A High Performance – Handheld Base Station Analyzer
MT8222A
BTS Master™

Introduction
High performance handheld base station analyzer with a complete set of measurement tools, spectrum analyzer, cable and antenna analysis, power meter, Bit Error Rate Tester for communication backhaul, supports multiple modulation formats GSM/GPRS/EDGE, W-CDMA/HSDPA, CDMA/EVDO, WiMAX 802.16d/802.16e, TD-SCDMA, LTE and GPS.

High Performance Highlights
• Spectrum Analyzer 100 kHz to 7.1 GHz
• 2 port Cable & Antenna Analyzer 10 MHz to 4 or 6 GHz
• High Accuracy Power Meter ± 0.16 dB
• 4 kg (9.0 lbs)
• Bit Error Rate Tester E1, T1 & T3
• Interference Analyzer
• Channel scanner
• GPS receiver option
• 2 and 2.5G modulation options GSM/GPRS/EDGE, IS-95
• PIM Analyzer
• 3G Modulation options W-CDMA/ HSDPA, 1xrtt/EVDO and TD-SCDMA
• 3.5G modulation options LTE, 802.16d and 802.16e
• 2.5 – 3 hour battery life

The Anritsu MT8222A is the most advanced ultra-portable base station analyzer on the market, featuring unparalleled performance at a modest price.
Specifications

**Cable and Antenna Analyzer**

- **Frequency Range**: 10 MHz to 7.1 GHz
- **Maximum Continuous Input**: +30 dBm
- **Tuning Resolution**: 1 Hz
- **Frequency Reference**: Aging: ± 1 ppm/10 years
- **Accuracy**: ± 0.3 ppm (25 °C ± 25 °C) + aging
- **Frequency Span**: 10 Hz to 7.1 GHz plus 0 Hz (zero span)
- **Sweep Time**: Minimum 100 ms, 10 µs to 600 seconds (zero span)
- **Sweep Trigger**: Free run, Single, Video, External
- **Resolution Bandwidth**: (~3 dB) 1 Hz to 3 MHz in 1–3 sequence
- **Video Bandwidth**: (–3 dB) 1 Hz to 3 MHz in 1–3 sequence

**SSB Phase Noise**:
- ~7028 MHz –80 dBm (–92 dBm)
- ~5894 MHz –75 dBm (–87 dBm)
- ~5084 MHz –70 dBm (–83 dBm)
- ~4010 MHz –80 dBm (–90 dBm)
- 10 MHz to 6.5 GHz –85 dBm
- 6.5 GHz –7 GHz: ± 2 dB
- 10 GHz –7.1 GHz: ± 1.75 dB
- 10 MHz to 7.1 GHz: ± 0.8 dB for ACLR ≥ –50 dB at 5 MHz offset
- ≤ 57 dB typical at 10 MHz offset
- ≤ 54 dB typical at 5 MHz offset
- ≤ 50 dB typical at 10 MHz offset

**Leakage Ratio (ACLR)**:
- (824 to 894 MHz, 1710 to 2170):
  - –54 dB typical at 5 MHz offset
  - –59 dB typical at 10 MHz offset

**Residual Adjacent Channel Leakage Ratio (ACLR)**:
- (2300-2700 MHz):
  - –54 dB typical at 5 MHz offset
  - –59 dB typical at 10 MHz offset

**ACLR Accuracy (Single Channel Active)**:
- (824 to 894 MHz, 1710 to 2170):
  - ± 0.8 dB for ACLR ≥ –45 dB at 5 MHz offset
  - ± 0.8 dB for ACLR ≥ –50 dB at 10 MHz offset

**ACLR Accuracy (Single Channel Active)**:
- (2300-2700 MHz):
  - ± 1.0 dB for ACLR ≥ –45 dB at 5 MHz offset
  - ± 1.0 dB for ACLR ≥ –50 dB at 10 MHz offset

**Freq Error**: ± 10 Hz + Time Base Error, 99% confidence level:
- ± 10 Hz + Time Base Error, 99% confidence level

**Power Meters**

- **Frequency Range**: 10 MHz to 7.1 GHz
- **Display Range**: –80 dBm to +80 dBm
- **Measurement Range**: –60 dBm to +30 dBm
- **Offset Range**: 0 to +60 dB

**Accuraccy**:
- ± 0.7 dB typical
- ± 1.25 dB max

**Spectrum Analyzer**

- **Frequency**: 100 kHz to 7.1 GHz
- **Maximum Continuous Input**: +30 dBm
- **Tuning Resolution**: 1 Hz
- **Frequency Reference**: Aging: ± 1 ppm/10 years
- **Accuracy**: ± 0.3 ppm (25 °C ± 25 °C) + aging
- **Frequency Span**: 10 Hz to 7.1 GHz plus 0 Hz (zero span)
- **Sweep Time**: Minimum 100 ms, 10 µs to 600 seconds (zero span)
- **Sweep Trigger**: Free run, Single, Video, External

**Resolution Bandwidth**: (~3 dB) 1 Hz to 3 MHz in 1–3 sequence

**Video Bandwidth**: (~3 dB) 1 Hz to 3 MHz in 1–3 sequence

**SSB Phase Noise**:
- –100 dBc/Hz max at 10, 20 and 30 kHz offset from carrier
- –102 dBc/Hz max at 100 kHz offset from carrier
- –100 dBc/Hz max at 1 MHz offset from carrier

**Amplitude**

- **Measurement Range**: DANL to +30 dBm
- **Absolute amplitude accuracy Power Levels**:
  - ± 50 dBm, ± 35 dB input attenuation,
  - Preamplifier Off: 100 kHz to 10 MHz ± 1.5 dB
  - > 10 MHz to 4 GHz ± 1.25 dB
  - > 4 GHz to 7.1 GHz ± 1.75 dB

**Displayed Average Noise Level (DANL in 1 Hz RBW, 0 dB attenuation, Reference level –50 dBm, preamp on):**

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Typical</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 MHz to 1 GHz</td>
<td>–163 dBm</td>
<td>–161 dBm</td>
</tr>
<tr>
<td>&gt; 1 GHz to 2.2 GHz</td>
<td>–160 dBm</td>
<td>–159 dBm</td>
</tr>
<tr>
<td>&gt; 2.2 GHz to 2.8 GHz</td>
<td>–156 dBm</td>
<td>–153 dBm</td>
</tr>
<tr>
<td>&gt; 2.8 GHz to 4.0 GHz</td>
<td>–160 dBm</td>
<td>–159 dBm</td>
</tr>
<tr>
<td>&gt; 4.0 GHz to 7.1 GHz</td>
<td>–158 dBm</td>
<td>–154 dBm</td>
</tr>
</tbody>
</table>

**Input-Related Spurious**:
- (<–30 dBm input, 0 dB input attenuation, Span < 1.7 GHz)

<table>
<thead>
<tr>
<th>Input Frequency</th>
<th>Spur Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.674 MHz</td>
<td>–38 dBc (–48 typical)</td>
</tr>
</tbody>
</table>

**Residual Spurious**:
- (Preamplifier on, RF input terminated, 0 dB input attenuation)
  - –100 dBm max
- (Preamplifier off, RF input terminated, 0 dB input attenuation)
  - −90 dBm max**, 100 kHz to <2000 MHz
  - –84 dBm max**, 3200 to 7100 MHz

**Exceptions**

- **Frequency Max Spur Level (Typical)**
  - 250, 300, and 350 MHz: –85 dBm
  - –4010 MHz –80 dBm (–90 dBm)
  - –5084 MHz –70 dBm (–83 dBm)
  - –5974 MHz –75 dBm (–97 dBm)
  - –7028 MHz –80 dBm (–92 dBm)

**Display Range**: 1 to 15 dB/div in 1 dB steps. Ten divisions displayed

**Amplitude Units Log Scale Modes**: dBm, dBV, dBmV, dBµV

**Attenuator Range**: 0 to 65 dB

**Attenuator Resolution**: 5 dB steps

**Power Meters**

- **Frequency Range**: 10 MHz to 7.1 GHz
- **Display Range**: –80 dBm to +80 dBm
- **Measurement Range**: –60 dBm to +30 dBm
- **Offset Range**: 0 to +60 dB

**Accuracy**:
- ± 40 dBm < Max ≤ +15 dBm:
  - 10 MHz –4 GHz: ± 1.25 dB
  - 4 GHz –7.1 GHz: ± 1.75 dB
- Max > +15 dBm:
  - 10 MHz –6.5 GHz: ± 1.75 dB
  - 6.5 GHz –7 GHz: ± 2 dB
- Max ≤ –40 dBm:
  - 10 MHz –4 GHz: ± 1.5 dB
  - 4 GHz –7.1 GHz: ± 1.75 dB

**VSWR**: 1.5:1 typical

**Maximum Power**: ±30 dBm (1 W) without external attenuator

**W-CDMA/HSDPA RF Measurements (Option 44)**

**Frequency Ranges**: Bands I - IX

**RF Channel Power**
- (Temperature range 15 °C to 35 °C):
  - ± 0.7 dB typical
  - (± 1.25 dB max)

**Occupied Bandwidth Accuracy**: ± 100 kHz

**Residual Adjacent Channel Leakage Ratio (ACLR)**:
- (824 to 894 MHz, 1710 to 2170):
  - ± 54 dB typical at 5 MHz offset
  - ± 59 dB typical at 10 MHz offset

**Leakage Ratio (ACLR)**:
- (2300-2700 MHz):
  - ± 54 dB typical at 5 MHz offset
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**ACLR Accuracy (Single Channel Active)**:
- (824 to 894 MHz, 1710 to 2170):
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- (2300-2700 MHz):
  - ± 1.0 dB for ACLR ≥ –45 dB at 5 MHz offset
  - ± 1.0 dB for ACLR ≥ –50 dB at 10 MHz offset

**Freq Error**: ± 10 Hz + Time Base Error, 99% confidence level:
- ± 10 Hz + Time Base Error, 99% confidence level
Adjacent Channel Power Accuracy:

Signal ID:

Collect data up to 72 hours

Spectrogram:

RSSI:

Collect data up to 72 hours

CPICH (dBm) Accuracy:

2.5% typical

Residual EVM:

Code Domain Power:

when GPS antenna is connected:

GPS Location Indicator:

GPS (Option 31)

Channel Power:

+20 dBm to –110 dBm

Measurement Range:

Frequency Accuracy:

100 KHz to 7.1 GHz

Frequency Range:

Channel Scanner (Option 27)

Frequency Range: 100 KHz to 7.1 GHz

Frequency Accuracy:

±10 Hz + Time base error, 99% confidence level

Measurement Range: +20 dBm to −110 dBm

Channel Power:

100 kHz to ≤ 10 MHz ± 1.5 dB
> 10 MHz to 4 GHz ± 1.25 dB
> 4 GHz to 7.1 GHz ± 1.75 dB

Adjacent Channel Power Accuracy: ± 0.75 dB

GPS (Option 31)

GPS Location Indicator:

Latitude, Longitude and Altitude on display

Longitude, Latitude and Altitude with trace storage

GPS High Frequency Accuracy

when GPS antenna is connected:

± 25 ppb with GPS ON, 3 minutes after satellite lock

Internal High Accuracy, when

GPS antenna is not connected:

Better than ± 50 ppb for 3 days from a High Accuracy GPS Lock and with 0 °C to 50 °C ambient temperature

W-CDMA Demodulation and W-CDMA/HSDPA

Demodulator (Options 45 and 46)

EVM Accuracy (824 to 894 MHz, 1710 to 2170 MHz):

(3GPP Test Model 4) ± 2.5%; 6%

(3GPP Test Model 5) ± 2.5%; 6%

(2300 MHz to 2700 MHz)

EVM Accuracy: ± 2.5% for 6 ± 20%

Residual EVM: 2.5% typical

Code Domain Power: ± 0.5 dB for code channel power > −25 dB

16, 32, 64 DCPH (test model 1)

16, 32, 64 DCPH (test model 2, 3)

CPICH (dBm) Accuracy: ± 0.8 dB typical

Scrambling Code: 3 seconds

W-CDMA/HSDPA OTA (Option 35)

Resolution: 0.1 dB

Power Monitor (Option 5) (requires external sensor)

Display Range: −80 to +80 dBm (10 pW to 100 kW)

Measurement Range: −40 dBm to +20 dBm (10 nW to 40 mW)

Offset Range: 0 to +60 dB

Resolution: 0.1 dB or 0.1W

Accuracy: ± 1 dB for >−40 dBm using 560-7N50 detector

Bias Tee (Option 10A)

Voltage Range: ±12V to ±32V

Current (Low/High): 250 mA/450 mA, 1 A surge for 100 ms

Resolution: 0.1 V

Interference Analyzer (Option 25)

Strength of the Interferer: Locate the interferer

RSSI: Collect data up to 72 hours

Spectrogram: Collect data up to 72 hours

Signal ID:

Identifies CDMA, GSM and WCDMA signals with Signal-to-noise ratio greater than 10 dB.

Channel Scanner (Option 27)

Frequency Range: 100 KHz to 7.1 GHz

Frequency Accuracy:

±10 Hz + Time base error, 99% confidence level

Measurement Range: +20 dBm to −110 dBm

Channel Power:

100 kHz to ≤ 10 MHz ± 1.5 dB
> 10 MHz to 4 GHz ± 1.25 dB
> 4 GHz to 7.1 GHz ± 1.75 dB

Adjacent Channel Power Accuracy: ± 0.75 dB

GPS (Option 31)

GPS Location Indicator:

Latitude, Longitude and Altitude on display

Latitude, Longitude and Altitude with trace storage

GPS High Frequency Accuracy

when GPS antenna is connected:

± 25 ppb with GPS ON, 3 minutes after satellite lock

Internal High Accuracy, when

GPS antenna is not connected:

Better than ± 50 ppb for 3 days from a High Accuracy GPS Lock and with 0 °C to 50 °C ambient temperature

GSM/GPRS/EDGE RF Measurements (Option 40)

Occupied Bandwidth: Bandwidth within which 99% of the power transmitted on a single channel lies

Burst Power: ± 1 dB typical for −50 dBm to +20 dBm (± 1.5 dB max)

Frequency Error: ± 10 Hz + time base error, 99% confidence level

GSM/GPRS/EDGE Demodulator (Option 41)

GSMK Modulation Quality (RMS Phase) Measurement Accuracy: ± 1 deg

Residual Error (GSMK): 1 deg

8PSK Modulation Quality (EVM) Measurement Accuracy: ± 1.5%

Residual Error (8PSK): 2.5%

CDMA – RF Measurements (Option 42)

and EVDO RF Measurements (Option 62)

Channel Power Accuracy: ± 1 dB typical for RF Input from +20 dBm to −50 dBm (± 1.5 dB maximum)

cdmaOne and CDMA2000 1xEVTT Demodulator (Option 43)

Residual Rho: > 0.995 typical for RF Input from +20 dBm to −50 dBm

(> 0.99 dB maximum)

Rho Accuracy: ± 0.005 for Rho > 0.9

Frequency Error: ± 10 Hz + Time base error, 99% confidence level

PN Offset: with 1 x 64 chips

Pilot Power Accuracy: ± 1 dB typical, relative to Channel Power

Tau: ± 0.5 µs typical (+1 µs maximum)

EVDO Demodulator (Option 63)

Demodulator Measurements are EVDO Rev A compatible.

Residual Rho: > 0.995 typical for RF Input from +20 dBm to −50 dBm

(> 0.99 dB maximum)

Rho Accuracy: ± 0.01 for Rho > 0.9

Frequency Error: ± 20 Hz + Time base error, 99% confidence level

PN Offset: within 1 x 64 chips

Pilot Power Accuracy: ± 1 dB typical relative to Channel Power

Tau: ± 0.5 µs typical (+1 µs maximum)

cdmaOne and CDMA2000 1xEVTT Over The Air (Option 33) and EVDO Over The Air (Option 34)

Over The Air Measurement: Nine strongest pilots with Tau and Ec/Lo.

Six multipaths relative to strongest pilot.

Fixed WiMAX RF Measurements (Option 46)

Channel Power Accuracy: ± 1 dB Typical for +20 dBm to −50 dBm

(± 1.5 dB max)

Fixed WiMAX Demodulator (Option 47)

Residual EVM (rms): 3% for +20 dBm to −50 dBm (3.5% max.)

Frequency Error: ± 0.1 ppm + time base error, 99% confidence level

Mobile WiMAX Specifications

Bandwidths: 3.5 MHz, 5 MHz, 7 MHz 8.75 MHz, 10 MHz

Frame Length: 5 ms, 10 ms

Zone Types: PUSC

DL-MAP Support:

Regular and Compressed Map, DIUC support

DL-MAP Auto Decoding: Convolutional Coding (CC), Convolution Turbo Coding (CTC)

Mobile WiMAX Over the Air (OTA) Measurements (Option 37)

Time Interval: 1 sec – 60 sec

Measurement Duration: 72 hours max

Auto Save: Yes

GPS Logging: Yes

Mobile WiMAX RF Measurements (Option 66)

Channel Power Accuracy: ± 1 dB Typical (± 1.5 dB max)

for +20 dBm to −50 dBm

Mobile WiMAX Demodulator (Option 67)

For +20 dBm to −50 dBm, Residual EVM (rms): 2.5% typical (3% max), at −50 dBm on FCH

Frequency Error: ± 0.02 ppm + time base error, 99% confidence level

1 Channel power accuracy will vary with amount of data burst traffic.
TD-SCDMA RF Measurements (Option 60)
Channel Power (RRC): ± 1 dB typical, 1.5 dB max
(Slot power from +10 dBm to -40 dBm)

TD-SCDMA Demodulator (Option 61)
Residual EVM (rms): 3% typical (for P-CCPCH slot, slot power > –50 dBm)
Freq Error Accuracy: ± 10 Hz typical + time base error (in the presence of a
downlink slot)
Timing Error (Tau) for dominant SYNC-DL code: ± 0.2 μs (external trigger)
Supported Modulation: QPSK
Spreading Factor: 1, 16

TD-SCDMA Over the Air (OTA) Measurements
(Option 38)
32 codes displaying Echo, Tau

Frequency Error:
± 0.2 ppm + time base error, 99% confidence level

T1 Bit-Error-Rate-Tester (BERT), (Option 51)
T1 Analyzer, Fractional T1 and sub-channels BER testing at 1.544 MB, 64, 16
and 8 kB rates
Line Coding: AMI, B8ZS
Framing Modes: D4 (Superframe), ESF (Extended Superframe)
Connection Configurations: Terminate: 100 Ω
Bridge: ≥ 1000 Ω
Receiver Sensitivity: Terminate: +6 dB to –36 dB
Bridge: +6 dB to –36 dB
Monitor: 20 dB flat gain
Transmit Level: 0 dB, –7.5 dB, and –15 dB Clock
Sources: External Bits Clock
Internal: 1.544 MHz ± 5 ppm
Pulse Shapes: Conform to ANSI T1.403 and ITU G.703
Pattern Generation and Detection: PRBS: 2-9, 2-11, 2-15, 2-20, 2-23
Inverted and non-inverted
QCSS, 1-in-8 (1-in-7), 2-in-8, 3-in-24,
All ones, All zeros, T1-Daloxy,
User defined (≤ 32 bits)

Circuit Status Reports: Carrier present, Frame ID and Sync.,
Pattern ID and Sync.
Alarm Detection: AIS (Blue Alarm), RAI (Yellow Alarm)
Error Detection: Frame Bits, BER, BPV, CRC
Error Sec Error Insertion: Bit, BPV, Framing Bits, RAI, AIS
Loopback Modes: Self loopback
Level Measurements: 10 dB to –43 dB
Data Log: Continuous, up to 72 hrs
E1 - 2 MB/s Frequency Measurement: ± 5 ppm
VF TONE Generator:
Frequency: 100 Hz to 3000 Hz
Level: –40.0 to +3.0 dBm ± 0.2 dBm
Audio Monitor: Manually select channel 1-31
VF Measurement:
Frequency: 100 Hz to 3000 Hz ± 3 Hz
Level: –30 to 0 dBm with 1 dB steps

T3/T1/FT1 Bit-Error-Rate-Tester (BERT),
(Option 053)
T3 Analyzer
Line Coding: BSZS, AMI
Framing Modes: Unframed, M13, C-bit
Connection Configurations: Terminate (75 Ω) BNC unbalanced
Receiver Sensitivity: +6 dB to –24 dB
Transmit Level: DS3, Low, Pulse shape: conforms to ITU G.703
Clock Sources: External, Internal: 44.736 MHz ± 5 ppm
Pulse Shapes: Conform to ANSI T1.102 & ITU G.703
Pattern Generation and Detection: PRBS: 2-9, 2-11, 2-15, 2-20, 2-23
Inverted and non-inverted,
User defined (≤ 32 bits)

Circuit Status Reports: Carrier present, Frame ID and Sync.,
Pattern ID and Sync.
Alarm Detection: AIS (Blue Alarm), RAI (Yellow Alarm)
Error Detection: Frame Bits, BER, BPV, FEBE, C-bit, P-bit, Error Sec
Error Insertion: Bit, Framing Bits (FAS), RAI, AIS
Loopback Modes: Self loopback
Level Measurements: ± 5 ppm
Data Log: Continuous, up to 72 hrs
E1 - 2 MB/s Frequency Measurement: ± 5 ppm
VF TONE Generator:
Frequency: 100 Hz to 3000 Hz ± 3 Hz
Level: –40.0 to +3.0 dBm ± 0.2 dBm
Audio Monitor: Manually select channel 1-31
VF Measurement:
Frequency: 100 Hz to 3000 Hz ± 3 Hz
Level: –30 to 0 dBm with 1 dB steps
**T1 Analyzer, Fractional T1 and sub-channels**

**BER Testing:** BER testing at 1.544 MB, 64, 16 and 8 kB rates

**Line Coding:** AMI, BB8S

**Framing Modes:** D4 (Superframe), ESF (Extended Superframe)

**Connection Configurations:** Terminate: 100 Ω balanced, Bantam
Bridge: ≤ 1000 Ω
Monitor: Connect via 20 db pad in DSX

**Receiver Sensitivity:** Terminate: +6 dB to –36 dB
Bridge: +6 dB to –36 dB
Monitor: 20 db flat gain

**Transmit Level:** 0 dB, –7.5 dB, and –15 dB

**Clock Sources:**
- Terminate: +6 dB to –36 dB
- Bridge: +6 dB to –36 dB
- Monitor: 20 dB flat gain

**Transmit Level:**
- 0 dB, –7.5 dB, and –15 dB

**Pulse Shapes:** Conform to ANSI T1.403 & ITU G.703

**Pattern Generation and Detection:**
- PRBS: 2-9, 2-11, 2-15, 2-20, 2-23 inverted and non-inverted, QRSS, 1-in-8 (1-in-7), 2-in-8, 3-in-24, All ones, All zeros, T1-Daly, User defined (≤ 32 bits)

**Circuit Status Reports:**
- Carrier present, Frame ID and Sync.,
- Pattern ID and Sync.

**Alarm Detection:** AIS (Blue Alarm), RAI (Yellow Alarm)

**Error Detection:** Frame Bits, Bit, BER, BPV, CRC, Error Sec

**Error Insertion:** Bit, BPV, Framing Bits, RAI, AIS

**Loopback Modes:** Self loop, CSU, NIU, User defined, In-band or Data Link

**Level Measurements:** Vp-p (± 5%), can also display in dBsdx

**Data Log:** Continuous, up to 72 hrs

**T1 Frequency Measurement:** ± 5 ppm

**DS0 Channel Access:** Tone Generator Frequency: 100 Hz to 3000 Hz
Level: –30 to 0 dBm, with 1 dB steps

**VF Measurement:** Frequency: 100 Hz to 3000 Hz, ± 3 Hz
Level: –40.0 to +3.0 dBm, ± 0.2 dBm

**Audio Monitor:** Manually select channel 1 to 24

**ITU G-821 Analysis:**
- Errored seconds, error free seconds, severely errored seconds, unavailable seconds, available seconds, degraded minutes

**Gated Sweep (Option 090):**

The option adds gated sweep to the spectrum analyzer mode, giving the user the capability to view pulsed or burst signals only when they are on, or conversely look at the spectrum only when a signal is off.

**Trigger Signal:** External TTL input, user selectable high or low level

**Gate Delay:** 0 to 65 ms typical

**Gate Length:** 1 µs to 65 ms typical

**PIM Analyzer Specifications (Option 0419) (requires PIM Master™):**

See Product Brochure 11410-00546

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**LTE Specifications**

**Bandwidth:** 10 MHz

**Span:** 1.4, 3, 5, 10, 15, 20 MHz

**Frame Length:** 2.5, 5.0, 10.0 msec

**LTE RF Measurements (Option 0541):**

**RF Channel Power Accuracy:** ± 1.0 dB typical, (RF input –50 to +10 dBm)

**LTE Modulation Measurements (Option 0542):**

**Frequency Error:** ± 10 Hz + time base error, 99% confidence level

**Residual EVM (rms):** 2.5 % typical (E-UTRA Test Model 3.1)

(RF Input -50 dBm to +10 dBm)

**LTE Over-the-Air (OTA) Measurements (Option 0546):**

**Scanner:** Six strongest Sync Signals

**Auto Save:** Yes

**GPS Tagging and Logging:** Yes

**System**

**Measurement Resolution:** 0.01 dB

**Offset Range:** ± 60 dB

**Interfaces:** USB Alumi-B 2.0

**General Specifications**

**Maximum Continuous Input into Spectrum Analyzer:**
- 10 dB attenuation, +30 dBm, ± 50 VDC

**RF Input VSWR:** 2.0:1 maximum, 1.5:1 typical (≥ 10 dB attenuation)

**Internal Time Base Accuracy:** ± 0.3 ppm

**Interfaces:**
- Type N female RF Connector
- Type N female RF Out Port and RF In Port (50 Ω)
- BNC female connectors for external reference and external trigger
- Reverse BNC connector for GPS antenna
- E1-2Mb/s (Receive and Transmit): RJ48 (75 Ω) connector and BNC(f) (120 Ω)
- T1 (Receive and Transmit): Bantam Jack (100 Ω)
- T1, T3 (Receive and Transmit): Bantam Jack (100 Ω) and BNC (75 Ω)
- RF Detector: Type N(m) 50 Ω
- RJ45 connector for Ethernet 10/100-Base T
- 2.5 mm 3-wire cellular headset connector
- 5-pin Mini-B USB 2.0 device connector
- USB 2.0 Host connector used with PSN50 and USB Flash Drives

**Maximum Input (Damage Level) into Cable and Antenna Analyzer Test Port:**
- Type N: +23 dBm, ± 50 VDC

**Environmental:**
- MIL-PRF-28800F Class 2
- Operating: –10 °C to 55 °C, humidity 85%
- Storage: –51 °C to 71 °C
- Altitude: 4600 meters, operating and non-operating

**Safety:** Conforms to EN 61010-1 for Class 1 portable equipment

**Electromagnetic Compatibility:** Meets European Community requirements for CE marking

**Size:** 315 x 211 x 94 mm (12.4 x 8.3 x 3.7 in.)

**Weight:** 4 kg (9 lbs.)

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* Excludes mismatch errors.

Excludes noise, zero set, zero drift for levels ≤–20 dBm.

Excludes digital modulation uncertainty between +17 and +20 dBm.

**After 30 min warm-up**
Model
MT8222A - BTS Master
100 kHz to 7.1 GHz

Standard
Cable and Antenna Analyzer
Frequency Range: 10 MHz to 4 GHz
Spectrum Analyzer
Frequency Range: 100 kHz to 7.1 GHz
Power Meter
Frequency Range: 100 kHz to 7.1 GHz

Optional
Interference Analyzer
Frequency Range: 100 kHz to 7.1 GHz
Channel Scanner
Frequency Range: 100 kHz to 7.1 GHz
W-CDMA/HSDPDA Analyzer
Frequency Range: 824 to 894 MHz, 1710 to 2170 MHz, and 2300 to 2700 MHz
GSM/GPRS/EDGE Analyzer
Frequency Range: 824 to 894 MHz, 1710 to 2170 MHz, and 2300 to 2700 MHz
CDMA Analyzer
Frequency Range: 2.3 to 2.7 GHz, 3.3 to 3.8 GHz
EVDO Analyzer
Frequency Range: 2.3 to 2.7 GHz, 3.3 to 3.8 GHz
TD-SCDMA Analyzer
Frequency Range: 400 MHz to 2.7 GHz

 cancers
Frequency Range: 10 MHz to 4 GHz
Power Monitor (requires external detector)**
Bias Tee variable voltage
High Voltage Bias Tee
High Accuracy Power Meter (PSN50 sensor not included)
Interference Analysis
6 GHz Cable and Antenna Analyzer (10 MHz to 6 GHz)
Channel Scanner
CW Signal Generator (requires CW Signal Generator kit)
GPS Receiver (includes GPS antenna, Anritsu part number: 2000-1410)
cdmaOne and CDMA2000 1xRTT Over The Air (OTA)**
EVDO Over the Air (OTA)***
W-CDMA/HSDPDA (OTA)****
Mobile WiMAX Over The Air (OTA) Measurements
TD-SCDMA Over The Air (OTA) Measurements
GSM/GPRS/EDGE RF Measurement
GSM/GPRS/EDGE Demodulation
CDMA RF Measurements
cdmaOne and CDMA2000 1xRTT Demodulator
W-CDMA/HSDPDA RF Measurement
W-CDMA Demodulation
Fixed WiMAX RF Measurement
Fixed WiMAX Demodulation
T1/T1.1 BERT (Bit-Error-Rate-Tester)**
E1-2 Mbit/s Bit-Error-Rate-Tester (BERT)**
T3/T1/T1.1 BERT (Bit-Error-Rate-Tester)**
TD-SCDMA RF Measurement
TD-SCDMA Demodulation
EVDO RF Measurements
EVDO Demodulator
DVB-T/H Digital Video Measurement
W-CDMA/HSDPDA Demodulation***
Mobile WiMAX RF Measurements

High Accuracy Power Meter Accessories
PSN50
High Accuracy Power Sensor, 50 MHz to 6 GHz
MA24106A
High Accuracy Power Sensor, 50 MHz to 6 GHz
3-2000-1498
Attenuator (Bi-directional), 20 dB, 5 watt, DC to 12.4 GHz, N(m) to N(f)
3-1010-122
Attenuator (Bi-directional), 30 dB, 50 watt, DC to 8.5 GHz, N(m) to N(f)
3-1010-123
Attenuator (Uni-directional), 40 dB, 100 watt, DC to 8.5 GHz, N(m) to N(f)

Standard Accessories
10920-00060
Handheld Instruments Documentation Disc
10580-00156
BTS Master™ User’s Guide
11410-00433
BTS Master MT8222A Technical Data Sheet
65681
Soft Carrying Case
2300-498
Master Software Tools
2300-530
Anritsu Tool Box with Line Sweep Tools
63-44
Rechargeable Li-Ion Battery
40-158-R
AC/DC Adapter
806-141-R
Automotive Cigarette Lighter/12 Volt DC Adapter
3-2000-1567
512 MB Compact Flash Memory Module
2000-1520-R
USB Flash Drive
3-2000-1360
USB A/mini-B cable 6 ft.
3-806-152
Cross-over Ethernet cable
1091-27-R
Adapter, DC to 18 GHz, N(m) to SMA(f), 50 Ω
1091-172-R
Adapter, DC to 1.3 GHz, N(m) to BNC(f), 50 Ω

One Year Warranty (Including battery, firmware, and software Certificate of Calibration and Conformance

Optional Accessories
800-109
Detector Extender Cable, 7.6 m (25 ft.)
800-111
Detector Extender Cable, 30.5 m (100 ft.)
2000-1374
Dual External, Li-Ion Charger with Universal Power Supply
2000-1410
Magnet Mount GPS Antenna with 3 m (10 ft) Cable
3-2000-1567
512 MB Compact Flash Memory Module
2000-1520-R
USB Flash Drive
760-243-R
Transit Case for Anritsu MT8222A BTS Master
1N50C
Limit, N(m) to N(f), 50 Ω, 10 MHz to 18 GHz
790-641
Cable Lock
4250-20
Attenuator, 20 dB, 5 watt, DC to 18 GHz, N(m) to N(f)
4250A-30
Attenuator, 30 dB, 50 watt, DC to 18 GHz, N(m) to N(f)
2250
Open/Short, DC to 18 GHz, N(m), 50 Ω
22NF50
Open/Short, DC to 18 GHz, N(f), 50 Ω
SM/PPL-1
Precision Load, DC to 6 GHz, 42 dB, N(m), 50 Ω
SM/PNF-1
Precision Load, DC to 6 GHz, 42 dB, N(f), 50 Ω
OSL50-1
Precision Open/Short/Load, DC to 6 GHz, 42 dB, 50 Ω, N(m)
OSLNF50-1
Precision Open/Short/Load, DC to 6 GHz, 42 dB, 50 Ω, N(f)
2000-767-R
Precision Open/Short/Load, DC to 4 GHz, 7/16 DIN(m), 50 Ω
2000-768-R
Precision Open/Short/Load, DC to 4 GHz, 7/16 DIN(f), 50 Ω
1091-26-R
N(m) to SMA(m) DC to 18 GHz, 50 Ω
1091-27-R
N(m) to SMA(f) DC to 18 GHz, 50 Ω
1091-80-R
N(f) to SMA(m) DC to 18 GHz, 50 Ω
1091-81-R
N(f) to SMA(f) DC to 18 GHz, 50 Ω

**All the options are upgradeable at Service Centers except T1 option.
***Option 5 and Options 51, 52 and 53 are mutually exclusive.
****Requires Option 31 GPS

Hardware Accessories
3-2000-1498
USB A/mini-B cable 10 ft
40-158-R
AC/DC Adapter
806-141-R
Automotive Cigarette Lighter/12 Volt DC Adapter
2000-1520-R
USB Flash Drive
3-806-152
Cross-over Ethernet cable
1091-27-R
Adapter, DC to 18 GHz, N(m) to SMA(f), 50 Ω
1091-172-R
Adapter, DC to 1.3 GHz, N(m) to BNC(f), 50 Ω

2250
Open/Short, DC to 18 GHz, N(m), 50 Ω
22NF50
Open/Short, DC to 18 GHz, N(f), 50 Ω
SM/PPL-1
Precision Load, DC to 6 GHz, 42 dB, N(m), 50 Ω
SM/PNF-1
Precision Load, DC to 6 GHz, 42 dB, N(f), 50 Ω
OSL50-1
Precision Open/Short/Load, DC to 6 GHz, 42 dB, 50 Ω, N(m)
OSLNF50-1
Precision Open/Short/Load, DC to 6 GHz, 42 dB, 50 Ω, N(f)
2000-767-R
Precision Open/Short/Load, DC to 4 GHz, 7/16 DIN(m), 50 Ω
2000-768-R
Precision Open/Short/Load, DC to 4 GHz, 7/16 DIN(f), 50 Ω
1091-26-R
N(m) to SMA(m) DC to 18 GHz, 50 Ω
1091-27-R
N(m) to SMA(f) DC to 18 GHz, 50 Ω
1091-80-R
N(f) to SMA(m) DC to 18 GHz, 50 Ω
1091-81-R
N(f) to SMA(f) DC to 18 GHz, 50 Ω

6
Adapters
- 510-90-R: 7/16 DIN(f) to N(m), DC to 7.5 GHz, 50 Ω
- 510-91-R: 7/16 DIN(f) to N(f), DC to 7.5 GHz, 50 Ω
- 510-92-R: 7/16 DIN(m) to N(m), DC to 7.5 GHz, 50 Ω
- 510-93-R: 7/16 DIN(m) to N(f), DC to 7.5 GHz, 50 Ω
- 510-96-R: 7/16 DIN(m) to 7/16 DIN(m), DC to 7.5 GHz, 50 Ω
- 510-97-R: 7/16 DIN(f) to 7/16 DIN(f), DC to 7.5 GHz, 50 Ω
- 510-102-R: N(m) to N(m), DC to 11 GHz, 50 Ω, 90° right angle

Precision Adapters
- 34NN50A: Precision Adapter, N(m) to N(m), DC to 18 GHz, 50 Ω
- 34NFNF50: Precision Adapter, N(f) to N(f), DC to 18 GHz, 50 Ω

Directional Antennas
- 2000-1411-R: Portable Yagi Antenna, 10 dBd, N(f), 822 to 900 MHz
- 2000-1412-R: Portable Yagi Antenna, 10 dBd, N(f), 885 to 975 MHz
- 2000-1413-R: Portable Yagi Antenna, 9.3 dBd, N(f), 1.71 to 1.88 GHz
- 2000-1414-R: Portable Yagi Antenna, 10 dBd, N(f), 2.4 to 2.5 GHz
- 2000-1415-R: Portable Yagi Antenna, 10 dBd, N(f), 2.4 to 2.5 GHz
- 2000-1416-R: Portable Yagi Antenna, 10 dBd, N(f), 1.92 to 2.17 GHz

GPS Antenna
- 2000-1410: Magnet Mount GPS Antenna with 15 ft. cable

Portable Antennas
- 2000-1200-R: 806 MHz to 866 MHz, SMA(m), 50 Ω
- 2000-1030-R: 1.71 GHz to 1.88 GHz, SMA(m), 50 Ω (1/2 wave)
- 2000-1031-R: 1.85 GHz to 1.99 GHz, SMA(m), 50 Ω (1/2 wave)
- 2000-1032-R: 2.4 GHz to 2.5 GHz, SMA(m), 50 Ω (1/2 wave)
- 2000-1035-R: 896 MHz to 941 MHz, SMA(m), 50 Ω (1/2 wave)
- 2000-1361-R: 1.71 GHz to 1.88 GHz with knuckle elbow (1/2 wave)
- 2000-1474-R: 1.71 GHz to 1.88 GHz with knuckle elbow (1/2 wave)
- 2000-1475-R: 1.92 GHz to 1.98 GHz and 2.11 GHz to 2.17 GHz, SMA(m), 50 Ω

Attenuator
- 42N50A-30: 30 dB, 50 W, Bi-directional, DC to 18 GHz, N(m) to N(f)

Cables
- 806-16-R: Bantam Plug to Bantam Plug
- 3-806-116: Bantam Plug to BNC
- 3-806-117: Bantam “Y” Plug to RJ48
- 3-806-169: 72-inch (1.8 m), BNC to BNC, 75.5 RG59 Type Coax Cable
- 806-176-R: Bantam Plug to Alligator Clips
- 806-177-R: RJ48 to RJ48

Band Pass Filters
- 1030-105-R: 890 to 915 MHz Band, N(m) to N(f), 50 Ω
- 1030-106-R: 1710 to 1970 MHz Band, N(m) to N(f), 50 Ω
- 1030-107-R: 1910 to 1990 MHz Band, N(m) to N(f), 50 Ω
- 1030-109-R: 824 to 849 MHz Band, N(m) to SMA(f), 50 Ω
- 1030-110-R: 860 to 915 MHz Band, N(m) to SMA(f), 50 Ω
- 1030-111-R: 1850 to 1910 MHz Band, N(m) to SMA(f), 50 Ω
- 1030-112-R: 2400 to 2484 MHz Band, N(m) to SMA(f), 50 Ω
- 1030-114-R: 806 to 869 MHz Band, N(m) to SMA(f), 50 Ω

Test Port Cable Armored
- 15NN50-1.5C: 1.5 meters, N(m) to N(m), 6 GHz, 50 Ω
- 15NNF50-1.5B: 1.5 meters N(m) to N(f), 18 GHz, 50 Ω
- 15NN50-3.0C: 3.0 meters, N(m) to N(m), 6 GHz, 50 Ω
- 15NN50-5.0C: 5.0 meters, N(m) to N(m), 6 GHz, 50 Ω
- 15NNF50-1.5C: 1.5 meters, N(m) to N(f), 6 GHz, 50 Ω
- 15NNF50-3.0C: 3.0 meters, N(m) to N(f), 6 GHz, 50 Ω
- 15NN50-5.0C: 5.0 meters, N(m) to N(m), 6 GHz, 50 Ω
- 15ND50-1.5C: 1.5 meters, N(m) to 7/16 DIN(m), 6 GHz, 50 Ω
- 15NDF50-1.5C: 1.5 meters, N(m) to 7/16 DIN(f), 6 GHz, 50 Ω

Power Monitor Detectors
- 560-7N50B: 0.01 to 20 GHz
- 560-7S50B: 0.01 to 20 GHz
- 560-7K50: 0.01 to 40 GHz
- 560-7VA50: 0.01 to 50 GHz

CW Signal Generator Kit
- 67276: CW Signal Generator Kit (includes the 4 parts listed below)
- 65-54: Attenuator, 0-90 dB (1 dB and 10 dB steps), 2.5 GHz, N(f), N(f)
- 510-102-R: Adaptor, N(m) to N(m), DC to 11 GHz, 50 Ω, 90° right angle
- SC7651: Power Splitter, 50 Ω, N(f), N(m), N(f)
- 67263: Cable, N(m), N(m)
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