HEWLETT PACKARD

HP	E8285A	CDMA Mobile Station Test Set

HP E8285A CDMA Mobile Station Test Set
30 MHz to 1000 MHz and 1700 MHz to 2000 MHz

HP E8290A Point-of-Service Test Software

HP 83217A CDMA Dual-Mode Mobile Station Test Software

Increase test throughput and product quality when manufacturing mobile phones

TEST AT THE SPEED OF THE REVOLUTION.

The best value in a CDMA mobile station test set

As a mobile phone manufacturer, you operate in a highly competitive, fast-changing environment. Your test equipment needs to provide excellent value, enabling you to produce high quality phones in the least amount of time, with the confidence that yields will meet specifications—and to minimize the cost of test, keeping manufacturing expenses in line.

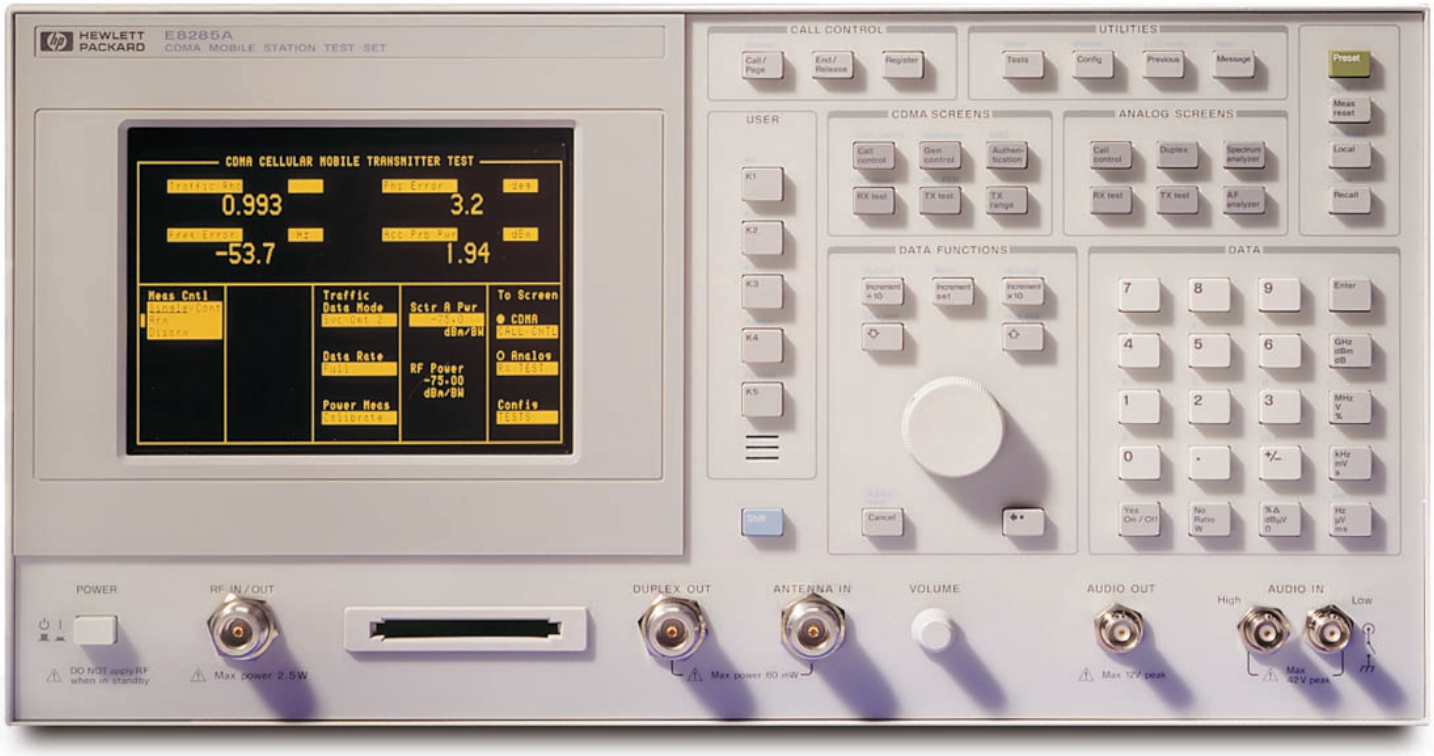
The HP E8285A CDMA mobile station test set delivers this value. Designed for fast, accurate testing of dual-mode and triple-mode CDMA mobile phones, this test set acts as a calibrated, high performance CDMA base station. It has all the features and functions you need for making parametric and functional measurements on analog, CDMA cellular, and CDMA PCS mobile phones, over the air or with special test modes.

The HP E8285A is based on the hardware of the HP 8924C mobile station test set. So you get the familiar interface and outstanding measurement capability of the industry's leading CDMA mobile phone tester—plus many new features.

- One box for analog, CDMA cellular, and PCS testing
- Higher speed performance
- Larger display
- Convenient front panel layout
- Smaller and lighter weight
- Lower cost, competitively priced
- Worldwide support
- Improved accuracy and reliability

Ideal for a wide range of uses

In a high-volume manufacturing environment, the HP E8285A is ideal for CDMA mobile phone calibration, final test, and rework. It also offers the flexibility and capabilities needed in R&D for testing mobile phone designs. And, it can help cut test times and lower costs in high-volume service and repair environments for incoming inspection and return testing.



Optimized for speed to reduce test time and increase throughput

The HP E8285A CDMA test set helps increase your throughput with measurement speeds significantly faster than the industry-standard HP 8924C. A new host microprocessor, faster GPIB operation, faster internal processor LAN communication speed, and improved DSP-based measurement algorithms optimize the test set's measurement speed.

Concurrent measurements

The HP E8285A supports multiple, independent IFs that allow it to perform simultaneous CDMA transmitter and receiver measurements to significantly reduce your test time.

Confidence-limit testing

Confidence-limit testing lets you make accurate CDMA FER measurements in the shortest possible time. You simply set the target FER specification and confidence limit, then start the test. The HP E8285A performs the statistical calculations (as defined in the TIA/EIA-98-B standard) that determine if and when the CDMA phone has passed the test. As soon as the HP E8285A determines that a phone has statistically passed or failed, testing stops automatically to minimize test time.

Handoff support

To speed testing, the HP E8285A supports hard handoffs between RF channels, so that once a CDMA call has been established, testing can continue on different RF channels without having to end the call and then re-establish the link. The HP E8285A also supports CDMA to analog handoffs from both the cellular and PCS bands.

Test-mode support

The built-in flexibility of the HP E8285A supports CDMA phones in test-mode states. This capability allows you to measure transmitter waveform quality (rho), frequency accuracy, time offset, carrier feedthrough, and power without going through normal over-the-air protocol.

The flexible source and power measurement functions of the HP E8285A are ideal for calibrating the open-loop power characteristics of CDMA phones in a test mode. The test set measures and reports the power received from the phone, using a channel power measurement of more than four readings per second. This measurement technique saves valuable time in a test that typically represents a large portion of the total test time of a CDMA phone.

Designed for the highest measurement accuracy

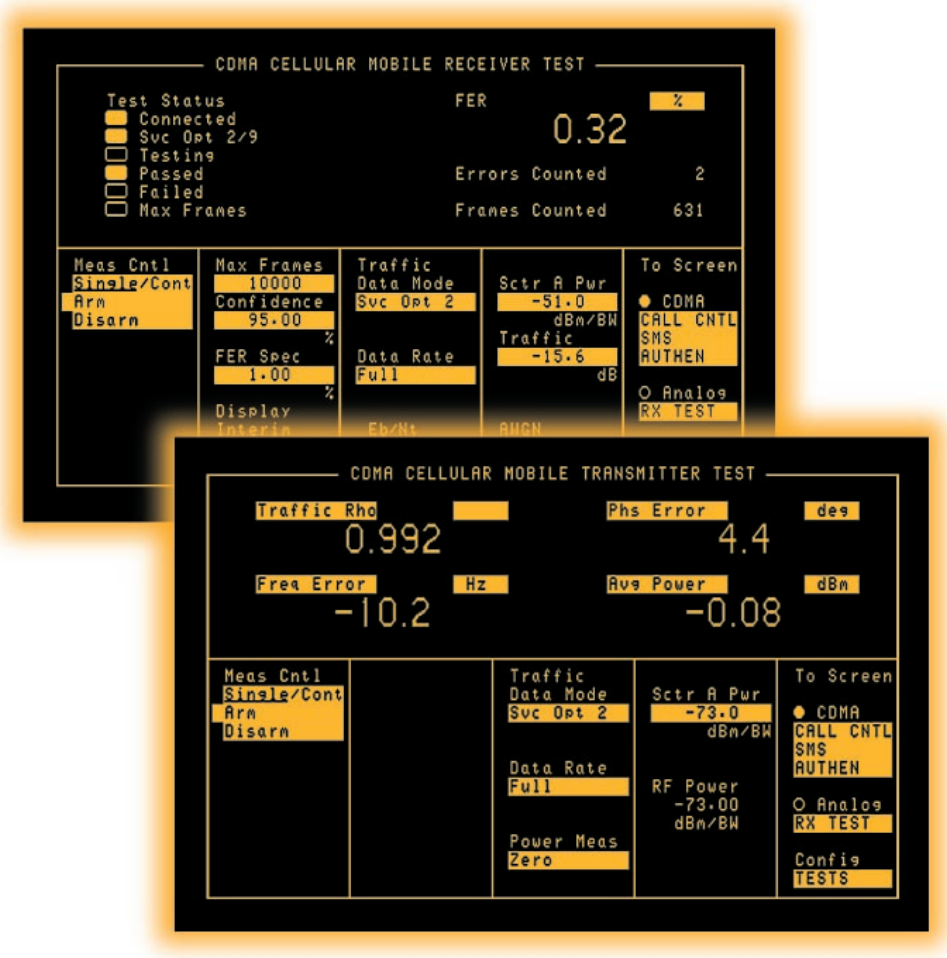
Comprehensive CDMA power measurements

The HP E8285A provides three highly accurate power level measurements. These measurements maintain their accuracy on CDMA signals with inherently high peak-to-average ratio, whether or not the signals are pulsed.

CDMA average power measures the average power in CDMA signals from –10 dBm to 34 dBm with ±7.5% accuracy. This allows you to calibrate the maximum transmit power of a CDMA phone with an accuracy of ±0.34 dB.

CDMA channel power provides a way to accurately measure the transmit power of a CDMA phone over its entire 80 dB transmit-power dynamic range, with an accuracy of ±1.2 dB.

CDMA access probe power allows you to determine the open-loop power performance of a phone, with an accuracy of ±1.2 dB, by measuring the power of a phone each time it attempts to access the test set.



Accurate base station simulation

Accurate base station simulation, determined by the relative accuracy of the CDMA code-channel power sources, is essential for verifying the operation of CDMA receivers. The HP E8285A provides realistic base station simulation with pilot, sync, and paging channels that operate in real time.

The test set's advanced design yields an outstanding ±0.2 dB relative accuracy of code-channel power sources, and traffic channel to AWGN Eb/Nt accuracy of ±0.2 dB for critical CDMA receiver tests.

CDMA receiver tests

The HP E8285A features a high-accuracy RF source with typical performance of better than ±1.0 dB accuracy to ensure accurate sensitivity measurements.

The AWGN source included in the test set provides interference that simulates the noise generated by adjacent cells in a working CDMA network, allowing you to test FER with AWGN.

The HP E8285A performs the sensitivity and FER with AWGN measurements according to the industry-standard method specified in TIA/EIA IS-126-A, and using the data loop-back modes (Service Options 002 and 009). To provide complete receiver characterization, the test set measures FER at all data rates used in the CDMA system.

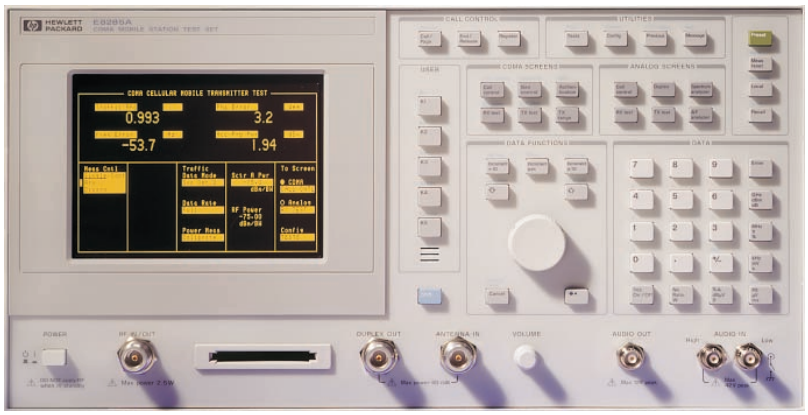
CDMA transmitter tests

The HP E8285A test set measures transmitted waveform quality by the TIA/EIA-98-B recommended correlated power method, also known as the rho (ρ) measurement. The rho measurement also reports the frequency error, amplitude error, time offset, phase error, and carrier feedthrough. Two types of rho measurements are available: traffic channel rho, performed while the mobile is on a normal traffic channel connection, and test mode rho, a nonstandard test mode that makes faster measurements and is useful in troubleshooting.

Fully equipped with essential features

High performance CDMA and analog testing

In addition to its CDMA functionality, the HP E8285A includes full AMPS, NAMPS, TACS, NTACS, and JTACS analog phone test capability. The test set also supports CDMA-to-analog handoffs from both the cellular and PCS bands. For troubleshooting in analog mode, the test set includes a built-in toolbox with a signal generator, modulation analyzer, audio analyzer, digital oscilloscope, and an optional spectrum analyzer.



Softer handoff verification

With two configurable CDMA sectors, the test set can also verify the ability of a CDMA mobile phone to support softer handoffs. Softer handoffs are similar to soft handoffs, and testing differs only in that for softer handoffs, the HP E8285A transmits identical power control bits in both CDMA cell sectors. This capability offers a low-cost way to verify softer handoffs, along with all soft handoff functionality except power control.

High-stability timebase

Without a high-stability timebase, CDMA phones may not be able to find and lock on to a test signal. The HP E8285A includes an internal 10 MHz, high-stability timebase as a standard feature—no external timebase jumper is required. The timebase has 0.1 ppm per year stability to ensure the accuracy of critical CDMA measurements. An externally supplied 1, 2, 5, or 10 MHz timebase can also be used.

Authentication and short message service support

The HP E8285A has the necessary features for testing a CDMA mobile phone's ability to perform call-processing functions with authentication for the U.S. and Korea. Once you have registered the mobile phone, the test set generates valid A-key check digits. The Unique Challenge and Shared Secret Data Update functions are fully supported. A table displays the authentication parameters sent by the mobile phone, along with the expected value and a pass/fail notification.

The HP E8285A also supports mobile-terminated short-message-service (SMS), providing fields for entering and sending messages to the mobile station over the traffic and the paging channels. Alert, priority, and privacy options can be added to the SMS message to test whether the phone responds properly.

Enhanced user interface

The user interface of the HP E8285A has been enhanced for ease of use. You now have front-panel access to SMS, authentication, and mobile reported FER screens. A larger, electro-luminescent display offers better visability, and all RF inputs and outputs now feature type-N connectors.

Simple upgrades

To reduce the time and effort it takes to upgrade an instrument, HP provides firmware upgrades for the HP E8285A on PC cards. You simply insert the upgrade card into the test set, cycle power, and follow the easy on-screen instructions. Re-calibration of the test set after a firmware upgrade is not required.

Other standard features include

- Electronic attenuator for all bands
- 14.4/9.6 traffic-channel support
- Service Options 001, 002, 003, 006, 009, 014, 32768
- One-button min/max power measurements
- IS-95, IS-95-A, TSB-74, Korean PCS, ARIB-T53, and J-STD-008 protocols
- Mobile-reported FER
- Voice echo mode for audio evaluation
- Comprehensive power control modes
- CDMA mobile phone parameter read-and-set capability
- Remote-programming screen display

Exceptional flexibility to meet your R&D and quality assurance needs

Maximum flexibility

The HP E8285A provides the flexibility needed for R&D applications. For example, a CDMA cell site configuration screen allows the HP E8285A to simulate a user-specified CDMA base-station configuration. From this screen, you can enter configuration parameters, control the behavior of the access probes during call establishment, control paging-channel parameters, and specify the analog channel parameters for CDMA-to-analog handoffs.

Two-unit synchronization for soft handoff

With two-unit synchronization, two HP E8285As can be time-aligned and synchronized. This powerful feature allows testing of some idle state handoff tests and the decision-of-power control bits tests found in TIA/EIA-95-B.

Protocol message logging

The ability to view the over-the-air protocol messages between a test set and a mobile phone yields valuable debugging information for new designs. The HP E8285A provides this information as a standard feature to aid in your development process. You simply connect a PC running a standard communications program via a serial interface to the logging ports of the test set. You can then view all of the messages sent to and received from a CDMA phone. Messages are displayed as formatted text or in raw hexadecimal data form. The logging ports can also display the traffic channel frame rates, power control data, and frame data as desired. Using the logging function, you can view many other base station parameters not accessible through the user interface.

Flexible control options

The HP E8285A is ready for remote control in automated environments since it includes GPIB as a standard feature. Serial ports and a standard parallel port provide flexibility for connecting a printer directly to the test set.

The test set also includes an internal, programmable IBASIC controller that can be used with the HP 83217A IBASIC software or your own custom software.

GPIB code written for the HP 8924C is better than 98% compatible with the HP E8285A, requiring only minor modifications.

Dual-mode mobile station test software

The HP 83217A dual-mode mobile station test software automates CDMA and analog mobile measurements to TIA/EIA-98-B and J-STD-018 standards using the HP E8285A built-in IBASIC controller. This software turns the HP E8285A into an automated test system without the need for an external PC. You can customize the test sequence, pass/fail limits, test channels and testing parameters. Customized tests can be stored on a PCMCIA RAM card. Options are available to meet your test needs for dual-mode or dual-band phones.

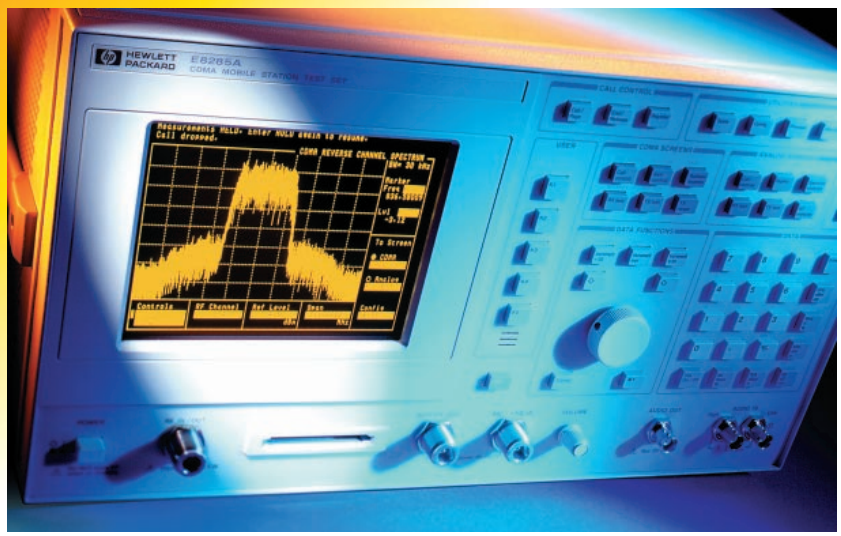
Point-of-service-test software

The HP E8285A mobile station test set can be used with the HP E8290A Point-of-Service-Test (PoST) software to automate dual-mode CDMA mobile phone testing. The easy-to-use, mouse-driven graphics displayed on the PC allow you to make fast, accurate, repeatable measurements with virtually no manual interaction with the test set. This allows sales clerks and other nontechnical personnel to perform testing at the point of sale, and thereby respond more quickly to customers' problems.

With a built-in database, you can view results for further analysis. You can also generate reports and combine data so that trends in mobile phone performance can be characterized. The software features two modes of operation: one that ensures ease-of-use for nontechnical users, and another that provides access to a rich development environment. In development mode, you can access the system's full set of capabilities to create tests for different models of CDMA phones. Test configurations, test plans, test specifications, and measurement parameters can all be set up and customized with ease.

The PoST software supports the following formats:

- IS-95-A CDMA in the AMPS band
- J-STD-008 CDMA in the U.S. PCS band
- IS-95A CDMA in the Korean PCS bands
- AMPS



CDMA training and support for the complete solution

Testing CDMA cellular and mobile phones in a manufacturing environment requires more than just the right equipment. With Hewlett-Packard, you get a partner committed to your success.

Our approach to testing emphasizes a total solution approach. We offer hardware, software, computers, consultants, training, and technical support built upon our many decades of experience and leadership in communications technology and testing.

We have applied our pioneering work in CDMA to develop a customized education program that provides practical, hands-on training for technicians. We also offer advanced topics in PCS technology and testing.

Worldwide service and support

HP provides CDMA hands-on product training that will help you get up to speed quickly using the HP E8285A. Job aids—step-by-step procedures on equipment connection and use—provide easy-to-understand quick reference guides for using HP products. The HP wireless product application support line (1-800-922-8920), and technical consultation with HP engineers offer a way to solve difficult problems by giving you direct access to our product experts. And, of course, our sales, support, and service organizations are available worldwide.

For more information about the HP E8285A CDMA mobile station test set, visit our web site at:

http://www.hp.com/wirelesstestsets

Available literature may include: brochures, technical specifications, product notes, product overviews, case studies, configuration guides, application notes, and more.

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For more information about Hewlett-Packard test and measurement products, applications, services, and a current sales office listing, visit our web site at:

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Printed in U.S.A. 6/99
5968-4605E