

# Anritsu

## MX880118A

### DECT Measurement Software

(For MT8801B Radio Communication Analyser)



*High-Speed Tester for DECT Fixed and Portable Parts*

## DECT

# High-Speed Tester for DECT Fixed and Portable Parts

In keeping with its commitment to the global telecommunications industry, Anritsu has introduced the DECT option for the MT8801B Radio Communications Analyser.

Aimed primarily at high volume manufacturing and Research & Developing applications, the DECT option adds further to the flexibility of the MT8801B. The MT8801B already supports many other standards, such as GSM, PHS, PDC and IS-136A, and therefore is able to support future dual-mode systems.

Since its introduction, The Digital Enhanced Cordless Telecommunications (DECT) standard has been successfully addressing a wide number of applications with the full endorsement of ETSI. The RF tests described in this brochure are all compliant with the ETSI TBR06 specification and allow the user to test both Portable Part (PP) and Fixed Part (FP) DECT equipment.

The DECT option for the MT8801B Radio Communications Analyser offers:

- Accuracy and Speed
- Multiple System Capability
- Built-in Spectrum Analysis
- Adjacent Channel Power Measurement
- Fast "All-Measure Mode" < 6 s (PP)
- Complete Remote Control



# Measurements

The following table summarises the ETSI test cases supported by the MT8801B. The test cases are detailed in the ETS 300 176-1 (Nov 1996)

ETS 300 176-1		Test
Test case	Section ref.	
1	7	Accuracy and stability of RF carriers
2	8.3	Timing jitter: slot-slot on same channel
4	8.4	Reference timing accuracy of a RFP
4b	8.5	Measurement of packet transmission accuracy
5	9	Transmission Burst (Power against Time)
6	10.2	Transmitted power - integral antenna
7	10.3	Transmitted power - external antenna connection
8	11	RF carrier modulation
9	12.2	Emissions due to modulation
10	12.3	Emissions due to transmitter transients
14	13.1	Radio receiver sensitivity
15	13.2	Radio receiver reference bit error rate
16	13.3	Radio receiver interference performance*
17	13.4	Radio receiver blocking case 1 *
18	13.5	Radio receiver blocking case 2 *
19	13.6	Receiver intermodulation performance *

\* For use with external signal generators such as MG3670C

# MAC Layer Support

The MT8801B is capable of establishing MAC layer communication to the Device Under Test. To enable testing of a Portable Part, the MT8801B uses the DECT protocol to emulate a Fixed Part, likewise, to test a Fixed Part, the MT8801B emulates a Portable Part.

Once Communication has been established, special MAC layer test messages are sent to the DUT as part of the testing process.

The following MAC layer test messages are supported as listed below:

- Force\_Transmit
- Loopback\_Data
- Defeat\_Antenna\_Diversity
- Clear\_Test\_Mode

The MAC layer may be disabled enabling the user to carry out diagnostic tests at board or module level. In this mode the MT8801B will measure continuous or burst Tx signals, and can generate continuous or burst DECT signals for Rx testing.



# Fast, High-Accuracy Transmitter Measurements

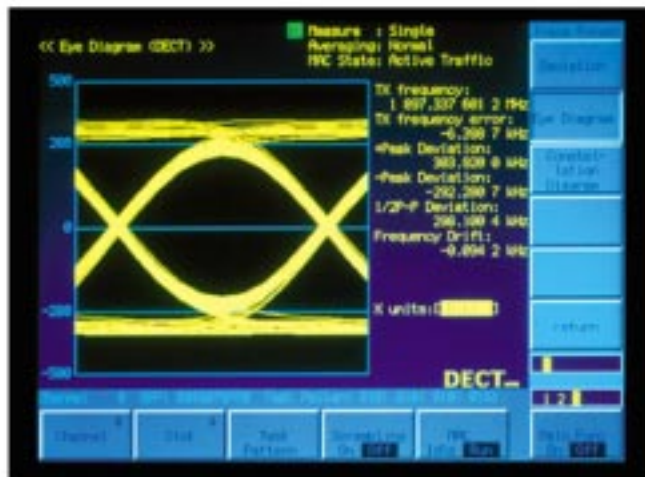
## Modulation Analysis

These tests allow the user to perform the following ETSI test cases:

ETSI test case 1,  
Accuracy and Stability of RF carriers

ETSI test case 8,  
RF Carrier modulation

The user can display the waveform as either Frequency Deviation, Eye Diagram or Constellation Diagram to easily show any irregularities in the modulation.



## Transmitter Burst Measurements

ETSI test case 5,  
Transmission Burst (Power against Time)

The following test can be performed by the MT8801B providing high accuracy power measurements including Normal Transmitter Power (NTP) during the "on portion" of the burst as well as leakage power during carrier-off. These results are then displayed against either the standard or user-defined Burst Template.



# Ultra-fast Adjacent Channel Power Measurements

Utilising the latest DSP technology and Anritsu's innovative high-speed Spectrum Analysis method, Adjacent Channel Power tests can be completed in under 7 seconds (PP) and 12 seconds (FP) approx. This is achieved without additional equipment and can be performed while maintaining a duplex traffic bearer.

ETSI test case 9,  
Emissions due to Modulation

ETSI test case 10,  
Emissions due to Transmitter Transients



## Overall Pass/Fail using "ALL MEASURE" Mode

To speed up the overall Pass/Fail verification process which would normally require a large number of individual tests, Anritsu has implemented the ALL MEASURE mode.

This provides a fast PASS/FAIL decision, made against user defined limits for all of the main transmitter measurements. These can include: RF Carrier accuracy and stability, Transmission Burst (Power against Time), Transmitter Power, RF Carrier Modulation and Adjacent Channel Power measurements.



The MX880118A software provides the PASS/FAIL analysis result: this is accomplished without any additional user intervention or external control.



# Adaptive Bit Error Rate Test Reduces BERT Test Time

## Adaptive BER Receiver Testing

The ETSI specification requires a large number of bit samples to be taken to provide sufficient confidence that a receiver meets the required performance criteria. If, however, during the first samples the BER is substantially better than that required, the receiver may be deemed to have passed with a high enough level of confidence. Anritsu's Adaptive BER Test provides the ability to optimise the measurement without compromising measurement accuracy using a two-stage process to get an accurate pass/fail, automatically using more or less samples as required. Anritsu recognises that all receivers are different and therefore provides the user with total flexibility to define any early pass criteria as well as the normal test limits.

For each test there is one FER and two BER measurements. The two BER measurements, one quick and the other full, allow the number of samples required to conclude a test to be adapted to suit the receiver being tested.

Using the internally modulated signal source of the MT8801B, receiver testing can be performed using the specified ETSI Loopback method.

ETSI test case 14,  
Radio receiver sensitivity

ETSI test case 15,  
Radio receiver reference Bit Error Rate

\*ETSI test case 16,  
Radio receiver interference performance

\*ETSI test case 17,  
Radio receiver blocking case 1

\*ETSI test case 18,  
Radio receiver blocking case 2

\*ETSI test case 19,  
Receiver Intermodulation performance



Note\* For use with external signal generators such as MG3670C

# Specifications

## • MX880118A DECT Measurement Software

Frequency modulation measurement	Frequency range	10 MHz to 2.2 GHz
	Signal input level range	-5 dBm to +40 dBm (Main connector) -30 dBm to +15 dBm (Auxiliary connector)
	RF carrier accuracy	±250 Hz + Ref. Osc. Accuracy
	Frequency drift measurement accuracy	±250 Hz
	Modulation measurement accuracy	±10 kHz
	Wave form display	Deviation v. Bit, Eye Diagram, Constellation Diagram.
RF power measurement	Frequency range	10 MHz to 2.2 GHz
	Signal input level range	-5 dBm to +40 dBm (Main connector)
	Calibration input level range	+15 dBm to +40 dBm (Main connector)
	Power measurement Accuracy	±0.4 dB <sup>1</sup> (+15 to +40 dBm) ±0.7 dB <sup>1</sup> (-5 to +15 dBm)
	Carrier - off power Measurement range	Normal mode: ≥ 50 dB <sup>2</sup> Wide dynamic range mode: ≥ 69 dB <sup>2</sup>
	Rise/Fall characteristics	Display rising/falling edges while synchronising to modulation data of signal to be measured. Standard template display possible.
Timing measurement	Jitter	
Adjacent channel power measurement (high speed)	Frequency range	100 MHz to 2.2 GHz
	Emission due to <sup>3</sup> modulation	M±1 -8 dBm / 160 µW M±2 -30 dBm / 1 µW M±3 -44 dBm / 40 µW M±4, M±5 -47 dBm / 20 µW
	Emission due to <sup>3</sup> transmitter transient	M±1 -6 dBm / 250 µW M±2 -13 dBm / 40 µW M±3 -23 dBm / 4 µW M±4, M±5 -30 dBm / 1 µW
	Measurement items	Frequency, Deviation, Frequency drift, Tx power, Carrier-off power, Template pass fail, Timing, Adjacent channel emission
Error rate measurement	Modes	FER, BER (Quick Mode), BER (Full Mode)
	Number of samples	1k to 99000k
Power meter	Frequency range	300 kHz to 3 GHz
	Level range	0 to +40 dBm
	Measurement accuracy	±10% (±0.4 dB) (after zero point calibration)
Signal generator	Frequency range	10 MHz to 3 GHz
	Accuracy	Reference frequency accuracy ± 0.1 Hz
	Resolution	1 Hz
	Level range	-143 dBm to -28 dBm (Main connector) -143 dBm to -3 dBm (Auxiliary connector)
	Accuracy	10 MHz to 1 GHz (≥ -123 dBm) ±1.5 dB 10 MHz to 1 GHz (≥ -133 dBm) ±3 dB >1 GHz (≥ -123 dBm) ±2 dB >1 GHz (≥ -133 dBm) ±4 dB
	Resolution	0.1 dB
	Modulation system	GFSK, BbT=0.5
	Deviation	0 to 550 kHz
	Modulation error	≤ ± 8% (at 288 kHz deviation, freq: 10 MHz to 2.2 GHz)
	Burst repeat period	One burst in one frame or non burst signal (generic mode)
Modulation data	0000111100001111, 0011001100110011, 0101010101010101 1010 64x1 64x0 1010, Pseudo-RandomD-M2, ETSI patterns	
Call processing function	Bearer Setup, Bearer Release, Handover Loopback	
Synchronisation	External, (Rising); Internal	

### Notes:

1. After calibration by using built-in power meter.
2. Compared with 250 mW of burst average power, as measured by MT8801B. Measurement limit is determined by average noise level ≤ -45dBm.
3. Where M=current DECT channel and its measured power = 250 mW (+24 dBm).

For full instrument specification, refer to the MT8801B data sheet.



# Ordering Information

Model/Order No.	Item
MT8801B *	<b>Instrument</b> Radio Communication Analyser
J0576B	<b>Standard Accessories</b> Coaxial cord N-P-5D-2W-N-P, 1m
J0768	Coaxial adapter N-J-TNC-P 2 pcs
J0017F	Power cord 2.6m
F0014	Fuse 6.3A for 100V/200V system 2 pcs
MX880118A	<b>Software Options</b> DECT Measurement Software
MX880113A	IS-136A Measurement Software
MX880115A	GSM Measurement Software
MX880116A	PDC Measurement Software with Call Processing
MX880117A	PHS Measurement Software with Call Processing
MX880131A	PDC Measurement Software
MX880132A	PHS Measurement Software
MT8801B-01	<b>Options</b> Analog measurements
MT8801B-02	SG local - this is mandatory with DECT software
MT8801B-07	Spectrum analyser - this is mandatory with DECT software
J0127C	<b>Optional Accessories</b> Coaxial cord BNC-PRG-58A/U-BNC-P, 0.5m
J0769	Coaxial adapter BNC-J-TNC-P
J0040	Coaxial adapter N-P BNC-J
J0007	GPIB connection cable 408JE-10 1, 1m
J0008	GPIB connection cable 408JE-10 2, 2m
J0742A	RS-232C cable 1m, D-sub 25pins, for PC-9800 Series personal computer of NEC Corp.
J0743A	RS-232C cable 1m, D-sub 9pins, for IBM PC/AT personal computer
MN1607A	Coaxial switch DC to 3GHz, 50W, externally controllable
MA1612A	4-Port junction pad 5MHz to 3GHz
J0395	Attenuator for high power 30dB, 30W, DC to 9GHz
MA5611A	Antenna
B0329D	Protective cover
B0331D	Front handle kit 2 pcs/set
B0332	Coupling plate 4 pcs/set
B0333D	Rack mounting kit
B0334D	Carrying case with casters and protective cover

Note\* For use with DECT measurement software options 02 and 07 are required

# Anritsu

Specifications are subject to change without notice.

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