Meet the demand for next-generation mobile phones and **lower the cost** of testing with Agilent's flexible, multi-format solutions

Agilent Technologies
8960 Series 10 Wireless
Communications Test Set

Mobile Test Applications for W-CDMA, GPRS, GSM, cdma2000, IS-95, IS-136, AMPS

NEW

- W-CDMA test application
- GPRS lab application
- Automated software
- Enhancements for cdma2000/IS-95/AMPS, fast switching, and more!

Let the proven performance of Agilent's test solutions and services accelerate your time to volume and help you reduce the cost of test
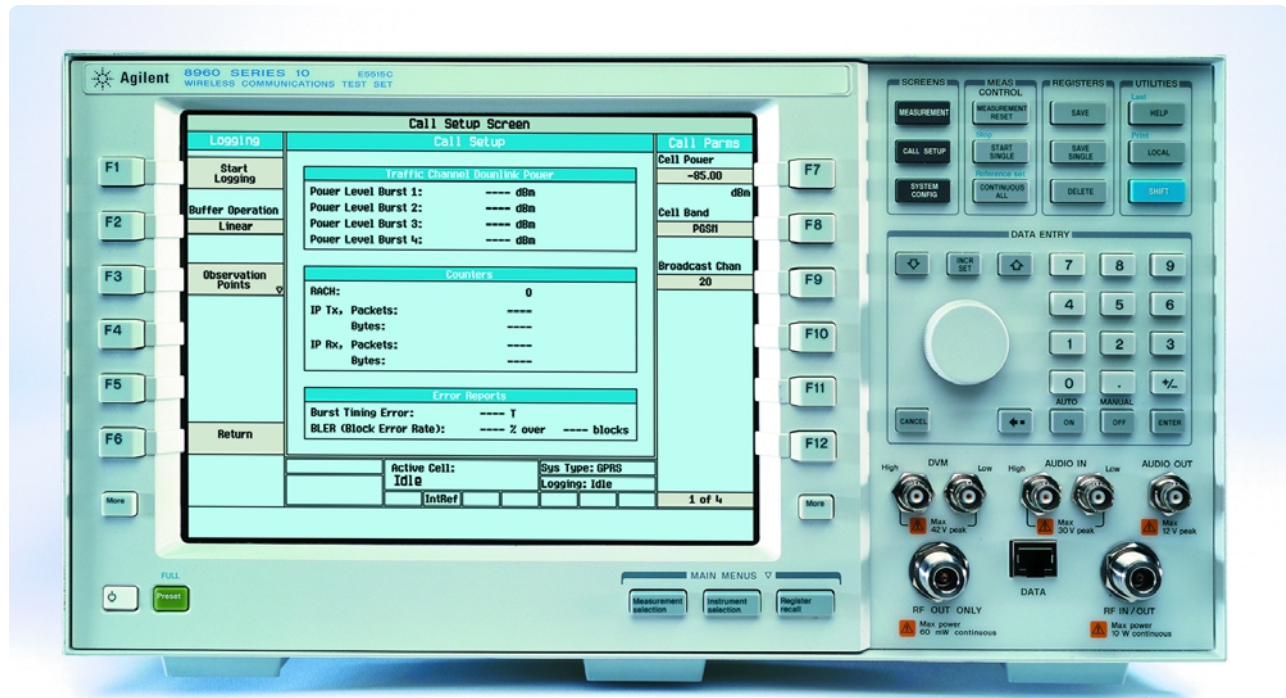
Agilent Technologies

Get the benefits of the one multi-format test set that delivers dramatic breakthroughs in speed and throughput

Today's mobile phone manufacturing market is fast-moving and highly competitive. To be successful, manufacturers have to produce high volumes of quality phones at the lowest possible cost.

The Agilent Technologies 8960 Series 10 wireless communications test set (E5515C) will help you meet time-to-market and time-to-volume goals.

For manufacturing

This test set has been designed from the start to deliver break-though speed and flexibility needed for high-volume, automated production-test environments.

For R&D

A new lab application and other enhancements accelerate the pace of product development and help move your design from the lab into manufacturing in the shortest possible time.

A growing family of mobile test applications provides the 8960 Series 10 test set with all the features and functionality you need for fast, accurate, repeatable, and automated testing of today's most popular wireless formats:

- cdma2000
- W-CDMA
- GPRS
- GSM
- IS-95
- IS-136 (TDMA)
- AMPS

The fast-switching test application lets you switch between test applications in less than two seconds, creating a practical solution for testing the latest "world" phones.

The flexible design of the 8960 Series 10 supports all test modes and wireless technologies in a single chassis, ensuring a continued upgrade path to evolving 2.5G and 3G formats and other enhancements. This makes the 8960 Series 10 truly a versatile, cost-effective platform for testing next-generation phones. It is the one manufacturing and R&D test set that can deliver a competitive advantage for your business, today and in the future.

Gain an instant competitive advantage with the test platform designed for measurement speed

The speed and concurrent measurement capability of the 8960 Series 10 test set provides immediate benefits that translate into a competitive advantage for mobile-phone manufacturers.

Designed for speed, the 8960 Series 10 test set significantly cuts test times to help reduce the manufacturing cost per phone. It runs individual tests from 10 to 30 times faster than first- or second-generation wireless test sets.

With this dramatic speed improvement, your production lines will require fewer test sets, have lower test costs, and require less floor space. The 8960 Series 10 offers the option to further enhance the reliability and quality of your mobile phones by running tests that were once considered too time-consuming to execute in a high-volume manufacturing environment.

By taking advantage of measurement speed, you will likely be able to boost the overall throughput of your production-test system, in some cases by as much as 200 to 300 percent!

Concurrent measurements

The 8960 Series 10 wireless communications test set uses Agilent Technologies' reduced instruction parallel processing (RIPP) architecture, which allows the test set to run concurrent measurements using independent hardware and firmware. In addition to enabling faster measurements, the RIPP architecture greatly simplifies remote programming of complex, parallel measurements.

You can launch a series of transmitter and receiver measurements to be executed simultaneously. Because the test set has parallel hardware and an operating system that allows concurrent processes, the total test time will be significantly shorter than if the same tests were run sequentially. Simultaneous measurements do not prevent you from retrieving the results of each measurement as it is completed.

Measurement speed

Measurement speed is improved with the 8960 Series 10. For example, using the test set with the GSM mobile test application, a GSM phase-error measurement (typical five-burst average), which takes five seconds to run on a previous-generation test set, now takes only 150 milliseconds. An output RF spectrum measurement, which also requires five seconds on a previous-generation test set, takes only 200 milliseconds. Transmitter and receiver measurements can be made concurrently, reducing test time even further.
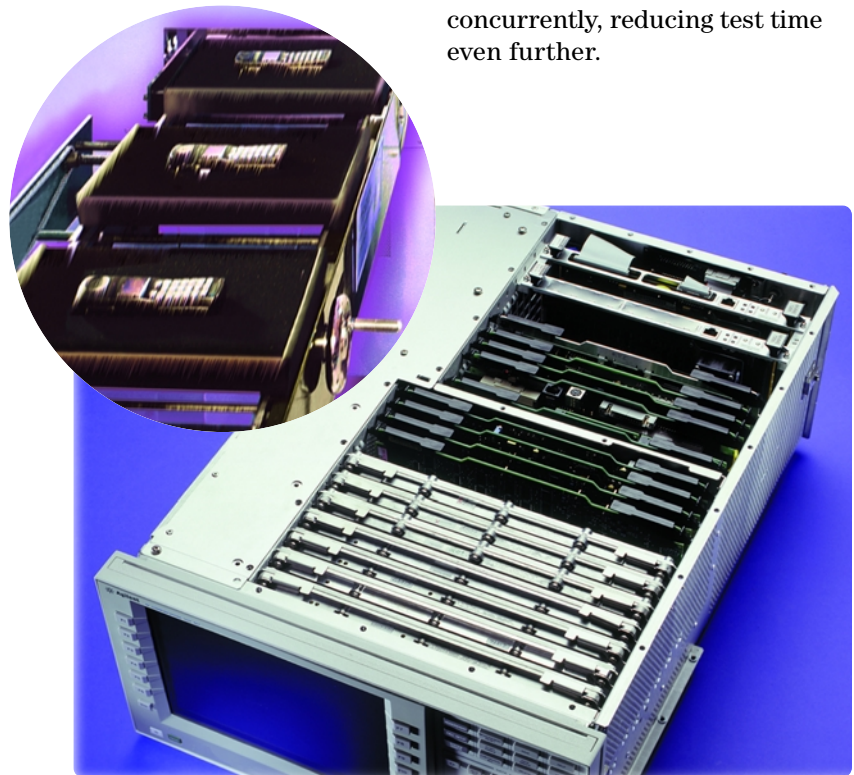
Innovative test set design improves measurement efficiency

FPGA-based core CDMA architecture emmulates IS-95, cdma2000, and W-CDMA without reliance on base station chipsets. Layer 1 changes in the standard can be made quickly though software updates.

- Fast-settling hardware eliminates waiting for the measurement path to stabilize.

- Separate analog-to-digital converters for measurements eliminate the wait for shared resources, allowing protocol, receiver, and transmitter measurements to run simultaneously.

- Separate processors and receivers handle the link maintenance and make RF measurements.

- Hardware speed is optimized using fast processing algorithms and the latest processor technology.

Transmitter test time comparison
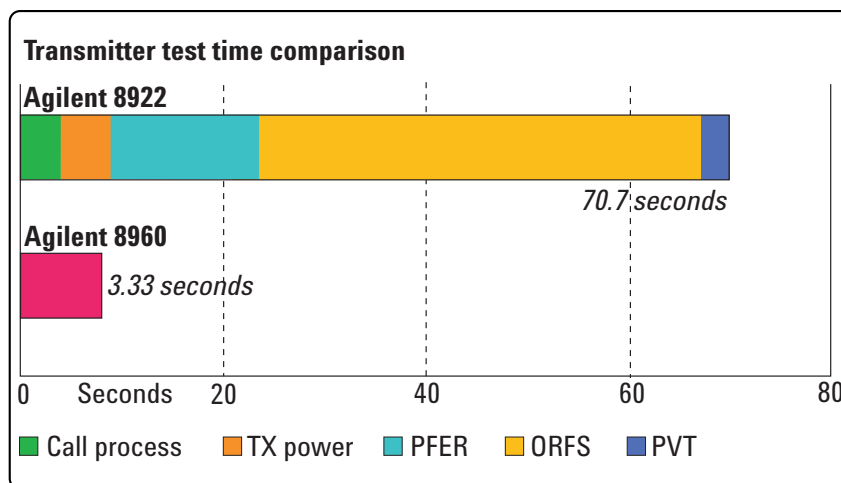

```
10   OUTPUT 714; "SET:CONTINUOUS OFF
20   OUTPUT 714; "INIT:TXP;PFER"
30   OUTPUT 714; "FETCH:TXP?;PFER?"
40   ENTER  714; I1,Power,I2,Rms_ph_max, Peak_ph_max, Freq_worst
50   PRINT "RESULTS= ";I1, Power,I2,Rms_ph_max, Peak_ph_max, Freq_worst
```

Easy to program and control

The test set's remote user interface (RUI) has been designed to allow the use of high-level tests to launch measurements and retrieve results. With high-level tests, complex measurement processing algorithms are built into the test set and executed internally, reducing the bus traffic and increasing overall measurement throughput.

Because the RUI takes fewer lines of code, integrating the test set into your manufacturing environment is greatly simplified. Your programmers will find it much easier to write, maintain, and upgrade the test code with fewer lines required.

An additional benefit of the 8960 Series 10's efficient RUI is the programmable measurement time out. Test engineers no longer need to worry about a faulty phone hanging up the test set. Programmable time out allows
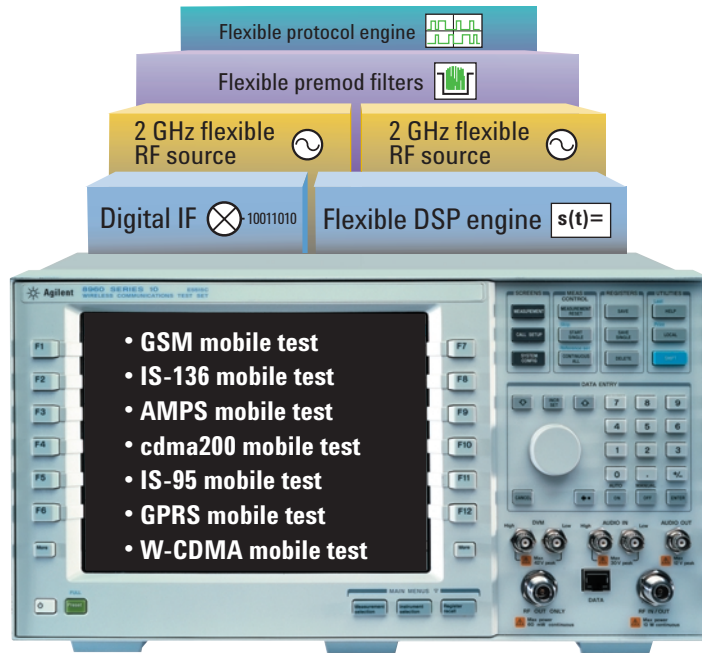
overall control of each measurement procedure to ensure that a faulty phone does not halt the test program.

In the GSM measurement example below, only five lines of code are required for a program that can measure and print transmit power (TXP) and phase and frequency error (PFER). Measurement initiation and retrieval takes only three lines of code (20–40) and will execute in 50 milliseconds.

The results captured in this simple program include an integrity value for each of the two measurements, transmit power, phase error, peak phase error, and worst-case frequency error. The same program on a similar test set would take at least 15 lines of code and would not include measurement integrity.

Flexible architecture accommodates your changing needs

With the emergence of 2.5 and 3G standards, the number of wireless technologies deployed around the world is growing. The demand for any particular wireless technology can change quickly. If you manufacture for a global market, you need a flexible test solution that can accommodate multiple frequency bands and technologies.

Flexible protocol engine

Flexible premod filters

2 GHz flexible RF source

2 GHz flexible RF source

Digital IF 10011010

Flexible DSP engine $s(t)=$

- **GSM mobile test**
- **IS-136 mobile test**
- **AMPS mobile test**
- **cdma200 mobile test**
- **IS-95 mobile test**
- **GPRS mobile test**
- **W-CDMA mobile test**

A platform for today and tomorrow

With a growing family of test applications, the 8960 Series 10 test set meets a wide variety of manufacturing and R&D test needs:

Agilent E1960A GSM test application covers frequency bands and measurements for GSM900, DCS1800, GSM850, and PCS1900 mobile phones.

Agilent E1961A AMPS/136 test application covers frequency bands and measurements for 136 cellular and PCS and AMPS cellular phones.

Agilent E1962B cdma2000/IS-95/ AMPS test application covers cellular and PCS frequency bands, providing protocol and measurements for cdma2000 and IS-95 phones. (This model replaces the E1962A IS-2000 test application.)

Agilent E1963A W-CDMA test application covers UMTS wideband CDMA frequency bands. It works with the GSM and GPRS test applications to create the only single instrument capable of testing all 3GPP radio formats.

Agilent E1964A GPRS test application covers GSM900, DCS1800, GSM850, and PCS1900 frequency bands and provides measurements for new GPRS mobile phones.

Agilent E1985A GSM_AMPS/136_GPRS fast switching test application allows you to switch quickly between GSM, AMPS/136, and GPRS formats.

Agilent E6701A GPRS lab application adds R&D features for troubleshooting and validating next-generation wireless appliance designs.

Flexible architecture *continued*

Components of the platform

The 8960 Series 10 hardware platform consists of modules for RF and base-band measurements, digital signal processing, and computing. The hardware set is based on standard components, so that the platform can incorporate the latest technologies and can be upgraded easily as new technologies evolve.

With open hardware slots and an internal VME bus, the test set is ready to accept future technology enhancements with test application and/or hardware additions.

All test applications can be stored on the test set's internal hard drive. New test applications can be downloaded into the test set, saved, and recalled easily so you can make quick format and configuration changes with minimal disruption to production lines.

A fully optioned (purchased with all available hardware options and all available test or lab applications) 8960 Series 10 can easily switch between applications and does not require adding, removing, or exchanging of hardware.

Reliable measurement results

The 8960 Series 10 wireless communications test set offers the excellent accuracy and reliability that you have come to expect from Agilent Technologies products. To ensure these qualities, all of the test set's components, circuits, and modules undergo rigorous physical, mechanical, and environmental testing. The test set's accurate, repeatable measurements help insure the quality of your phones during testing, and the measurement results can be used to predict trends and help improve manufacturing processes.

Benefits of standardization

By standardizing on the 8960 Series 10, you will have a single test platform that is easy to program and easy to support. Whether transferring designs from R&D to manufacturing, wireless technologies or frequency bands, you will have the advantage of a familiar user interface with common operating and testing procedures.

Roll out the next generation of CDMA technology

With growing demand for high-speed data services, the wireless industry is moving rapidly to launch the next generation of CDMA technology, based on the IS-2000 standard commonly known as cdma2000.

The Agilent E1962B cdma2000/IS-95/AMPS mobile test application, used with the 8960 Series 10 model E5515C chassis, provides the test capability you'll need to get to market quickly with cdma2000 and IS-95 mobile phones.

With fast and comprehensive cdma2000, IS-95, and AMPS measurements, you can speed the development of new dual-mode and tri-mode wireless appliances and ramp up for high-volume manufacturing.

Meet aggressive time-to-market goals

With the cdma2000 mobile test application, you can finalize product designs, perform calibration and final tests, and quickly build production volume. Call processing and key RF parametric test capabilities let you evaluate the quality and RF performance of your products.

The test application performs extremely fast cdma2000, IS-95, and AMPS transmitter and receiver tests using call processing to establish a traffic or fundamental channel via standard test service options or in test modes for mobile phone calibration.

Simultaneous receiver and transmitter measurements further increase test speed and throughput.

Full cdma2000 and IS-95 call-processing capability

• call origination
• paging
• registration
• hard handoffs

CDMA transmitter tests

• maximum power
• minimum power
• multi-coded waveform quality (including frequency error)
• handoff waveform quality
• open loop power accuracy
• open loop power calibration procedure
• access probe power
• code domain power
• gated power
• code channel timing and phase
• spurious emissions

CDMA
technology *continued*

CDMA receiver tests

- frame error rate (FER)
- fundamental/traffic channel sensitivity
- supplemental channel sensitivity
- dynamic range
- demodulation with AWGN

AMPS transmitter tests

- RF power output
- RF frequency and frequency error
- FM deviation and distortion
- audio frequency response
- audio distortion
- FM hum and noise
- SAT deviation and frequency error
- compressor response

AMPS receiver tests

- SINAD
- audio frequency response
- audio distortion
- hum and noise
- expander response

Flexible forward-link emulation

The test application also provides flexible cdma2000 and IS-95 forward-link emulation that offers control of the pilot, sync, paging, QPCH (cdma2000 only), F-FCH or traffic channel, S-SCH (cdma2000 only), AWGN levels and data rates used in many test applications.

The fully coded, cdma2000 forward-link emulation supports radio configurations 1 through 5 and all supplemental channel data rates associated with those configurations up to 153.6 kbps.

Comprehensive signal-generation capability includes:

- CDMA channels (F-pilot, F-sync, F-paging, F-FCH or traffic channel, F-SCH and F-OCNS)
- CDMA modulation
  - parallel BPSK for pilot, sync, paging, traffic (IS-95)
  - QPSK for F-FCH and F-SCH (cdma2000)
- AWGN source (1.8 MHz minimum bandwidth)

Flexible user control of the forward link emulation is provided through an easy-to-use front-panel control and remote GPIB.

Simplify cdma2000 and IS-95 testing on the production line

To simplify CDMA mobile phone testing in the production environment, Agilent's E1990A cdma2000/IS-95/AMPS mobile station test software provides the functionality you need to develop and launch customized test plans. Running under HTBASIC for Windows® on an external controller, the E1990A software works with the 8960 Series 10 test set and the E1962B cdma2000/IS-95/AMPS test application, offering a familiar user interface plus support of all E1962B call processing functions and CDMA tests.

Create the highest-quality W-CDMA devices

Wideband CDMA is clearly the most exciting and highly anticipated of all the 3G standards. The pressure is on to get W-CDMA wireless appliances to market.

Let Agilent help you meet aggressive time-to-market goals with the E1963A W-CDMA mobile test application. Now you can have a single design and manufacturing test solution that covers all the Universal Mobile Telecommunications (UMTS)/ Third Generation Partnership Project (3GPP) radio formats: W-CDMA, GPRS, and GSM.

Speed 3G product development and production

The W-CDMA mobile test application puts a W-CDMA system simulator and fast parametric test set on your desk. As prototypes move into production, the test solution's fast measurements, accuracy, flexibility, and ease of programming will help you reach high-volume production goals.
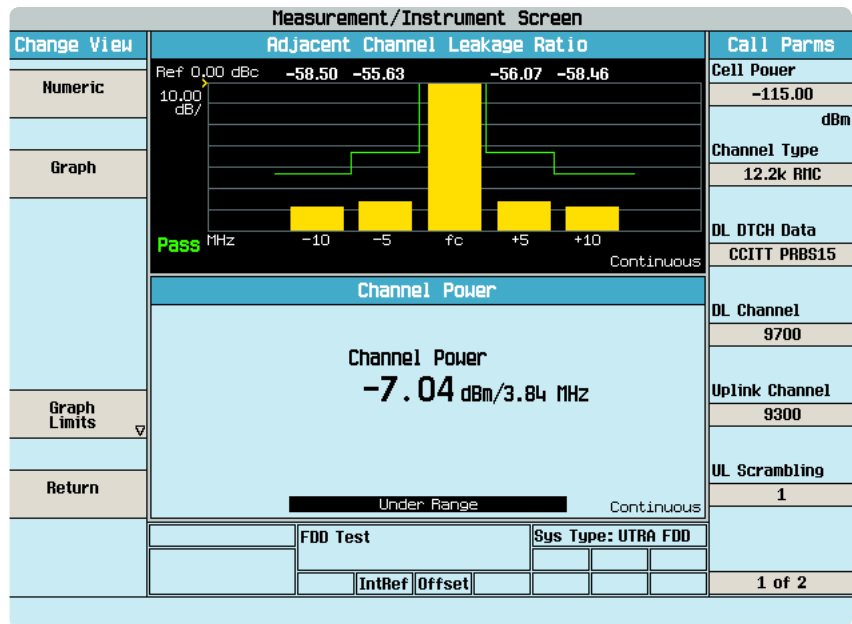
Currently available measurement capabilities

- thermal power
- channel power
- adjacent channel leakage
- waveform quality
  - error vector magnitude
  - frequency error
  - phase error
  - magnitude error
  - origin offset
- loopback BER

You can retrieve transmitter measurements in a fraction of a second with high performance CDMA architecture based on a flexible field programmable gate array (FPGA) design.

All measurements conform to UMTS/3GPP UTRA FDD TS. 34.121 specifications for user equipment.

Channel coverage

The W-CDMA test application operates in the U.S. cellular, GSM900, DCS1800, PCS1900, and IMT2000 frequency bands.

Get your GPRS mobile phones to market quickly

The Agilent E1964A GPRS mobile test application has capabilities for worry-free testing of GPRS mobile phones.

GPRS offers a way to increase data rates over existing GSM networks, and it provides an evolutionary path to the higher rates of 3G wireless communications. Many GSM service providers are rolling out this new technology aggressively.

With the GPRS test application and the 8960 Series 10, you will have a solution designed especially to meet test needs in high-volume manufacturing of GPRS transceivers and mobile phones. Recent enhancements to the test application make it possible to test nearly any GPRS mobile device.

GPRS functionality now includes coding schemes CS1 through CS4. Multi-slot configurations of up to four contiguous downlink time slots and up to two contiguous uplink time slots allow you to characterize the performance of a GPRS mobile phone over realistic conditions. Fast-switching with the GSM test application is available. (See page 14.)
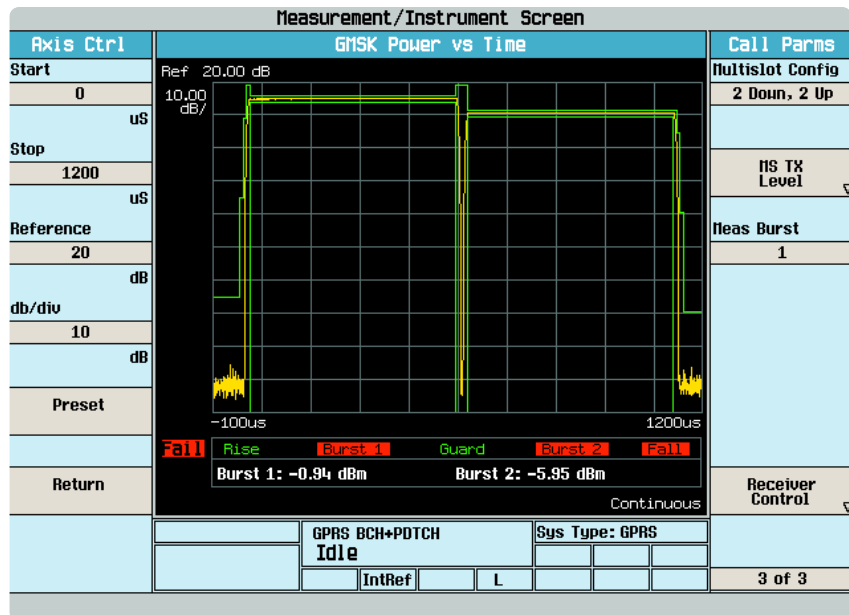
Measurement capability

The E1964A mobile test application provides the essential GPRS and GSM measurements required for GPRS mobile testing.

GPRS measurements
- bit error ratio (BER)
- fast BER
- block error ratio (BLER)
- multi-slot power versus time (PvT)

GSM measurements
- power
- phase error
- frequency error
- output RF spectrum (ORFS)

Signaling features

Signaling test modes are used to set up a GPRS call. The mobile test application provides several options:

- ETSI test modes A and B
- Agilent BLER test mode
- instrument test modes — BCH only, BCH + PDTCH

To help speed the product development cycle, the Agilent BLER test mode lets you test "immature" devices that do not yet support ETSI test modes or GPRS mobility management (GMM) messaging.

Base station emulator

The test application's base station emulator enables the call-processing functions needed for transmitter and receiver testing.

- mobile station originated attach/detach
- packet data transfer on the uplink and downlink
- PDTCH, MS power level, ARFCN assignments
- inter-band handovers

The base-station emulator can emulate a cell in any of the following frequency bands:

- GSM 900 MHz (GSM, EGSM, PGSM)
- GSM 850 MHz (cellular band)
- GSM 1800 MHz (DCS band)
- GSM 1900 MHz (PCS band)

Measurement graphics

For tasks in which detailed pass/fail information is required, such as final integration of mobile devices in R&D and manufacturing re-work, the GPRS test application now provides extensive graphics capability. The initial release includes measurement graphics for peak phase error, multi-slot PvT, and ORFS due to switching and modulation.

Accelerate your GPRS design cycle

The Agilent E6701A GPRS lab application for the 8960 Series 10 gives R&D engineers a one-box solution to quickly troubleshoot and validate GPRS wireless appliance designs.

The lab application's flexible, comprehensive protocol-logging and two-way IP data communication provide the tools required to evaluate and verify an appliance's parametric and signaling functionality and performance. User-settable timing advance and cell parameters help resolve timing and base-station configuration issues quickly. Within minutes of instrument power-up, you will have access to these powerful tools.

The GPRS lab application enhancements makes the 8960 one of the most advanced wireless test instruments available today—and Agilent will continue to introduce new lab functionality in future product releases, increasing the value of your investment for R&D and manufacturing.

Protocol logging

The E6701A provides protocol logging for more efficient trouble-shooting and signaling feature verification.

This capability lets you:

- view the implemented portions of layers 1, 2 (RLC/MAC, LLC), 3 (GMM, SM), and SNDCP
- view the IP datagrams
- select the protocol layers to be logged

The lab application provides a summary of logged message information that includes the protocol path, message name, message direction (uplink or downlink), and time stamps (elapsed and system). It also provides the detail of logged message information, including the complete protocol log stream.

Data channels

As part of your troubleshooting strategy, data channel features allow you to originate and terminate GPRS data traffic. Using the 8960, the E6701A lab application software sets up a GPRS PDTCH for two-way IP data communication between a GPRS appliance under test and a network.

This two-way communication provides real data flow on a real channel, so that you can fully test more of the data-handling performance of the GPRS appliance.

Protocol enhancements

To help solve timing and network issues, the lab application has many user-settable features:

- Timing advance
- Uplink state flag (USF) in assignment message
- Cell parameters (MCC, NCC, BCC, MNC, LAC, RAC)

All of the functionality of the E1964A GPRS mobile test application is included in the E6701A GPRS lab application to give you all the benefits of extremely fast, accurate, and repeatable transmitter measurements, full receiver test capability, and realistic multi-slot and data-coding configurations.

Stay competitive with the proven standard for GSM testing

The E1960A GSM mobile test application takes advantage of the 8960 Series 10 test set's independent hardware (models E5515A/B/C) to allow simultaneous measurement of mobile-phone transmitters and receivers, and to maintain the link for high throughput testing.

This test application provides complete GSM functionality as specified in European Telecommunication Standards Institute (ETSI) Phase 2 GSM recommendations:

- bit/frame error rate measurements
- mobile station power output level control
- traffic channels, including TCH/FS, full-rate speech
- broadcast channel configuration (BCCH + CCCH +SDCCH/4)
- full and limited signaling call-setup modes
- audio speech echo with 1sec fixed delay
- measurement coordination, including flexible control of burst type, ARFCN, and timeslot
- MS loop-back types A, B, C

Call-processing functionality and high-level tests for mobile phone testing include the following:
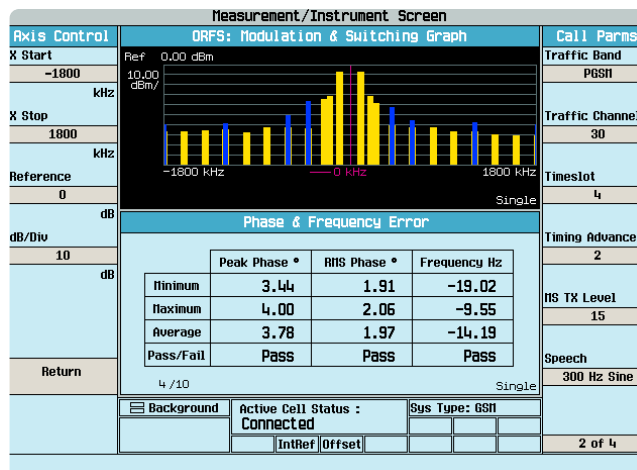
Call processing functionality

- mobile-station origination and release
- base-station-initiated call and release
- channel assignments
- handovers
- mobile station transmitter and receiver quality and level reports

Transmitter measurements

- frequency error
- carrier power
- phase error
- power versus time
- burst timing
- ORFS due to switching and modulation

Receiver measurements

- FER
- burst-by-burst BER (fast BER)

Audio functionality

- speech echo back to the mobile station
- encoded audio source on the downlink
- decoded audio from the uplink
- audio level, frequency and distortion measurements
- audio source

Mobile station reports

- timing advance
- transmitter level
- receiver level and quality

Measurement graphics

For tasks in which detailed pass/fail information is required, such as final integration of mobile devices in R&D and manufacturing re-work, the GSM test application now provides extensive graphics capability. The initial release includes measurement graphics for peak phase error, IQ tuning, PvT, and ORFS due to switching and modulation.

Add AMPS/136 mobile test capability

The E1961A AMPS/136 mobile test application performs fast analog and digital mobile-phone tests for the EIA/TIA-136 specifications. Used with the 8960 Series 10 Model E5515B or C, it tests new 136-compliant mobile phones in all three bands of operation—analog 800 MHz, digital 800 MHz, and digital 1900 MHz—and all call-processing functions, including handoffs between bands and modes.

```
                    Call Setup Screen
Call Control      Active Cell Operating Mode        DCCH Parms
Operating Mode          Mobile Station Information   Cell Power
  Active Cell                                          -50.00
                ESN (Decimal):        231-10327786              dBm
                ESN (Hex):            0xE79D96EA
                MIN1 (Hex):           00E65EA3       DCCH Band
                MIN2 (Hex):           000003E7          PCS
                Phone Number:         0000327786
    End         SCM:                  Class IV, Cont, 25 MHz
    Call        Rate Capability:                     DCCH Channel
                Digital MS Protocol Version: 4 (TIA/EIA-136 pv0)  299
Paging Number   MS Called Party Number: 2447486
  0000327786          Current DTC Information        DCCH DVCC
                                                        1
                Digital MS TX Level:   2
                DTC Channel:           1998           DCCH Burst Size
Call/Handoff    DTC Band:              PCS              Normal
   Setup        DTC Timeslot:          1 and 4
      ▽         DTC DVCC:              1
                DTC Vocoder Type:      ACELP (CC1)

              ⊟ Background  Active Cell Status :  Sys Type: DIG136
                            Connected
    1 of 2                 Shift  IntRef Offset                2 of 2
```

Comprehensive RF measurements for transmitters and receivers include the following:

- analog TX power
- analog frequency stability and modulation
- digital TX power
- digital modulation accuracy, including EVM, peak phase and magnitude, frequency error, and origin offset
- adjacent channel power
- IQ tuning and dynamic power measurement
- loopback BER
- MAHO BER, RSSI, and neighbor reports on six channels

Additional functionality and features include the following:

Call processing functionality, including origination from base station or mobile station, release from base station or mobile station, digital and analog modes (ACC, AVC, DCCH, DTC), selectable call setup parameters, and hand-offs between all bands and modes.

Audio functionality, including an audio generator and audio analyzer with level, SINAD, distortion, and audio frequency. Audio parameters are settable.

Operating modes, including full signaling active cell mode, DTC, or AVC generation test modes, and carrier wave mode.

Induced bit error rate, allowing specific levels of bit errors to be induced onto the DTC link.

Reports, including measurement integrity and automatic statistical test results.

Test the latest multi-format "world" phones

With the new E1985A GSM_AMPS/ 136_GPRS mobile test application for fast switching, the 8960 Series 10 is the ideal solution for testing multiple-format world phones. In less than two seconds, you can switch between these radio formats—a process that took a minute and a half before.

Fast switching reduces setup time and helps increase throughput on the production line. Each time the software switches between formats, it does a partial preset, so that instrument states, including channel number and power level, are preserved. That means when you switch back to a previously used format, you will be able to continue testing without having to stop and reset the measurement parameters.

In addition, GPIB commands can be sent to the radio format that is idle while testing the active format, so that you will be ready to test every time you make a switch.

As world phones incorporate new radio formats, Agilent will continue to introduce the fast-switching software needed for cost-effective testing.

Looking for a faster way to get to market with your wireless device?

Moving new wireless communication devices from design into manufacturing presents numerous challenges. The last thing you want to worry about is what test system you will use. Ramping to high volume production requires a fast, efficient test solution to minimize test time and increase throughput.

Agilent's N4051A and N4052A wireless test systems are designed specifically for today's wireless appliance manufacturing environment. It combines the hardware and software you need to get to the "first test" as quickly and easily as possible—with fewer decisions about test system design required on your part.

Streamline initial test engineering

Built around the 8960 Series 10 wireless communications test set, the Agilent N4051A/52A gives you all the benefits of extremely fast measurements, outstanding performance and accuracy, ease of programming, and a flexible platform designed to accept new technologies without having to do a major redesign of your system.

The N4051A/52A system hardware and software is optimized for calibration and performance testing at the circuit-board level and for final testing of your fully assembled product. Agilent has put the wealth of its test knowledge into this flexible system, which can be designed and installed directly on your production line by our local delivery team.

System design and components

Instruments such as the 8960 Series 10 test set capitalize on our knowledge of test, so that you can be sure of getting the right solution.

Software is flexible and comprehensive, with an easy-to-configure user interface. It includes a full-featured test executive, an easy-to-use test development environment with libraries of measurement and instrument-control routines, and an automated RF path characterization tool. The N4051A/52A works with the Agilent E6560A wireless test manager, which combines simple and complete menu-driven test plans, test executive functionality, and a user-friendly test development environment. Test applications for the 8960 test set at the heart of the system support all major 2G and 3G wireless phone protocols.

Fixtures such as the new E8421A wireless test fixture with changeable nests can be integrated into the system to allow testing of appliances of varying form factors. The test fixture provides RF isolation to protect the test environment, manual or automatic connection to the appliance under test, RF paths, acoustic testing, and limited button pushing

Racking includes integration of all instruments and cabling into a rack carefully designed to provide cooling, power, ergonomics, safety, and mechanical stability.

System hardware also includes power supplies, industrial PC, display, keyboard, and modular interconnect panel. The N4051A/52A can be configured with options for power, rack size, instrument set, multiplexer, digital multimeter, and digital I/O.

Keep up with changing test needs

The N4051A/52A functional test system provides a robust and flexible platform that can meet the changing needs of a wireless manufacturing business. In addition to being new-technology ready, the system can be tailored for your unique situation. For example, Agilent's delivery team can tailor the fixture, design calibration and device-communication software, develop device-specific measurements, and optimize your test processes.
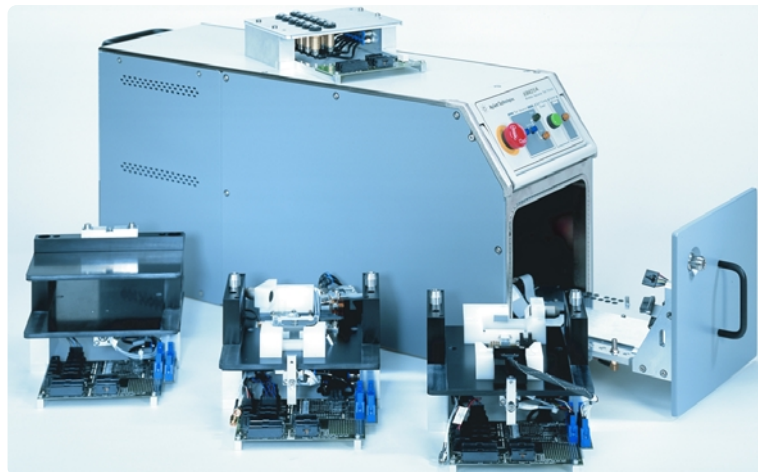
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