

A High Performance – Handheld Base Station Analyzer

MT8222A

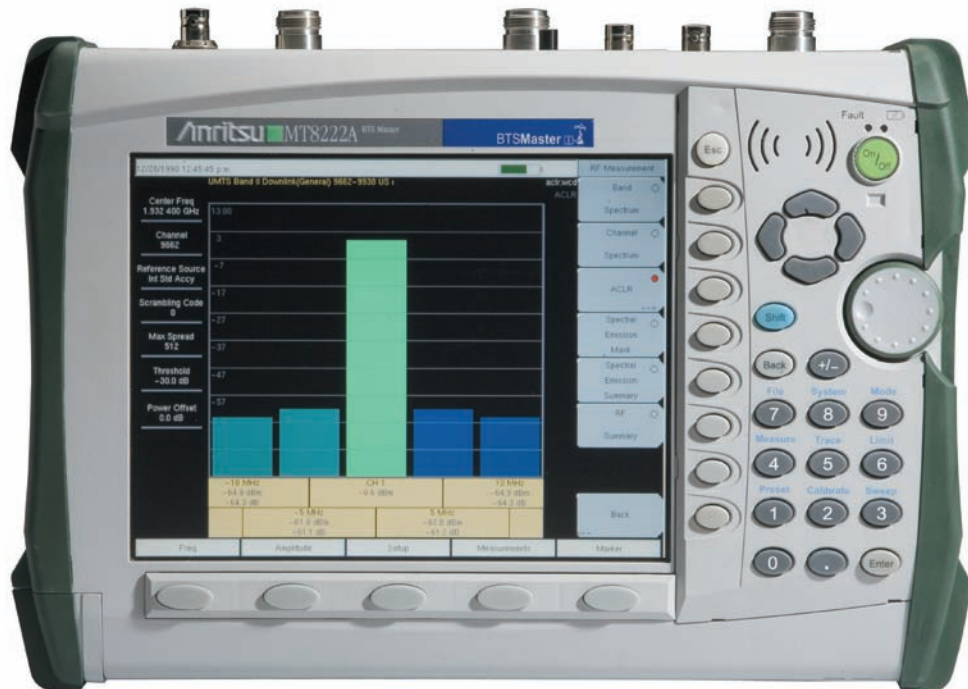
BTS Master™

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 4 GHz

Frequency Range (Option 26): 10 MHz to 6 GHz
(All other specs remain the same)

Frequency Accuracy: 25 ppm

Frequency Resolution: 10 kHz

Data Points: Low, Medium, High (137/275/551)

Interference Immunity: On-Channel: +17 dBm
On-Frequency: 0 dBm (RF Out) +30 dBc RF In

1-Port Power: High: 0 dBm (typical)

2-Port Power: High: 0 dBm (typical)
Low: -35 dBm (typical)

Corrected Directivity: 42 dB (10 MHz to 6 GHz)

1-Port Accuracy:

$= < 0.8 + |20 \log(1 \pm 10^{-E_{\Delta}})|$ dB, typical E_{Δ} = Directivity - Measured Return Loss

System Dynamic Range: 80 dB, 10 MHz to 3 GHz

70 dB, > 3 GHz to 5.5 GHz

65 dB, > 5.5 GHz to 6 GHz

Return Loss: Range: 0 to 60 dB
Resolution: 0.01 dB

VSWR: Range: 1 to 65
Resolution: 0.01

Cable Loss: Range: 0 to 30 dB
Resolution: 0.01 dB

1-Port Phase: Range: -180° to +180°
Resolution: 0.01°

Smith Chart: Resolution: 0.01

2-Port Gain: Range: -120 to 100 dB
Resolution: 0.01 dB

2-Port Phase: Range: -180° to +180°
Resolution: 0.01°

Distance-to-Fault: Fault Resolution (meters): $(1.5 \times 10^9 \times vp) / \Delta F$ vp is the propagation constant and ΔF is F2-F1 in Hz
Horizontal Range (meters): 0 to (data points-1) x Fault Resolution to a maximum of 1500m (4921 ft.)
where datapoints = 137/275/551

Vertical Range (Return Loss): 0 to 60 dB

Vertical Range (VSWR): 1 to 65

Spectrum Analyzer

Frequency:

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 μ s to 600 seconds (zero span)

Sweep Trigger: Free run, Single, Video, External

Resolution Bandwidth: (-3 dB width) $\pm 10\%$, 1 Hz to 3 MHz in 1-3 sequence 8 MHz demodulation bandwidth

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

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):

Frequency	Typical	Max
10 MHz to 1 GHz	-163 dBm	-161 dBm
> 1 GHz to 2.2 GHz	-160 dBm	-159 dBm
> 2.2 GHz to 2.8 GHz	-156 dBm	-153 dBm
> 2.8 GHz to 4.0 GHz	-160 dBm	-159 dBm
> 4.0 GHz to 7.1 GHz	-158 dBm	-154 dBm

Input-Related Spurious:

(-30 dBm input, 0 dB input attenuation, Span < 1.7 GHz)

-70 dBc typical -60 dBc max*

*Exceptions:

Input Frequency	Spur Level
1674 MHz	-38 dBc (-48 typical)

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 <3200 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)

-5894 MHz -75 dBm (-87 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, dB μ V

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 \leq +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 \leq -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)¹

(824 to 894 MHz, 1710 to 2170):

-54 dB typical at 5 MHz offset

-59 dB typical at 10 MHz offset

Leakage Ratio (ACLR)¹ (2300-2700 MHz):

-54 dB typical at 5 MHz offset

-57 dB typical at 10 MHz offset

ACLR Accuracy (Single Channel Active)

(824 to 894 MHz, 1710 to 2170):

± 0.8 dB for ACLR \geq -45 dB at 5 MHz offset

± 0.8 dB for ACLR \geq -50 dB at 10 MHz offset

ACLR Accuracy (Single Channel Active)

(2300-2700 MHz):

± 1.0 dB for ACLR \geq -45 dB at 5 MHz offset

± 1.0 dB for ACLR \geq -50 dB at 10 MHz offset

Frequency Error: ± 10 Hz + Time Base Error,

99% confidence level:

± 10 Hz + Time Base Error, 99% confidence level

W-CDMA Demodulation and W-CDMA/HSDPA Demodulator (Options 45 and 65)

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

(3GPP Test Model 4) $\pm 2.5\%$; $6\% \leq \text{EVM} \leq 25\%$
(3GPP Test Model 5) $\pm 2.5\%$; $6\% \leq \text{EVM} \leq 20\%$
(2300 MHz to 2700 MHz)

EVM Accuracy: $\pm 2.5\%$ for $6\% \leq \text{EVM} \leq 20\%$

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 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: $+12\text{V}$ to $+32\text{V}$

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:

Monitors one particular frequency or scan the span and identify up to 12 signals. 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 within 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: $\pm 1.5\%$

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 1xRTT 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 $\text{Rho} > 0.9$

Frequency Error: ± 10 Hz + Time base error, 99% confidence level (in slow mode)

PN Offset: with 1×64 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 $\text{Rho} > 0.9$

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

PN Offset: within 1×64 chips

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

Tau: ± 0.5 μs typical (± 1 μs maximum)

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

Over The Air Measurement: Nine strongest pilots with Tau and Ec/Io. Six multipaths relative to strongest pilot.

Fixed WiMAX RF Measurements (Option 46)

Channel Power Accuracy¹: ± 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

¹Channel 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 μ s (external trigger)

Supported Modulation: QPSK

Spreading Factor: 1, 16

TD-SCDMA Over the Air (OTA) Measurements (Option 38)

32 codes displaying Ec/Io, Tau

Frequency Error:
 ± 0.02 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
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: 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
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 ($\pm 5\%$), can also display in dBdsx

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: Error seconds (ES), error free seconds (EFS),
severely errored seconds (SES), unavailable seconds (UAS),
available seconds (AS), degrade minutes (DGRM)

E1 - 2 MB/s Bit-Error-Rate-Tester (BERT), (Option 52)

E1 - 2 MB/s Analyzer, sub-channels

BER testing: BER testing at 2.048 MB, 64, 16 and 8 kB rates

Line Coding: AMI, HDB3

Framing Modes: PCM30, PCM30CRC-4, PCM31, PCM31CRC-4

Connection Configurations: Terminate: 75 Ω BNC unbalanced, 120 Ω
RJ48C balanced
Bridge: > 1000 Ω
Monitor: Connect via 20 dB pad in DSX

Receiver Sensitivity: Terminate: +6 dB to -43 dB
Bridge: +6 dB to -43 dB
Monitor: 20 dB flat gain

Clock Sources: External: Sets clock,
Internal: 2.048 MHz ± 5 ppm

Pulse Shapes: Conform to 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, User defined ≤ 32 bits)

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

Alarm Detection: AIS, RAI, MFAS RAI (PCM-30)

Error Detection: Frame Bits, BER (FAS), Bit, CRC-4, E-Bits, BPV

Error Analysis: Error rates, Error Counts

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

Error Insertion: E-bit, Framing Bits (FAS), RAI, AIS

Loopback Modes: Self loopback

Level Measurements: Vp-p ($\pm 5\%$)

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: -30 to 0 dBm with 1 dB steps

Audio Monitor: manually select channel 1-31

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

T3/T1/FT1 Bit-Error-Rate-Tester (BERT), (Option 053)

T3 Analyzer

Line Coding: B3ZS, AMI

Framing Modes: Unframed, M13, C-bit

Connection Configurations: Terminate (75 Ω) BNC unbalanced
Monitor (Connect via 20 dB pad in DSX)

Receiver Sensitivity: +6 dB to -24 dB

Transmit Level: DSX, 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, Bit, BER, BPV, FEBC,
C-bit, P-bit, Error Sec

Error Insertion: Bit, Framing Bits

Loopback Modes: Stuff Bit (M13 & C-bit): 1 of DS1
FEAC (C-bit): DS3, 1 of DS1 all DS1

Level Measurements: Vp-p ($\pm 5\%$), can also display in dBdsx

Data Log: Continuous, up to 72 hrs

T3 Frequency Measurement: ± 5 ppm

ITU G-821 Analysis: Errored seconds, error free seconds,
severely errored seconds, unavailable seconds,
available seconds, degraded minutes (32 bits)

T1 Analyzer, Fractional T1 and sub-channels

BER Testing: 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 balanced, Bantam
Bridge: \leq 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: External Bits clock,

Internal: 1.544 MHz \pm 5 ppm

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 (\leq 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 (\pm 5%), can also display in dBdsx

Data Log: Continuous, up to 72 hrs

T1 Frequency Measurement: \pm 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, \pm 3 Hz

Level: -40.0 to +3.0 dBm, \pm 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 μ s to 65 ms typical

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

See Product Brochure 11410-00546

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: \pm 1.0 dB typical, (RF input -50 to +10 dBm)

LTE Modulation Measurements (Option 0542)

Frequency Error: \pm 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: \pm 60 dB

Interfaces: USB A/mini-B 2.0

General Specifications

Maximum Continuous Input into Spectrum Analyzer:

10 dB attenuation, +30 dBm, \pm 50 VDC

RF Input VSWR: 2.0:1 maximum, 1.5:1 typical (\geq 10 dB attenuation)

Internal Time Base Accuracy: \pm 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, \pm 50 VDC

Environmental: MIL-PRF-28800F Class 2

Operating: -10 $^{\circ}$ C to 55 $^{\circ}$ C, humidity 85%

Storage: -51 $^{\circ}$ C to 71 $^{\circ}$ 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.)

* 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

Ordering Information

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/HSDPA Analyzer

Frequency Range: 824 to 894 MHz, 1710 to 2170 MHz, and 2300 to 2700 MHz

GSM/GPRS/EDGE Analyzer

Frequency Range: 380 to 400 MHz, 410 to 430 MHz, 450 to 468 MHz, 478 to 496 MHz, 698 to 746 MHz, 747 to 792 MHz, 806 to 866 MHz, 824 to 894 MHz, 890 to 960 MHz, 880 to 960 MHz, 876 to 960 MHz, 870 to 921 MHz, 1710 to 1990 MHz

Fixed WiMAX Analyzer

Frequency Range: 2.3 to 2.7 GHz, 3.3 to 3.8 GHz, 5.25 to 5.875 GHz

Mobile WiMAX Analyzer

Frequency Range: 2.3 to 2.7 GHz, 3.3 to 3.8 GHz

CDMA Analyzer

Frequency Range: 1 MHz to 2.7 GHz

EVDO Analyzer

Frequency Range: 1 MHz to 2.7 GHz

TD-SCDMA Analyzer

Frequency Range: 400 MHz to 2.7 GHz

Options

MT8222A-005	Power Monitor (requires external detector)**
MT8222A-010	Bias Tee variable voltage
MT8222A-10A	High Voltage Bias Tee
MT8222A-019	High Accuracy Power Meter (PSN50 sensor not included)
MT8222A-025	Interference Analysis
MT8222A-026	6 GHz Cable and Antenna Analyzer (10 MHz to 6 GHz)
MT8222A-027	Channel Scanner
MT8222A-028	CW Signal Generator (requires CW Signal Generator kit)
MT8222A-031	GPS Receiver (includes GPS antenna, Anritsu part number: 2000-1410)
MT8222A-033	cdmaOne and CDMA2000 1xRTT Over The Air (OTA)****
MT8222A-034	EVDO Over the Air (OTA)****
MT8222A-035	W-CDMA/HSDPA (OTA)****
MT8222A-037	Mobile WiMAX Over The Air (OTA) Measurements
MT8222A-038	TD-SCDMA Over The Air (OTA) Measurements
MT8222A-040	GSM/GPRS/EDGE RF Measurement
MT8222A-041	GSM/GPRS/EDGE Demodulation
MT8222A-042	CDMA RF Measurements
MT8222A-043	cdmaOne and CDMA2000 1xRTT Demodulator
MT8222A-044	W-CDMA/HSDPA RF Measurement
MT8222A-045	W-CDMA Demodulation
MT8222A-046	Fixed WiMAX RF Measurement
MT8222A-047	Fixed WiMAX Demodulation
MT8222A-051	T1/FT1 BERT (Bit-Error-Rate-Tester)**
MT8222A-052	E1-2 Mb/s Bit-Error-Rate-Tester (BERT)**
MT8222A-053	T3/T1/FT1 BERT (Bit-Error-Rate-Tester)**
MT8222A-060	TD-SCDMA RF Measurement
MT8222A-061	TD-SCDMA Demodulation
MT8222A-062	EVDO RF Measurements
MT8222A-063	EVDO Demodulator
MT8222A-064	DVB-T/H Digital Video Measurement
MT8222A-065	W-CDMA/HSDPA Demodulation***
MT8222A-066	Mobile WiMAX RF Measurements

MT8222A-067	Mobile WiMAX Demodulator
MT8222A-090	Gated Sweep
MT8222A-0419	PIM Analyzer (requires PIM Master™)
MT8222A-0541	LTE RF Measurements
MT8222A-0542	LTE Modulation Measurements
MT8222A-0546	LTE Over-the-Air 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	USB A/mini-B cable 10 ft
3-1010-122	Attenuator (Bi-directional), 20 dB, 5 watt, DC to 12.4 GHz, N(m) to N(f)
3-1010-123	Attenuator (Bi-directional), 30 dB, 50 watt, DC to 8.5 GHz, N(m) to N(f)
3-1010-124	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
633-44	Rechargeable Li-Ion Battery
40-168-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 (15 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	Limiter, N(m) to N(f), 50 Ω, 10 MHz to 18 GHz
790-641	Cable Lock
42N50-20	Attenuator, 20 dB, 5 watt, DC to 18 GHz, N(m) to N(f)
42N50A-30	Attenuator, 30 dB, 50 watt, DC to 18 GHz, N(m) to N(f)
22N50	Open/Short, DC to 18 GHz, N(m), 50 Ω
22NF50	Open/Short, DC to 18 GHz, N(f), 50 Ω
SM/PL-1	Precision Load, DC to 6 GHz, 42 dB, N(m), 50 Ω
SM/PLNF-1	Precision Load, DC to 6 GHz, 42 dB, N(f), 50 Ω
OSLN50-1	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.

***Option 65 includes Option 45.

****Requires Option 31 GPS

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
34NFN50	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, 10 dBd, N(f), 1.71 to 1.88 GHz
2000-1414-R	Portable Yagi Antenna, 9.3 dBd, N(f), 1.85 to 1.99 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
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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	2.4 GHz to 2.5 GHz, 5 GHz to 6 GHz, SMA(m), 50 Ω
2000-1473-R	870 MHz to 960 MHz, SMA(m), 50 Ω
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
2000-1636-R	Antenna Kit (Consists of: 2000-1030-R, 2000-1031-R, 2000-1032-R, 2000-1200-R, 2000-1035-R, 2000-1361-R, and carrying pouch)

Attenuator

42N50A-30	30 dB, 50 W, Bi-directional, DC to 18 GHz, N(m) to N(f)
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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 1790 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	880 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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