HP E8285A

NEW

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HP E8285A CDMA Mobile Station Test Set

The HP E8285A CDMA Mobile Station Test Set provides the key set of measurements to manufacture high quality Dual Mode CDMA cellular and PCS mobile telephones in a single box. Acting as a calibrated, high performance CDMA base station, the HP E8285A verifies not only the parametric performance of CDMA phones, but also the functional aspects of phone performance. The HP E8285A is optimized to provide fast high accuracy measurements for efficient manufacturing. The HP E8285A is based on the industry standard HP 8924C. In addition to its CDMA functionality, the HP E8285A includes full AMPS, NAMPS, TACS, NTACS and JTACS analog phone test capability. With the HP E8285A, you save cost by making both analog cellular and CDMA digital cellular/PCS measurements with one instrument.

CDMA Base Station Simulator

The HP E8285A includes a full QPSK signal generator that follows the TIA/EIA-95-A CDMA air interface specifications for base stations. The CDMA signal generator supports an AWGN (Additive White Gaussian Noise) source as well as two CDMA sectors. Sector A supports the following CDMA channels: Pilot, Sync, Paging, Traffic, and OCNS. Sector B offers Pilot, Traffic and OCNS channels. Absolute power is individually settable for the AWGN source, Sector A and Sector B in terms of total power in a 1.23 MHz bandwidth. Using industry standard ASICs, the HP E8285A supports the protocol required to emulate a CDMA base station for mobile station test.

Functional CDMA Mobile Test

The HP E8285A supports mobile or base station terminated call connect and disconnect. To check voice quality the HP E8285A offers a voice echo mode. When active the voice echo mode delays and then retransmits to the mobile phone any audio spoken into it. An operator can quickly verify voice quality by speaking into the phone and then listening to the echoed audio in the mobile handset. The HP E8285A can also send pre-vocoded audio tones of 400 Hz, 1 kHz and an audio sweep to the phone for further audio testing.

CDMA Transmitter Tests

Transmitter tests include fast DSP based average power measurements from +34 dBm to –10 dBm and accurate channel power and access probe power measurements from +30 dBm to –50 dBm. The tuned channel power measurement reports the power in a 1.23 MHz bandwidth. These two power measurement modes allow accurate verification of maximum power, minimum power, open loop power control, and closed loop power control.

The HP E8285A measures transmitted waveform quality by the TIA/EIA-98-A recommended correlated power method “p” (rho). In addition the “p” measurement reports the frequency error, phase error, amplitude error, time offset, and carrier feedthrough of the mobile phone CDMA transmitted signal.

CDMA Receiver Tests

The key performance parameter for CDMA mobile station receivers is Frame Error Rate with and without the presence of AWGN. The built-in high accuracy AWGN generator in the HP E8285A guarantees the FER tests provide the true picture of a CDMA mobile ability to correctly demodulate a signal in the presence of high interfering noise. The HP E8285A fully supports service Options 002 and 009 (RF loopback mode) to test receiver FER performance. The HP E8285A optimizes FER measurement time by employing confidence limit technology. With confidence limits, FER measurements are made in the fastest possible time.

Hand-off Verification

To speed testing, the HP E8285A supports hard hand-offs between RF channels. CDMA to analog hand-offs from both cellular and PCS bands are also supported. With two configurable CDMA sectors, the HP E8285A can verify the ability of a CDMA mobile to support softer hand-offs. Two HP E8285A test sets can be synchronized for more complete idle and soft hand-off testing.

Short Message Service Testing

The HP E8285A supports mobile terminated SMS on both paging and traffic channels. Messages can be sent in both ASCII and HEX formats to support international character sets.

CDMA and AMPS Authentication Testing

The HP E8285A includes authentication tests which support both CDMA (US and Korean) and AMPS. The HP E8285A displays expected mobile phone values and actual values returned. SSD update, A-key entry, RANDC and other authentication procedures are supported.

Analog Capabilities

In addition to powerful CDMA test capabilities, the HP E8285A retains full analog cellular test capability. Based on the HP 8924C CDMA Mobile Station Test Set, the HP E8285A is backwards compatible with most HP 8924C GPIB commands. The HP E8285A includes as standard equipment a high stability timebase, a C-message filter, and a 6 kHz bandpass filter. In addition the HP E8285A supports easy CDMA to analog handoffs from both cellular and PCS channels. It also offers one button analog cellular call processing for AMPS, NAMPS, TACS, NTACS, and JTACS phones. These analog features not only allow the HP E8285A to test dual mode CDMA phones, but also provide an effective suite of measurement tools for radio troubleshooting.

HP 83217A Dual-mode Mobile Station Test Software

Besides its many measurement functions, the HP E8285A includes a programmable IBASIC controller. The HP 83217A Option 004 automates CDMA dual-mode mobile measurements using the HP E8285A. Automated testing improves consistency and reduces operator error resulting in lower operation costs and improved product quality. This software package provides a comprehensive suite of analog and digital tests that can be easily arranged to fit specific testing requirements. Test points, test limits, and test sequences can be stored for future retrieval.

HP E8290A Point of Service Test Software

The new HP E8290A PoST (Point of Service Test) Software makes the HP 8285A an easy to use automated CDMA test solution. The HP E8290A quickly provides accurate phone performance and quality data at the point of sale. This PC-based solution is very easy to use, reduces churn, reduces NTF (No Trouble Found), and improves customer care. Test results can also be stored in databases for further analysis.

HP E8285A Analog Mode Specifications

Signal Generator

Range
100 MHz to 1000 MHz,
1700 MHz to 2000 MHz.

RF IN/OUT Connector
Level Range: –120 dBm to –18 dBm into 50 ohms
Level Accuracy:
±1.0 dB (100 MHz to 1000 MHz), typically ±0.7 dB.
±1.25 dB (1.7 to 2.0 GHz), typically ±1.0 dB.
Reverse Power: 2.5 watts

DUPLEX OUT Connector
Level Range: –120 dBm to –8 dBm into 50 ohms
Level Accuracy: ±1.0 dB

FM Deviation (rates >25 Hz):
100 kHz; 501 to 1000 MHz,
100 kHz; 1700 MHz to 2000 MHz.

Audio Source (both internal sources)
Range: dc to 25 kHz
Accuracy: 0.025% of setting
Range: 0.1 mV to 4 Vrms

RF Analyzer
RF Frequency Measurement
Measurement Range:
100 MHz to 1000 MHz,
1700 MHz to 2000 MHz.

RF Power Measurement

Accuracy: ±7.5% (–10 dBm to +30 dBm)
Measurement Range:–10 dBm to +34 dBm (0.1 mW to 2.5 W)

FM Measurement
Frequency Range
5 MHz to 1000 MHz,
1700 MHz to 2000 MHz.
Deviation Range: 20 Hz to 75 kHz

Spectrum Analyzer (Option 102)
Frequency Range
0.4 MHz to 1000 MHz,
1700 MHz to 2000 MHz
Resolution Bandwidth (coupled): 300 Hz to 300 kHz
Display Range: 80 dB

Audio Analyzer
Frequency Measurement
Measurement Range: 20 Hz to 400 kHz
Accuracy: ±0.02% plus resolution plus reference oscillator accuracy

SINAD Measurement
Fundamental Frequency Range: 300 Hz to 10 kHz ±5%
Input Level Range: 30 mV to 30 Vrms
Accuracy: ±1 dB for frequencies from 300 to 1500 Hz, measured with the 15 kHz LPF (0 to 46 dB SINAD).

Oscilloscope
Frequency Range (–3 dB BW): 2 Hz to 50 kHz
Scale/Division: 10 mV to 10 V

CDMA Signal Generator

CDMA Channels:
Additive White Gaussian Noise
Sector A with Selectable PN Offset:
Pilot Channel at Walsh Code 0
Sync Channel at Walsh Code 32
Paging Channel at Walsh Code 1
Traffic Channel with selectable Walsh Code
OCNS Channel with selectable Walsh Code
Sector B with selectable PN offset:
Pilot Channel at Walsh Code 0
Traffic Channel with Selectable Walsh Code
OCNS Channel with Selectable Walsh Code

Frequency
Frequency Range
501 MHz to 1000 MHz,
1700 MHz to 2000 MHz

Amplitude
Composite Signal Output Level Range:
RF IN/OUT
–120 dBm/1.23 MHz to –20 dBm/
1.23 MHz, useable to -15 dBm.
DUPLEX OUT
–120 dBm/1.23 MHz to –10 dBm/
1.23 MHz, useable to -10 dBm.
Composite Signal Output Level Accuracy
AWGN Off
±1.25 dB 501 MHz to 1000 MHz,
±1.35 dB 1700 MHz to 2000 MHz
Relative CDMA Channel Level Accuracy: <0.2 dB

CDMA Analyzer
CDMA Average Power Measurement
Input Frequency Range
100 MHz to 1000 MHz,
1700 MHz to 2000 MHz.
Measurement Range: –10 dBm to +34 dBm
Accuracy: –10 dBm to +30 dBm
±7.5% ±1 µW (100 MHz to 1000 MHz)
±8% ±1 µW (1.7 GHz to 2.0 GHz) Typically ±5%

CDMA Tuned Channel and Access Probe Power Measurements

Measurement Range
RF IN/OUT: –50 dBm to +30 dBm
ANT IN: –70 dBm to +15 dBm

CDMA Modulation Measurement
Measurement Input Level Range: –20 dBm to +34 dBm
Measurement Accuracy: ±0.003
Frequency Error Measurement Accuracy: ±30 Hz ± timebase accuracy

CDMA Frame Error Rate Measurement
FER Measurement Method: Data loopback per Service Option 002 or Service Option 009 supporting Confidence limits as outlined in TIA/EIA-98-B
FER Reported Parameters: Measured FER, Number of Errors, Number of Frames tested, and one of the following: Passed Confidence limit, Failed Confidence limit, or Max. Frames (test indeterminate)

General Specifications

Dimensions (H x W x D): 22.2 cm x 42.5 cm x 59.0 cm
Weight: 22 kg, 48 lbs
Operating Temperature: 0° C to +55° C
Power: 100 V to 240 V, 50/60 Hz, nominally 250 VA.
Calibration Interval: Two years

Ordering Information

E8285A CDMA PCS mobile station test set
Opt 002 Add HP E8290A PoST automated PC software
Opt 011 Add CCITT filter for TACS/ETACS
Opt 102 Add spectrum analyzer with tracking generator
Opt 0B0 Delete manual set.
Opt 0B1 Add one additional manual set.
Opt 0BW Printed service documentation, assembly-level.
Opt AX4 Rack flange kit.
Opt UK6 Commercial calibration certificate with test data.