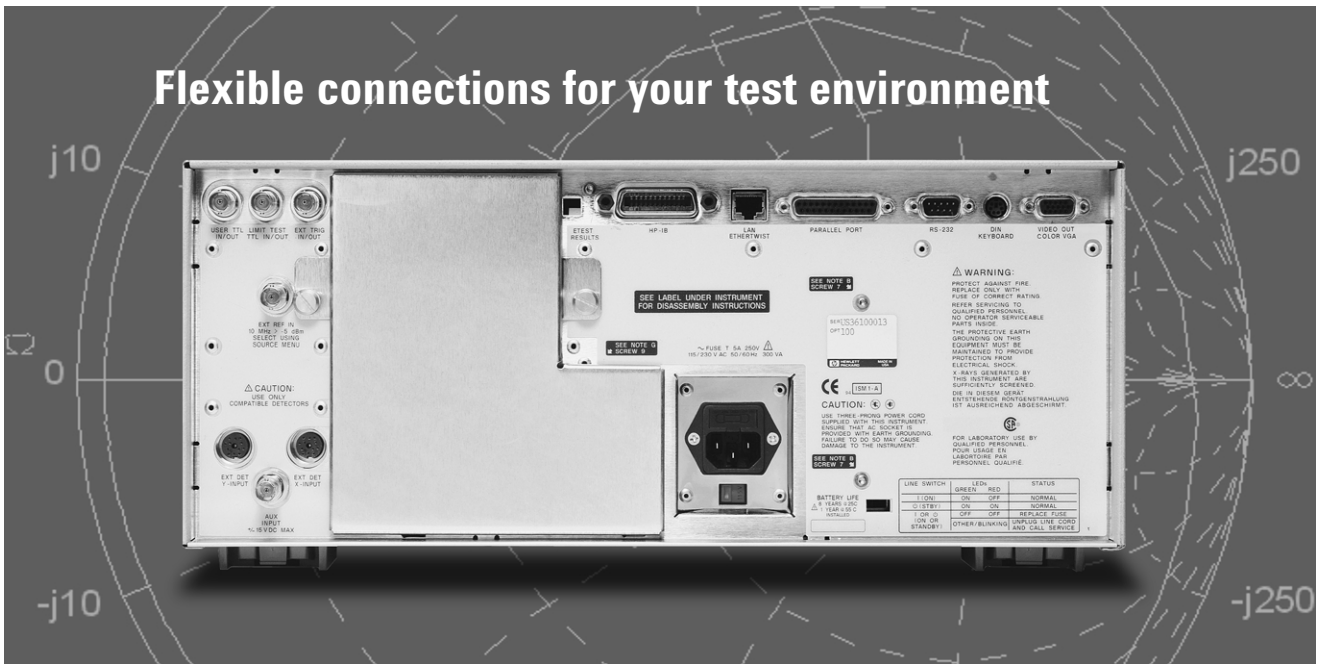
Built-in disk drive

A built-in DOS-compatible 3.5-inch disk drive allows unlimited storage of instrument states, calibration and measurement data, IBASIC programs, and graphical screen dumps in bit-mapped or vector formats. The disk drive can also be used to quickly and easily upgrade the instrument's firmware as new revisions are released.

LAN capability

A standard TCP/IP-compliant, 10Base-T (Ethertwist) LAN interface makes the simultaneous distribution of new test programs, test parameters, limit lines, and custom interfaces to all the instruments on your production lines fast and reliable. With LAN capability, R&D and manufacturing departments can easily collect, share, and analyze data to improve component designs and manufacturing processes.

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Flexible interface ports

GPIB (IEEE 488.2), parallel (Centronics), and serial (RS-232C) interfaces provide connections to commonly used peripherals such as printers and plotters. It's easy to print test results for analysis, reports, or archival purposes, with the touch of a button. The GPIB, serial, and parallel ports can also be programmed with IBASIC to control other test instruments and equipment such as part handlers and sorters.

Video output

For enhanced viewing, any VGA-compatible color monitor can easily be connected so operators have a clear, full-color view of all display information. This is especially useful when the analyzer cannot be located near the operator, and when color display of data and annotations is helpful.

Limit-test output

This TTL-level signal is based on the results of pass/fail tests of components and can be used to control part handlers and sorters.

User-TTL and footswitch control

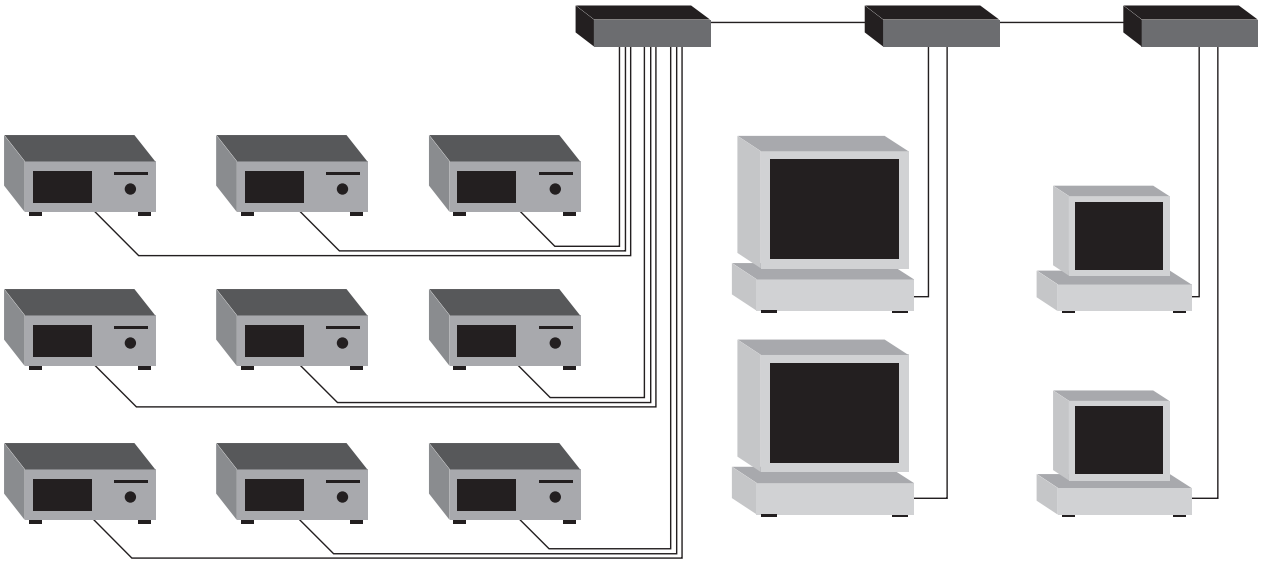
This open-collector signal can be used as an input or output for custom IBASIC applications. When the analyzer's fast-recall mode is active, a foot switch can be connected to the user-TTL line to rapidly recall successive instrument states for hands-free switching during alignment or assembly operations.

Keyboard/bar-code interface

Connecting a standard, full-size PC keyboard (using a 6-pin mini-DIN connector) makes it easy to enter and edit screen titles, recall-state names, and IBASIC programs. A barcode reader can also be connected for efficient tracking of components.

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Unleash the power of factory-wide connectivity



LAN capability provides a new level of control and knowledge over your entire operation.

LAN interface now standard

Agilent's RF economy network analyzers now include a local area network (LAN) interface as a standard feature. In manufacturing environments, a LAN is an efficient and reliable way to communicate with your test instruments. But, a factory-wide LAN can provide much more. It makes it easy for your R&D and manufacturing departments to collect, share, and analyze production data to help improve the quality of your processes and designs.

When your manufacturing test engineers and managers connect to the same LAN, 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.

When R&D connects to the same LAN as manufacturing, 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.

Achieve a stronger competitive edge

A factory-wide LAN helps you produce components with lower costs, better specifications, and greater reliability, giving you a valuable competitive edge over other vendors.

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Expand your operation *and* stay within budget

Versatile options for capital acquisitions
Starting a new production line can be a significant investment. While Agilent economy network analyzers bring unprecedented levels of performance at affordable prices, flexible financing can also help reduce initial capital expenditures. Agilent's Technology Finance programs improve your bottom line with a variety of rental, lease, and installment plans, ranging in lengths from one to five years. Simply choose the financing alternative that best suits your business needs.

Get the latest technology at a lower cost
To encourage businesses to take advantage of Agilent's Technology Finance, we've eliminated the fees normally associated with renting and leasing. NO start-up fees. NO credit-processing fees. NO interim rents. NO penalty fees for upgrades, add-ons or early buyouts. Agilent's Easy Rent or Lease plan lets you reap the benefits of up-to-date technology without the full expense or the risk of ownership.

Flexible end-of-term options
During the term of your agreement with Agilent, you can upgrade, add on, or buyout some or all of the equipment without penalties. At the end of the term, you can choose to return, renew, upgrade, or purchase your analyzer. Working with Agilent makes staying on the cutting edge of technology affordable and helps maximize your return on investment.

Increase your purchase power with used equipment
To help you acquire new instruments, Agilent offers both ongoing and time-limited trade-in programs that leverage the value of your used test equipment. For details of current programs, please contact your local Agilent sales representative.



Starting a new production line can be a significant investment. You can choose the financing alternative that best suits your business situation.

* Please note: All financing options are subject to credit approval, a minimum transaction amount, and may be limited due to local government rules and regulations.

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Key specifications

Frequency range	
8712ET/ES	300 kHz to 1.3 GHz
8714ET/ES	300 kHz to 3 GHz
Frequency resolution	1 Hz
Impedance	50 or 75 ohms
Maximum output power (depending on model and options)	+2 to +16 dBm
Dynamic range	
Narrowband	> 100 dB
Broadband (ET models)	> 66 dB
Broadband (ES models)	> 56 dB
Directivity (corrected)	> 40 dB
Source match (corrected)	> 35 dB
Load match	
ET models (uncorrected)	> 16 dB (typical)
ES models (corrected)	> 45 dB
Forward sweep (201 points, 1-port/response cal)	40 ms
Trace transfer (201 points, real format)	20 ms

Agilent RF economy network analyzer literature	**Pub. number**
Data sheet	5967-6314E
Configuration guide	5967-6315E
Option 100 fault location and SRL product overview	5964-0264E
Agilent 87075C 75-ohm multiport test set product overview	5965-8165E
Agilent 87050E 50-ohm multiport test set product overview	5968-4763E

World-class Agilent service and support

Applications and test expertise at your service

Our Solution Services Division is ready to help you with test-process analysis, consulting, and software development. Our applications engineers have a wealth of knowledge to draw upon, based on more than fifty years of experience developing and manufacturing RF and microwave test equipment. Agilent also offers a wide variety of technical training classes worldwide that can be customized to your specific needs.

Quality and reliability by design

Agilent economy RF network analyzers are manufactured in ISO 9001-registered facilities in concurrence with Agilent's commitment to quality. The reliability of these analyzers has been verified through extensive environmental testing including shock, vibration, and extreme temperature cycling. Further improvements are continually realized by process and design changes resulting from careful analysis of manufacturing data.

ISO 9001

Industry-leading, three-year warranty

Agilent's commitment to quality is backed by a standard three-year return-to-Agilent warranty that can be converted at no charge to one-year on-site servicing (note: on-site support is not available in all countries). Support options to extend your warranty or to cover periodic calibrations are also available at low, fixed prices.

Local telephone support

Agilent offers technical and application phone support in most countries. The best place to start is to contact your local Agilent sales office or sales representative. The best time to put Agilent products and services to work for you is right now!

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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.

Get assistance with all your test and measurement needs at:

www.agilent.com/find/assist

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