The MS8606A can measure CDMA (IS-95, ARIB STD-T53) forward and reverse transmission characteristics. It is ideal for measuring transmitter characteristics including frequency, waveform quality (\( \rho \)), timing error (\( \tau \)), code domain power, transmitter power, occupied bandwidth, neighboring spurious, etc.

The MS8606A can measure PDC transmission characteristic such as transmission frequency and power, modulation accuracy, occupied bandwidth, and adjacent channel power, in addition to the bit error rate.

The built-in spectrum analyzer covers frequencies of 10 MHz to 3 GHz making it ideal for R&D. In addition, the general-purpose evaluation functions can be used to measure the adjacent channel power, occupied bandwidth, and sideband noise of radio equipment.

The MS8606A has general-purpose analog measurement functions, including frequency counter, power meter, FM/AM measurement, AF oscillator and audio analyzer, making it perfect for FM radio transmission tests (AF oscillator and audio analyzer optional).

**Features**
- For CDMA, PDC measurement
- High-speed, high precision measurement
- Built-in spectrum analyzer and AF measurement function

CDMA modulation analysis

Code domain power measurement
### Specifications

<table>
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<th><strong>MS8606A</strong></th>
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<td><strong>Frequency range</strong></td>
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<td><strong>Max. input level</strong></td>
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<tr>
<td><strong>Input impedance</strong></td>
</tr>
<tr>
<td><strong>Input connector</strong></td>
</tr>
</tbody>
</table>

#### Reference oscillator
- **Frequency**: 10 MHz
- **Starting characteristics**: ≤5 x 10⁻⁸/day (after 10 minutes of warm-up, compared to the frequency after 24-hour warm-up)
- **Aging rate**: ≤2 x 10⁻⁸/year (compared to the frequency after 24-hour warm-up)
- **Temperature characteristics**: ≤5 x 10⁻⁸ (compared to the frequency at 25°C)
- **External reference input**: 10 or 13 MHz (±1 ppm), 2 to 5 Vp-p

#### Power meter
- **Frequency range**: 300 kHz to 3 GHz
- **Level range**: 0 to +40 dBm
- **Measurement accuracy**: ±10% (after zero calibration)

### Spectrum analyzer

#### Frequency
- **Setting range**: 0 to 3 GHz (band: 0), 10 MHz to 3 GHz (band: 1)
- **Setting resolution**: 1 Hz
- **Frequency accuracy**: ±(display frequency x reference frequency accuracy + span x span accuracy)
- **Normal marker**: Same as display frequency accuracy
- **Delta marker**: Same as span accuracy
- **RBW (resolution bandwidth)**: Setting range: 300 Hz to 1 MHz (3 dB BW, 1-3 sequence)
- **Accuracy**: ±2% (300 Hz to 300 kHz), ±1% (1 kHz)
- **Selectivity (60 dB, 3 dB)**: ≤5:1

#### Amplitude (at Band: 1)
- **Reference level**: ±1.5 dB (reference level: +10.1 to +40 dBm, at 0 to –50 dB of reference level)
- **Reference level**: AUX connector: ±1.5 dB (reference level: –9.9 to +20 dBm, at 0 to –50 dB of reference level)

#### Sweep
- **Setting range**: 100 ms to 1000 s (frequency axis sweep), 100 ms to 1000 s (time axis sweep, RBW: ≤1 kHz), 1 ms to 100 s (time axis sweep, RBW: >1 kHz)
- **Trigger switch**: FREERUN, TRIGGERED
- **Trigger source**: WIDE IF VIDEO (3 dB bandwidth: ≥20 MHz, trigger slope: RISE/FALL)
- **Gate delay, gate width**: Setting range: 2 µs to 100 ms, Resolution: 2 µs

#### Marker
- **Signal search**: PEAK→CF, PEAK→REF
- **Zone marker**: NORMAL, DELTA
- **Peak search**: PEAK, NEXT PEAK, NEXT RIGHT PEAK, NEXT LEFT PEAK

#### Functions
- **Noise power**: dBm/Hz, dBm/ch
- **Occupied bandwidth**: Power N% method, X dB down method
- **Reference measurement**: Total power/reference level method
- **Average power of burst signal**: Average power within the specified time range of the time axis waveform

### Others
- **Number of data point**: 501
- **Detection mode**: POS PEAK, NEG PEAK, SAMPLE
- **Display function**: TRACE A, TRACE B, TRACE TIME
- **Storage function**: NORMAL, VIEW, MAX HOLD, MIN HOLD, AVERAGE, CUMULATIVE, OVER WRITE
Power measurement (wide band)
- Frequency range: 300 kHz to 3 GHz
- Level range: 0 to +40 dBm (MAIN connector)
- Accuracy: ±10% (after zero point calibration)

Power measurement (narrow band)
- Frequency range: 10 MHz to 3 GHz
- Input level: –15 to +40 dBm (MAIN connector), –40 to +20 dBm (AUX connector)
- Accuracy: ±10% (MAIN connector, after calibration with internal wide band power meter) ±1 dB (AUX connector, reference level: 0 to –12 dBm, after calibration)
- Linearity: ±0.3 dB (0 to –30 dB)

Frequency measurement
- Frequency range: 10 MHz to 3 GHz
- Resolution: 1 Hz
- Accuracy: ±(reference oscillator accuracy + 10 Hz) ±IF frequency counting (bandwidth: ±30 kHz)

FM measurement
- Frequency range: 10 MHz to 3 GHz
- Input level: –15 to +40 dBm (MAIN connector), –40 to +20 dBm (AUX connector)
- Accuracy: ±0.5 dB (bandwidth: ±30 kHz, referred to 1 kHz)

FM demodulation output
- Deviation: 0 to 40 kHz (40/40 kHz range)
- Demodulation frequency: 50 Hz to 10 kHz
- Output level: ±4 Vpeak (EMF, at full-scale range)
- Output impedance: 600 Ω

Display: Color TFT-LCD, 7.8", 640 x 480 dots
Hard copy: Enables data hard copy of the display through a parallel interface (printer: ESC/P compatible printer)
GPIB: This equipment is specified as a device, can be controlled from external controller (excluding power switch).
- Interface functions: SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT1, C0, E2
- Parallel interface: Conform to the Centronics. Outputs printing data to printer. D-sub 25-pin connector (female)
- RS-232C: All functions except power switch controlled by external controller (baud rate: 1200, 2400, 4800, 9600 bps)

Dimensions and mass
- 426(W) x 221.5(H) x 451(D) mm, ≤22 kg
- Power: 100 to 120/200 to 240 Vac (–15%/+10%, max. voltage: 250 V, automatic voltage switch system), 47.5 to 63 Hz, ±300 VA
- Operating temperature: 0° to 50°C

Option 01: AF measurement
The following items have been added to the standard analog measurement items.

Audio analyzer
- Input impedance: 600 Ω/100 kΩ (unbalanced, BNC connector)
- Filters: HPF: 400 Hz (for tone rejection), De-emphasis: 750 μs, Weighting filter: ITU-T P.53, C-Message
- AF Level measurement
  - Frequency range: 30 Hz to 20 kHz, Level range: 1 mVrms to 30 Vrms, Accuracy: ±0.5 dB
- Distortion measurement
  - Frequency range: 100 Hz to 5 kHz, Level range: 30 mVrms to 30 Vrms, Accuracy: ±1 dB (frequency: 1 kHz, distortion factor: 1%)
- AF frequency measurement
  - Frequency range: 30 Hz to 20 kHz, Level range: 30 mVrms to 30 Vrms, Accuracy: ±0.1 Hz

AF generator
- Frequency range: 20 Hz to 20 kHz, Setting resolution: 0.1 Hz, Accuracy: Same as reference oscillator
- Output
  - Level range: 0.1 mVrms to 3.0 Vrms (EMF, main output impedance: 600 Ω) 0.1 mVrms to 0.3 Vrms (EMF, main output impedance: 50 Ω)
  - Setting resolution: 1 μV (output level: <4 mV), 10 μV (output level: ≤40 mV), 100 μV (output level: ≤0.4 V), 1 mV (output level: ≤3 V)
- Accuracy (bandwidth: <30 kHz)
  - Unbalanced output: ±0.5 dB (frequency: 1 kHz, output level: ≤1 mV), ±1 dB (frequency: 20 Hz to 20 kHz, output level: ≤1 mV)
  - Floating output: ±2 dB (frequency: 1 kHz, output level: ≤1 mV)
- Output impedance
  - Main output: 600 Ω, 50 Ω (unbalanced, BNC-type)
  - Microphone input: 600 Ω (floating, DUT interface)
- Microphone input: 600 Ω (floating, DUT interface)
- Distortion: ≤–50 dBc (bandwidth: <30 kHz, demodulation frequency: 1 kHz, output level: 1 V) ≤–45 dBc (bandwidth: <30 kHz, demodulation frequency: 20 Hz to 20 kHz, output level: 1 V)
- Noise generator: White noise passed through a weighting filter (conforming to ITU-T Rec. G.227)

FM demodulation output
- Deviation: 0 to 40 kHz (40/40 kHz range)
- Demodulation frequency: 50 Hz to 10 kHz
- Output level: ±4 Vpeak (EMF, at full-scale range)
- Output impedance: 600 Ω

Mass
- ≤1 kg
## MX860601A CDMA Measurement Software
All specifications are guaranteed after the Adjust Range key and Calibration key are pressed.

<table>
<thead>
<tr>
<th>Modulation/frequency measurement</th>
<th>Frequency range: 10 MHz to 2.2 GHz</th>
<th>Input level: −10 to +40 dBm (average power during burst on, MAIN connector)</th>
<th>Carrier frequency accuracy: ±10 Hz</th>
<th>Waveform quality (p)</th>
<th>Measurement accuracy: &lt;0.001</th>
<th>Residual vector error: &lt;3.0%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code domain analysis</td>
<td>Frequency range: 10 MHz to 2.2 GHz</td>
<td>Input level: +10 to +40 dBm (MAIN connector)</td>
<td>Carrier frequency accuracy: ±10 Hz</td>
<td>Code domain power measurement accuracy: ±0.1 dB (at −7 dBc)</td>
<td>Waveform quality (p)</td>
<td>Measurement accuracy: &lt;0.001</td>
</tr>
<tr>
<td>Amplitude measurement</td>
<td>Frequency range: 10 MHz to 2.2 GHz</td>
<td>Input level: +10 to +40 dBm (average power during burst on, MAIN connector), 0 to +40 dBm (continuous signal, MAIN connector)</td>
<td>Transmitter power accuracy: ±10% (MAIN connector), ±1 dB (AUX connector, reference level: ≥−12 dBm, 18˚ to 28˚C)</td>
<td>Burst analysis: Rise/fall edge characteristics and on/off ratio analysis function</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occupied bandwidth measurement</td>
<td>Frequency range: 20 MHz to 2.2 GHz</td>
<td>Input level: 0 to +40 dBm (average power during burst on, MAIN connector), −20 to +20 dBm (average power during burst on, AUX connector)</td>
<td>Measurement system: Spectrum analyzer or FFT method</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Neighboring spurious measurement</td>
<td>Frequency range: 20 MHz to 2.2 GHz</td>
<td>Input level: +10 to +40 dBm (average power during burst on, MAIN connector), −20 to +20 dBm (average power during burst on, AUX connector)</td>
<td>Measurement system: Spectrum analyzer method</td>
<td>Measurement range: &gt;50 dB (900 kHz offset), &gt;60 dB (1.98 MHz offset)</td>
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</tr>
</tbody>
</table>

## MX860602A PDC Measurement Software
All specifications are guaranteed after the Adjust Range key and Calibration key are pressed.

<table>
<thead>
<tr>
<th>Modulation/frequency measurement</th>
<th>Frequency range: 10 MHz to 2.2 GHz</th>
<th>Input level: −10 to +40 dBm (average power during burst on, MAIN connector), −30 to +15 dBm (average power during burst on, AUX connector)</th>
<th>Carrier frequency accuracy: ±(reference oscillator accuracy + 1 Hz)</th>
<th>Modulation accuracy</th>
<th>Measurement range: 0 to 12.5%, Accuracy: ± (2% of indicated value + 0.5%)</th>
<th>Origin of fset accuracy: ±0.5 dB (relative to signal of –30 dBc)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amplitude measurement</td>
<td>Frequency range: 10 MHz to 2.2 GHz</td>
<td>Input level: +10 to +40 dBm (average power during burst on, MAIN connector), −40 to +20 dBm (average power during burst on, AUX connector)</td>
<td>Transmitter power accuracy: ±10% (MAIN connector), ±1 dB (AUX connector, reference level: ≥−12 dBm, 18˚ to 28˚C)</td>
<td>Carrier-off power measurement: ≥65 dB (normal mode, compared to average power during burst on)</td>
<td>≥85 dB (wide dynamic range mode, compared to average power during burst on: 3 W)</td>
<td>Measured limit determined by average noise level (&lt;−60 dBm, 100 MHz to 2.1 GHz)</td>
</tr>
<tr>
<td>Occupied bandwidth measurement</td>
<td>Frequency range: 10 MHz to 2.2 GHz</td>
<td>Input level: +5 to +40 dBm (average power during burst on, MAIN connector), −15 to +20 dBm (average power during burst on, AUX connector)</td>
<td>Standard mode: Displays calculation result after measured signal with sweep-type spectrum analyzer</td>
<td>High speed mode: Displays calculation result after analyzing signal (one burst) with FFT</td>
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<tr>
<td>Adjacent channel power measurement</td>
<td>Frequency range: 10 MHz to 2.2 GHz</td>
<td>Input level: +5 to +40 dBm (average power during burst on, MAIN connector), −20 to +20 dBm (average power during burst on, AUX connector)</td>
<td>Standard mode: Displays calculation result after measured signal with sweep-type spectrum analyzer</td>
<td>High speed mode: Displays calculation result after analyzing signal (one burst) with spectrum analyzer emulation</td>
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</tr>
<tr>
<td>Batch measurement function</td>
<td>Measurement item: Transmission frequency, modulation accuracy, origin offset, transmission rate, transmitter power, leakage power during carrier-off, pass/fail decision for specifications of transmitter output time response, occupied bandwidth, adjacent channel power</td>
<td>Measurement range: ≥65 dB (50 kHz offset), ≥65 dB (100 kHz offset)</td>
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<tr>
<td>Error rate measurement</td>
<td>Measurement pattern: PN9, PN15</td>
<td>Number of measurement bit: 10^2, 2556, 10^3, 10^4, 10^5, ∞</td>
<td>Input level: TTL (NRZ), Input terminal: BNC-type (rear panel) or DUT interface (front panel)</td>
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</tbody>
</table>
### Ordering information

Please specify model/order number, name and quantity when ordering.

<table>
<thead>
<tr>
<th>Model/Order No.</th>
<th>Name</th>
</tr>
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<tbody>
<tr>
<td>MS8606A</td>
<td>Mainframe Digital Mobile Radio Transmitter Tester</td>
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<tr>
<td>J0576B</td>
<td>Coaxial cord (N-P-5D-2W-N-P), 1 m: 1 pc</td>
</tr>
<tr>
<td>J0766</td>
<td>Coaxial adaptor (N-J-TNC-P): 1 pc</td>
</tr>
<tr>
<td>J0017F</td>
<td>Power cord, 2.6 m: 1 pc</td>
</tr>
<tr>
<td>F0014</td>
<td>Fuse, 6.3 A: 2 pcs</td>
</tr>
<tr>
<td>MS8606A-01</td>
<td>AF measurement (audio analyzer, AF oscillator)</td>
</tr>
<tr>
<td>MX860601A</td>
<td>CDMA Measurement Software</td>
</tr>
<tr>
<td>MX860602A</td>
<td>PDC Measurement Software</td>
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<tr>
<td>MT8601B</td>
<td>Radio Communication Analyzer</td>
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<tr>
<td>MS8604A</td>
<td>Digital Mobile Radio Transmitter Tester</td>
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<tr>
<td>MD1620C</td>
<td>Signalling Tester</td>
</tr>
<tr>
<td>MD6420A</td>
<td>Data Transmission Analyzer</td>
</tr>
<tr>
<td>MS2602A</td>
<td>Spectrum Analyzer</td>
</tr>
<tr>
<td>MG3670B/C</td>
<td>Digital Modulation Signal Generator</td>
</tr>
<tr>
<td>MG3671A/B</td>
<td>Digital Modulation Signal Generator</td>
</tr>
<tr>
<td>J0127C</td>
<td>Coaxial cord (BNC-P-RG-58A-U-BNC-P), 0.5 m</td>
</tr>
<tr>
<td>J0040</td>
<td>Coaxial adaptor (N-P-BNC-J)</td>
</tr>
<tr>
<td>MN1607A</td>
<td>Coaxial Switch (DC to 3 GHz, 50 Ω, external controllable)</td>
</tr>
<tr>
<td>MA1612A</td>
<td>Four-Point Junction Pad (5 to 3000 MHz)</td>
</tr>
<tr>
<td>J0395</td>
<td>Fixed attenuator for high power (30 dB, 30 W, DC to 8 GHz)</td>
</tr>
<tr>
<td>J0007</td>
<td>GPIB cable, 1 m</td>
</tr>
<tr>
<td>J0008</td>
<td>GPIB cable, 2 m</td>
</tr>
<tr>
<td>B0329D</td>
<td>Front cover (1MW5U)</td>
</tr>
<tr>
<td>B0331D</td>
<td>Front handle (2 pcs/1 set)</td>
</tr>
<tr>
<td>B0332</td>
<td>Joint plate (4 pcs/set)</td>
</tr>
<tr>
<td>B0333D</td>
<td>Rack mount kit</td>
</tr>
<tr>
<td>B0334D</td>
<td>Carrying case (hard type)</td>
</tr>
</tbody>
</table>