

PRODUCT INTRODUCTION

MS8608A/MS8609A

Digital Mobile Radio Transmitter Tester
(GSM,EDGE)

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MS8608A/MS8609A

Digital Mobile Radio Transmitter Tester (GSM,EDGE)

Product Introduction



March 2002
Ver 4.0
Anritsu Corporation
Measurement Solutions

Product Introduction

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Product Overview

MS8608A/MS8609A Digital Mobile Radio Transmitter Tester

Product overview

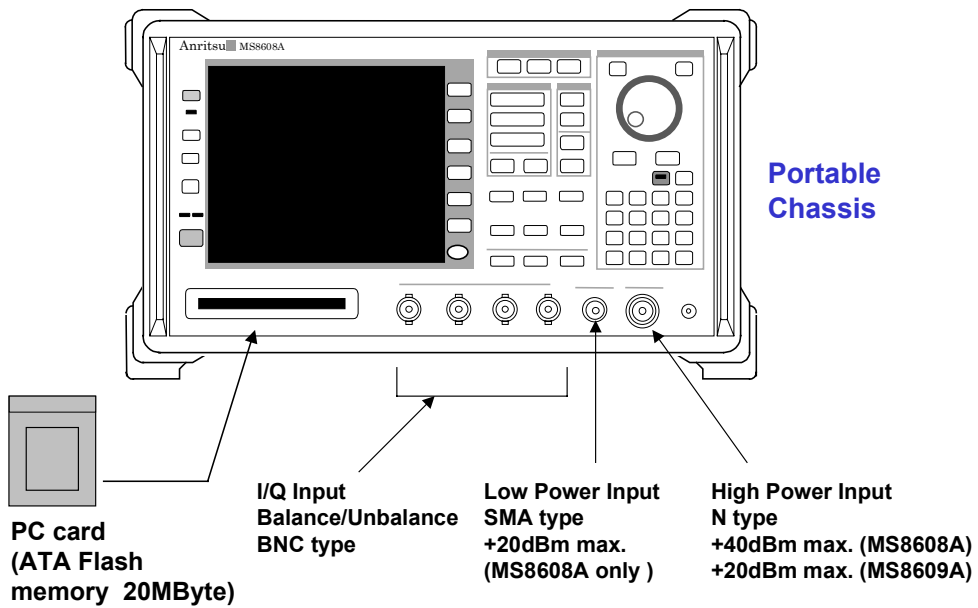
The MS8608A/MS8609A is transmitter tester equipped with an internal spectrum analyzer, a modulation analyzer and a power meter.

The measuring instrument is suitable for evaluating W-CDMA, GSM, EDGE, cdma2000, cdmaOne, PDC, PHS, and IS-136 transmission test items.

Therefore, it will become possible to support multiple systems with only one unit of the MS8608A/MS8609A.

It is a platform-type measuring instrument which can analyze even high speed and wide bandwidth 20MHz. Therefore, it is also usable for future evaluation only with changes of software.

MS8608A/MS8609A Front panel



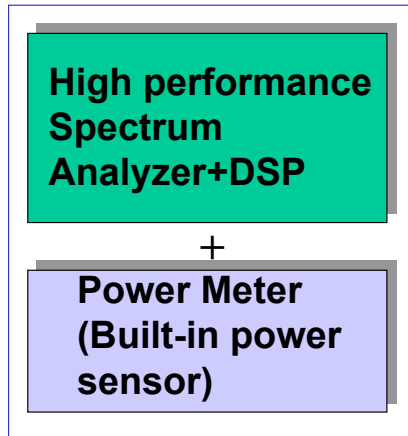
Product Concept

MS8608A/MS8609A



Concept of Anritsu "Transmitter Tester"

Hardware Platform



MS8608A/MS8609A

Software

Measurement Software
(installed in main frame)

+

Provided by PC card

MX860x01A: W-CDMA
 MX860x02A: GSM(GSM,EDGE)
 MX860x03A:cdma(IS-95,cdma2000)
 MX860x05A: $\pi/4$ DQPSK
 (PDC,PHS,IS-136)

MS8608A/MS8609A



Product Concept

- **20MHz analytical bandwidth**
- **High speed, High performance Modulation Analysis (Latest DSP processor and A/D converter enable analysis function and high speed)**
- **Wide dynamic range and High C/N (High performance RF front-end)**
- **Small portable chassis for field use(16kg) (case size; the same as that for the MS2660 series spectrum analyzer)**

Specifications

MS8608A/MS8609A

Main Specification

- Spectrum Analyzer
 - Frequency Range : 9kHz to 7.8GHz(MS8608A)
9kHz to 13.2GHz(MS8609A)
 - Frequency Span : Zero, 5kHz to 7.8GHz or 13.2GHz
 - Span Accuracy : $\pm 1\%$
 - RBW : 300Hz to 3MHz, 5MHz, 10MHz, 20MHz
 - Narrow RBW : 1Hz to 1kHz(Option)
 - Maximum Input Level : +40dBm (MS8608A)
+20dBm (MS8609A)
 - Input ATT : 2dB to 82dB (2dB step)
 - 1dB Gain Compression : +3dBm
 - Average Noise Level : -146dBm/Hz

MS8608A/MS8609A



Main Specification

- Spectrum Analyzer
 - Sweep Time (frequency span) : 10ms to 1000s
 - Sweep Refresh Rate : >20 times/s
 - Measurement Function : CH Power, C/N, OBW, ACP, etc
 - GPIB Data Transmission Speed : 120kbytes/s
- Power Meter (thermal sensor)
 - Frequency Range : 10MHz to 3GHz
 - Level Range : 0 to +40dBm(high-power input :MS8608A)
 - 20 to +20dBm(low-power input:MS8608A)
 - 20 to +20dBm(MS8609A)
 - Level Accuracy: ± 0.4 dB

MX860802A/ MX860902A GSM Measurement Software



GSM / EDGE Main Specification

- Frequency Range : 50MHz to 2.7GHz
- Modulation
- GMSK (GMSK) Residual phase error : 0.5° (rms)
 - EDGE (8PSK) Residual EVM : <1% (rms)
- Transmitter power: ± 0.4 dB

MX860802A/ MX860902A GSM Measurement Software



GSM / EDGE Measurement items

Modulation Analysis :

- Carrier frequency, Frequency stability
- Phase error(rms,peak), Vector error(rms),
- Magnitude error

RF power, Rise/Fall Edge characteristics

Output RF spectrum

Spurious Emission

I/Q level



Features

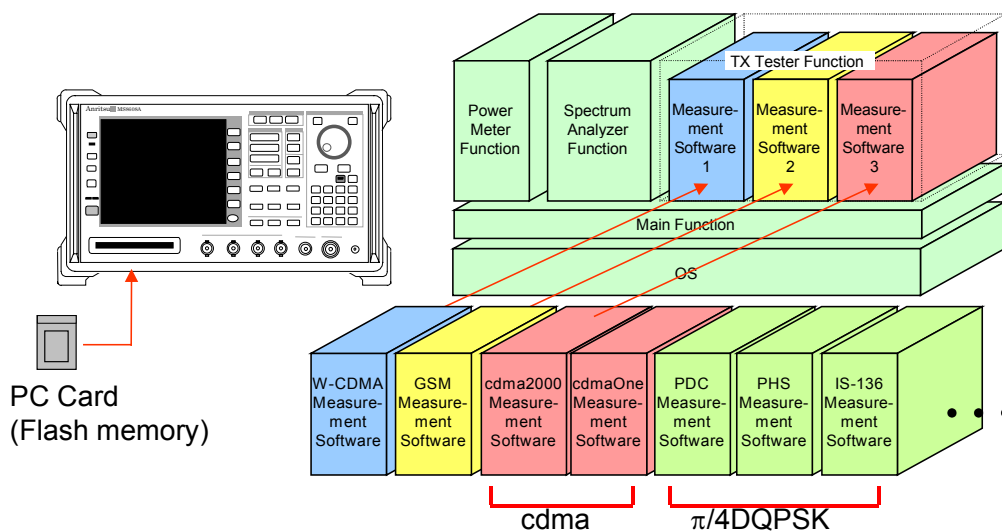
MS8608A/MS8609A

Advantages against competitors

- 1) Modulation analysis bandwidth up to 20MHz
- 2) Built-in power meter
- 3) Excellent ACPR measuring performance
- 4) High speed modulation analysis/code domain power measurement
- 5) Easy switch over between GSM and EDGE
- 6) High speed GPIB data transfer (120 kBytes/s)

MS8608A/MS8609A

Up to 3 System Software can be installed simultaneously inside the Box



Applications

System Change

MS8608A		System Change
<< Setup Common Parameter (W-CDMA) >>		MASTER W-CDMA V2.4b
Input		MX860803A cdma smp106
Terminal	: [RF]	MX860802A GSM V 1.2
Reference Level & Offset	: [22.00dBm] [40.00dB]	
Frequency		
Channel & Frequency	: [10712CH] = [2142.400000MHz]	
Channel Spacing	: [0.200000MHz]	
Signal		
Measuring Object	: [Down Link]	
Filter	: [Filtering]	
Synchronization		
Scrambling Code Sync. & Number	: [Set] = [00000]	
Spreading Factor	: [P-CPICH] = (256)	
Channelization Codes Number	: (0)	
Spreading Factor for DPCH	: [64]	
Trigger	: [Free Run]	
		return
Ch :	10712CH	
Input :	Low	
Level :	22.00dBm	Power Cal : Off
Freq :	2142.400000MHz	Offset : 40.00dB
		Correction : Off

**Push
System key**

Select

Setup common parameter

MS8608A
 << Setup Parameter (GSM) >>

Input
 Terminal : [RF]
 Reference Level & Offset : [22.00dBm] [0.00dB]

Frequency
 Channel & Frequency : [1CH] = [890.200000MHz]
 Channel Spacing : [0.200000MHz]

Signal
 Modulation : [GMSK]
 Measuring Object : [Normal Burst]

Training Sequence
 Pattern : [TSC0] (= 0970897)

Trigger
 Trigger : [External]
 Trigger Edge : [Rise]
 Trigger Delay : [0.000ms]

Ch : 1CH Input : Low
 Freq : 890.200000MHz Level : 22.00dBm Power Cal : Off
 Offset : 0.00dB Correction : Off

RF / IQ

GMSK (GSM)
 8PSK (EDGE)

Free Run / Triggered

After parameter setting, each item can be measured very easily!

Modulation analysis

MS8608A
 << Modulation Analysis (GSM) >>

Measure : Continuous
 Storage : Normal
 Trace : Non

Frequency
 Carrier Frequency : 890.200 001 2 MHz
 Carrier Frequency Error : 0.001 2 kHz
 0.00 ppm

Modulation
 RMS Phase Error : 0.34 deg. (rms)
 Peak Phase Error : 0.83 deg.
 Magnitude Error : 0.75 % (rms)

Ch : 1CH Input : Low
 Freq : 890.200000MHz Level : -14.00dBm Power Cal : Off
 Offset : 0.00dB Correction : Off

Modulation Analysis

#

Trace Format

*

Storage Mode

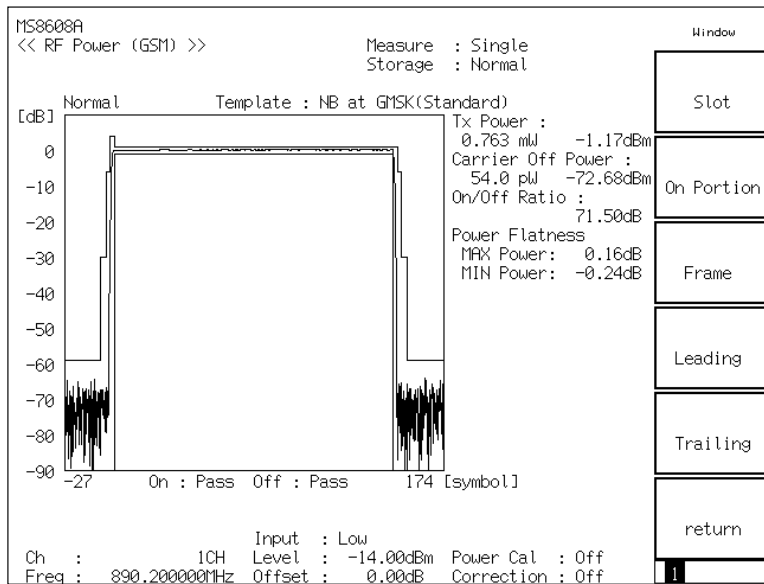
*

Scale Mode

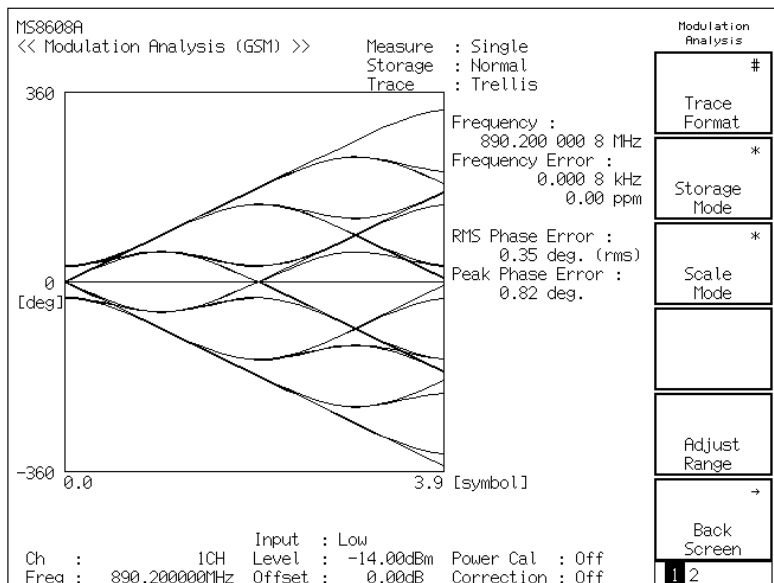
Adjust Range

Back Screen

RF Power measurement



Trellis of modulation analysis



Output RF Spectrum measurement

```

MS8608A
<< Output RF Spectrum (GSM) >>
Measure : Single
Storage : Normal
Method : High Speed

Offset Freq.      Modulation      Switching Transients
0.000MHz          -8.57dBm        -2.52dBm

Lower      Upper      Lower      Upper
f 1 = 0.100MHz -9.20dB  -8.37dB  -9.16dBm -10.92dBm
f 2 = 0.200MHz -35.36dB -36.28dB -37.64dBm -34.65dBm
f 3 = 0.250MHz -45.86dB -44.31dB -41.96dBm -42.43dBm
f 4 = 0.400MHz -66.73dB -66.82dB -67.08dBm -68.24dBm
f 5 = 0.600MHz -69.31dB -70.13dB -72.97dBm -71.71dBm
f 6 = 0.800MHz -76.23dB -71.98dB -75.01dBm -73.90dBm
f 7 = 1.000MHz -77.57dB -76.60dB -76.27dBm -76.20dBm
f 8 = 1.200MHz -80.60dB -75.25dB -76.77dBm -78.46dBm
f 9 = 1.400MHz -81.18dB -77.30dB -81.14dBm -78.55dBm
f10 = 1.600MHz -79.88dB -81.55dB -80.51dBm -79.73dBm
f11 = 1.800MHz -73.77dB -73.34dB -81.92dBm -79.07dBm

Ch :      1CH      Input : Low
Freq : 890.200000MHz Offset : 0.00dB Power Cal : Off
Correction : Off
    
```

Spurious Emission measurement

```

MS8608A
<< Spurious Emission (GSM) >>
Spurious : Spot
Detect : Average

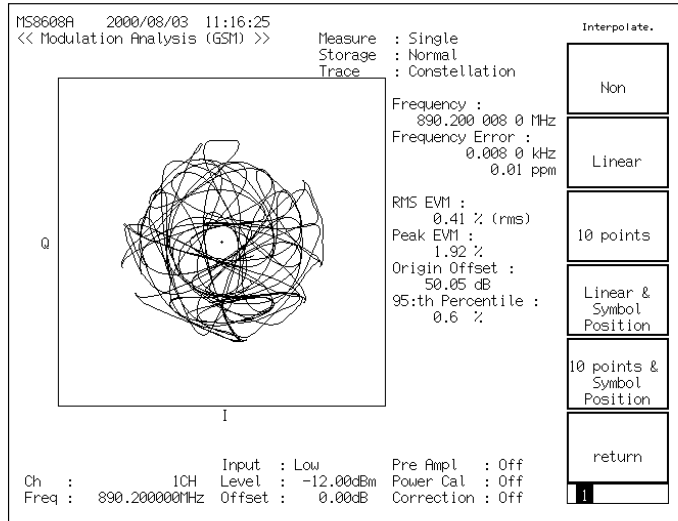
Tx Power : -1.16 dBm

Frequency      Level      RBW      VBW      SWT
f 1 = 1 780.400 000 MHz: -45.83 dBm ( 3MHz, 3MHz, 10 ms)
f 2 = 2 670.600 000 MHz: -51.16 dBm ( 3MHz, 3MHz, 10 ms)
f 3 = 3 560.800 000 MHz: -79.69 dBm ( 3MHz, 3MHz, 10 ms)
f 4 = 4 451.000 000 MHz: -83.54 dBm ( 3MHz, 3MHz, 10 ms)
f 5 = 5 341.200 000 MHz: -82.92 dBm ( 3MHz, 3MHz, 10 ms)
f 6 = 6 231.400 000 MHz: -83.21 dBm ( 3MHz, 3MHz, 10 ms)
f 7 = 7 121.600 000 MHz: -82.38 dBm ( 3MHz, 3MHz, 10 ms)
f 8 = ----- MHz: ----- dBm (--- Hz, --- Hz, ---ms)
f 9 = ----- MHz: ----- dBm (--- Hz, --- Hz, ---ms)
f10 = ----- MHz: ----- dBm (--- Hz, --- Hz, ---ms)
f11 = ----- MHz: ----- dBm (--- Hz, --- Hz, ---ms)
f12 = ----- MHz: ----- dBm (--- Hz, --- Hz, ---ms)
f13 = ----- MHz: ----- dBm (--- Hz, --- Hz, ---ms)
f14 = ----- MHz: ----- dBm (--- Hz, --- Hz, ---ms)
f15 = ----- MHz: ----- dBm (--- Hz, --- Hz, ---ms)

Ch :      1CH      Input : Low
Freq : 890.200000MHz Offset : 0.00dB Power Cal : Off
Correction : Off
    
```

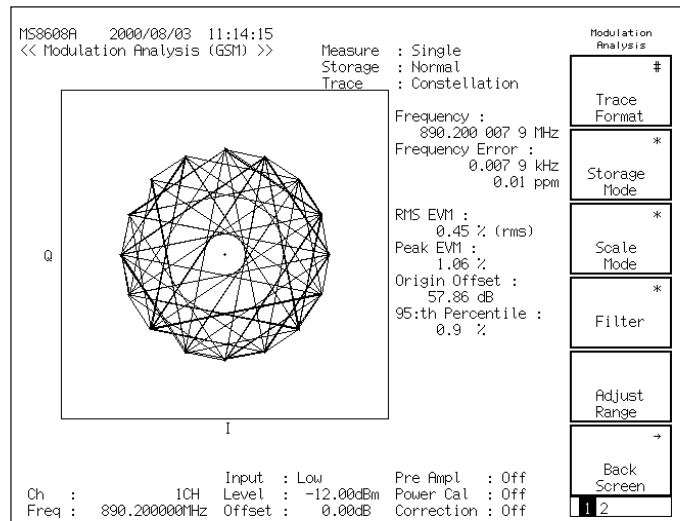
For EDGE Testing

Constellation with the ETSI Standard Filter



For EDGE Testing

Constellation with Nyquist & Inverse Filter



MS8608A Options



MS8608A-01 Precision Frequency Reference (5×10^{-10} /day)

MS8608A-03 Extension of preselector lower limit to 1.6GHz

MS8608A-04 Digital Resolution Band Width

MS8608A-05 Rubidium Reference Oscillator (5×10^{-10} /month)

MS8608A-08 Pre-Amplifier

MS8608A-09 Ethernet Interface

MS8608A-35 7.9GHz Frequency Extension

MS8608A-46 Auto Power Recovery

MS8608A-90 Extension service 3 year

MS8608A-91 Extension service 5 year

MS8609A Options



MS8609A-01 Precision Frequency Reference (5×10^{-10} /day)

MS8609A-04 Digital Resolution Band Width

MS8609A-05 Rubidium Reference Oscillator (5×10^{-10} /month)

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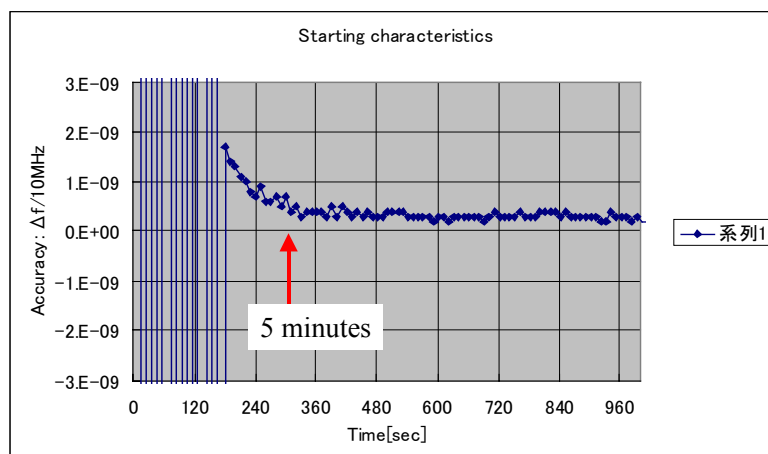
MS8608A-04/MS8609A-04 Digital Resolution Bandwidth



Digital Resolution Band Width Option to realize RMS detection with 10Hz to 1MHz of RBW

RMS detection is specified for detection method in 3GPP measurement

MS8608A-05/MS8609A-05 Rubidium Reference Oscillator



Build in MS8608A/MS8609A

Starting characteristics: $<\pm 1 \times 10^{-9} / 5 \text{ minutes}$

Aging rate : $<\pm 1 \times 10^{-10} / \text{month}$

MS8608A-35 7.9GHz Frequency Extension



Frequency range : 9kHz to 7.9GHz
Other performance : same as standard version

GSM BTS manufacturing section measures spurious up to 7.85GHz

Optional accessories



B0488
Real Protector



B0479
Soft carrying case



B0481B
Soft carrying case supporter



Specifications are subject to change without notice.

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