Agilent E6380A
8935 Series AMPS/CDMA
Base Station Test Set

Data Sheet

0.4 to 1000 MHz
1.4 to 2.0 GHz

- **Cellular and PCS frequency coverage**
- **Analog and digital (IS-95B and IS-2000 1XRTT) capabilities**
- **Built-in average power meter with ±7.5% accuracy**
- **Waveform quality ρ (rho), frequency error, code domain power, timing, and phase analysis**
- **Built-in AWGN source for calibrated E_b/N_o settings**
- **Dedicated, one-button user interface keys**
- **Firmware upgradeable (via PCMCIA to Flash Memory)**
- **Network equipment manufacturer (NEM) base station specific automation software increases measurement repeatability and enhances technician efficiency**

The Agilent Technologies 8935 Series E6380A AMPS/CDMA Cellular/PCS base station test set is the next generation in CDMA base station test equipment. The E6380A is a full featured, one-box test set designed to meet the needs of installation teams, service providers, and network equipment manufacturers.

Building on the success of our third generation of base station test equipment, the new test set heavily incorporates feedback from PCS and Cellular users. For example, the E6380A utilizes a large, bright, easy-to-read, electroluminescent display. A convenient connector section on the side of the test set allows unobtrusive, out-of-the-way hook up, as well as protects the connectors from damage. A suitcase form factor provides better portability.

The new "rugged design" includes a reliable membrane keypad, a gasketed display, and filtered airflow to resist dirt and moisture. The unit's enclosure provides for stand up operation, and helps protect itself from bumps and shocks.

More importantly, the E6380A incorporates a user-friendly interface with one-key measurement execution. This interface, coupled with test set's fast measurement speed and automated software for LGIC, Lucent, Nortel, and Samsung base stations, results in less off-line time and improved system performance. Errors due to test variability are reduced, and measurement data can be output to a printer or to the PCMCIA memory card. Additionally, new features and capabilities can be added to the E6380A without returning the unit to a service center. The test set's firmware is user upgradeable via a PCMCIA card to Flash Memory.

To complete the CDMA parametric test solution, Agilent also offers a technician training program to provide install teams and service providers with a comprehensive understanding of base station test.

For more information about the 8935 series E6380A, refer to the **products** link on our Web site at: **www.agilent.com/find/basestations**

Agilent Technologies

Specifications describe the instrument's warranted performance and are valid over the entire operating/environmental range unless otherwise noted.

Supplemental Characteristics are intended to provide additional information useful in applying the instrument by giving typical, but non-warranted performance parameters. These characteristics are shown in italics or labeled as "typical," "usable to," or "nominal."

CDMA Signal Generator Specifications

Frequency Range: 800 MHz to 1000 MHz, and 1.7 GHz to 2.0 GHz (usable 4 to 200 MHz)

Output Level Range:
RF IN/OUT: –120 dBm to –40 dBm
DUPLEX OUT: –120 dBm to –10 dBm

Output Level Accuracy:
RF IN/OUT: ±1.5 dB, *Typically ±1 dB*
DUPLEX OUT: ±1.5 dB, *Typically ±1 dB*

Modes: Noise only, data only, and user selectable E_b/N_o settings

CDMA Signal Generator RF Level Accuracy (when in E_b/N_o mode): *Typically ±1.5 dB*

Modulation

Reverse Link Source Modulation: OQPSK per TIA IS-95

Reverse Link Source Modulation Data: Internal data buffer, Idle (all zeroes)

Forward Link Source Modulation: QPSK per TIA IS-95

Forward Link Source Modulation Data: Internal (Pilot Channel)

Residual rho (ρ): Better than 0.96,
Typically better than 0.98

Carrier Feedthrough: *Typically <–35 dBc*

Adjacent Channel Noise: *Typically <–50 dBc measured in a 30 kHz BW filter relative to the total carrier power at f_c ±900 kHz for output levels <–40 dBm at the RF IN/OUT connector (<–10 dBm when using the DUPLEX OUT connector)*

Data Buffer

Size/Length: 1800 frames per data rate set

Modes: Single, Continuous Looping, and Idle

Coding: IS-95 CDMA full rate reverse link channel coding, interleaving and spreading

Long Code Mask: 42 zeros

Input Data: 9600 bps and 14.4 kbps entered via GPIB

Data Source: For each data rate set there are 300 frames of random data factory loaded, 1800 frames additional user definable data which can be entered via GPIB.

AWGN Source

(Additive White Gaussian Noise)

Bandwidth: *2 MHz nominally*

Distribution: Gaussian to >3 sigma

E_b/N_o Resolution: 0.1 dB

E_b/N_o Range: –5 to 25 dB

E_b/N_o Accuracy: ±0.5 dB for E_b/N_o of 5 to 20 dB, 25° C ±10° C, *Typically ±1 dB for E_b/N_o of 0 to +5 dB and +20 dB to +25 dB*

CDMA Analyzer Specifications

Average Power Measurement

Input Frequency Range: 30 MHz to 1000 MHz, and 1.7 to 2.0 GHz

Input Connector: RF IN/OUT only

Measurement Bandwidth: Provides an accurate measure of the total power for signals within ±2 MHz of the operating frequency. If other signals are present outside this frequency range, reduced measurement accuracy will result.

Maximum Input Level: 15 W average for CDMA signals

Measurement Range:
4 mW to 15 W for f >100 MHz (+6 to +42 dBm)
4 mW to 1 W for f <100 MHz (+6 to +30 dBm)

Measurement Period: 0.25 ms to 26.66 ms

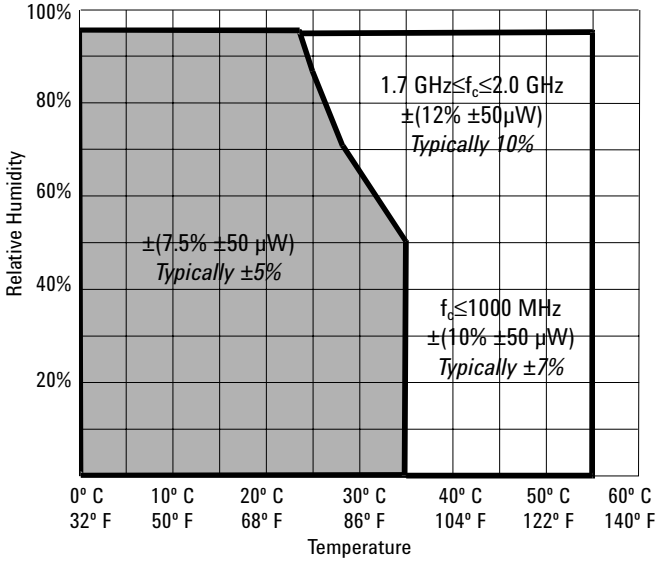

Figure 1. Average Power Measurement Accuracy

Channel Power Measurement (1.23 MHz)

Input Frequency Range: 800 MHz to 1000 MHz, and 1.7 to 2.0 GHz

Measurement Bandwidth: Measures the total average power in a 1.23 MHz bandwidth centered on the selected frequency

Measurement Range:
RF IN/OUT: 0.1 µW to 15 W average (–40 to +42 dBm)
ANTENNA: *Typically, 16 pW to 1.25 W average (–78 to +4 dBm)*

Measurement Accuracy (within five minutes of calibration (user initiated) and within the 7.5% average power environmental window):
RF IN/OUT: 800 to 1000 MHz ± (0.75 dB ±25 nW)
at 4.95 MHz ± (1 dB ±40 nW)
ANTENNA: 800 to 1000 MHz *typically*, ± (0.75 dB ±6.5 pW)
at 4.95 MHz *typically*, ± (0.75 dB ±10 pW)

Measurement Period: 0.25 ms to 26.66 ms

Channel Power Measurement (30 kHz)

Input Frequency Range: 30 MHz to 1000 MHz, and 1.7 to 2.0 GHz

Measurement Bandwidth: Measures the total average power in a 30 kHz bandwidth centered on the selected frequency

Measurement Range:
RF IN/OUT: 2.4 nW to 15 W average (–56 to +42 dBm)
ANTENNA: *Typically, 0.39 pW to 1.25 W average (–94 to +4 dBm)*

Measurement Accuracy (within five minutes of calibration (user initiated) and within the 7.5% average power environmental window):
RF IN/OUT: 30 to 1000 µHz ± (0.75 dB ±0.61 nW)
at 4.95 MHz ± (1 dB ±0.61 nW)
ANTENNA: *At 4.95 MHz, 30 to 1000 MHz typically, ±(0.75 dB ±0.16 pW)*

Measurement Period: 0.25 ms to 26.66 ms

Adjacent Channel Power

Frequency Range: 800 MHz to 1000 MHz and 1.7 GHz to 2.0 GHz

Adjacent Channel Power Bandwidth: 10 kHz to 1.23 MHz
(for BW >100 kHz, refer to ACP Filter in Reference Guide)

Adjacent Channel Power Offset: 100 kHz to 3 MHz

Measurement Range:
RF IN/OUT: 0.1 µW to 15 W average (–40 to +42 dBm)
ANTENNA: *Typically 16 pW to 1.25 W average (–78 to +4 dBm)*

Measurement Accuracy:
RF IN/OUT:
Typically ±(0.75 dBc ±(2 x 10^{-14})(ACP BW)) W
ANTENNA
Typically ±(0.75 dBc ±(5.3 x 10^{-18})(ACP BW)) W

Waveform Quality Measurement

Frequency Range: 4 MHz to 1000 MHz, and 1.7 to 2.0 GHz

Input Level Range:
RF IN/OUT: –20 dBm to +42 dBm
ANTENNA: –58 dBm to +7 dBm

Measurement Period: 0.25 ms to 20 ms forward link 0.25 ms to 10 ms reverse link

Measurement Range: 0.509 to 1.00

Rho Measurement Accuracy: Within ±0.005

Input Frequency Error Range: ±900 Hz

Frequency Error Measurement Accuracy: ±30 Hz using a measurement interval >0.5 ms

Other Reported Parameters: Pilot Time Offset, Carrier Feedthrough Error, Vector Magnitude, Amplitude Error, and Phase Error

Pilot Time Offset Measurement Accuracy: *Typically <±500 nsec from even second signal to start of PN sequence*

Code Domain Analyzer

Frequency Range: 4 MHz to 1000 MHz, and 1.7 to 2.0 GHz

Input Connector: RF IN/OUT or ANT IN

Input Frequency Error Range: ±900 Hz

Input Level Range:
RF IN/OUT: –20 dBm to +42 dBm
ANTENNA: –58 dBm to +7 dBm

Code Domain Power Measurement

Displayed Dynamic Range: 40 dB

Relative Code Domain Power Accuracy: ±0.5 dB
(using a measurement interval >0.5 ms and Walsh channel power >1% of channel power)

Absolute Code Domain Power Accuracy: ±1.25 dB
(using a measurement interval >0.5 ms and Walsh channel power >1% of channel power)

Measurement Resolution: 0.01 dB

Carrier Frequency Offset Accuracy: ±30 Hz using a measurement interval ≥0.5 ms

Pilot Time Offset Accuracy: *Typically <500 nsec from even second signal to start of PN sequence*

Other Reported Parameters: Estimated Rho, marker readings of individual code power and noise

Code Domain Timing Measurement[1]
(Pilot to Code Channel Time Tolerance)

Measurement Range: ±200 nsec

Measurement Accuracy: ±10 nsec using a measurement interval of 12.5 ms

Measurement Resolution: 0.01 nsec

Code Domain Phase Measurement[1]
(Pilot to Code Channel Phase Tolerance)

Measurement Range: ±200 mrad

[1] IS-95B only

Measurement Accuracy: ±20 mrad using a measurement interval of 12.5 ms

Measurement Resolution: 0.01 mrad

Signal Generator Specifications

RF Frequency

Range: 400 kHz to 1000 MHz, and 1.7 to 2.0 GHz

Accuracy and Stability: ±(0.065 Hz plus reference oscillator accuracy)

Output

RF IN/OUT Connector

Level Range: –137 to –40 dBm into 50 W

Level Accuracy: ±1.0 dB (level >–127 dBm); if RF Analyzer is also connected add ±0.1 dB
Typically ±1.0 dB for levels below –127 dBm

Reverse Power: 100 watts continuous, temperature <40° C, 75 W continuous, for temperature <55° C

SWR: <1.5:1

DUPLEX OUT Connector

Level Range: –125 to –10 dBm into 50 Ω

Maximum Power Output: +3 dBm

Level Accuracy: ±1.5 dB, *Typically ±1.0 dB for all levels*

Reverse Power: 200 mW max

SWR: <1.7:1

Supplemental Characteristics
Resolution: *0.1 dB*

Spectral Purity

(For output levels of <–10 dBm at DUPLEX OUT or <–40 dBm at RF IN/OUT)

Harmonics: <–25 dBc

Non-Harmonic Spurious (>5 kHz from carrier):

250 kHz	≤f_c	<249 MHz	<–45 dBc
249 MHz	≤f_c	≤1000 MHz	<–60 dBc
1700 MHz	≤f_c	≤2000 MHz	<–55 dBc

Residual FM (rms, CCITT filter):

250 kHz	≤f_c	<249 MHz	<7 Hz
249 MHz	≤f_c	<501 MHz	<4 Hz
501 MHz	≤f_c	≤1000 MHz	<7 Hz
1700 MHz	≤f_c	≤2000 MHz	<14 Hz

Supplemental Characteristics
SSB Phase Noise (20 kHz offset):

f_c <1 GHz	*<–116 dBc/Hz*
1.7 GHz < f_c <2.0 GHz	*<–90 dBc/Hz*

FM

FM Deviation Maximum (For rates >25 Hz):

400 kHz	<f_c	<249 MHz	100 kHz
249 MHz	<f_c	<501 MHz	50 kHz
501 MHz	<f_c	<1000 MHz	100 kHz
1.7 GHz	<f_c	<2.0 GHz	100 kHz

[FM not specified for (f_c minus FM dev) <400 kHz]

FM Rate (1 kHz reference):

Internal: DC to 25 kHz (1 dB BW)

External: AC Coupled: *20 to 75 kHz (typically 3 dB BW)*
DC Coupled: *DC to 75 kHz (typically 3 dB BW)*

FM Accuracy (1 kHz rate):
<10 kHz dev: ±3.5% of setting ±50 Hz
>10 kHz dev: ±3.5% of setting ±500 Hz

FM Distortion (THD + noise, in a 0.3 to 3 kHz BW):
<0.5% at >3 kHz dev. and 1 kHz rate, f_c <1000 MHz
<1.0% at >3 kHz dev. and 1 kHz rate, 1.7 GHz < f_c <2.0 GHz

Center Frequency Accuracy in DC FM mode (external source impedance <1k Ω):
±500 Hz (after DC FM zero), *typically ±50 Hz*

Supplemental Characteristics
Ext. Mod. Input Impedance: *600 Ω nominal*
Resolution:
50 Hz for <10 kHz deviation
500 Hz for >10 kHz deviation

AM

Supplemental Characteristics
AM Depth: *0 to 60%*
External Modulation Input Impedance:
600 Ω nominal

RF Analyzer Measurements

SWR:

RF IN/OUT Port: < 1.5: 1
ANT IN Port: <1.6:1, except <1.8:1 for 0 dB attenuation in 1.7 to 2.0 GHz band

RF Frequency Measurements

Measurement Range: 400 kHz to 1 GHz, 1.7 to 2.0 GHz

Level Range:

RF IN/OUT:
1 mW to 100 watts continuous, temp. <40° C, 75 W continuous, for temperatures <55° C
ANT IN: –38 dBm to +15 dBm

Accuracy: ±1 Hz plus timebase accuracy

Supplemental Characteristics
Frequency Resolution: *1 Hz (The user must set the instrument within 15 kHz of the signal under test)*

RF Power Measurements

Frequency Range: 30 MHz to 1 GHz, 1.7 to 2.0 GHz

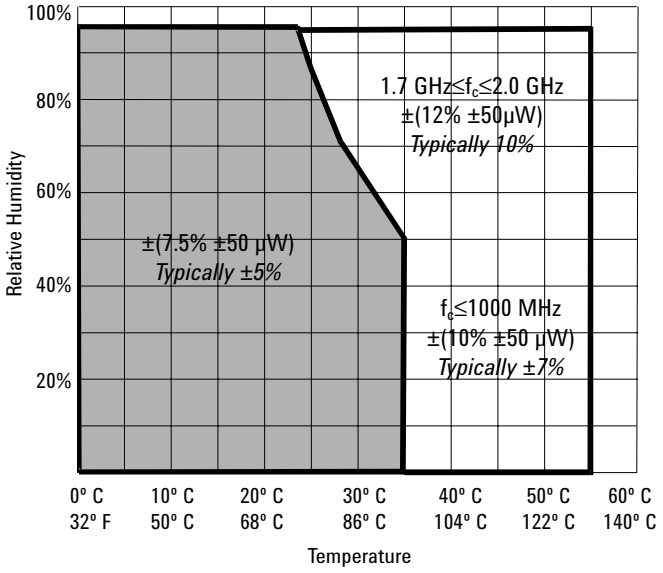

Figure 2. Accuracy

Measurement Range RF IN/OUT:[2]

100 MHz <f_c <2.0 GHz:
4 mW to 100 W continuous, temperatures <40° C,
75 W continuous, for temperatures <55° C

30 MHz <f_c <100 MHz: 4 mW to 1 W continuous

Supplemental Characteristics
Resolution: *3 digits (Example: Resolution of 10 mW for powers <10 W and >1 W)*

FM Measurement

Frequency Range: 5 MHz to 1 GHz (usable to 400 kHz), and 1.7 to 2.0 GHz

Deviation: 20 Hz to 75 kHz

Sensitivity: 4 µV for 12 dB SINAD, (30 kHz IF BW, high sensitivity mode, 0.3 to 3 kHz BW)
Typically: < 2 µV (12 dB SINAD, f_c >10 MHz)

Accuracy: ±4% of reading plus residual FM and noise contribution (20 Hz to 25 kHz rates, deviation < 25 kHz, 230 kHz IF BW)

Bandwidth (3 dB): 20 Hz to 70 kHz

THD + Noise: <1% rms, (for deviation >5 kHz and at a rate of 1 kHz in a 0.3 to 3 kHz BW, 230 kHz IF BW)

Input Level Range for Specified Accuracy:
–6 to +50 dBm at RF IN/OUT
–44 to +12 dBm at ANTENNA IN

Residual FM and Noise (0.3 to 3 kHz, rms):
<7 Hz, for f_c <1000 MHz
<14 Hz, for 1.7 <f_c <2.0 GHz

Supplemental Characteristics
Resolution: *1 Hz, f <10 kHz ; 10 Hz, f >10 kHz*

AM Measurement

Frequency Range: 10 MHz to 1 GHz (usable to 400 kHz), 1.7 to 2.0 GHz

Depth: 0 to 95%

Input Level Range (levels in PEP):
–6 to +52 dBm at RF IN/OUT
–44 to +14 dBm at ANTENNA IN

Supplemental Characteristics
Accuracy: *±5% of reading ±1.5 % AM, (50 Hz to 10 kHz rates, modulation <80%)*
THD + Noise: *<2% rms for modulation <80% AM, (at 1 kHz rate in a 0.3 to 3 kHz bandwidth)*
Residual AM: *<0.2% in a 0.3 to 3 kHz bandwidth*
Resolution: *0.1%*

Spectrum Analyzer Specifications

Frequency Range: 400 kHz to 1 GHz, 1.4 to 2.0 GHz

Frequency Span/Resolution Bandwidth (coupled):

Span	Bandwidth
<50 kHz	300 Hz
<200 kHz	1 kHz
<1.5 MHz	3 kHz
<18 MHz	30 kHz
>18 MHz	300 kHz

Span Capability:[3] Full span capability 1 GHz

Display: Log with 1, 2, and 10 dB per division

Display Range: 80 dB or 8 divisions

Reference Level Range: +50 to –50 dBm

Residual Responses: <–70 dBm (ANT IN port, no input signal, 0 dB attenuation)

Image rejection: >50 dB

Supplemental Characteristics
Non-harmonic Spurious Responses:
>65 dB down (for input signals >50 MHz, <–30 dBm),
>55 dB down (for input signals <50 MHz, <–30 dB)
Log Scale Linearity: *±2 dB, (for input levels <–30 dBm within 6 divisions of reference level*
Displayed Average Noise Level: *<–114 dBm, for <50 kHz span, –50 dBm reference level*
Level Accuracy (at center frequency and within 1 division of reference level): *±2.5 dB*

Tracking Generator Specifications

Tracking Generator Frequency Range: 400 kHz to 1 GHz, 1.7 to 2.0 GHz

Frequency Offset: Frequency span endpoints ± frequency offset cannot be <400 kHz or >1 GHz in the 1 GHz band and cannot be <1.7 GHz or >2.0 GHz in the 2 GHz band

Output Level Range: Same as signal generator, page 4

Sweep Modes: Normal and inverted

2. To achieve the specified accuracy when measuring power at the RF IN/OUT port, the internal signal generator level must be 60 dB below the measured power or less than –20 dBm at the Duplex port.
3. Center frequency must be <1.0 GHz or between 1.7 to 2.0 GHz

Oscilloscope Specifications

Frequency Range: 2 Hz to 50 kHz (3 dB BW)

Scale/Division: 10 mV to 10 V

Amplitude Accuracy: ±1.5 % of reading ±0.1 division (20 Hz to 10 kHz)

Time/Division: 10 µsec to 100 msec

Trigger Delay: 20 µsec to 3.2 seconds

Supplemental Characteristics
3 dB Bandwidth: *Typically >100 kHz*
Internal DC Offset: *<0.1 div (>50 µV/div sensitivity)*

AF Analyzer Specifications

Frequency Measurement

Measurement Range: 20 Hz to 400 kHz

Accuracy: ±0.02% plus 0.1 Hz plus timebase accuracy

External Input: 20 mV to 30 Vrms

Supplemental Characteristics
Resolution:
0.01 Hz, f <10 kHz; 0.1 Hz, f <100 kHz; and 1 Hz for f >100 kHz

AC Voltage Measurement

Measurement Range: 0 to 30 Vrms

Accuracy: ± 3% of reading + residual noise (20 Hz to 15 kHz, inputs >1 mV)

Residual Noise: 150 µV (15 kHz LPF) 450 µV (>99 kHz LPF)

Supplemental Characteristics
3 dB Bandwidth: *Typically 2 Hz to 100 kHz*
Nominal Input Impedance: *Switchable between 1 MΩ in parallel with 95 pF or 600 Ω floating*
Minimum Resolution: *4 digits for inputs >100 mV; 3 digits for inputs <100 mV*

DC Voltage Measurement

Voltage Range: 100 mV to 42 V

Accuracy: ±1.0% of reading ±45 mV

DC offset: ±25 mV

Supplemental Characteristics
Resolution: *1 mV*

Distortion Measurement

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 (0.5 to 100% distortion) for tones from 300 to 1500 Hz measured with the 15 kHz LPF

±1.5 dB (1.5 to 100% distortion) for tones from 300 Hz to 10 kHz measured with the >99 kHz LPF

Residual THD + Noise: –60 dB or 150 µV whichever is greater, for tones from 300 to 1500 Hz measured with the 15 kHz LPF

Typically –52 dB or 450 µV, whichever is greater, for tones from 300 Hz to 10 kHz measured with >99 kHz LPF

Supplemental Characteristics
Resolution: *0.1 % distortion*

SINAD Measurement

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 (0 to 46 dB SINAD) for tones from 300 to 1500 Hz measured with the 15 kHz LPF

±1.5 dB (0 to 36 dB SINAD) for tones from 300 Hz to 10 kHz measured with the >99 kHz LPF

Residual THD + Noise: –60 dB or 150 µV, whichever is greater, for tones from 300 to 1500 Hz measured with the 15 kHz LPF

Typically –52 dB or 450 µV, whichever is greater, for tones from 300 Hz to 10 kHz measured with >99 kHz LPF

Supplemental Characteristics
Resolution: *0.01 dB*

Audio Filters

Standard Fixed: <20 Hz HPF, 50 Hz HPF, 300 Hz HPF, 300 Hz LPF, 3 kHz LPF, 15 kHz LPF, >99 kHz LPF, 750 µsec de-emphasis, 6 kHz BPF, and C-Message

Variable Frequency Notch Filter:
Frequency Range: 300 Hz to 10 kHz
Notch Depth: >60 dB
Notch Width: *Typically ±5%*

Audio Detectors

RMS, Pk+, Pk–, Pk+hold, Pk–hold, Pk±/2, Pk±/2 hold, Pk ± max, and Pk ± max hold.

Signaling

Capability for Generating and Analyzing the Following Formats: CDCSS, DTMF, 1 Tone, 2 Tone, 5/6 Tone, Sequential, RPC1 (POCSAG), EIA, CCITT, CCIR, ZVEI, DZVEI, GOLAY, EEA, AMPS, NAMPS, TACS, NTACS, NMT-450, NMT-900, LTR, EDACS, and MPT 1327.

Function Generator Waveforms: Sine, square, ramp, triangle, dc, white Gaussian and white uniform noise

Function Generator Frequency Range and Level: Same as audio source

Audio Source Specifications

(Applicable to both internal sources)

Frequency

Range: DC to 25 kHz

Accuracy: 0.025% of setting

Supplemental Characteristics
Minimum Resolution: *0.1 Hz*

Output Level

Range: 0.1 mV to 4 Vrms

Maximum Output Current: 20 mA peak

Output Impedance: < 1.5 Ω (1 kHz)

Accuracy: ±2% of setting plus step size

Residual Distortion: 0.125%, (THD plus noise, for amplitudes >200 mVrms), for tones 20 Hz to 25 kHz measured in an 80 kHz BW

Supplemental Characteristics
Step Size:
Level <0.01V: ±50 µV pk
Level <0.1V: ±0.5 mV pk
Level <1V: ±5 mV pk
Level <10V: ±50 mV pk
Offset in DC Coupled Mode: *<50 mV*

RF Tools Measurements

(All specifications are typical and assume the use of the E6554A RF Tools Accessories Kit)

Swept Insertion Loss Test:
Frequency Range: *0.4 to 1000 MHz, 1.7 to 2.0 GHz*
Swept Signal Level: *–54 dBm to +10 dBm*
Insertion Loss Accuracy: *±0.75 dB*

Swept Gain Test:
Frequency Range: *0.4 to 1000 MHz, 1.7 to 2.0 GHz*
Swept Signal Level: *–54 dBm to +10 dBm*

Swept Return Loss Test:
Frequency Range: *0.4 to 1000 MHz, 1.7 to 2.0 GHz*
Swept Signal Level: *–54 dBm to +10 dBm*
Swept Return Loss Accuracy: *±2 dB ±10% of reading, for readings between 0 dB and 30 dB*

Cable Fault Test:
Cable Types Tested: *Heliax, RG, Custom*
Cable Length Range: *0 to 1000 feet, 0 to 300 meters*
Distance Accuracy: *±5% of the cable length value entered by the user*

Precision Calibration

Option 012 / R12 Time Offset Precision Calibration
Cal factor accuracy +/- 21 nsec

General Specifications

Dimensions (H x W x D): 8.75 x 15.6 x 21.5 inches (222 x 396 x 546 mm)

Weight: 49 lbs. (22 kgs)

Operating Temperature: 0° C to +55° C

Operating Humidity: <95% relative humidity, 0° C to 40° C

Storage Temperature: –40° C to +70° C

Power: 100 Vac to 240 Vac ±10%, 50 to 60 Hz, nominally 350 VA

Display Size: 9.7 cm x 13 cm, electroluminescent (EL)

Calibration Interval: Two years

Operating Altitude: 4500 m max

Supplemental Characteristics
Minimum Frequency Resolution: *1 Hz*
Switching Speed: *<150 ms to be within 100 Hz of the carrier frequency*
Leakage: *At RF generator output levels <–40 dBm, typical radiated leakage is <10 µV induced in a resonant dipole antenna 25 mm (1 inch) away from any surface. Spurious leakage levels are typically <10 µV in a resonant dipole antenna 25 mm (1 inch) away from any surface.*

Side Panel Connectors

External Ref In:
Input Frequencies: 1, 2, 5, 10, and 15 MHz; 1x, 2x, 4x, 8x, and 16x chip clock
Input Level: >0.15 Vrms

10 MHz Ref Out:
Output Frequency: 10 MHz
Output Level: >0.5 Vrms
Waveform: Sine wave

Chip Clock - 1.2288 MHz Out:
Output Level: Nominally, TTL with 50 Ω impedance
Waveform: Square wave with ~50% duty cycle

16X Chip Clock - 19.6608 MHz Out:
Output Level: Nominally, TTL with 50 Ω impedance
Waveform: Square wave with ~50% duty cycle

Frame Clock Out:
Clock Selections: 20 ms, 26.67 ms, 80 ms, or 2.00 s
Output: ~800 ns pulse, 1.5 Vpk into 50 Ω

Even Second - Sync In: A positive edge starts CDMA frame clocks and Pilot PN sequence generation

Trig Qualifier In: A rising edge is used to start the trigger delay timer

Audio Out: Provides output signals from the audio frequency generators

Audio In: A switchable (1 MΩ and 600 Ω) inputs to the AF analyzer

Analog Modulation In: Provides an external modulation (AM or FM) connection for the RF Generator

Scope Monitor Out: External output from the AF analyzer

External Scope Trig In: Provides an external trigger input for the oscilloscope

Video Out: Provides a signal for any standard PAL monitor (15.7 kHz scan rate)

Data In: Provides a data input to the CDMA generator

Base-band Out (I and Q): Provides buffered versions of the I and Q drive signals from the CDMA generator

Remote Programming

GPIB: Implementation of IEEE Standard 488.2

Functions Implemented: SH1, AH1, T6, L4, SR1, RL1, LE0, TE0, PP0, DC1, DT1, C4, C11, E2

RS-232: Three serial ports through DB-9 connectors used for serial data in and out

Rates: 150, 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, and 115200 Baud

Standard User Memory, RAM

Approximately 928 Kbytes of RAM are available for nonvolatile **save/recall** of settings. This typically will allow you to save >500 sets of instrument settings; depending on the type of information saved.

Reference Oscillator

Standard TCXO: (Temperature controlled crystal oscillator)

Temperature: 0.1 ppm (0° C to +55° C)
Aging: <0.5 ppm/year (<1 ppm in first year)
Warm-up Time: <15 minutes to be within ±0.1 ppm of final frequency

Option 1D5 High Stability Reference: (Oven controlled crystal oscillator)

Temperature: 0.05 ppm (0° C to +55° C)
Aging: <0.5 ppm/year (<1 ppm in first year)
Warm-up Time: <15 minutes to be within ±0.1 ppm of final frequency

Memory Card Specifications

Card Compatibility: Single industry standard PCMCIA slot accepts Type I or Type II SRAM and ROM memory cards

Storage Capability: Allows for the storage and retrieval of IBASIC program parameter and results data, input of new calibration data, and long-term storage of Store/Recall information

Firmware Upgrades: Accepts PCMCIA flash memory cards (4 Mbytes) to allow automatic loading of new firmware from the front panel. Upgrade time is about eight minutes

Ordering Number

8935 Series CDMA Cellular/PCS Base Station Test Set ordering number: **E6380A**

For More Product Information

For more information visit our Web site: **www.agilent.com/find/basestations**

Agilent Technologies' Test and Measurement Support, Services, and Assistance

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Our Promise

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Printed in U.S.A. August 14, 2001
5968-3798E

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