The Agilent Technologies 8924C CDMA mobile station test set provides the key set of measurements to verify the performance of dual-mode CDMA mobile phones operating from 500 to 1000 MHz. With the Agilent Technologies 83236B PCS Interface, the 8924C additionally offers CDMA mobile testing from 1700 to 2000 MHz. Acting as a calibrated, high performance CDMA base station, the 8924C verifies not only the parametric characteristics of CDMA phones, but also the functional aspects of phone performance.

The 8924C’s full AMPS, NAMPS, EAMPS, TACS, NTACS, ETACS, and JTACS test capability saves you space, cost, and training expenses by allowing you to make both analog and CDMA digital measurements with the same instrument.

For complete call processing verification, the 8924C supports both mobile and base station initiated call connect and disconnect. Once a phone call is established, verifying the overall functionality of a CDMA mobile is simple using the 8924C’s voice echo mode. For testing a variety of protocol formats, the 8924C offers six user selectable protocol stacks: IS-95, IS-95A, TSB-74, J-STD-008, ARIB T53, and KOREAN PCS. The 8924C also supports a number of service options, including 9600 BPS and 14,400 BPS traffic channel configurations.

8924C CDMA Mobile Station Test Set
Data Sheet
High Accuracy CDMA Source for CDMA Receiver Test
Active cell site emulation in the 8924C is supplied by Sector A. The Sector A source supports the following CDMA channels: pilot, sync, paging, traffic, and orthogonal channel noise source (OCNS). In addition, the 8924C has a second sector for testing softer hand-offs. Sector B is a partial sector that has a pilot channel, a traffic channel, and an OCNS channel. An additive white Gaussian noise (AWGN) Source is also included to provide the interference generated by adjacent cells in a working CDMA network. The 8924C measures receiver frame error rate (FER) at all four data rates used in the CDMA system: full, half, quarter, and one-eighth. Confidence limit technology is used to reduce receiver test time to an absolute minimum.

CDMA Transmitter Measurements
The 8924C provides an average power measurement based on new DSP technology. A DSP based channel power measurement enables the 8924C to achieve accurate low level CDMA power measurements. Access probe power measurements are also available. The 8924C measures transmitted waveform quality by using the IS-98A/J-STD-018 recommended correlated power method, also known as the rho ($\rho$) measurement. In addition, the rho measurement reports the frequency error, modulation phase and amplitude error, and the carrier feedthrough.

Hand-off Verification
To speed testing, the 8924C supports hard handoffs between RF channels. CDMA to analog handoffs from both cellular and PCS bands are also supported. With two configurable CDMA sectors, the 8924C can verify the ability of a CDMA mobile to support softer hand-offs. Two 8924C test sets can be synchronized for complete idle and soft hand-off testing.

Authentication and Short Message Service Support
The 8924C provides the necessary features for testing a CDMA mobile station’s ability to perform call processing functions with authentication for Korea and the United States. Also, the 8924C supports mobile terminated SMS.

Automated Software
The new E8290A PoST (point of service test) software makes the 8924C an automated CDMA test solution. The 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.

The 83217A CDMA dual-mode mobile station test software can also be used to automate CDMA and analog mobile phone measurements. The 83217A solution does not require a PC. Rather, automatic tests can be completely set up using the front panel of the 8924C. Options are available to meet your test needs for CDMA, AMPS, NAMPS, JTACS, NTACS, U.S. PCS, and Korean PCS phones.

Specifications describe the instrument’s warranted performance and apply after a 30 minute warm-up. These specifications are valid over the 8924C’s entire operating environmental range unless otherwise noted. Specifications are subject to change without notice.

Supplemental Characteristics (shown in italics) are intended to provide additional information, useful in applying the instrument by giving typical expected, but non-warranted, performance.
8924C ANALOG MODE SPECIFICATIONS

Call Processing Functionality
Standards: AMPS, NAMPS, TACS, JTACS, and NTACS
Registration Support: Zone Registration
Call Control: BS call originate and disconnect, MS call originate and disconnect
Authentication: Registration, paging, origination, SSD update, and unique challenge
Orders: Power levels 0 through 7, maintenance, and alert
Hand-off Support: Hand-off to new frequency, between narrow channel and wide channel

Signal Generator
RF Frequency
Range:
Standard: 30 MHz to 1000 MHz
With the 83236B:
800 MHz to 960 MHz
1710 MHz to 1785 MHz
1805 MHz to 1910 MHz
1930 MHz to 1990 MHz
Usable from 1700 to 1999.999999 MHz
Accuracy and Stability: Same as reference oscillator ±0.015 Hz
Switching Speed: <150 ms to be within 100 Hz of carrier frequency
Resolution: 1 Hz

Output
RF In/Out Connector
Level Range:
Standard: -127 dBm to -10.5 dBm into 50 Ω
With the 83236B: -130 dBm to -10 dBm into 50 Ω
Level Accuracy:
Standard: ±1.2 dB (Level ≥-127 dBm)
Typically ±1.0 dB for all levels
With the 83236B:
±1.8 dB, at 25°C ±10°C
±2.0 dB, at 0°C to 55°C
±1.0 dB typically
Reverse Power:
Standard: 3 W
With the 83236B: 10 W
SWR:
Standard: <1.5:1
With the 83236B: <1.2:1

Duplex Out/RF Out Only Connector
Level Range:
Standard: -127 dBm to +3.5 dBm into 50 Ω
With the 83236B: -130 dBm to -10 dBm into 50 Ω
Level Accuracy:
Standard: ±1.0 dB
With the 83236B:
±1.8 dB, at 25 °C ±10 °C
±2.0 dB, at 0 °C to 55 °C
±1.0 dB typically
Reverse Power: 200 mW maximum
SWR:
Standard: <2.0:1 (level <-7.5 dBm)
With the 83236B: <1.6:1
Resolution: 0.1 dB (setable in 0.01 dB increments)

Spectral Purity
All specifications are for ≤-2.5 dBm output level at Duplex Out or ≤-16.5 dBm output level at RF In/Out
Harmonics: <-30 dBc
Non-Harmonic Spurious: <-60 dBc (at >5 kHz offset from carrier)
Residual FM (CCITT, rms):
Standard:
<7 Hz for 500 MHz ≤f_c≤1000 MHz
<4 Hz for 250 MHz ≤f_c≤500 MHz
<7 Hz for 30 MHz ≤f_c <250 MHz
With the 83236B:
<7 Hz for 810 MHz ≤f_c≤960 MHz
<10 Hz for 1710 MHz ≤f_c≤1990 MHz
SSB Phase Noise:
Standard: <-116 dBc/Hz (for >20 kHz offsets at a 1000 MHz carrier frequency)
With the 83236B: <-100 dBc/Hz at >20 kHz offsets

FM
Maximum FM Deviation (rates >25 Hz):
Standard:
100 kHz; 30 to <249 MHz
50 kHz; 249 to <501 MHz
100 kHz; 501 to 1000 MHz
With the 83236B:
100 kHz; 800 MHz to 960 MHz, 1710 MHz to 1785 MHz, 1805 MHz to 1910 MHz, 1930 MHz to 1990 MHz
FM Rate (1 kHz reference):
Internal: DC to 25 kHz (1 dB BW)
External:
AC Coupled: 20 Hz to 75 kHz (typical -3 dB BW)
DC Coupled: DC to 75 kHz (typical -3 dB BW)
FM Accuracy (1 kHz rate):
≤10 kHz deviation: ±3.5% of setting ±50 Hz
>10 kHz deviation ±3.5% of setting ±50 Hz
FM Distortion (THD+Noise, 0.3 to 3 kHz BW):
<0.5 % at >4 kHz deviation and 1 kHz rate
Center Frequency Accuracy in DC FM Mode (external
timebase accuracy<1 kΩ): ±500 Hz (after DCFM
zero), typically ±50 Hz
External Modulation Input Impedance: 600 Ω nominal
Resolution:
50 Hz for <10 kHz deviation
500 Hz for ≥10 kHz deviation
Audio Source (both internal sources)
Frequency
Range: 0.1 mV to 4 Vrms
Maximum Output Current: 20 mA peak
Output Impedance: <2.5 Ω (at 1 kHz)
Accuracy: ±2% of setting plus resolution
Residual Distortion (THD + Noise, level ≥200 mVrms):
<0.125 %; 20 Hz to 25 kHz in an 80 kHz BW
Resolution:
Level ≤0.01V: ±50 µV
Level ≤0.1V: ±0.5 mV
Level ≤1V: ±5 mV
Level <10V: ±50 mV
Offset in DC Coupled Mode: <50 mV
RF Analyzer
RF Frequency Measurement
Measurement Range:
Standard: 30 MHz to 1000 MHz
With the 83236B:
800 MHz to 960 MHz
1710 MHz to 1785 MHz
1805 MHz to 1910 MHz
1930 MHz to 1990 MHz
Usable from 1700 to 1999.999999 MHz
Level Range:
Standard:
RF In/Out: -10 dBm to +35 dBm (0.1 mW to 3 W)
ANT In: -36 dBm to +20 dBm
With the 83236B:
RF In/Out: -10 dBm to +40 dBm (0.1 mW to 10 W)
Accuracy: ±1 Hz plus timebase accuracy
Minimum Resolution: 1 Hz
RF Power Measurement
Note: To achieve the specified accuracy when
measuring power at the RF In/Out port, the
internal signal generator level must be 40 dB below
the measured power or less than -20 dBm at the
Duplex output port.
Frequency Range:
Standard: 30 MHz to 1000 MHz
With the 83236B:
800 MHz to 960 MHz
1710 MHz to 1785 MHz
1805 MHz to 1910 MHz
1930 MHz to 1990 MHz
Input Connector: RF In/Out connector only
Measurement Range:
Standard: -10 dBm to +35 dBm (0.1 mW to 3 W)
With the 83236B: -13 dBm to +40 dBm (50 µW to 10 W)
Accuracy (after power meter zero):
Standard:
±5% of reading ±1 µW from 15° C to 35° C
±10% of reading ±1 µW from 0° C to 55° C
With the 83236B:
±5% of reading ±2.5 µW at 23° C ±10° C
±10% of reading ±2.5 µW
SWR:
Standard: <1.5:1
With the 83236B: <1.2:1
Resolution:
Standard:
Power <10W: 1 mW
Power <100 mW: 0.1 mW
Power <10 mW: 0.01 mW
With the 83236B: 0.01 dB or 10 µW
FM Measurement
Frequency Range:
Standard: 30 MHz to 1000 MHz
With the 83236B:
800 MHz to 960 MHz
1710 MHz to 1785 MHz
1805 MHz to 1910 MHz
1930 MHz to 1990 MHz
Deviation Range: 20 Hz to 75 kHz
Sensitivity: 2 µV (15 kHz IF BW, High Sensitivity
Mode, 0.3 to 3 kHz BW), Typically <1 µV (12 dB
SINAD, f ≥30 MHz)
1. Possible degradation in the 1700 to 1999 MHz bandwidth.
Accuracy (20 Hz to 25 kHz rates, deviation ≤25 kHz): ±4 % of reading plus residual FM and noise contribution

Bandwidth (3 dB): 2 Hz to 70 kHz (DFCM measurements also available)

THD+Noise: <1% for ≥5 kHz Deviation and 1 kHz rate in a 0.3 to 3 kHz BW

Input Level Range for Specified Accuracy:
Standard:
-28 to +35 dBm at RF In/Out (1.6 µW to 3 W)
-50 to +14 dBm at Ant In

With the 83236B: -36 dBm to +40 dBm

Residual FM and Noise (0.3 to 3 kHz, rms):
Standard: <7 Hz
With the 83236B: <10 Hz

Resolution:
Deviation <10 kHz: 1 Hz
Deviation ≥10 kHz: 10 Hz

Spectrum Analyzer
Frequency Range: (Center frequency coupled to RF Analyzer setting)
Standard: 30 MHz to 1000 MHz

With the 83236B:
800 MHz to 960 MHz
1710 MHz to 1785 MHz
1805 MHz to 1910 MHz
1930 MHz to 1990 MHz

Frequency Span/Resolution Bandwidth (coupled)
Standard:
Span | Bandwidth
---|---
<50 kHz | 300 Hz
<200 kHz | 1 kHz
<1.5 MHz | 3 kHz
<18 MHz | 30 kHz
≥18 MHz | 300 kHz

Plus full span capability

With the 83236B:
Span | Bandwidth
---|---
<50 kHz | 300 Hz
<200 kHz | 1 kHz
<1.5 MHz | 3 kHz

Display: Log with 10 dB/division, 2 dB/division, or 1 dB/division
Display Range: 80 dB
Reference Level Range: +50 to -50 dBm

Residual Responses: < -70 dBm (no input signal, 0 dB attenuation)

Image Rejection: > 50 dB

Non-harmonic Spurious Responses: > 70 dB (for input signals ≤ -30 dBm)

Level Accuracy: ±2.5 dB

Log Scale Linearity: ±2 dB (for input levels ≤ -30 dBm and/or 60 dB range)

Displayed Average Noise Level: ≤-114 dBm (≤50 kHz spans)

Other Features: Peak hold, marker with frequency and level readout, marker to peak, marker to next peak, trace comparison A-B.

Tracking Generator
(Not available when used with the 83236B)
Frequency Range: 30 MHz to 1000 MHz

Frequency Offset: Frequency span endpoints ± frequency offset cannot be <30 MHz or >1000 MHz

Output Level Range: Same as signal generator

Sweep Modes: Normal and Inverted

Adjacent Channel Power
Relative Measurements
Level Range:
RF In/Out: -10 dBm to +35 dBm
ANT In: -40 dBm to +20 dBm

Dynamic Range: Typical values for channel offsets
Offset | Residual BW | Dynamic Range
---|---|---
12.5 kHz | 8.5 kHz | -65 dBc
20 kHz | 4 kHz | -68 dBc
25 kHz | 16 kHz | -68 dBc
30 kHz | 16 kHz | -68 dBc
60 kHz | 30 kHz | -65 dBc

Relative Accuracy: ±2.0 dB

Absolute Measurements
Level: Results of absolute power in watts or dBm are determined by adding the ACP ratio from the Spectrum Analyzer to the carrier power measurement obtained from the input section RF power detector.

Level Range:
RF In/Out: -10 dBm to +35 dBm
Antenna In: Not available

Dynamic Range: Typical values for channel offsets
Offset | Residual BW | Dynamic Range
---|---|---
12.5 kHz | 8.5 kHz | -65 dBc
20 kHz | 14 kHz | -68 dBc
25 kHz | 16 kHz | -68 dBc
30 kHz | 16 kHz | -68 dBc
60 kHz | 30 kHz | -65 dBc

Absolute Accuracy: Is the sum of the RF Power Measurement Accuracy found in the RF Analyzer section and the ACP Relative Accuracy of ±2.0 dB.

1. Possible degradation in the 1700 to 1999 MHz bandwidth.
Audio Analyzer
Frequency Measurement
Measurement Range: 20 Hz to 400 kHz
Accuracy: ±0.02% plus resolution plus reference oscillator accuracy
External Input: 20 mV to 30 Vrms
Resolution:
$ f < 10 \text{kHz}: 0.01 \text{Hz} $
$ f < 100 \text{kHz}: 0.1 \text{Hz} $
$ f \geq 100 \text{kHz}: 1 \text{Hz} $

AC Voltage Measurement
Measurement Range: 0 to 30 Vrms
Accuracy (20 Hz to 15 kHz, \geq 1 mV): ±3% of reading
Residual THD+Noise (15 kHz BW):
With a load (\leq 600 \Omega) connected to “Audio In Hi”: 150 µV
Without load: 480 µV
3 dB Bandwidth: Typically 2 Hz to 100 kHz
Nominal Input Impedance: Switchable between 1 M\Omega in parallel with 95 pF or 600 \Omega floating.
Resolution:
4 digits for inputs \geq 100 mV
3 digits for inputs <100 mV

DC Voltage Measurement
Voltage Range: 100 mV to 42 V
Accuracy: ±1.0 % of reading plus DC Offset
DC Offset: ±45 mV
Resolution: 1 mV

Distortion Measurement
Fundamental Frequency Range: 300 Hz to 10 kHz ±5%
Input Level Range: 30 mV to 30 Vrms
Display Range: 0.1% to 100%
Accuracy: ±1 dB for frequencies from 300 to 1500 Hz, measured with the 15 kHz LPF (0.5 to 100% distortion).
±1.5 dB for frequencies from 300 Hz to 10 kHz, measured with the >99 kHz LPF (1.5 to 100% distortion).
Residual THD + Noise: -60 dB or 150 µV, whichever is greater for frequencies from 300 Hz to 1500 Hz measured with the 15 kHz LPF.
-57 dB or 450 µV, whichever is greater for frequencies from 300 Hz to 10 kHz measured with the >99 kHz LPF.
Resolution: 0.1% distortion

SINAD Measurement
Fundamental Frequency Range: 300 Hz to 10 kHz ±5%
Input Level Range: 30 mV to 30 Vrms
Display Range: 0 to 60 dB
Accuracy: ±1 dB for frequencies from 300 to 1500 Hz, measured with the 15 kHz LPF (0 to 46 dB SINAD).
±1.5 dB for frequencies from 300 Hz to 10 kHz, measured with the >99 kHz LPF (0 to 36 dB SINAD).
Residual THD + Noise: -60 dB or 150 µV, whichever is greater for frequencies from 300 Hz to 1500 Hz measured with the 15 kHz LPF.
-57 dB or 450 µV, whichever is greater for frequencies from 300 Hz to 10 kHz measured with the >99 kHz LPF.
Resolution: 0.01 dB

Audio Filters
High Pass Filters: <20 Hz, 50 Hz, and 300 Hz
Low Pass Filters: 300 Hz, 3 kHz, 15 kHz, >99 kHz
Other Filters: C-Message Weighting Filter, and 6 kHz Bandpass Filter
Optional Filters: Option 011, CCITT Weighting Filter replaces the C-Message filter (for TACS phones)
Compander: None

Variable Frequency Notch Filter
Frequency Tuning Range: 300 Hz to 10 kHz
Notch Depth: >60 dB
Notch Width: Typically ±5% of the notch center frequency
Audio Detectors: RMS, Pk+, Pk-, Pk+hold, Pk-hold, Pk+/2, Pk-/2 hold, Pk+max, Pk±max hold, rms *\sqrt{2}
Oscilloscope
Frequency Range (-3 dB BW): 2 Hz to 50 kHz
Scale/Division: 10 mV to 10 V
Amplitude Accuracy (20 Hz to 10 kHz): ±1.5% of reading ±0.1 division
Time/Division: 10 µs to 100 ms
Trigger Delay: 20 µs to 3.2 seconds
3 dB Bandwidth: Typically >100 kHz
Internal DC Offset: <=0.1 division (≥50 µV/division sensitivity)

Signaling
Function Generator Waveforms: Sine, square, triangle, ramp, dc, White Gaussian and White Uniform noise.
Function Generator Frequency Range and Level: Same as audio source
DC Current Meter
Measurement Range: 0 to 10A (Usable to 20A)
Accuracy: The greater of ±10% of reading after zeroing or 30 mA (levels >100 mA)

8924C CDMA MODE SPECIFICATIONS
Call Processing Functionality
User Settable Parameters
Protocol Stack: J-STD-008, KOR PCS, ARIB T-53, IS-95, IS-95A, TSB-74
Channel Standards: MS AMPS, US PCS, Korean PCS 0, Korean PCS 1, Japan CDMA, MS NAMPS Upper/Middle/ Lower, MS TACS, MS ETACS, MS NTACS, MS JTACS, and User Defined (PCS bands require the 83236B PCS Interface).
Access Probe Parameters: NOM_PWR, NOM_PWR_EXT, INIT_PWR, PWR_STEP, PAM_SZ, NUM_STEP, MAX_REQ_SEQ, and MAX_RSP_SEQ.
Paging Channel Parameters: Paging Data Rate (full or half rate), NUM_PAGES.
Threshold Parameters: T_ADD, T_DROP, T_COMP, and T_TDROP.
Service Option Support:
Service Option 001 (Normal Voice)
Service Option 002 (9600 bps Data Loopback)
Service Option 003 (EVRC 9600 bps Voice)
Service Option 006 SMS for Rate Set 1 (9600 bps)
Service Option 014 SMS for Rate Set 2 (14,400 bps)
Service Option 009 (14.4 kbps Data Loopback)
Service Option 32768 (14.4 kbps Voice)
Call Control: BS call originate, BS call disconnect, MS call originate, MS call disconnect.
Hand-off Support:
CDMA to CDMA Hard (RF Frequency)
CDMA Softer (between two sectors)
CDMA Soft (requires two units)
CDMA to Analog (intra band)
CDMA PCS to Analog cellular
CDMA to Analog Hand-off: Execute, System Type, Channel, SAT, and Power Level.
Authentication: Registration, paging, origination, SSD update, data burst, and unique challenge.
Short Message Service: Mobile terminated on paging or traffic channel
Call Status Indicators: Transmitting (cell active), Registering, Page Sent, Access Probe Received, Connected, Softer Hand-off, Hard Hand-off, Service Option 002/009.
SMS In Progress, MS Acknowledge Received. All indicators are also available over GPIB.
Speech Encoding: None (No vocoder)
Speech Echo Mode: Three user selectable fixed delays: 0 seconds, 2 seconds, and 5 seconds.
CDMA Data Source: Pseudorandom data (CCITT 2^n–1 pattern)
Voice Echo
1 kHz Tone
400 Hz Tone
Audio Chirp (3 second sweep from 5 Hz to 3.75 kHz)
Closed Loop Power Control:
Supports True Closed Loop Power Control
Open Loop (Alternating 0 and 1 power control bits)
Always Up
Always Down
Off (no puncturing, requires special mode in mobile)
Closed Loop Change Modes:
Step n Up (up to 150 bits)
Step n Down (up to 150 bits)
Ramp of n Up followed by n Down power (max. 150)
Open Loop Power Control: Supported through varying the level of CDMA Generator. CDMA analyzer auto-ranges to the ideal RF power level for the nominally expected open loop response.
Ideal Mobile Power Display: Reports the ideal open loop power for the mobile’s transmitter based upon the forward link power set on the 8924C, the current protocol mode, and the set values of NOM_PWR, NOM_PWR_EXT (J-STD-008 mode only), and INIT_PWR.

Mobile Station FER Reporting: User selectable number of frames (from predefined list). Report by number of frames or by user defined number of errors.

Adjacent Cell Mobile Reporting: Displays status, PN offset, strength, and keep bit for all pilots found by the CDMA mobile and reported via pilot strength messages. Also displays the current user set PN offsets and strengths of Sector A and Sector B to aid in verifying mobile performance.

Neighbor List Support: Automatically generates a list of seven neighbors based on the user entry of Sector A PN offset, Sector B PN offset, and Pilot Increment.

Mobile Station Identification: 10-digit phone number (IS-95 mode only), MIN (IS-95 mode only with hex entry), IMSI (MCC + MNC + MSIN), or AUTO (uses power-on or user initiated registration to obtain the mobile ID).

Registration: Supports mobile power-on registration, timer-based registration (registration period parameter settable from 29 to 85, 12.18 to 199515 seconds), implicit, or user-initiated registration (modulates SID to force the mobile to perform a zone based registration) via GPIB command or front panel button.

IMSI Support: Class 0 only in TSB-74 and J-STD-008 protocols:

- **IMSI Mode**: Class 0, Type 3 only
- **Auto Mode**: The phone’s registration subclass is used by the instrument to page the phone.

Mobile Database: Upon registration, the database contains the following information:

- **IS-95 Mode**: ESN, MIN1, MIN2, Phone Number, Dual-Mode, Slot Class, Slot Index, Protocol Revision, Power Class, Transmit Mode, and Called Number.
- **IS-95A, TSB74 and ARIB T-53 Modes**: ESN, MCC, MNC, MSIN, Dual-mode, Slot Class, Slot Index, Protocol Revision, Power Class, Transmit Mode, and Called Number.
- **J-STD-008 and Korean PCS Modes**: ESN, MCC, MNC, MSIN, Slot Class, Slot Index, Protocol Revision, Band Class, EIRP Class, Operation Modes, and Called Number.

Retrievable Mobile Parameters:

- **IS-95/IS-95A Modes**: MUX1_REV_(1 to 8, 11 to 14), MUX1_FOR_(1 to 14), PAG_(1 to 7), ACC_(1 to 8), and LAYER2_RTC(1 to 5).

- **TSB-74/J-STD-008 Modes**: In addition to the above parameters, these parameters are available: MUX2_REV_(1 to 25), and MUX2_FOR_(1 to 26).

Protocol Logging: Two rear panel serial ports allow logging of paging/access channel messages and forward/reverse traffic channel messages. Requires an external PC running terminal emulation software connected to the rear panel serial ports.

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**:
  - **Standard**: 501 MHz to 1000 MHz
  - **Usable from 30 MHz to 248.9 MHz**
  - **With the 83236B**:
    - 800 MHz to 960 MHz
    - 1710 MHz to 1785 MHz
    - 1805 MHz to 1910 MHz
    - 1930 MHz to 1990 MHz
    - **Usable from 1700 to 1999.999999 MHz**

- **Frequency Resolution**: 1 Hz

- **Frequency Accuracy**: Same as reference oscillator accuracy ±0.015 Hz

Amplitude

- **Composite Signal Output Level Range**:
  - **Standard**:
    - **RF In/Out**: -109 dBm/1.23 MHz to -21.5 dBm/1.23 MHz
  - **Duplex Out**: -109 dBm/1.23 MHz to -7.5 dBm/1.23 MHz
  - **With the 83236B**:
    - **RF In/Out**: -109 dBm/1.23 MHz to -20.01 dBm/1.23 MHz (-23 dBm/1.23 MHz max. if AWGN only)
    - **RF Out Only**: -109 dBm/1.23 MHz to -10.01 dBm/1.23 MHz (-13 dBm/1.23 MHz max. if AWGN only)
Composite Signal Output Level Accuracy:
(Using the IS-98A sensitivity setup)

Standard:
- **AWGN Off:** ±1.5 dB
- ±1.0 dB typically
- **AWGN On:** ±2.0 dB

With the 83236B:
- **AWGN Off:** ±2.1 dB, at 25 °C ±10 °C
- ±2.3 dB, at 0 °C to 55 °C
- ±1.3 dB typically
- **AWGN On:**
  - ±2.6 dB, at 25 °C ±10 °C
  - ±2.8 dB, at 0 °C to 55 °C

Attenuator Hold:
Standard: -15 dB from attenuator setting when hold is enabled.

With the 83236B: Up to -60 dB from attenuator setting when hold is enabled depending upon the initial setting level. Holds mechanical attenuator in the 83236B and uses the electronic attenuator in the 8924C to provide low-transient amplitude transitions.

Composite Signal Output Power: Equal to the sum of the individually settable power levels for AWGN, Sector A, and Sector B.

Maximum Individual Signal Dynamic Range: The maximum dynamic range of any CDMA channel (AWGN, Sector A: Pilot, Sync, Paging, Traffic, or OCNS, Sector B: Pilot, Traffic, or OCNS) is from 0 dB to -30 dB relative to the total composite output power. Paging and Traffic channels may have more or less dynamic range depending on the data rate in use.

**AWGN Bandwidth:** Typically >1.8 MHz bandwidth. Because the reported total composite power and AWGN power is in terms of dBm in a 1.23 MHz bandwidth, the actual broadband output power as seen by a power meter on the front panel will be higher than reported on the front panel.

Sector A OCNS Channel Relative Level Range:
Automatically calculated from other Sector A channel relative levels to provide the set Sector A power.

Sector B OCNS Channel Relative Level Range:
Automatically calculated from other Sector B channel relative levels to provide the set Sector B power.

Individual Channel Amplitude Resolution: 0.01 dB

Relative CDMA Channel Level Accuracy:
- **AWGN to Traffic Channel:** <0.2 dB, ±5 °C from the last temperature at which PCB_CAL was run for values of E_b/N_t from 1 dB to 10 dB.
- Between any Two CDMA Channels: <0.2, dB ±5 °C from the last temperature at which PCB_CAL was run.

**CDMA Modulation**

**Modulation Type:** QPSK per TIA IS-95A/J-STD-008
- **Residual p:** Better than 0.97, typically >0.98

**Carrier Feedthrough:** Better than -30 dBc, typically better than -30 dBc

**Adjacent Channel Spectral Purity:** <-45 dBc at ±895 kHz offset from carrier frequency relative to the total carrier power in a 1.23 MHz bandwidth.

**Rate Set Support:** Rate set 1 (9600 bps traffic -8 kbps voice)
- Rate set 2 (14.4 kbps traffic -13 kbps voice)

**Data Rate Transmission Modes:** IS-95A/J-STD-008 defined base station modes including full rate, half rate, quarter rate, one-eighth rate data transmission, and variable rate with equally weighted, randomly spaced occurrences of each rate.

**Data Generator Patterns:**
- Pseudorandom data (CCITT 2^15-1 pattern)
- 1 kHz tone
- 400 Hz tone
- Audio Chirp (3 second sweep from 10 Hz to 3.75)
- Tones and chirp conform to IS-96A (Service Option 1), IS-127 (Service Option 3), and CDG-27 (Service Option 32768) vocoder standards

**CDMA Analyzer**

**CDMA Average Power Measurement**

**Note:** To achieve the specified accuracy when measuring power at the RF In/Out port of the 8924C or the 83236B, the internal signal generator level must be 40dB below the measured power or less than -20 dBm at the 8924C’s Duplex Output port or the 83236B’s RF Out Only port.

**Input Frequency Range:**
- **Standard:** 30 MHz to 1000 MHz
- **With the 83236B:**
  - 800 MHz to 960 MHz
  - 1710 MHz to 1785 MHz
  - 1805 MHz to 1910 MHz
  - 1930 MHz to 1990 MHz
  - Usable from 1700 to 1999.999999 MHz

**Input Connector:**
- Standard: RF In/Out connector on the 8924C
- With the 83236B: RF In/Out connector on the 83236B

**Measurement Bandwidth:** Provides an accurate measure of the total power for all present signals within ±2 MHz of the specified operating frequency. If other signals are present outside of this frequency range, reduced measurement accuracy will result.
Maximum Input Level:
- **Standard:** +35 dBm (3 W continuous)
- **With the 83236B:** +37 dBm (5 W continuous)

Measurement Range:
- **Standard:** -10 dBm to +35 dBm.
  - Usable to -20 dBm with degraded accuracy
- **With the 83236B:** -13 dBm to +37 dBm

Measurement Method: Reports the overall average power for all active power control groups captured

Measurement Period: Measures over ½ of a CDMA frame (eight power control groups) in full, half, quarter, or one-eighth rate modes

Measurement Update Rate: Typically 1.5 readings per second

Measurement Accuracy (after power meter zero):
- **Standard:**
  - ±5% ±1 µW at 25 °C ±10 °C
  - ±10% ±1 µW from 0 °C to +55 °C
- **With the 83236B:**
  - ±5% ±2.5 µW at 23 °C ±10 °C
  - ±10% ±2.5 µW from 0 °C to +55 °C

CDMA Tuned Channel Power and Access Probe Power Measurements

Input Frequency Range:
- **Standard:** 30 MHz to 1000 MHz
- **With the 83236B:**
  - 800 MHz to 960 MHz
  - 1710 MHz to 1785 MHz
  - 1805 MHz to 1910 MHz
  - 1930 MHz to 1990 MHz
  - Usable from 1700 to 1999.999999 MHz

Input Connector:
- **Standard:** RF In/Out connector on the 8924C
- **With the 83236B:** RF In/Out connector on the 83236B

Measurement Bandwidth: Measures the total power in a 1.23 MHz bandwidth centered on the active reverse channel center frequency.

Maximum Input Level:
- **Standard:** +35 dBm (3 W continuous)
- **With the 83236B:** +37 dBm (5 W continuous)

Measurement Range:
- **Standard:** -50 dBm to +30 dBm, usable to -60 dBm

Measurement Accuracy:
- **Relative Mode** (Uncalibrated against average power):
  - 0 to -10 dB relative level: ±0.1 dB
  - -10 to -20 dB relative level: ±0.2 dB
  - -20 to -40 dB relative level: ±0.5 dB
- **Calibrated Mode** (Calibrated against average power):
  - **Standard:** ±1.0 dB at ±10 °C from the calibration temperature
  - **With the 83236B Cellular bands** (source level <-35 dBm/1.23 MHz):
    - ±1.0 dB at ±10 °C from the calibration temperature
  - **With the 83236B PCS bands** (source level <-35 dBm/1.23 MHz):
    - ±1.6 dB at ±10 °C from the calibration temperature

Temperature Drift: Typically 0.1 dB per 10 °C temperature change

Measurement Period: Measures power in a 1.23 MHz bandwidth over ½ of a CDMA frame (eight power control groups) in full, half, quarter, or one-eighth rate modes.

Calibrate: Calibrates the channel power measurement over the entire operating frequency range of the currently selected RF Channel Standard. This calibration requires the user to connect the Duplex Out Port to the RF In/Out port (or to connect the RF Out Only Port to the RF In/Out Port when using the 83236B) before initiating the calibration.

Alternate Channel Standard: Allows the selection of a second channel standard to be calibrated when the channel power calibration is performed. Also allows calibrating the entire cell band, PCS band, or all bands at one time. This allows switching between to standards without having to recalibrate after each RF Channel Standard change.

Uncalibrated Flag: Displays "Uncal" under the Channel Power measurement whenever the unit detects that the channel power calibration has not been run for the currently set RF Channel Standard.

Access Probe Power Measurement Triggering: Measurement automatically triggers above -55 dBm

CDMA Modulation Measurement

Input Frequency Range:
- **Standard:** 30 MHz to 1000 MHz
- **With the 83236B:**
  - 800 MHz to 960 MHz
  - 1710 MHz to 1785 MHz
  - 1805 MHz to 1910 MHz
  - 1930 MHz to 1990 MHz
  - Usable from 1700 to 1999.999999 MHz
Modulation Measurement Format: OQPSK per TIA IS-95A/J-STD-008

\( \rho \) Measurement Input Level Range:
- **Standard**: -20 dBm to +35 dBm
  - Usable to -25 dBm with degraded accuracy
- **With the 83236B**: -25 dBm to +37 dBm
  - Usable to -28 dBm with degraded accuracy

Range of \( \rho \) Measurement for Specified Accuracy: 0.45 to 1.00

\( \rho \) Measurement Interval:
- **Traffic Channel**: \( \rho \) = 1.042 msec (5 Walsh symbols)
- **Test Mode**: \( \rho \) = 1.25 msec (6 Walsh symbols)

**Measurement Update Rate**: Typically 1.5 readings per second

\( \rho \) Measurement Accuracy: \( \rho \pm 0.003 \)

Frequency Error Measurement Range: \( \pm 1 \) kHz

Frequency Error Measurement Accuracy: \( \pm 30 \) Hz

Other Reported Parameters with \( \rho \) Measurement:
- Transmit time error (\( \tau \), time offset), frequency error, carrier feedthrough, amplitude error, and phase error

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.

**Supported Data Rates for FER Measurement**: Full, half, quarter, or one-eighth rate

**Confidence Limit Range**: User definable from 80.0% to 99.9% and Off

**Confidence Limit Statistical Model**: Meets TIA/EIA-98-B statistical model parameters

**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).

**Conditions for Terminating FER Test (with confidence limits on)**:
- **Max Frames**: Maximum number of frames to test completed, indicative of an indeterminate test result.
- **Failed**: Measured FER failed the specified FER limit with specified confidence.
- **Passed**: Measured FER passed the specified FER limit with specified confidence.

**FER Measurement Indicators**: Testing, passed, failed, and max. frames. All indicators are available over GPIB.

One Button Min/Max Power Measurement

**Measurement Method**: Automatically sets the 8924C to the nominal TIA/EIA-98-B test conditions for the minimum power measurement and then maximum power measurement. Restores the 8924C to the instrument state active before the measurement in initiated.

**Measurement Output**: Maximum TX power and minimum TX power measured

**Measurement Rate**: Approximately 7 seconds per measurement

CDMA Reverse Channel Spectrum Display

**Frequency Range**: Fixed to the active CDMA reverse channel setting. Not independently adjustable.

**Frequency Span/Resolution Bandwidth (coupled, maximum span of 5 MHz)**:

<table>
<thead>
<tr>
<th>Span</th>
<th>Bandwidth</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;50 kHz</td>
<td>300 Hz</td>
</tr>
<tr>
<td>&lt;200 kHz</td>
<td>1 kHz</td>
</tr>
<tr>
<td>&lt;1.5 MHz</td>
<td>3 kHz</td>
</tr>
<tr>
<td>5 MHz</td>
<td>30 kHz</td>
</tr>
</tbody>
</table>

**Display**: Log with 10 dB/division

**Display Range**: 80 dB

**Reference Level Range**: +50 to -50 dBm

**Residual Responses**: <70 dBm (no input signal, 0 dB attenuation)

**Image Rejection**: >50 dB

**Non-harmonic Spurious Responses**: >70 dB (for input signals \( \leq -30 \) dBm)

**Level Accuracy**: \( \pm 2.5 \) dB

**Log Scale Linearity**: \( \pm 2 \) dB (for input levels \( \leq -30 \) dBm and/or 60 dB range)

**Displayed Average Noise Level**: <114 dBm (\( \leq 50 \) kHz spans)

**Other Features**: Peak hold, marker with frequency and level readout, marker to peak, marker to next peak, trace comparison A-B.

CDMA Triggers

**Output Trigger Signals**: Open loop power trigger on AUX CONTROL connector (line toggles whenever the output level of the 8924C’s CDMA source is changed)
8924C CDMA COMMON SPECIFICATIONS

Remote Programming
GPIB: Agilent Technologies implementation of IEEE Standard 488.2
Remote Front Panel Lockout: Allows remote user to disable the front panel display to improve GPIB measurement speed.
Functions Implemented: SH1, AH1, T6, L4, SR1, RL1, LE0, TE0, PP0, DC1, DT1, C4, C11, E2.
RS-232: 3-wire RJ-11 connector used for serial data in and out (no hardware handshake capability; two RS-232 ports available in standard mode, one RS-232 port available with the 83236B).
Baud Rates: 300, 600, 1200, 2400, 4800, 9600, and 19200 selectable
Centronics Port: Industry standard parallel printer port for hardcopies of test results or screen dumps.

Timebase Subsystem
(For proper operation, this reference must be locked to either the 8924C’s high stability 10 MHz timebase output on the rear panel or to an external, high quality reference.)
Locking Range: ±10 ppm
Input: Rear panel coaxial BNC
Accepted Input Frequencies: 19.6608 MHz, 15 MHz, 10 MHz, 9.8304 MHz, 5 MHz, 4.9152 MHz, 2.4576 MHz, 2 MHz, 1.2288 MHz, and 1 MHz.
Outputs (All on Rear Panel):
Coaxial BNC’s: 19.6608 MHz, 10 MHz, 1.2288 MHz
Frame Clock BNC Output (CDMA Mode Only): User selectable output of one of the following clocks via this BNC:
  1.25 msec
  20 msec frame clock
  26.67 msec short sequence clock
  80 msec clock
  Every even second (PP2S)
TTL Sub Min. D Connector: Individual pins for
  1.25 msec, 20 msec frame clock, 26.67 msec short sequence clock, 80 msec clock, and every even second (PP2S).

Ovenized Reference
Aging Rate: <0.005 ppm pk-pk/day, <±0.1 ppm per year (±85 Hz at 850 MHz in one year)
Warm-up: ±0.1 ppm in 5 minutes, ±0.01 ppm in 15 minutes
Temperature: <0.01 ppm
Supply Voltage: 2 x 10⁻⁹ (±1%)

Rear Panel BNC Connectors:
  Output Frequency: 10 MHz
  Output Level: 0 dBm ±3 dB into 50 Ω

Store/Recall
Available RAM: Approximately 928 Kbytes of user available RAM. When running the 83217A Dualmode CDMA Mobile Station Test Software, about 280 Kbytes of RAM is available for save/recall use.

Memory Card
Card Compatibility: Single industry standard PCMCIA slot that accepts type I and type II SRAM and ROM cards.
Storage Capability: Allows for the storage and retrieval of IBASIC programs, IBASIC program parameter and results data, input of new calibration data, and long-term storage of Store/Recall information.
Firmware Upgrades: Accepts PCMCIA memory cards to allow automatic loading of new firmware for the Host CPU, Protocol CPU, DSP, and Channel Card CPU’s without opening the 8924C (order 8924 CRT Option R58 for latest version; contact Agilent Technologies if unit contains firmware revision A.02.37 or less).
**General Specifications**

**Dimensions (HxWxD):**
- **Standard:** 177 H x 426 W x 629 D mm (7 x 16.75 x 24.75 inches)
- **With the 83236B:** 254 H x 426 W x 574 D mm (12 x 16.75 x 24.75 inches) using the optional bench-top cabinet

**Weight:**
- **Standard:** 27 kg, 59 lbs
- **With the 83236B:** 32.6 kg, 72 lbs

**CRT Image Size:** 7 x 10 cm

**Operating Temperature:** 0 °C to +55 °C

**Storage Temperature:** -55 °C to +75 °C

**Power:**
- **8924C:** 100 V to 240 V, 50/60 Hz, nominally 400 VA
- **83236B:** 90 V to 132 V, 198 V to 264 V, 47 to 63 Hz, 100 VA maximum

**Calibration Interval:** 24 months

**EMI:**
- **Standard:** Conducted and Radiated interference meets CISPR-11, IEC 801-2, IEC 801-3, and IEC 801-4.
- **With the 83236B:** Conducted and Radiated interference meets IEC 801-3.

**Leakage:** At RF Generator output levels <-40 dBm, typical radiated leakage is <1 µV induced in a resonant dipole antenna 25 mm (one inch) away from any surface except the rear panel. Spurious leakage levels are typically <5 µV in a resonant dipole antenna 25 mm (1 inch) away from any surface except the rear panel. Spurious leakage levels at the rear panel are typically <5 µV in a resonant dipole antenna at a distance of 250 mm (ten inches).

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**Front Panel**

![Front Panel Image]
Rear Panel Inputs
RF Input/Output: Type N
Antenna Input: BNC
Microphone/Accessory: 8-pin DIN
Audio Input: Dual BNC’s

Rear Panel Outputs
CRT Video Output: BNC
Audio Monitor Output: BNC
10 MHz Oven Output: BNC
10 MHz Reference Output: BNC
CDMA [Frame] Clock Multiplexer Output: BNC
16X Chip [19.6608 MHz Clock] Output: BNC
1X Chip [1.2288 MHz Clock] Output: BNC
DSP IF Aux [3.6864 MHz] Output: BNC
Cellsite/Triggers: 37-pin sub-min D [protocol logging output]
83217A CDMA Dual-Mode Mobile Station Test Software Test List

Option 001
AMPS/NAMPS/CDMA
CDMA RX/TX Quick General Test
CDMA RX/TX Voice Quality
CDMA Call Processing Registration
CDMA Call Processing Origination
CDMA Call Processing Page
CDMA Call Processing Release
CDMA Call Processing Digital to Analog Hand-off
CDMA Call Processing Talk Time
CDMA Call Processing Check
CDMA CP Soft Hand-off Add and Drop Check
CDMA RX Sensitivity and Dynamic Range
CDMA RX Traffic Channel FER with AWGN
CDMA RX Sensitivity Level Search
CDMA TX Modulation Quality
(includes frequency accuracy)
CDMA TX Open Loop Power Control Accuracy
CDMA TX Closed Loop Power Control Range
CDMA TX Maximum RF Output Power
CDMA TX Minimum Controlled Output Power
CDMA TX Spectrum Emissions
AMPS/NAMPS CP Call Processing Registration
AMPS/NAMPS CP Call Processing Page
AMPS/NAMPS CP Call Processing Release
AMPS/NAMPS CP Call Processing Origination
AMPS/NAMPS CP Call Processing Hook Flash
AMPS/NAMPS CPA Flow Chart
(manual phone test)
AMPS/NAMPS TX Functional Test
(no audio connections)
AMPS/NAMPS TX Frequency Error
AMPS/NAMPS TX RF Output Power
AMPS/NAMPS TX Modulation Deviation Limiting
AMPS/NAMPS TX Audio Frequency Response
AMPS/NAMPS TX Audio Distortion
AMPS/NAMPS TX Signaling Tone/DST
AMPS/NAMPS TX FM Hum and Noise
AMPS/NAMPS TX SAT/DSAT
AMPS/NAMPS TX RVC Data Deviation
AMPS/NAMPS TX Compressor Response
AMPS/NAMPS TX Current Drain
AMPS/NAMPS TX Expandor
AMPS/NAMPS TX Audio Frequency Response
AMPS/NAMPS TX Audio Distortion
AMPS/NAMPS TX Hum and Noise
AMPS/NAMPS TX SINAD
AMPS/NAMPS TX FVC Order Message Error Rate
CPA Release
CPA Origination
OTA No Audio Functional
TXA Quick General
RXA Quick General
CPA Flow Chart
TXA Switch Channels
CPA Hook Flash
TXA DTMF Frequency Error
CPD Registration
CPD Origination
CPD Page
TXD Waveform Quality and Freq. Acc.
TXD Open Loop Power Range
TXD Closed Loop Power Control
TXD Maximum RF Output Power
TXD Min. Controlled Output Power
RXD Traffic Channel FER
RXD Sensitivity and Dynamic Range
CPD Soft Hand-off
CPD CDMA Voice Quality
TXD Spectrum Emissions
CPD CDMA Release
CPD Digital to Analog Hand-off
CPD Talk Time
RXD Sensitivity Level Search

Option 002
JTACS/NTACS/CDMA
CPA Registration
CPA Page
TXA Frequency Error
TXA Carrier Power
TXA Peak Frequency Deviation
TXA Audio Frequency Response
TXA Audio Distortion
TXA Signaling Tone / DST
TXA FM Hum and Noise
TXA SAT / DSAT
TXA RVC Data Deviation
TXA Compressor Response
TXA Current Drain
RXA Expandor
RXA Audio Frequency Response
RXA Audio Distortion
RXA Hum and Noise
RXA SINAD
RXA FVC Order Message Error Rate
CPA Release
CPA Origination
OTA No Audio Functional
TXA Quick General
RXA Quick General
CPA Flow Chart
TXA Switch Channels
CPA Hook Flash
TXA DTMF Frequency Error
RXA MRI
CPD Registration
CPD Origination
CPD Page
TXD Waveform Quality and Freq. Acc.
TXD Open Loop Power Range
TXD Closed Loop Power Control
TXD Maximum RF Output Power
TXD Min. Controlled Output Power
RXD Traffic Channel FER
RXD Sensitivity and Dynamic Range
CPD Soft Hand-off
CPD CDMA Voice Quality
TXD Spectrum Emissions
CPD CDMA Release
CPD Digital to Analog Hand-off
CPD Talk Time
RXD Sensitivity Level Search

Option 003
JTACS/NTACS/CDMA
CPA Registration
CPA Page
TXA Frequency Error
TXA Carrier Power
TXA Peak Frequency Deviation
TXA Audio Frequency Response
TXA Audio Distortion
TXA Signaling Tone / DST
TXA FM Hum and Noise
TXA SAT / DSAT
TXA RVC Data Deviation
TXA Compressor Response
TXA Current Drain
RXA Expandor
RXA Audio Frequency Response
RXA Audio Distortion
RXA Hum and Noise
RXA SINAD
RXA FVC Order Message Error Rate
CPA Release
CPA Origination
OTA No Audio Functional
TXA Quick General
RXA Quick General
CPA Flow Chart
TXA Switch Channels
CPA Hook Flash
TXA DTMF Frequency Error
RXA MRI
CPD Registration
CPD Origination
CPD Page
TXD Waveform Quality and Freq. Acc.
TXD Open Loop Power Range
TXD Closed Loop Power Control
TXD Maximum RF Output Power
TXD Min. Controlled Output Power
RXD Traffic Channel FER
RXD Sensitivity and Dynamic Range
CPD Soft Hand-off
CPD CDMA Voice Quality
TXD Spectrum Emissions
CPD CDMA Release
CPD Digital to Analog Hand-off
CPD Talk Time
RXD Sensitivity Level Search

Option 004
CDMA/PCS/AMPS/NAMPS
CPA Registration
CPA Page
TXA Frequency Error
TXA RF Power Output
TXA Modulation Deviation Limiting
TXA Audio Frequency Response
TXA Audio Distortion
TXA Signaling Tone / DST
TXA FM Hum and Noise
TXA SAT / DSAT
TXA RVC Data Deviation
TXA Compressor Response
TXA Current Drain
RXA Expandor
RXA Audio Frequency Response
RXA Audio Distortion
RXA Hum and Noise
RXA SINAD
RXA FVC Order Message Error Rate
CPA Release
CPA Origination
OTA No Audio Functional
TXA Quick General
RXA Quick General
CPA Flow Chart
TXA Switch Channels
CPA Hook Flash
TXA DTMF Frequency Error
RXA MRI
CPD Registration
CPD Origination
CPD Page
TXD Waveform Quality and Freq. Acc.
TXD Open Loop Power Range
TXD Closed Loop Power Control
TXD Maximum RF Output Power
TXD Min. Controlled Output Power
RXD Traffic Channel FER
RXD Sensitivity and Dynamic Range
CPD Soft Hand-off
CPD CDMA Voice Quality
TXD Spectrum Emissions
CPD CDMA Release
CPD Digital to Analog Hand-off
CPD Talk Time
RXD Sensitivity Level Search
E8290A Point of Service Test (PoST) Software Test List

CDMA Tests
- CDMA Registration
- CDMA Origination
- CDMA Page
- CDMA Base Station Release
- CDMA Quick General
- CDMA Waveform Quality and Frequency Accuracy
- CDMA Open Loop Power Range
- CDMA Closed Loop Power Control
- CDMA Maximum RF Output Power
- CDMA Minimum RF Output Power
- CDMA Traffic Channel FER with AWGN
- CDMA Sensitivity and Dynamic Range
- CDMA Softer Hand-off
- CDMA Voice Quality
- CDMA Spectrum Emissions
- CDMA Talk Time
- CDMA Sensitivity Level Search
- CDMA Digital to Analog Hand-off

Analog Tests
- Analog Registration
- Analog Page
- Analog Origination
- Analog Base Station Release
- Analog TX Quick General
- Analog RX Quick General
- Analog No Audio Functional
- Analog TX Frequency Error

Analog Tests, continued
- Analog TX RF Power Output
- Analog TX Modulation Deviation Limiting
- Analog TX Audio Frequency Response
- Analog TX Audio Distortion
- Analog Signaling Tone/DST
- Analog TX FM Hum and Noise
- Analog SAT/DSAT
- Analog RVC Data Deviation
- Analog Compressor Response
- Analog Current Drain
- Analog Expander Response
- Analog RX Audio Frequency Response
- Analog RX Audio Distortion
- Analog RX Hum and Noise
- Analog SINAD
- Analog FVC Order Message Error Rate
- Analog No Audio Functional
- Analog Switch Channels
- Analog Hook Flash
- Analog DTMF Frequency Error
- Analog NAMPS MRI

Other Tests
- Change Global Parameters
- Change Channel For
- Change Channel List
- Access to a User DLL

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