

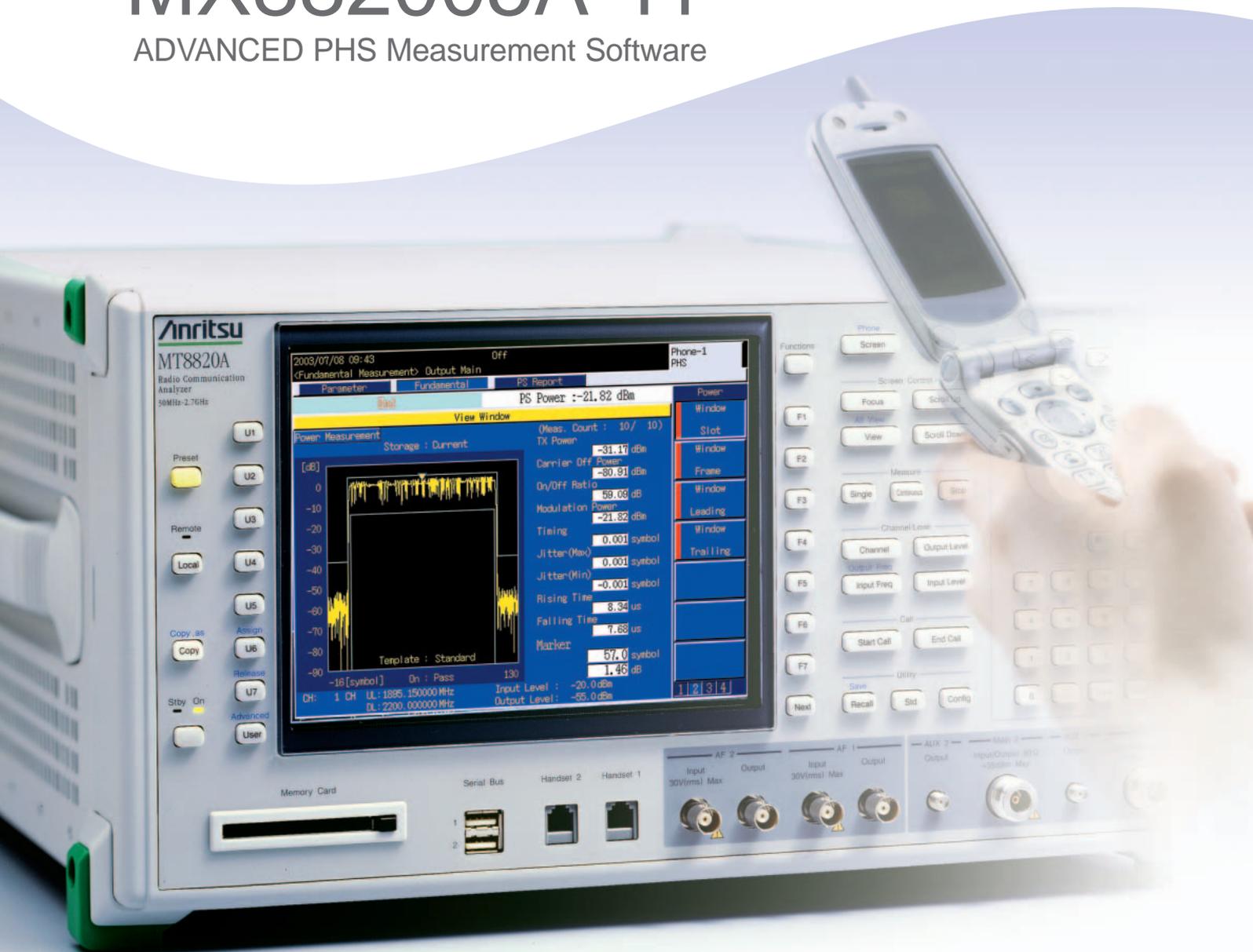
For MT8820A Radio Communication Analyzer

MX882005A

PHS Measurement Software

MX882005A-11

ADVANCED PHS Measurement Software



MX882005A

PHS Measurement Software

Solution for PHS terminals and base stations production lines

The MX882005A PHS Measurement Software supports transmission and reception measurements of mobile terminals conforming to the PHS system which is spreading through the world centering on Asia including Japan. By installing the MX882005A PHS Measurement Software in the MT8820A mainframe, one unit can evaluate major transmission and reception characteristics of PHS terminals and base stations. Advanced DSP and parallel measuring technologies greatly reduce manufacturing and test time for PHS terminals and base stations.

In addition, multiple measurement items can be selected freely for batch processing while the number of repetitive measurements can be set for each individual measurement.

In PHS measurement, selected items for measurement can be batch-measured with just one touch, thus a Pass/Fail evaluation on major test items such as transmission frequency, modulation accuracy, transmission power, adjacent channel power and BER can be conducted simply and quickly.

It can be built into automated production lines and can create an automated test system in maintenance site as the GPIB interface is equipped as standard.

• PHS measurement item

Transmitter measurement	Output power
	Modulation accuracy
	Occupied bandwidth
	Adjacent channel power
	Transmission rate
Receiver measurement	Bit error ratio

Transmission Measurement

Transmission Power

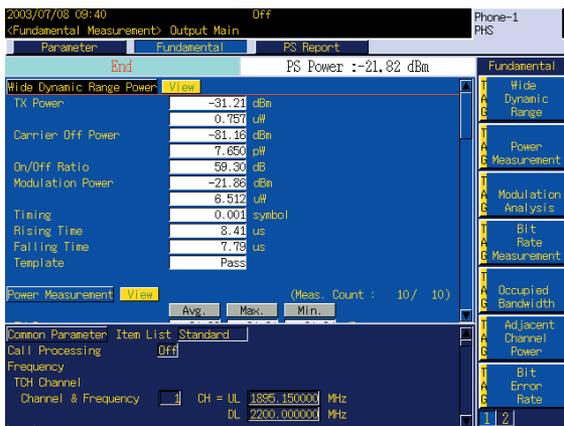
RF power and carrier-off leakage power of PHS terminals and base stations are measured. Maximum, average and minimum values of measured results are displayed by setting the number of repetitive measurements to 2 or above, so the variations in PHS terminal characteristics can be assessed. This repetitive measurement function is also equipped for other measurements.



Normal measurement

Wide Dynamic Range Mode

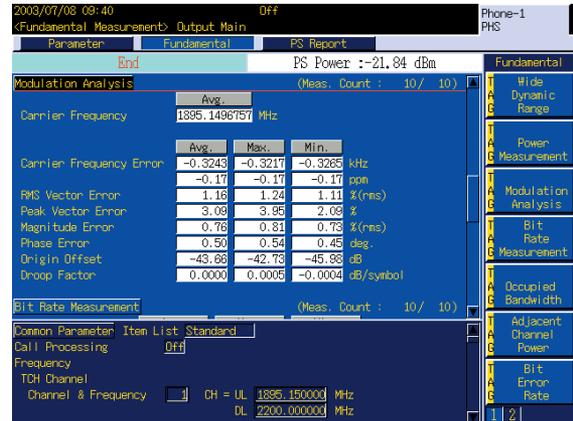
For carrier-off leakage power, the absolute value and On/Off ratio are measured. When the carrier-off level is low, measurement can be performed in the wide dynamic range mode.



Wide dynamic range mode

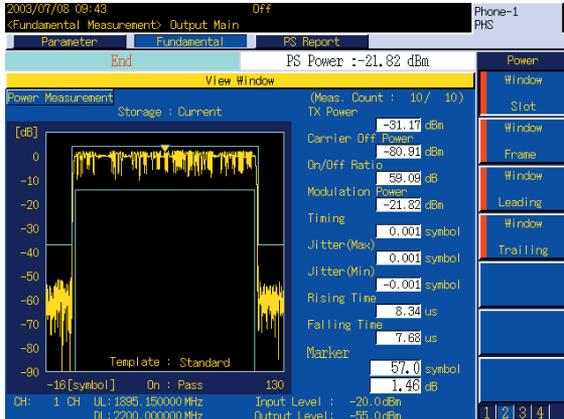
Modulation Accuracy

Frequency, frequency errors (in kHz and ppm), modulation accuracy, phase error, amplitude error and origin offset of PHS terminals and base stations are measured simultaneously. The waveform display function is also equipped.

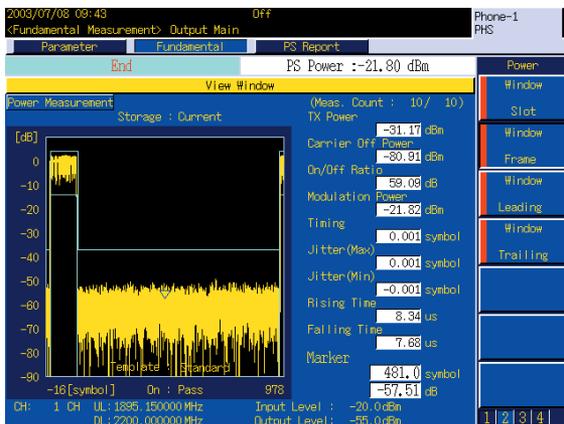


Burst Waveform Display

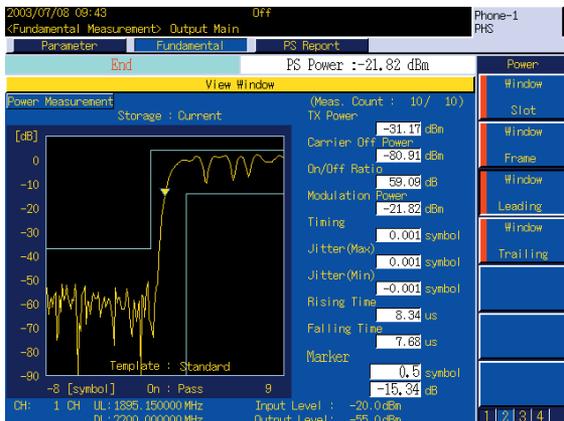
Graphical display of the burst waveform is also available. Magnified display of the entire time slot and the whole frame as well as the rising/falling edges enables users to confirm at a glance whether or not the burst waveform meets the PHS standard template.



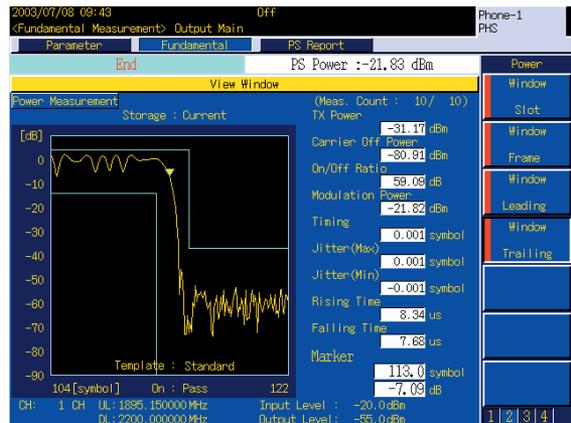
Entire time slot



Whole frame



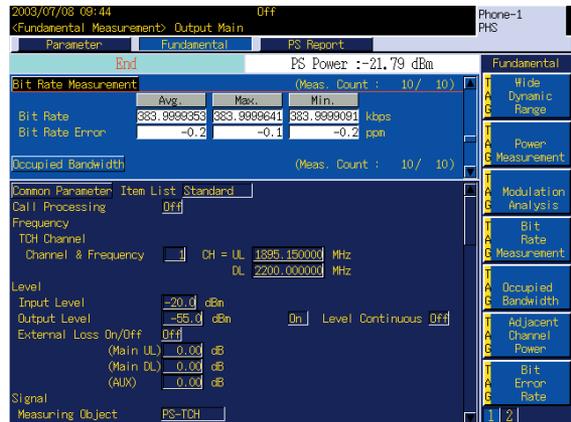
Rising edge



Falling edge

Transmission Rate

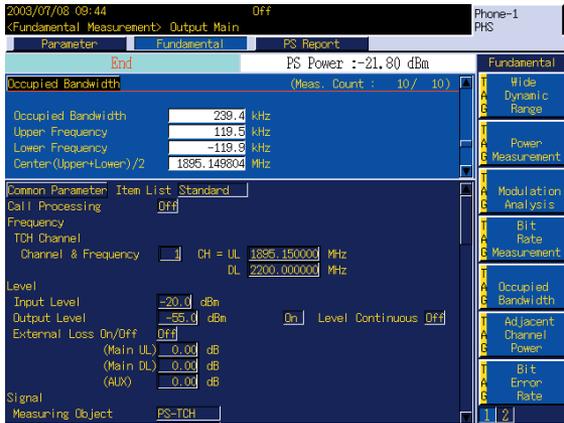
Transmission rate and transmission speed error of PHS terminals and base stations can be measured.



Occupied Bandwidth

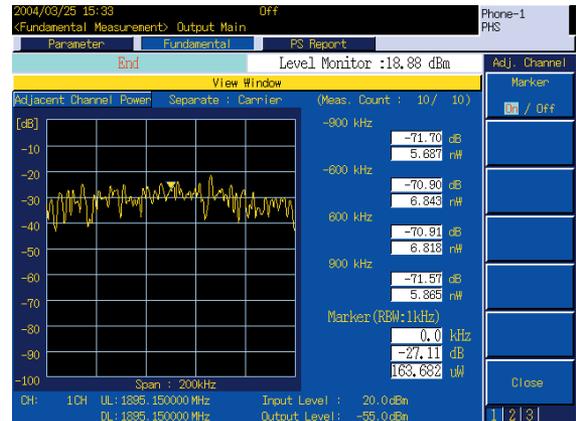
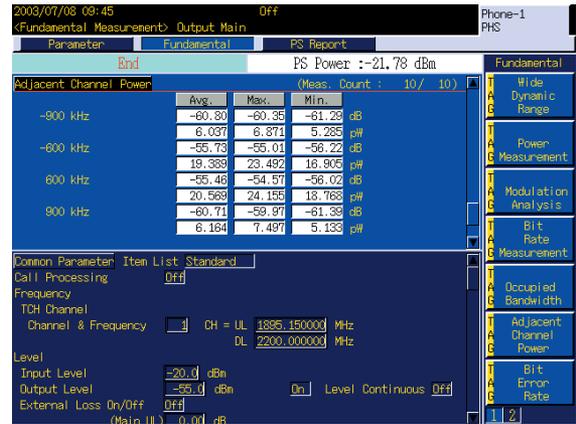
Occupied bandwidth of PHS terminals and base stations is measured.

The bandwidth ratio for total power can be changed within the range of 80.0 to 99.9%. Measurements can be performed in the high-speed mode. Waveform can be displayed in the normal mode.



Adjacent Channel Power

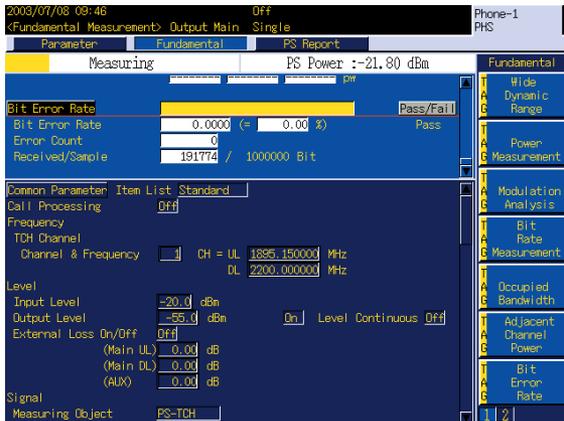
Adjacent channel power of PHS terminals and base stations is measured. Power spectrum is measured at 4 frequency points, -900 kHz, -600 kHz, +600 kHz and +900 kHz, offset from the carrier frequency. Advanced DSP technology and parallel processing of power spectrum with other measurements enable high-speed measurement. In addition, the waveforms can be displayed.



Reception Measurement

Error Rate Test

Bit error rate can be measured on receipt of demodulation data and clocks output from a PHS terminal/base station by controlling the PHS terminal with external PC etc. This measurement can be performed in parallel with transmitter measurement.

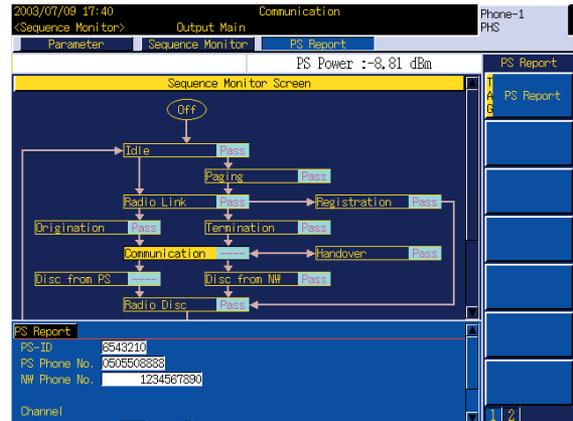


Bit error rate measurement

Call Processing Function

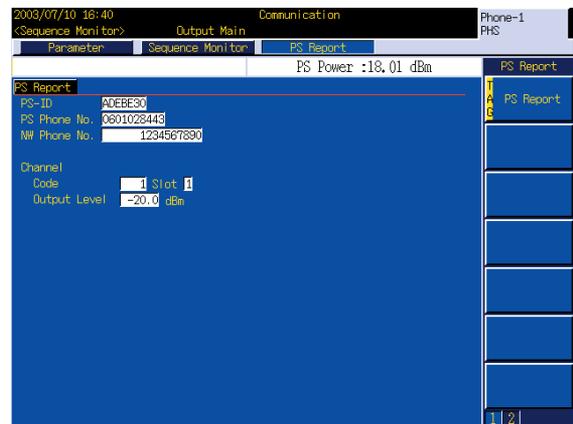
Connection Link Test

The call processing function enables to perform various connection tests including location registration, terminal call origination, network call origination, call communication, disconnection from network, disconnection from mobile terminal and handover. During a call, the user's speech can be echoed back from the mobile terminal to provide a simple voice communication test.



Mobile Terminal Report Monitor

Mobile terminal information reported by a PHS terminal is displayed on the screen. As well as the dial network number, this information includes the identification code (PS-ID) and phone number of the PHS terminal.



Sequence Monitor

Functions of a PHS terminal can be operated and verified by using the call processing function. The MT8820A simulates the PHS base station and displays the sequence screen. On this screen, Pass/Fail judgment results of connection test for location registration, call origination, call termination, communication, handover (for THC switch type), disconnection from network, disconnection from mobile terminal, etc., can be checked at a glance.



Transmission Test in Communication State

A transmission test can be performed in communication state. As well as being able to conduct evaluations in actual communication with the base station, transmission measurement can be performed regardless of restrictions on test controls, which vary depending on carriers and manufacturers. This function contributes greatly to production and maintenance.

Parameter	Avg.	Max.	Min.	Unit	Pass/Fail
TX Power	6.67	6.67	6.67	dBm	Pass
Carrier Off Power	-55.82	-55.82	-55.82	dBm	Pass
On/Off Ratio	71.88	71.88	71.88	dB	Pass
Modulation Power	16.04	16.04	16.04	dBm	Pass
Timing Jitter	-0.673	-0.673	-0.673	symbol	Pass

Measurement Result Evaluation Function

The upper and lower limits of the normal value can be specified for each item and Pass/Fail of measurement results can be displayed.

This function is useful for identifying fault parts at maintenance sites.

Parameter	Avg.	Max.	Min.	Unit	Pass/Fail
TX Power	9.52	9.52	9.51	dBm	Pass
Carrier Off Power	-48.50	-48.42	-48.56	dBm	Pass
On/Off Ratio	67.38	67.42	67.28	dB	Fail
Modulation Power	18.88	18.87	18.88	dBm	Pass
Timing Jitter	0.000	0.001	-0.002	symbol	Pass

High-speed, User-friendly GPIB Controls

Eliminating Dependence on Measurement Screen

Readout and changes of settings can be performed freely without having to change screens, even when no items that exist on screen are currently being displayed. This controls loss time effects, crucial for screen plotting.

Batch Measurement Results Readout Command

All results for batch measurements can be read out with one "ALLMEAS?" command. In addition, the desired measurement results can be selected for readout by specifying measurement targets such as "ALLMEAS? MOD" (Modulation Analysis). Decreases in the number of GPIB commands lower the load for the MT8820A and controller PC while enhancing measurement throughput. Since the step size of a control program is reduced, it's effective in creating a control program with high maintainability that's easy to view.

Specifications

MT8820A-02 TDMA measurement hardware, MX882005A PHS measurement software

Frequency/modulation measurement	<p>Frequency: 300 to 2200 MHz</p> <p>Input level (Average power within burst, Main Input/Output):</p> <ul style="list-style-type: none"> -30 to +40 dBm (Measurement object: PS-TCH, PS-SYNC, CS-TCH, CS-SYNC) -30 to +35 dBm (Measurement object: Continuous wave) <p>Carrier frequency accuracy: \pm (setting frequency x accuracy of the reference oscillator + 10 Hz)</p> <p>Modulation accuracy: \pm (2% of indicated value + 0.7%)</p> <p>Origin offset accuracy: \pm0.5 dB to signal level of -30 dBc</p> <p>Transmission rate: \pm1 ppm (Measurement range 384 kbps \pm100 ppm)</p>
Amplitude measurement	<p>Frequency: 300 to 2200 MHz</p> <p>Input level (Average power within burst, Main Input/Output):</p> <ul style="list-style-type: none"> -30 to +40 dBm (Measurement object: PS-TCH, PS-SYNC, CS-TCH, CS-SYNC) -30 to +35 dBm (Measurement object: Continuous wave) <p>Measurement accuracy (After calibration):</p> <ul style="list-style-type: none"> \pm0.5 dB (-20 to +40 dBm), \pm0.7 dB (-30 to -20 dBm) <p>Linearity: \pm0.2 dB (0 to -40 dB, \geq -30 dBm)</p> <p>Carrier-off power measurement range:</p> <ul style="list-style-type: none"> \geq 55 dB, \geq (Magnitude measurement value [dBm] + 70) dB (Wide dynamic range power measurement)
Occupied bandwidth	<p>Frequency: 300 to 2200 MHz</p> <p>Input level (Average power within burst, Main Input/Output):</p> <ul style="list-style-type: none"> -10 to +40 dBm (Measurement object: PS-TCH, PS-SYNC, CS-TCH, CS-SYNC) -10 to +35 dBm (Measurement object: Continuous wave)
Adjacent channel power	<p>Frequency: 300 to 2200 MHz</p> <p>Input level (Average power within burst, Main Input/Output):</p> <ul style="list-style-type: none"> -10 to +40 dBm (Measurement object: PS-TCH, PS-SYNC, CS-TCH, CS-SYNC) -10 to +35 dBm (Measurement object: Continuous wave) <p>Measurement range: \leq -60 dB (600 kHz offset), \leq -65 dB (900 kHz offset)</p>
RF signal generator	<p>Output frequency: 300 to 2200 MHz, 1 Hz step</p> <p>Modulation accuracy: \leq 3% rms</p> <p>Modulation data: PN9, PN15</p>
Error rate measurement	<p>Function: Bit error rate measurement</p> <p>Measurement object: Serial data inputted from the Call Proc. I/O terminal of a rear panel</p>
Call processing	<p>Call control: Location registration, call origination, call termination, call communication, disconnection from network, disconnection from mobile terminal, handover</p>

MX882005A-11

ADVANCED PHS Measurement Software

Utilizing advanced high-speed measuring methods and offering batch measurements to support Advanced PHS terminals and base station production lines.

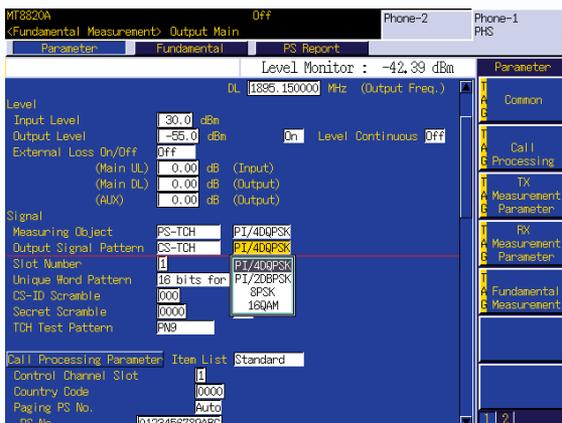
MX882005A-11 ADVANCED PHS Measurement Software*1 is a software option for PHS Measurement Software to enable Advanced PHS measurements corresponding to the PHS standard measurement specification (ARIB RCR-STD-28 edition 5.0). The Software can evaluate transmission and reception characteristics of Advanced PHS terminals and base stations.

Transmission and reception measurement is accomplished by installing the MX882005A-11 ADVANCED PHS Measurement Software in the MT8820A mainframe and selecting the desired modulation method from among $\pi/4$ DQPSK, 8PSK, and 16QAM.

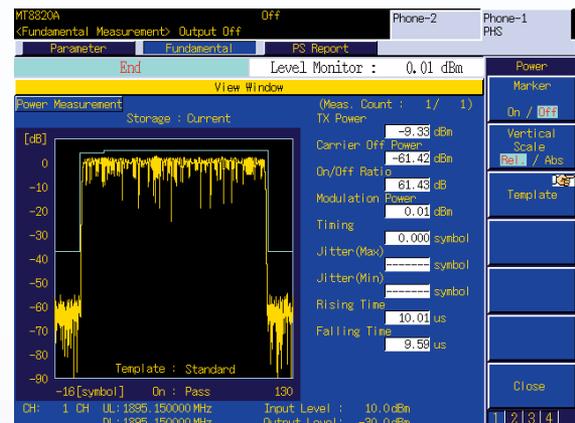
*1: Requires MT8820A-02 and MX882005A

• ADVANCED PHS measurement item

Transmitter measurement	Output power
	Modulation accuracy
	Occupied bandwidth
	Adjacent channel power
	Transmission rate
Receiver measurement	Bit error ratio



Modulation type select pop-up window



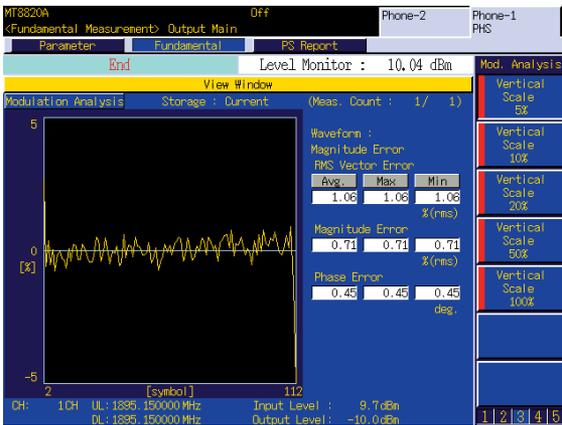
Burst waveform (Entire time slot: 8PSK)

Transmission Measurement

Modulation Accuracy

Frequency, frequency errors (in kHz and ppm), modulation accuracy, phase error, amplitude error, and origin offset of Advanced PHS terminals and base stations are measured simultaneously.

A waveform display function is also provided.



Output power, Wide dynamic range mode, Burst waveform display, Transmission rate, Occupied bandwidth and Adjacent channel power can be performed similarly to the MX882005A.

Reception Measurement

Error Rate Test

Bit error rate can be measured on receipt of demodulation data and clocks output from a Advanced PHS terminal/base station by controlling the PHS terminal with external PC etc. This measurement can be performed in parallel with transmission measurement.



Bit error rate measurement (8PSK)

Call Processing Function

Connection Test

The call processing function enables various connection tests including location registration, terminal call origination, network call origination, call communication, disconnection from network, disconnection from mobile terminal and handover. The call processing added $\pi/2$ DBPSK voice connection is based on the existing PHS standard (ARIB RCR-STD-28, $\pi/4$ DQPSK modulation). During a call, the user's speech can be echoed back from the mobile terminal to provide a simple voice communication test.

Mobile terminal report monitor, Sequence monitor, Transmission test in communication state, Measurement result evaluation function can be performed similarly to the MX882005A.

Specifications

MT8820A-02 TDMA Measurement Hardware, MX882005A-11 ADVANCED PHS Measurement Software

Measuring Object	<p>Specification is identical with MX882005A. Measuring object is the following.</p> <p>Measuring object: PS-TCH ($\pi/4$DQPSK, $\pi/2$DBPSK, 8PSK, 16QAM) PS-SYNC ($\pi/4$DQPSK, $\pi/2$DBPSK) PS-SCCH ($\pi/2$DBPSK) CS-TCH ($\pi/4$DQPSK, $\pi/2$DBPSK, 8PSK, 16QAM) CS-SYNC ($\pi/4$DQPSK, $\pi/2$DBPSK)</p> <p>*For modulation measurement It guarantees only when there is no bias in the symbol point when the modulation type of the measuring object is 16QAM.</p>
Call processing	<p>Call control with $\pi/4$DQPSK or $\pi/2$DBPSK: Location registration, call origination, call termination, call communication, disconnection from network, disconnection from mobile terminal, handover</p>

Ordering Information

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

Model/Order No.	Name
MT8820A	Main frame Radio Communication Analyzer
	Standard accessories
HB28B064C8H	Power cord, 2.6 m : 1 pc
CA68ADP	CF card (64 MB) : 1 pc
W2458AE	PC card adapter : 1 pc
	MT8820A/MT8815A operation manual (CD-ROM) : 1 copy
	Options
MT8820A-01	W-CDMA Measurement Hardware
MT8820A-02	TDMA Measurement Hardware
MT8820A-03	CDMA2000 Measurement Hardware
MT8820A-04	1xEV-DO Measurement Hardware
MT8820A-11	Audio Board
MT8820A-12	Parallel Phone Measurement Hardware
MT8820A-21	W-CDMA Measurement Hardware retrofit
MT8820A-22	TDMA Measurement Hardware retrofit
MT8820A-23	CDMA2000 Measurement Hardware retrofit
MT8820A-24	1xEV-DO Measurement Hardware retrofit
MT8820A-31	Audio Board retrofit
MT8820A-32	Parallel Phone Measurement Hardware retrofit
	Softwares
MX882000B	W-CDMA Measurement Software (requires MT8820A-01 and MX88205xA)
MX882000B-01	W-CDMA Voice Codec (requires MT8820A-11 and MX882000B)
MX882000B-11	HSDPA Measurement Software (requires MT8820A-01, MX882000B and MX882050A)
MX882001A	GSM Measurement Software (requires MT8820A-02)
MX882001A-01	GSM Voice Codec (requires MT8820A-11 and MX882001A)
MX882001A-02	GSM External Packet Data (requires MX882001A)
MX882001A-11	EGPRS Measurement Software (requires MX882001A)
MX882002A	CDMA2000 Measurement Software (requires MT8820A-03)
MX882002A-02	CDMA2000 External Packet Data (requires MX882002A)
MX882003A	1xEV-DO Measurement Software (requires MT8820A-03, MT8820A-04 and MX882002A)
MX882003A-02	1xEV-DO External Packet Data (requires MX882003A)
MX882004A	PDC Measurement Software (requires MT8820A-02)
MX882005A	PHS Measurement Software (requires MT8820A-02)
MX882005A-11	ADVANCED PHS Measurement Software (requires MX882005A)
MX882010A	Parallel Phone Measurement Software*1 [requires MT8820A-12, the two same measurement hardware (2 board/set) and one measurement software]
MX882022A	CDMA2000 Wireless Application Test Software (requires MT8820A-03)
MX882050A	W-CDMA Call Processing Software*2 (requires MX882000B)
MX882050A-02	W-CDMA External Packet Data*2, *3 (requires MX882050A)
MX882050A-03	W-CDMA Video Phone Test*2 (requires MX882050A)
MX882050A-09	W-CDMA Band IX*2 (requires MX882050A)
MX882050A-11	HSDPA External Packet Data*2 (requires MX882000B-11)
MX882070A	W-CDMA Ciphering Software*2 (requires MX882050A)
MX882051A	W-CDMA Call Processing Software*2 (requires MX882000B)
MX882051A-02	W-CDMA External Packet Data*2 (requires MX882051A)
MX882051A-03	W-CDMA Video Phone Test*2 (requires MX882051A)
MX882071A	W-CDMA Ciphering Software*2 (requires MX882051A)

Model/Order No.	Name
W2477AE	MX882000B operation manual*4 (attached to MX882000B)
W2463AE	MX882001A operation manual*4 (attached to MX882001A)
W2472AE	MX882002A operation manual*4 (attached to MX882002A)
W2473AE	MX882003A operation manual*4 (attached to MX882003A)
W2464AE	MX882004A operation manual*4 (attached to MX882004A)
W2465AE	MX882005A operation manual*4 (attached to MX882005A)
W2484AE	MX882022A operation manual*4 (attached to MX882022A)
W2480AE	MX88205xA operation manual*4 (attached to MX88205xA)
W2478AE	MX88207xA operation manual*4 (attached to MX88207xA)
	Warranty
MT8820A-90	Extended three year warranty service
MT8820A-91	Extended five year warranty service
	Application parts
P0019	TEST USIM001*5
P0027	W-CDMA/GSM Test USIM
A0012	Handset
J1249	CDMA2000 cable [D-sub (15 pin, P-type) · D-sub (15 pin, P-type), used in combination with J1267 (sold separately)]
J1267	CDMA2000 cross cable [D-sub (9 pin, P-type) · D-sub (9 pin, P-type), reverse cable, used in combination with J1249 (sold separately)]
J0576B	Coaxial cord (N-P · 5D-2W · N-P), 1 m
J0576D	Coaxial cord (N-P · 5D-2W · N-P), 2 m
J0127A	Coaxial cord (BNC-P · RG58A/U · BNC-P), 1 m
J0127C	Coaxial cord (BNC-P · RG58A/U · BNC-P), 0.5 m
J0007	GPIB cable, 1 m
J0008	GPIB cable, 2 m
MN8110B	I/O Adapter (for call processing I/O)
B0332	Joint plate (4 pcs/set)
B0333G	Rack mount kit
B0499	Carrying case (hard type, with protective cover and casters)
B0499B	Carrying case (hard type, with protective cover, without casters)
W2457AE	MT8820A operation manual (booklet)
W2476AE	MX882000B operation manual (booklet)
W2466AE	MX882001A operation manual (booklet)
W2470AE	MX882002A operation manual panel operation (booklet)
W2471AE	MX882002A operation manual remote control (booklet)
W2474AE	MX882003A operation manual panel operation (booklet)
W2475AE	MX882003A operation manual remote control (booklet)
W2467AE	MX882004A operation manual (booklet)
W2468AE	MX882005A operation manual (booklet)
W2482AE	MX882022A operation manual panel operation (booklet)
W2483AE	MX882022A operation manual remote control (booklet)
W2481AE	MX88205xA operation manual (booklet)
W2479AE	MX88207xA operation manual (booklet)

*1: The Measurement Hardwares applied to Parallel Phone Measurement are MT8820A-01, MT8820A-02, MT8820A-03, MT8820A-04. And these hardwares can be implemented all together.

*2: For terminal connectivity, contact your Anritsu sales representative.

*3: MX882050A preinstalls the integrity protection function.

*4: Supplied by CD-ROM

*5: This Test USIM can be worked on only W-CDMA mode.

When the connection of GSM is necessary, P0027 can be applied.

- Parallelphone™ is a registered trademark of Anritsu Corporation.
- CF® card is a registered trademark of SanDisk Corporation in the United States and is licensed to CFA (Compact Flash Association).

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