

cdmaOne,cdma2000 1xRTT

MS8608A/MS8609A

Digital Mobile Radio Transmitter Tester

MS8608A/MS8609A

Digital Mobile Radio Transmitter Tester (cdmaOne,cdma2000 1xRTT)

Product Introduction



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Anritsu Corporation

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MS8608A/MS8609A-E-I-2

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Product Introduction

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Product Overview

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Product overview

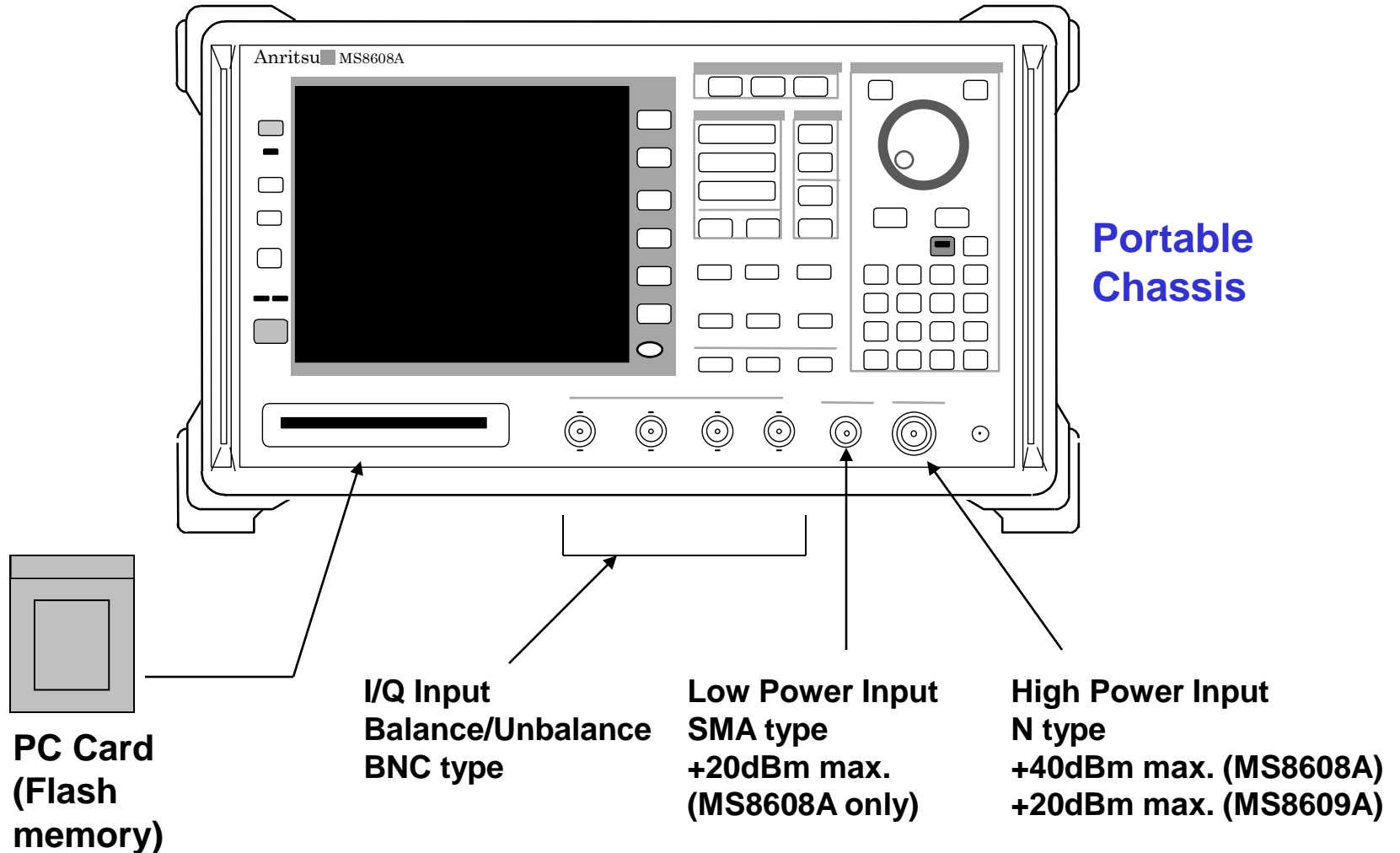
The MS8608A/MS8609A is transmitter tester equipped with an internal spectrum analyzer, a modulation analyzer and a power meter.

The measuring instrument is suitable for evaluating W-CDMA, GSM, EDGE, cdma2000(1xRTT), 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. Max. 3 systems of measurement software can be simultaneously installed in this unit.

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

MS8608A/MS8609A Front panel



Product Concept

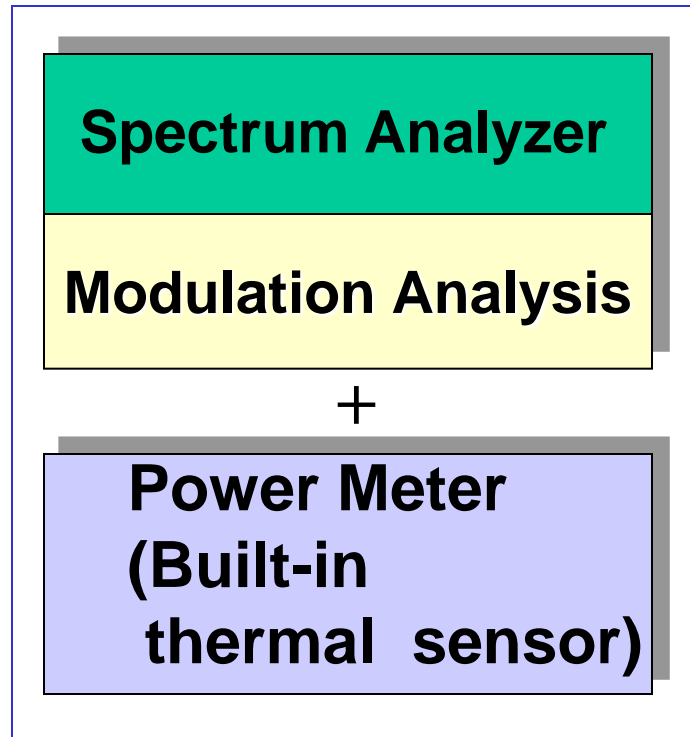
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Configuration

Main frame of Transmitter Tester



MS8608A/MS8609A

+

**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)

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

Main Specification

- Spectrum Analyzer

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

Main Specification

- Spectrum Analyzer

 - Sweep Time (frequency span) : 10ms ~ 1000s

 - Sweep Refresh Rate : >20 times/s

 - Measure Function : CH Power, C/N, OBW, ACP, etc

 - GPIB Data Transmission Speed : 120kbytes/s

- Power Meter (thermal sensor)

 - Frequency Range : 10MHz ~ 3GHz

 - Level Range : 0 ~ +40dBm (MS8608A high-power input)

 - 20 ~ +20dBm (MS8608A low-power input)

 - 20 ~ +20dBm (MS8609A)

 - Level Accuracy: ± 0.4 dB

MX860803A/ MX860903A

cdma Measurement Software

cdmaOne / cdma2000 1XRTT Main Specification

Frequency Range : 50MHz to 3GHz

Modulation Accuracy

Waveform quality : <0.001

Residual EVM : $<2.0\%$

Transmission Power

Power measurement accuracy : $\pm 0.4\text{dB}$

Power measurement linearity : $\pm 0.2\text{dB}$ (0 ~ -30dB)

Spurious close to the carrier

900MHz offset : $\geq 50\text{dBc}$

1.98GHz offset : $\geq 60\text{dBc}$

cdmaOne / 2000 1XRTT measurement items

Modulation Analysis :

Transmission frequency, Frequency error
Vector error(rms,peak),Phase error,
Magnitude error

Code Domain Analysis :

RF power

OBW

Close-in spurious measurement

Spurious Emission

I/Q level

Features

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Features

- 1) Modulation analysis bandwidth up to 20MHz**
- 2) Built-in power meter (high-accuracy measurement of transmission power, TPC, etc.)**
- 3) Excellent ACPR measurement performance**
- 4) High speed modulation analysis/code domain power measurement (2 sec.)**
- 5) Easy switch over between IS-95 and CDMA2000 1X**
- 6) High speed GPIB data transfer (120 kBytes/s)**

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



Applications

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Measurement Software Switch

```
MS8609A 2002/03/18 15:07:34
<< Setup Common Parameter (cdma) >>

Input
Terminal : [RF ]
Reference Level & Offset : [ 10.00dBm] [ 0.00dB]

Frequency
Channel & Frequency : [ 1092CH] = [ 887.650000MHz]
Channel Spacing : [ 1.250000MHz]

Signal
Measuring Object : [Reverse(RC1-2)] [Burst ]
Filter : [Filtering]

Trigger : [Free Run ]

System Change
MX860903A
cdma
V 3.0
MASTER
1xEV-DO
V0.0
MX860901B
W-CDMA
V 3.0
return
```

Ch : 1092CH Level : 10.00dBm Power Cal : Off
Freq : 887.650000MHz Offset : 0.00dB Correction : Off

**Push
System key**

Select cdma

Parameter Setup Screen

MS8608A
<< Setup Common Parameter (cdma) >>

Input Terminal	: [RF]	Setup Parameter
Reference Level & Offset	: [-12.00dBm] [0.00dB]	
Frequency Channel & Frequency	: [1092CH] = [887.650000MHz]	→ Modulation Analysis
Channel Spacing	: [1.250000MHz]	→ RF Power
Signal Measuring Object	: [Forward(RC1-2)] (Continuous)	→ Occupied Bandwidth
Filter	: [Filter+EQ]	→ Spurious close to the Carrier
Trigger	: [Free Run]	→ Spurious Emission

Ch : 1092CH Input : Low Level : -12.00dBm Power Cal : Off
Freq : 887.650000MHz Offset : 0.00dB Correction : Off

1 2

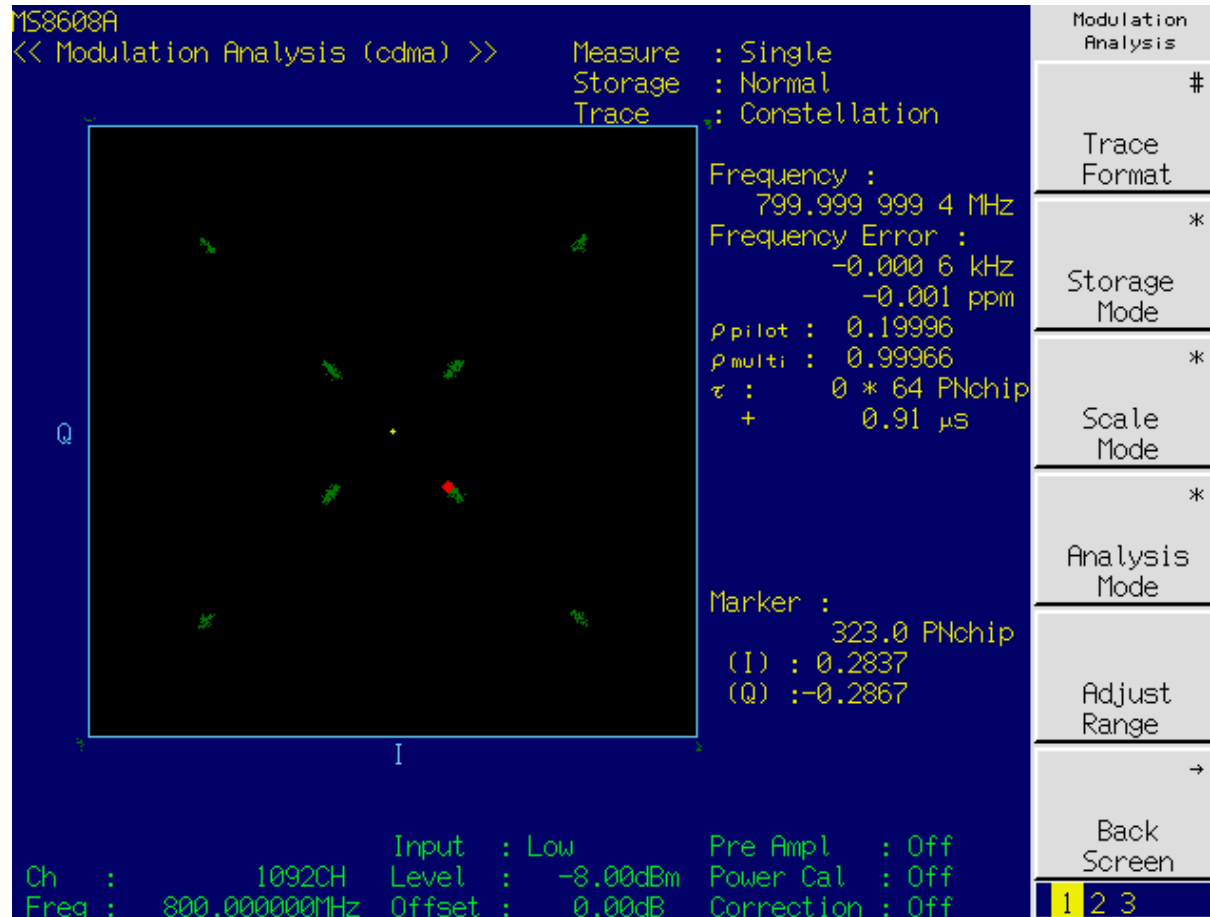
RF / IQ

**Forward(RC1-2)
Forward(RC3-5)
Reverse(RC1-2)
Reverse(RC3-5)
QPSK
OQPSK**

Free Run / Triggered

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

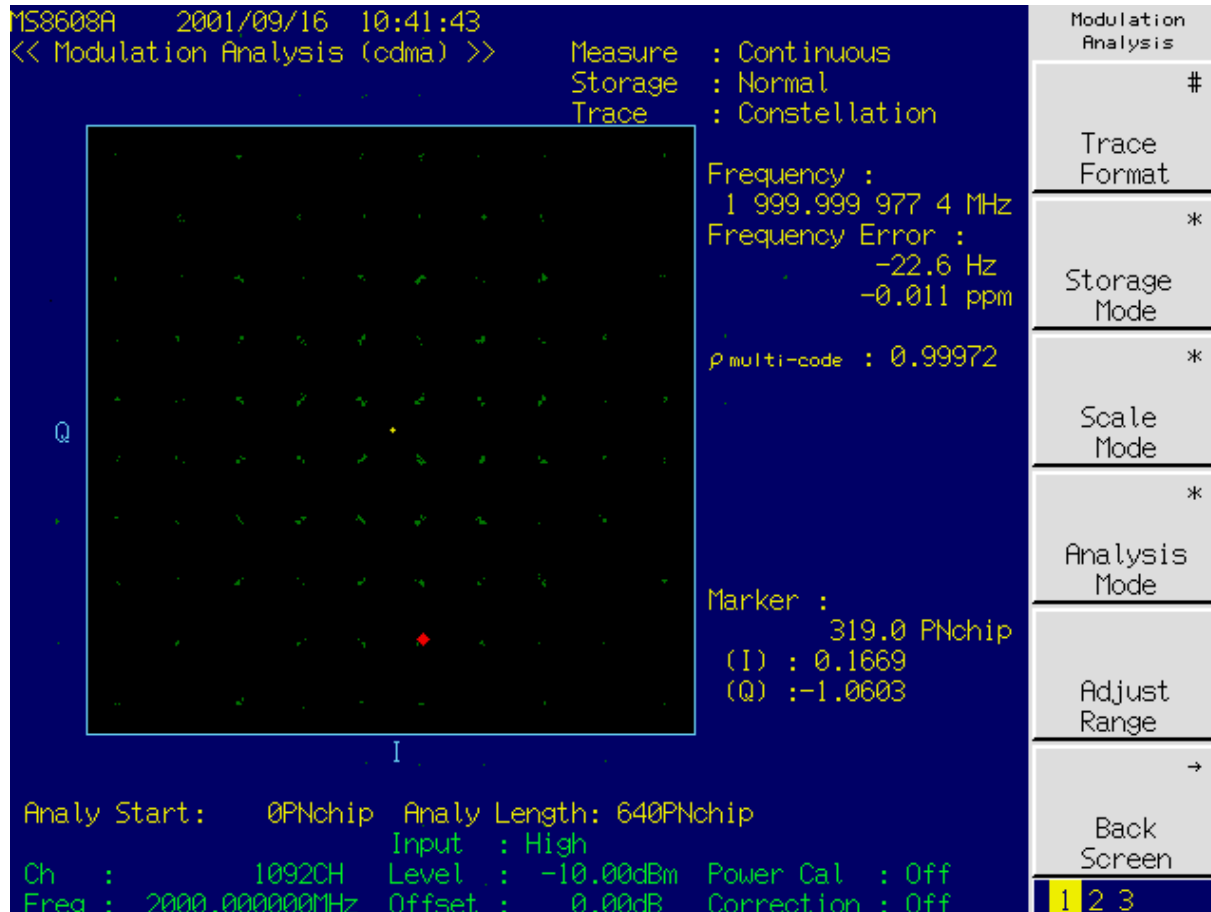
Modulation Analysis Screen for IS-95



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Modulation Analysis Screen for 1XRTT

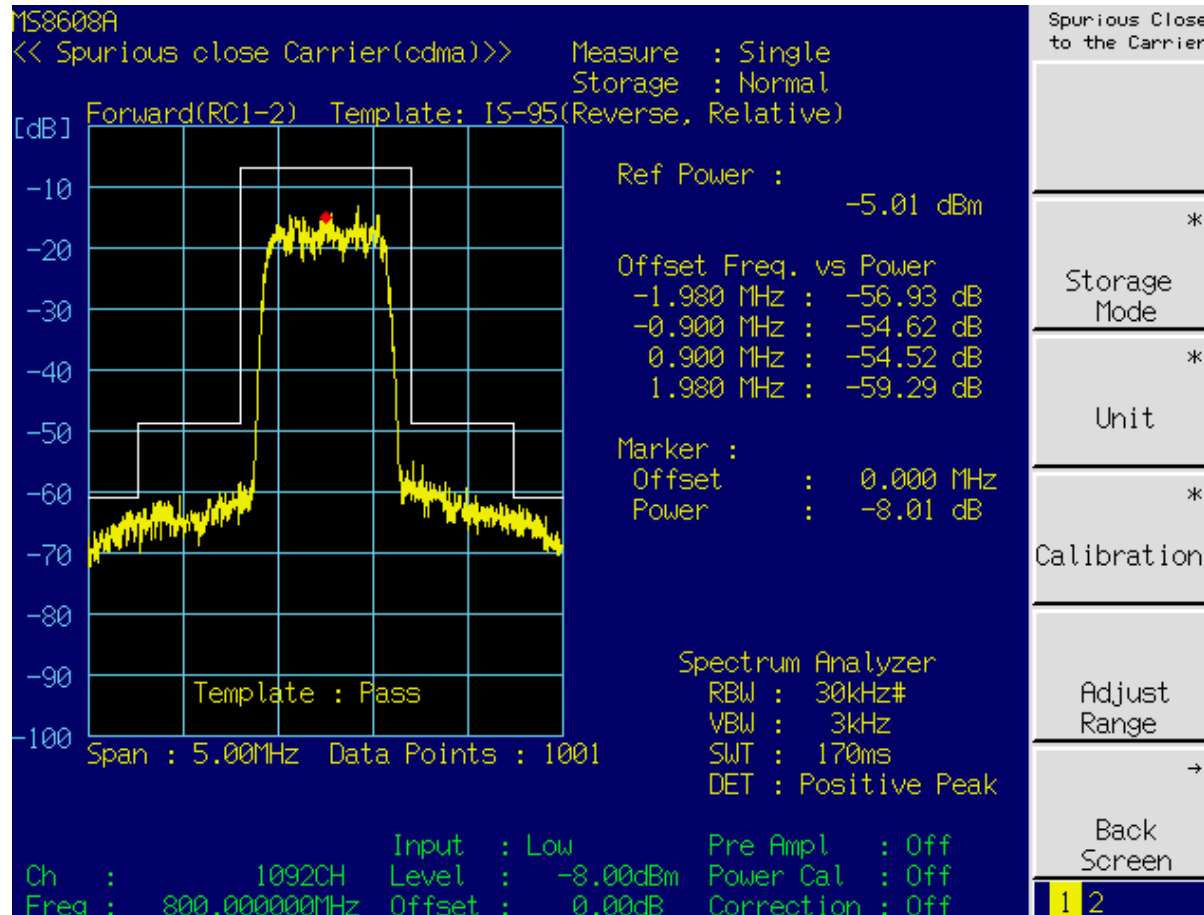


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Screen for Spurious Close to Carrier

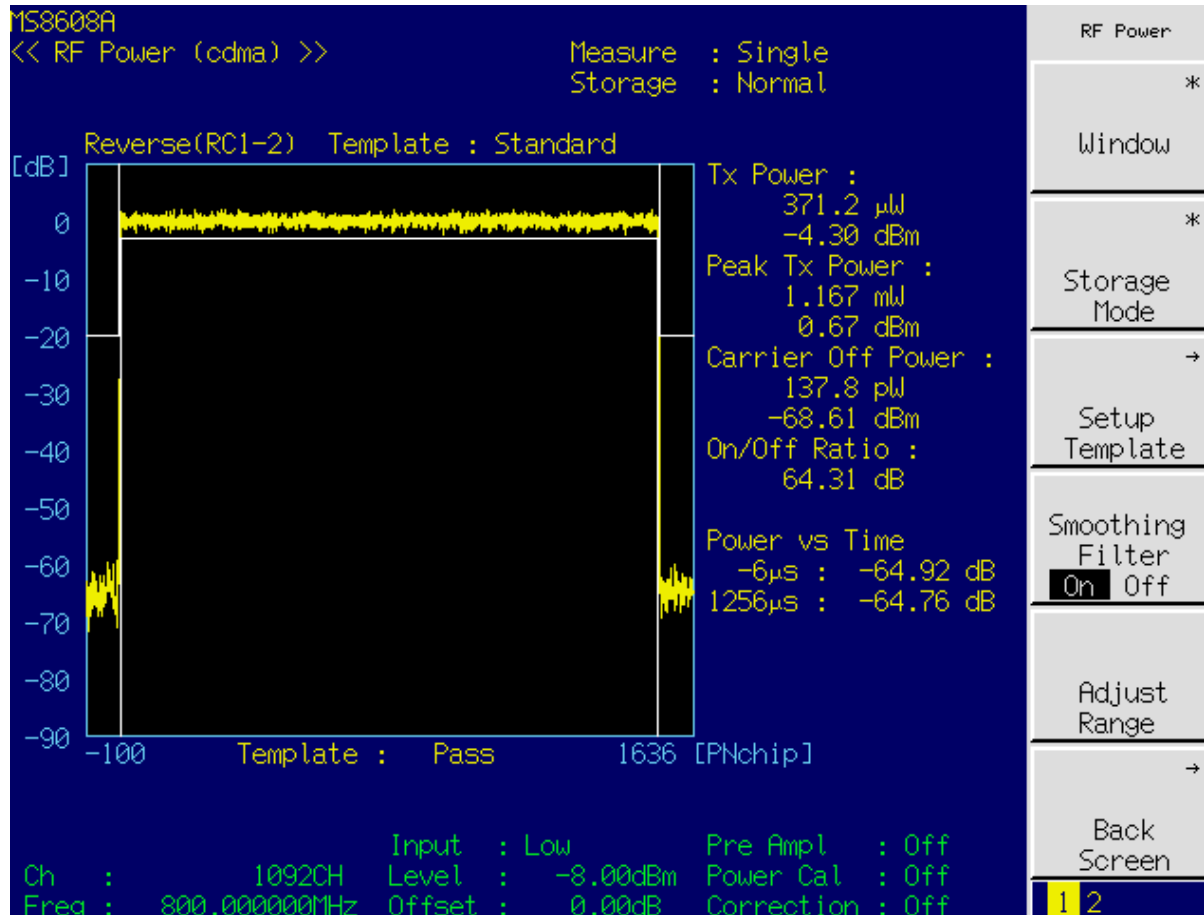


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Screen for RF Transmission Power

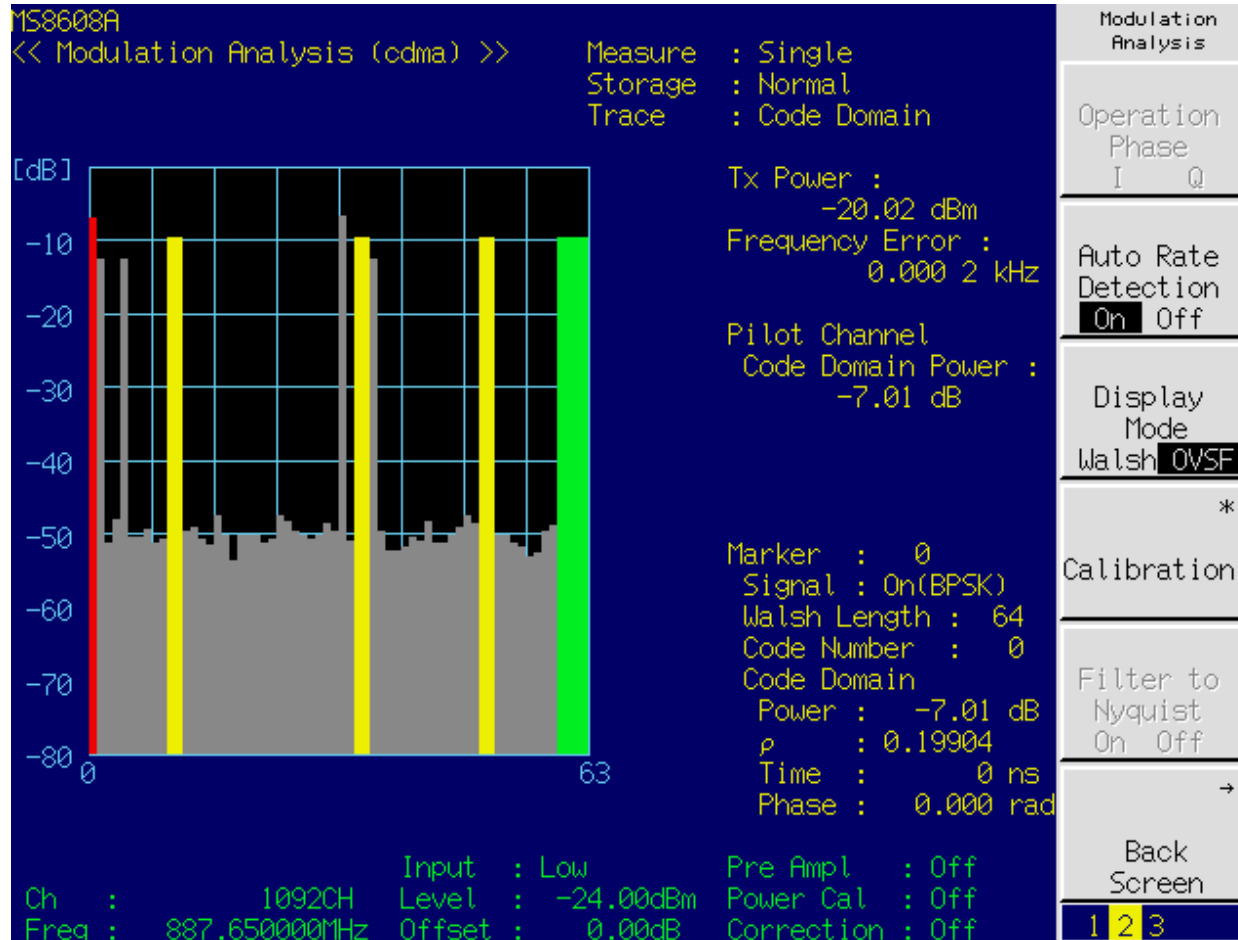


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Screen for Code Domain Analysis



Screen for Spurious Emissions

MS8608A
 << Spurious Emission (cdma) >>

Spurious : Spot
 Detect : Average
 Preselector : Normal

Ref Power : -5.01 dBm

	Frequency	Level	Judgement (Relative)
f 1 =	1 600.000 000 MHz:	-57.63 dBm	PASS
f 2 =	2 400.000 000 MHz:	-71.53 dBm	PASS
f 3 =	3 200.000 000 MHz:	-67.82 dBm	PASS
f 4 =	4 000.000 000 MHz:	-76.37 dBm	PASS
f 5 =	4 800.000 000 MHz:	-75.42 dBm	PASS
f 6 =	5 600.000 000 MHz:	-79.29 dBm	PASS
f 7 =	6 400.000 000 MHz:	-80.59 dBm	PASS
f 8 =	7 200.000 000 MHz:	-80.43 dBm	PASS
f 9 =	----- MHz:	----- dBm	-----
f10 =	----- MHz:	----- dBm	-----
f11 =	----- MHz:	----- dBm	-----
f12 =	----- MHz:	----- dBm	-----
f13 =	----- MHz:	----- dBm	-----
f14 =	----- MHz:	----- dBm	-----
f15 =	----- MHz:	----- dBm	-----

Total Judgement : **PASS**

Ch : 1092CH Input : Low Pre Ampl : Off
 Level : -8.00dBm Power Cal : Off
 Freq : 800.00000MHz Offset : 0.00dB Correction : Off

Spurious Emission

*
Spurious Mode

View BW,SWT
Judgement

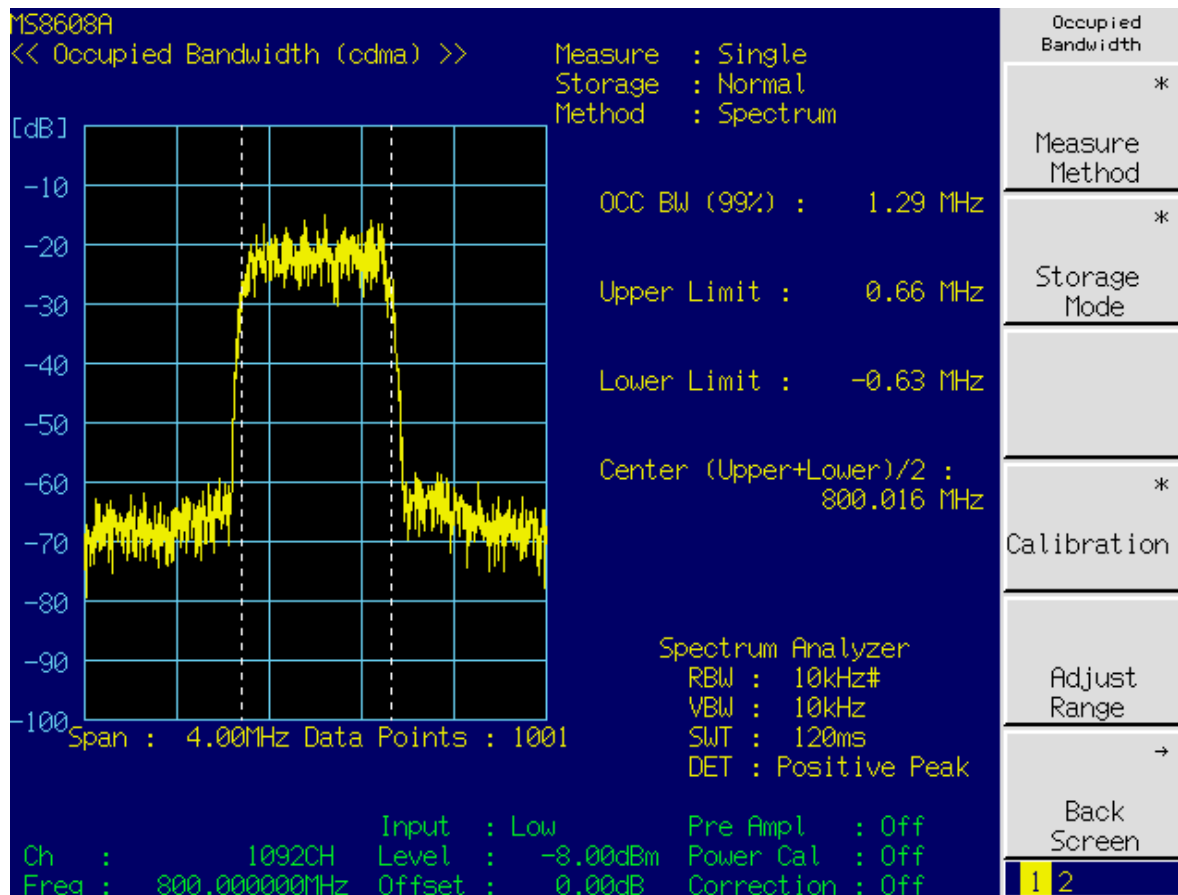
*
Calibration

Adjust Range

→
Back Screen

1 2 3

Screen for Occupied Bandwidth



MS8608A Options

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

MS8609A-02 Narrow Resolution Band Width (FFT)

MS8608A-03 Extension of preselector lower limit to 1.6GHz

MS8608A-04 Digital Resolution Band Width (RMS detection)

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 ($5 \times 10^{-10}/\text{day}$)**
- MS8609A-02 Narrow Resolution Band Width (FFT)**
- MS8609A-04 Digital Resolution Band Width**
- MS8609A-08 Pre-Amplifier**
- MS8609A-09 Ethernet Interface**
- MS8609A-30 2GHz Band Carrier-Cut LPF**
- MS8609A-32 Maximum Input Level Extension**
- MS8609A-33 High Accuracy Power Measurement**
- MS8609A-46 Auto Power Recovery**
- MS8609A-90 Extension service 3 year**
- MS8609A-91 Extension service 5 year**

MS8608A-02/MS8609A-02

Narrow Resolution Band Width

Outline : Narrow resolution bandwidth with FFT

RBW : 10Hz ~ 1MHz

Average Noise Level: RBW=1Hz, ATT=0dB

$\leq -146.5\text{dBm} + 1.5 \times f(\text{GHz})$; 1MHz ~ 2.5GHz

$\leq -142.5\text{dBm} + 1.5 \times f(\text{GHz})$; 2.5GHz ~ 3.2GHz

$\leq -137.5\text{dBm}$; 3.15GHz ~ 7.8GHz

$\leq -129.5\text{dBm}$; 7.7GHz ~ 13.2GHz

MS8608A-04/MS8609A-04

Digital Resolution Band Width

Outline: Real RMS detection with digital calculation

RBW : 10Hz ~ 1MHz

Average noise level: RBW 10Hz, ATT 0dB

$\leq -136.5\text{dBm} + 1.5 \times f(\text{GHz})$; 1MHz ~ 2.5GHz

$\leq -132.5\text{dBm} + 1.5 \times f(\text{GHz})$; 2.5GHz ~ 3.2GHz

$\leq -128.5\text{dBm}$; 3.15GHz ~ 7.8GHz

$\leq -119.5\text{dBm}$; 7.7GHz ~ 13.2GHz

MS8608A-08/MS8609A-08

Pre-Amplifier

Outline : Built-in pre-amplifier with 20dB gain

Gain : Gain 20dB(Typ.)

Noise exponent: 6.5dB(Typ.); Input frequency \leq 2GHz
12dB(Typ.); Input frequency $>$ 2GHz

Frequency range: 100kHz ~ 3GHz

Average noise level: RBW 300Hz, VBW 1Hz, ATT 0dB
 $\leq -137\text{dBm} + 2.0 \times f(\text{GHz})$; 1MHz ~ 3GHz

Optional Accessories



B0488
Real Protector



B0479
Soft carrying case



B0481B
**Soft carrying case
supporter**

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