

Maintenance Manual

MS2718B, MS2719B

Economy Spectrum Analyzer

MS2718B: 9 kHz to 13 GHz

MS2719B: 9 kHz to 20 GHz

The Anritsu logo is located in the bottom right corner of the page. It consists of the word "Anritsu" in a bold, sans-serif font. The letter "A" is stylized with a diagonal slash through it.

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DECLARATION OF CONFORMITY

Manufacturer's Name: ANRITSU COMPANY

Manufacturer's Address: Microwave Measurements Division
490 Jarvis Drive
Morgan Hill, CA 95037-2809
USA

declares that the product specified below:

Product Name: Economy Spectrum Analyzer

Model Number: MS2717B, MS2718B, MS2719B

conforms to the requirement of:

EMC Directive 89/336/EEC as amended by Council Directive 92/31/EEC & 93/68/EEC
Low Voltage Directive 2006/95/EC as amended by Council directive 93/68/EEC

Electromagnetic Compatibility: EN61326-1:1997 +A1:1998 +A2:2002 +A3:2003

Emissions: EN55011: 1998 +A1:1999 +A2:2002 Group 1 Class A

Immunity:

EN 61000-4-2:1995+ A1:1998+ A2:2001	- 4kV CD, 8kV AD
EN 61000-4-3:2002+ A1:2002	- 3V/m
EN 61000-4-4:2004	- 0.5kV SL, 1kV PL
EN 61000-4-5:1995+ A1:2001	- 0.5kV L-L, 1kV L-E
EN 61000-4-6:1996+ A1:2001	- 3V
EN 61000-4-11:1994+ A1:2001	- 100% @ 20msec

Electrical Safety Requirement:

Product Safety: EN61010-1: 2001

Morgan Hill, CA


Eric McLean, Corporate Quality Director

21 MAR 2007
Date

European Contact: For Anritsu product EMC & LVD information, contact Anritsu LTD, Rutherford Close,
Stevenage Herts, SG1 2EF UK, (FAX 44-1438-740202)

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产品中有毒有害物质或元素的名称及含量

For Chinese Customers Only YLNB

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 [Cr (VI)]	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷线路板 (PCA)	×	○	×	×	○	○
机壳、支架 (Chassis)	×	○	×	×	○	○
LCD	×	×	×	×	○	○
其他(电缆、风扇、 连接器等) (Appended goods)	×	○	×	×	○	○

○：表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。
 ×：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。

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Equipment marked with the Crossed-out Wheelie Bin symbol complies with the European Parliament and Council Directive 2002/96/EC (the "WEEE Directive") in the European Union.



For Products placed on the EU market after August 13, 2005, please contact your local Anritsu representative at the end of the product's useful life to arrange disposal in accordance with your initial contract and the local law.

Safety Symbols

To prevent the risk of personal injury or loss related to equipment malfunction, Anritsu Company uses the following symbols to indicate safety-related information. For your own safety, please read the information carefully *before* operating the equipment.

Symbols Used in Manuals

Danger



This indicates a very dangerous procedure that could result in serious injury or death, and possible loss related to equipment malfunction, if not performed properly.

Warning



This indicates a hazardous procedure that could result in light-to-severe injury or loss related to equipment malfunction, if proper precautions are not taken.

Caution



This indicates a hazardous procedure that could result in loss related to equipment malfunction if proper precautions are not taken.

Safety Symbols Used on Equipment and in Manuals

The following safety symbols are used inside or on the equipment near operation locations to provide information about safety items and operation precautions. Ensure that you clearly understand the meanings of the symbols and take the necessary precautions *before* operating the equipment. Some or all of the following five symbols may or may not be used on all Anritsu equipment. In addition, there may be other labels attached to products that are not shown in the diagrams in this manual.



This indicates a prohibited operation. The prohibited operation is indicated symbolically in or near the barred circle.



This indicates a compulsory safety precaution. The required operation is indicated symbolically in or near the circle.



This indicates a warning or caution. The contents are indicated symbolically in or near the triangle.



This indicates a note. The contents are described in the box.



These indicate that the marked part should be recycled.



For Safety

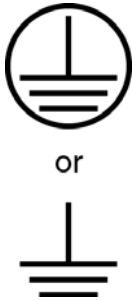
Warning



Always refer to the operation manual when working near locations at which the alert mark, shown on the left, is attached. If the operation, etc., is performed without heeding the advice in the operation manual, there is a risk of personal injury. In addition, the equipment performance may be reduced.

Moreover, this alert mark is sometimes used with other marks and descriptions indicating other dangers.

Warning



When supplying power to this equipment, connect the accessory 3-pin power cord to a 3-pin grounded power outlet. If a grounded 3-pin outlet is not available, use a conversion adapter and ground the green wire, or connect the frame ground on the rear panel of the equipment to ground. If power is supplied without grounding the equipment, there is a risk of receiving a severe or fatal electric shock.

Warning



This equipment can not be repaired by the operator. Do not attempt to remove the equipment covers or to disassemble internal components. Only qualified service technicians with a knowledge of electrical fire and shock hazards should service this equipment. There are high-voltage parts in this equipment presenting a risk of severe injury or fatal electric shock to untrained personnel. In addition, there is a risk of damage to precision components.

Warning



Use two or more people to lift and move this equipment, or use an equipment cart. There is a risk of back injury if this equipment is lifted by one person.

Caution



Electrostatic Discharge (ESD) can damage the highly sensitive circuits in the instrument. ESD is most likely to occur as test devices are being connected to, or disconnected from, the instrument's front and rear panel ports and connectors. You can protect the instrument and test devices by wearing a static-discharge wristband. Alternatively, you can ground yourself to discharge any static charge by touching the outer chassis of the grounded instrument before touching the instrument's front and rear panel ports and connectors. Avoid touching the test port center conductors unless you are properly grounded and have eliminated the possibility of static discharge.

Repair of damage that is found to be caused by electrostatic discharge is not covered under warranty.

Table of Contents

Chapter 1—General Information

1-1	Introduction	1-1
1-2	Description	1-1
1-3	Recommended Test Equipment	1-2
1-4	Replaceable Parts	1-5
1-5	Troubleshooting	1-6
1-6	Service Centers	1-7

Chapter 2—Performance Verification, Spectrum Analyzer

2-1	Frequency Accuracy	2-2
2-2	SSB Phase Noise Verification	2-3
2-3	Resolution Bandwidth Accuracy	2-5
2-4	Second Harmonic Distortion	2-6
2-5	Third Order Intercept Verification	2-7
	2400 MHz TOI Test	2-7
2-6	Displayed Average Noise Level (DANL)	2-10
2-7	Residual Spurious Response	2-12
	Residual Spurious Test with Preamp On	2-12
	Residual Spurious Test with Preamp Off	2-13
2-8	Input Related Spurious (IRS) Signals	2-14
	1000 MHz Input Related Spurious Check	2-14
	3275 MHz Input Related Spurious Check	2-15
	8000 MHz Input Related Spurious Check	2-16
	15000 MHz Input Related Spurious Check (for MS2719B only)	2-17
2-9	Absolute Amplitude Accuracy	2-18
	A. 50 MHz Amplitude Accuracy Verification Test	2-18
	B. Amplitude Accuracy Across Frequency Verification Test	2-21
	C. 9 kHz to 100 kHz Amplitude Accuracy Verification Test	2-23
2-10	RF Input VSWR Verification	2-27

Chapter 3—Performance Verification, Installed Options

3-1	GSM/GPRS/EDGE Signal Analyzer Option Verification	3-2
	Set up Procedure	3-3
	GSM Burst Power, Frequency Error, and Phase Error Tests (Option 40)	3-3
	EDGE Burst Power, Frequency Error, and Residual Error Tests (Option 41)	3-4
3-2	CDMA Signal Analyzer Option Verification	3-6
	Set up Procedure	3-7
	cdmaOne Channel Power, Frequency Error, Rho, and Tau Tests	3-7
	CDMA2000 Channel Power, Frequency Error, Rho, and Tau Tests	3-8

Table of Contents (Continued)

3-3	WCDMA/HSDPA Signal Analyzer Option Verification	3-9
	WCDMA Absolute Power Accuracy Verification (Option 44)	3-9
	WCDMA Occupied Bandwidth (OBW) Verification (Option 44)	3-14
	WCDMA RF Channel Power Accuracy and ACLR Verification (Option 44)	3-16
	HSDPA RF Channel Power Accuracy and ACLR Verification (Option 44)	3-19
	Error Vector Magnitude (EVM) Verification (Option 45 or Option 65)	3-22
	For MS2718B, MS2719B with Option 65:	3-24
3-4	Fixed WiMAX Signal Analyzer	3-25
	Fixed WiMAX Channel Power Accuracy Test (Options 46)	3-26
	Fixed WiMAX Residual EVM and Frequency Error Tests (Option 47)	3-27
3-5	TD-SCDMA Signal Analyzer	3-29
	TD-SCDMA Signal Analyzer Verification (Option 60 and/or 61)	3-30
3-6	EVDO Signal Analyzer Option Verification	3-31
	Options 62 or 63 or both	3-31
	Set up Procedure:	3-31
	8-PSK Modulation Channel Power, Frequency Error, Rho, and Tau Tests.	3-32
	QPSK Modulation Channel Power, Frequency Error, Rho, and Tau Tests.	3-33
	16-QAM Modulation Channel Power, Frequency Error, Rho and Tau Tests.	3-33
	Idle Slot Channel Power, Frequency Error, Rho, and Tau Tests.	3-34
3-7	Mobile WiMAX Signal Analyzer Verification	3-35
	Mobile WiMAX Channel Power Accuracy Tests (Option 66)	3-35
	Mobile WiMAX Residual EVM and Frequency Error Tests (Option 67).	3-38

Chapter 4—Adjustment

4-1	Internal Reference Frequency Adjustment	4-1
-----	---	-----

Chapter 5—Removal and Replacement

5-1	Introduction	5-1
5-2	Fuse	5-1
5-3	Enclosure	5-2
5-4	Battery	5-5
5-5	Power Input Module with Switch	5-6
5-6	Fan	5-8
5-7	Power Supply	5-9
5-8	Backlight Driver PCB for LCD	5-10
5-9	Front Panel Assembly	5-11
5-10	LCD Display	5-14
5-11	Numeric Keypad	5-17
5-12	Mode Function Keypad	5-19
5-13	Main PCB	5-21
5-14	SPA PCB	5-25

Appendix A—Test Records

Index

Chapter 1 — General Information

1-1 Introduction

This manual provides general service and maintenance information for the Anritsu MS2718B, MS2719B Economy Spectrum Analyzer. Performance verification procedures, parts replacement procedures, and a replaceable parts list are provided.

[Appendix A](#) contains blank test records that should be copied before use.

Familiarity with the basic operation of the front panel keys is assumed (for example, how to change measurement mode or preset the unit, or the meaning of “soft key”).

Caution	Before making any measurement, ensure that all equipment has been operating for at least 30 minutes to allow the internal circuitry to warm up and stabilize.
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This manual contains the following sections for maintenance information:

- “General Information” (Chapter 1)
- “Performance Verification, Spectrum Analyzer” (Chapter 2)
- “Performance Verification, Spectrum Analyzer” (Chapter 3)
- “Adjustment” (Chapter 4)
- “Removal and Replacement” (Chapter 5)
- “Test Records” (Appendix A)

Throughout this manual, the terms MS2718B, MS2719B, Economy Spectrum Analyzer, and Spectrum Analyzer are used interchangeably when referring to these instruments.

1-2 Description

The Anritsu Economy Spectrum Analyzer is a synthesizer-based Spectrum Analyzer that is designed for monitoring, measuring, and analyzing signals quickly and accurately. Measurements can be easily made by using the main instrument functions: frequency, span, amplitude, and bandwidth. Dedicated keys (for common functions) and a familiar calculator-type keypad are available for fast data entry.

Time and date stamping of measurement data is automatic. The internal memory provides for the storage and recall of more than 1000 measurement setups and more than 1000 traces. The bright, high-resolution color liquid crystal display (LCD) provides for easy viewing in a variety of lighting conditions.

A full range of marker capabilities (such as peak, center, and delta functions) are provided for faster, more comprehensive analysis of displayed signals. Upper and lower multi-segmented limit lines are available to create quick, simple pass/fail measurements. A menu option provides for an audible alert when the limit value is exceeded. The Anritsu Spectrum Analyzer can interface with Master Software Tools.

Anritsu Master Software Tools, a PC-based software program, provides for storing measurement data. Master Software Tools can also convert the Spectrum Analyzer measurement display into several graphic formats. An instrument can be easily updated with the latest firmware that is available from the Anritsu Web site:

<http://www.us.anritsu.com>

Measurements that are stored in internal memory can be downloaded to a PC by using the included USB or Ethernet cables. When stored, the graphic trace can then be displayed, scaled, or enhanced with markers and limit lines. Historical graphs can be overlaid with current data by using the PC mouse in a drag-and-drop manner. The measurement data can be extracted and used in spreadsheets or for other analytical tasks.

1-3 Recommended Test Equipment

The following test equipment is recommended for use in testing and maintaining the model MS2718B, MS2719B Spectrum Analyzer. [Table 1-1](#) includes a list of test equipment that is required for verifying the Spectrum Analyzer functions. [Table 1-2](#) includes a list of test equipment that is required for verifying optional functions.

Table 1-1. Recommended Test Equipment for Spectrum Analyzer Verification

Instrument	Critical Specification	Recommended Manufacturer/Model
Synthesized Signal Generator	Frequency: 0.1 Hz to 20 GHz Power Output: +16 dBm Step attenuator installed	Anritsu Model MG3692A or MG3692B with option 2A, option 4, option 22, option 15x ^a
Power Meter	Power Range: -70 to +20 dBm	Anritsu Dual Channel Model ML2438A
Power Sensor	Frequency: 100 kHz to 18 GHz Power Range: -30 to +20 dB	Anritsu Model MA2421D (Quantity 2) or SC7816 (Quantity 2)
Power Sensor	Frequency: 10 MHz to 18 GHz Power Range: -67 to +20 dB	Anritsu Model MA2442D (Quantity 2)
Vector Network Analyzer	40 MHz to 20 GHz	Anritsu Model 37x47A, B, C, or D
Type N Calibration Kit for VNA	40 MHz to 18 GHz	Anritsu Model 3653
Test Port Converter for VNA	40 MHz to 18 GHz	Anritsu Model 34UNF50
50 Ohm Termination	Frequency: DC to 18 GHz	Anritsu Model 28N50-2
Adapter	Frequency: DC to 20 GHz N(m)-N(m), 50 Ohm	Anritsu Model 34NN50A
Adapter	Frequency: DC to 20 GHz K(m)-N(f), 50 Ohm	Anritsu Model 34RKNF50
RF Coaxial Cable	Frequency: DC to 18 GHz N(m)-N(m), 50 Ohm	Anritsu Model 15NN50-0.6B (Quantity 2)
Lowpass Filter	Frequency: 50 MHz	Anritsu Part Number 1030-96
Low Frequency Cal Fixture	Frequency: 9 kHz to 100 kHz	Anritsu Part Number T3449
Frequency Reference	Frequency: 10 MHz	Symmetricom Model RubiSource T&M
Signal Generator		Agilent Model 8648D ^b with Option 1ES and option 1EA
Multimeter	Capable of measuring True RMS AC voltage in millivolts range	Agilent Model 34401A
Fixed Attenuator	10 dB Attenuation	Aeroflex/Weinschel Model 44-10 (Quantity 2)
Fixed Attenuator	20 dB Attenuation	Aeroflex/Weinschel Model 44-20 (Quantity 2)
Fixed Attenuator	6 dB Attenuation	Aeroflex/Weinschel Model 44-6 (Quantity 2)
Fixed Attenuator	2 dB Attenuation	Aeroflex/Weinschel Model 44-2 (Quantity 2)
Power Splitter	Frequency: DC to 18 GHz	Aeroflex/Weinschel Model 1870A
Precision Termination	DC to 18 GHz, 40 dB, 50 Ohm	Anritsu Part Number 28N50-2
Coaxial Cable	BNC(m) to BNC(m), 50 Ohm	Any (Quantity 2)
Adapter	Dual Banana Plug to BNC(f)	Any

a.Note that only MG3692A models require option 15 to achieve power of +16 dBm at 3.5 GHz.

b.No critical specification is required for this signal generator.

Caution

Factory tests have shown that the equipment listed above will provide satisfactory results at 20 GHz (the upper limit of the MS2719B) even though the chart above specifies 18 GHz (per manufacturer specifications). Many Type N cables have excessive loss for testing the Spectrum Analyzer section of the instrument up to 20 GHz. An SMA or K cable should therefore be installed on the MG3692A or MG3692B synthesizer for all Spectrum Analyzer tests on the MS2719B.

Table 1-2. Recommended Test Equipment for Options Function Verification

Instrument	Critical Specification	Recommended Manufacturer/Model
Synthesizer	Frequency: 0.1 Hz to 20 GHz	Anritsu Model MG3692A or MG3692B with option 2A, option 4, option 15 ^a and option 22
Vector Signal Generator	Frequency: 100 kHz to 3 GHz	Anritsu Model MG3700A ^b with Options: MG3700A-002, MG3700A-021
Power Meter	Power Range: -70 dBm to +20 dBm	Anritsu Dual Channel Model ML2438A
Power Sensor	Frequency: 10 MHz to 18 GHz Power Range: -60 dBm to +20 dBm	Anritsu Model MA2482D with Option 1 Quantity: 2 each
Frequency Counter	Frequency: 20 GHz	Anritsu Model MF2412B
Programmable Attenuator	Frequency: DC to 2 GHz Attenuation: 100 dB (in 1 dB and 10 dB steps)	Anritsu Model MN63A
Fixed Attenuator	Frequency Range: DC to 18 GHz Attenuation: 10 dB	Aeroflex/Weinschel Model 44-10 Quantity: 2 each
Power Splitter	Frequency: DC to 18 GHz	Aeroflex/Weinschel Model 1870A
RF Power Amplifier	Frequency: 100 MHz to 1000 MHz, Gain: 35 dB minimum	Mini Circuits Model TIA-1000-1R8 [Two each of BNC(m) to N(f) Adapters are required.]
Adapter	Frequency: DC to 20 GHz N(m)-N(m), 50 Ohm	Maury Microwave Model 8828B Quantity: 2 each [Required one each only if Anritsu Coupler and Circulator are used]
Adapter	Frequency: DC to 20 GHz K(m)-N(f), 50 Ohm	Anritsu Model 34RKNF50
Adapter	Frequency: 881.5 MHz BNC(m) to N(f), 50 Ohm	Midwest Microwave Model ADT-2615-NF-BNM-02 Quantity: 2 each
Adapter	Frequency: 881.5 MHz SMA(m) to N(f), 50 Ohm	Midwest Microwave Model ADT-2582-NF-SMM-02 Quantity: 4 each [Required only if Anritsu Coupler and Circulator are used.]
Adapter	Frequency: 881.5 MHz SMA(m) to SMA(m), 50 Ohm	Midwest Microwave Model ADT-2594-MM-SMA-02 [Required only if Anritsu Coupler and Circulator are used.]
50 Ohm Termination	Frequency: DC to 18 GHz	Anritsu Model 28N50-2

Table 1-2. Recommended Test Equipment for Options Function Verification (Continued)

Instrument	Critical Specification	Recommended Manufacturer/Model
High Power Load	DC to 18 GHz, 10 W	Aeroflex/Weinschel Model M1418
Coupler	Frequency: 881.5 MHz Coupling Factor: 30 dB	Midwest Microwave Model CPW-5140-30-NNN-05 or CPW-5141-30-NNN-05 Alternative: Anritsu part number 1091-307 [Two SMA(m) to N(f) adapters are required.]
Circulator	Frequency Range: 800 MHz to 1000 MHz Isolation: 20 dB minimum	Meca Electronics, Inc. part number CN-0.900 Alternative: Anritsu part number 1000-50 [Two SMA(m) to N(f) adapter and one SMA(m) to SMA(m) Adapter are required.]
RF Coaxial Cable	Frequency: DC to 18 GHz N(m)-N(m), 50 Ohm	Anritsu Model 15NN50-0.6B Quantity: 3 each
Coaxial Cable	BNC(m) to BNC(m), 50 Ohm	Any

a.Note that only MG3692A models require option 15 to achieve power of +13 dBm.

b.Note that the MG3700A requires several factory custom test pattern files installed into its memory.

1-4 Replaceable Parts

Table 1-3. Replaceable Parts

Part Number	Description
ND67988	MS2718B Main/Spectrum Analyzer Assembly; w/Option 9 Hardware ^a
ND67989	MS2719B Main/Spectrum Analyzer Assembly; w/Option 9 Hardware ^a
ND66821	Demodulation PCB (Option 9)
3-15-118	LCD Display
61368	clear plastic LCD protector
3-66549-3	LCD Backlight Driver PCB
40-170	Power Supply Module
631-81	1.6 A slow blow fuse
ND66437	Fan
3-633-26	3 V RTC battery
3-2000-1567	Internal Compact Flash card (512 MB)
65027-3	main keypad PCB
61362	main keypad
65340	main keypad bezel
61361	softkeys keypad
61378-1	softkey bezel
61333-3	softkey PCB
790-625	speaker
3-410-102	encoder (excluding knob)
61360-2	knob (excluding encoder)

a. When ordering the Main/Spectrum Analyzer PCB Assembly, in order to ensure installation of correct options on the replacement units, all options that are installed on the instrument must be declared on the order. Software based options (for example, Option 44 and Option 45) are enabled prior to shipment of the exchange assembly. The options are listed on a label on the top of the MS2718B or MS2719B and are shown in the System / Status display.

1-5 Troubleshooting

This section describes the primary troubleshooting operations that can be performed by all Anritsu Service Centers. Perform the troubleshooting suggestions in the order that they are listed. Operators of the MS2718B, MS2719B should refer to the MS271xB User Guide (Anritsu part number 10580-00181) for troubleshooting help. Error messages can be found in Appendix B of the User Guide.

Cautions:

Only qualified Anritsu personnel should replace internal assemblies.

Major subassemblies (as shown in the replaceable parts list) are typically the items that may be replaced.

Because they are highly fragile, items that must be soldered may not be replaced without special training.

Removing of RF shields from PC boards, or adjustment of screws on or near the shields, will detune sensitive RF circuits and will result in degraded instrument performance.

Turn-On Problems:

Unit cannot boot up, no activity occurs when On/Off key is pressed:

1. Ensure that the power cord is attached and that the rear panel switch is set to ON.
2. Check the fuse in the power input module.
3. Power supply may have failed. Open the case as described in [Section 5-3 on page 5-2](#) and ensure that power is available from the power input module (EMI filter). If the EMI filter has failed, then replace the EMI filter ([Section 5-5 on page 5-6](#)). If power is available from the the EMI filter, then ensure that the output from the power supply module (at J2, pins 1, 2, 3) is approximately +12 Volts. If the power supply has failed, then replace the power supply ([Section 5-7 on page 5-9](#)).
4. On/Off switch is damaged. Replace the keypad PCB or rubber keypad ([Section 5-11 on page 5-17](#)).
5. Main PCB has failed. Replace the Main/Spectrum Analyzer PCB assembly ([Section 5-13 on page 5-21](#)).

Unit begins the boot process, but does not complete boot up:

1. Using Master Software Tools, perform the Emergency Repair procedure, then update the system software (via the Tools menu).
2. Main PCB has failed. Replace the Main/Spectrum Analyzer PCB assembly ([Section 5-13 on page 5-21](#)).

Unit makes normal boot-up sounds, but the display has a problem:

1. If the display is dim, check the brightness setting under the System Menu/System Options.
2. Replace the Backlight Driver PCB ([Section 5-8 on page 5-10](#)).
3. Replace the LCD assembly ([Section 5-10 on page 5-14](#)).
4. Main PCB has failed. Replace the Main/Spectrum Analyzer PCB assembly ([Section 5-13 on page 5-21](#)).

Boot-up Self Test fails:

1. Perform a Master Reset (Hold the **System** key and then press the **On/Off** key to power on the instrument).
2. If the message relates to the RTC battery, then replace the battery on the Main PCB ([Section 5-4 on page 5-5](#)).
3. Main PCB has failed. Replace the Main/Spectrum Analyzer PCB assembly ([Section 5-13 on page 5-21](#)).

Lock Error Messages:

1. This message normally appears for 2 to 3 seconds when an external 10 MHz reference is applied.
2. Spectrum Analyzer PCB has failed. Replace the Main/Spectrum Analyzer PCB assembly (Section 5-13 on page 5-21).

Spectrum Analyzer Problems:

1. Inspect the Spectrum Analyzer RF In connector for damage.
2. Refer to the User Guide (Anritsu part number 10580-00181).
3. Update system software using Master Software Tools (via Tools menu).
4. Spectrum Analyzer PCB has failed. Replace the Main/Spectrum Analyzer PCB assembly (Section 5-13 on page 5-21).

1-6 Service Centers

For the latest service and sales information in your area, please visit the following URL:

<http://www.anritsu.com/Contact.asp>

and choose a country for regional contact information.

A list of Anritsu Service Centers is printed inside the back cover of this manual.

Chapter 2 — Performance Verification, Spectrum Analyzer

The procedures in this chapter are used to verify the performance of the Anritsu MS2718B, MS2719B Spectrum Analyzer functions. Installed option verification procedures are detailed in [Chapter 3](#).

Blank performance verification test records are provided in [Appendix A](#). These blank test records should be copied before use.

IMPORTANT

Before making any measurement, ensure that all equipment has been operating for at least 30 minutes to allow the internal circuitry to warm up and stabilize.

2-1 Frequency Accuracy

This test verifies the CW frequency accuracy of the Spectrum Analyzer in Anritsu Model MS2718B, MS2719B Economy Spectrum Analyzer.

Procedure:

1. Connect the external 10 MHz Reference to the Anritsu MG3692x Synthesized Signal Generator.

Note Do not connect the external 10 MHz Reference to the MS2718B, MS2719B Spectrum Analyzer.

2. Connect the output of the Synthesized Signal Generator to the Spectrum Analyzer RF In of the MS2718B, MS2719B.
3. On the MS2718B, MS2719B, change the Mode to Spectrum Analyzer. Then press **Shift** and press **Preset** (1) to preset the MS2718B, MS2719B.
4. Set the MG3692x output to 1 GHz CW, with an RF output level of -30 dBm.
5. On the MS2718B, MS2719B, press the Amplitude soft key, and set the Reference Level to -10 dBm.
6. Press the Freq soft key and set the Center Freq to 1.0 GHz.
7. Press the Span soft key, set the span to 10 kHz.
8. Press the BW soft key and set RBW to 100 Hz.
9. Press the VBW soft key and set to 30 Hz.
10. Press the **Marker** key, and press the Peak Search soft key.
11. Record the marker frequency in the test records in [Table A-1, "Spectrum Analyzer Frequency Accuracy"](#). Ensure that the measured frequency is within specification.
12. For the MS2718B, set the MG3692x output to 12.0 GHz CW and set the center frequency of the MS2718B to 12.0 GHz.
For the MS2719B, set the MG3692x output to 19.0 GHz CW and set the center frequency of the MS2719B to 19.0 GHz.
13. On the MS2718B, MS2719B, press the **Marker** key, and press the Peak Search soft key.
14. Record the marker frequency in the test records in [Table A-1, "Spectrum Analyzer Frequency Accuracy"](#). Ensure that the measured frequency is within specification.

Note If the MS2718B, MS2719B fails the Spectrum Analyzer "Frequency Accuracy" test, then perform the Spectrum Analyzer "Internal Reference Frequency Adjustment" procedure in Section 4-1 . If the MS2718B, MS2719B still fails the Frequency Accuracy test after the Internal Reference Frequency Adjustment has been completed, then replace the Main/SPA PCB assembly.
--

2-2 SSB Phase Noise Verification

This test verifies the single sideband phase noise of the Spectrum Analyzer in Anritsu Model MS2718B, MS2719B Economy Spectrum Analyzer.

Procedure:

1. Connect the external 10 MHz Reference to the Anritsu MG3692x Synthesized Signal Generator.
2. Connect the output of the Synthesized Signal Generator to the Spectrum Analyzer RF In connector of the MS2718B, MS2719B
3. Set the MG3692x output to 900 MHz CW, with an RF output level of +3 dBm.
4. Ensure that the MS2718B, MS2719B is in the Spectrum Analyzer mode. Then press **Shift** and press **Preset** (1) to preset the MS2718B, MS2719B.
5. Press the Amplitude soft key, then set the Reference Level to 0 dBm.
6. Press the Atten Lvl soft key and enter 15 dB.
7. Press the Freq soft key and set the Center Freq to 900.05 MHz.
8. Press the Span soft key and set span to 110 kHz.
9. Press the BW soft key and set the RBW to 1 kHz.
10. Press the VBW soft key and set to 3 Hz.
11. Press the **Shift** key, and then press the **Trace** (5) key.
12. Press Trace A Operations, and set the # of Averages to 7.
13. Wait until the Trace Count (left side of display) displays 7/7.
14. Press the **Marker** key and press the **Peak Search** soft key.
15. Press the Delta On/Off soft key to turn on Delta.
16. Use the keypad to enter 10 and press the kHz soft key.
17. Subtract 30 from the dB value that is shown on the marker readout in order to convert the value to dBc/Hz (for example, if the marker reads -80 dB, then the value becomes -110 dBc/Hz).
18. Record the dBc/Hz value in the test records in [Table A-2, "Spectrum Analyzer SSB Phase Noise Verification, 900 MHz"](#).
19. Repeat Step 16 through Step 18 for 20 kHz marker delta, 30 kHz marker delta, and 100 kHz marker delta.
20. Press the Freq soft key and set the Center Freq to 905 MHz.
21. Press the Span soft key and set span to 12 MHz.
22. Press the BW soft key and set VBW to 300 Hz.
23. Wait until the Trace Count (left side of display) displays 7/7.
24. Repeat Step 16 through Step 18 for 1 MHz marker delta and 10 MHz marker delta.

For Anritsu Model MS2719B Economy Spectrum Analyzer, continue to Step 25.

25. Press the **Freq** soft key and set the Center Freq to 19000.05 MHz.
26. Press the **Span** soft key, set span to 110 kHz.
27. Press the **BW** soft key and set the RBW to 1 kHz.
28. Press the **VBW** soft key, set to 3 Hz.
29. Press the **Shift** key and then press the **Trace** (5) key.
30. Select Trace A Operations, and set the # of Averages to 7.
31. Wait until the Trace Count (left side of display) displays 7/7.
32. Press the **Marker** key and select the **Peak Search** soft key.
33. Press the **Delta On/Off** soft key to turn Delta On.
34. Use the keypad to enter 10 and press the **kHz** soft key.
35. Subtract 30 from the dB value that is shown on the marker readout in order to convert the value to dBc/Hz (for example, if the marker reads -80 dB, then the value becomes -110 dBc/Hz).
36. Record the dBc/Hz value in the test records in [Table A-3, "Spectrum Analyzer SSB Phase Noise Verification, 19 GHz"](#).
37. Repeat Step 34 through Step 36 for 20 kHz marker delta, 30 kHz marker delta, and 100 kHz marker delta.
38. Press the **Freq** soft key and set the Center Freq to 19005 MHz.
39. Press the **Span** soft key, set span to 12 MHz.
40. Press the **BW** soft key, set VBW to 300 Hz.
41. Wait until the Trace Count (left side of display) displays 7/7.
42. Repeat Step 34 through Step 36 for 1 MHz marker delta and 10 MHz marker delta.

2-3 Resolution Bandwidth Accuracy

This test verifies the resolution bandwidth accuracy of the Spectrum Analyzer in Anritsu Model MS2718B, MS2719B Economy Spectrum Analyzer.

Procedure:

1. Connect the external 10 MHz Reference to both the MG3692x Synthesized Signal Generator and the MS2718B, MS2719B Spectrum Analyzer.
2. Set the MS2718B, MS2719B to Spectrum Analyzer mode, then press **Shift** and press **Preset (1)** and then press the **Preset** softkey to preset the MS2718B, MS2719B. Then set up the MS2718B, MS2719B as follows:
Center Frequency: 1.0 GHz
Reference Level: -10 dBm
Atten Lvl: 0 dB
3. Set the MG3692x to 1 GHz CW, with an output level of -30 dBm. Apply the signal to the Spectrum Analyzer RF In connector of the MS2718B, MS2719B.
4. On the MS2718B, MS2719B, set the Span to 4.5 MHz.
5. Press the **BW** soft key and set the RBW to 3 MHz.
6. Under the **Measure** menu, press **OCC BW** and set it to **ON**.
7. Press the **dBc** soft key and enter 3.
8. Record the occupied bandwidth in the test record in [Table A-4, "Spectrum Analyzer Resolution Bandwidth \(RBW\) Accuracy Test"](#) and verify that it is within specification.
9. Repeat Step 4 through Step 8 for all other settings in the test record in [Table A-4](#).

2-4 Second Harmonic Distortion

This test verifies the second harmonic distortion of the Spectrum Analyzer in Anritsu Model MS2718B, MS2719B Economy Spectrum Analyzer.

Procedure:

1. Set the MG3692x Synthesized Signal Generator to 50.1 MHz CW and set the output level to -30 dBm.
2. Connect the Synthesized Signal Generator output to the Spectrum Analyzer RF In connector of the MS2718B, MS2719B through the 50 MHz low-pass filter.
3. Set the MS2718B, MS2719B to Spectrum Analyzer mode, then press **Shift** and press **Preset** (1) to preset the MS2718B, MS2719B, then set up the MS2718B, MS2719B as follows:
Center Frequency: 50.1 MHz
Span: 100 kHz
Reference Level: -20 dBm
Atten Lvl: 0 dB
RBW: 1 kHz
VBW: 10 Hz
Detection: Peak
4. Press the **Shift** key and then the **Trace** (5) key. Press Trace A Operations and set # of Averages to 5.
5. After the Trace Count displays “5/5” (left side of display), press the Marker soft key and press Peak Search.
6. Record the amplitude of the 50.1 MHz signal in the test record in [Table A-5, “Spectrum Analyzer Second Harmonic Distortion”](#).
7. Change the Center Frequency of the MS2718B, MS2719B to 100.2 MHz. **Do not adjust** the MG3692x Synthesized Signal Generator.
8. After the Trace Count shows “5/5”, press the Marker soft key and press Peak Search.
9. Record the amplitude of the signal at 100.2 MHz in the test record in [Table A-5](#).
10. Subtract the value of the 50.1 MHz signal from the value of the 100.2 MHz signal. Record the result (the second harmonic distortion) in the test record in [Table A-5](#) and verify that it is within specification.

2-5 Third Order Intercept Verification

The following test verifies the Third Order Intercept point (also known as TOI or IP3) of the Spectrum Analyzer in Anritsu Model MS2718B, MS2719B Economy Spectrum Analyzer.

2400 MHz TOI Test

Procedure:

1. Connect the equipment as shown in [Figure 2-1](#). The splitter will be used as an RF combiner (the normal RF outputs will become inputs, and the normal input will become the RF output).
2. Set the MG3692x Synthesized Signal Generator to 2399.951 MHz CW, and set the Agilent 8648D Signal Generator to 2400.051 MHz.

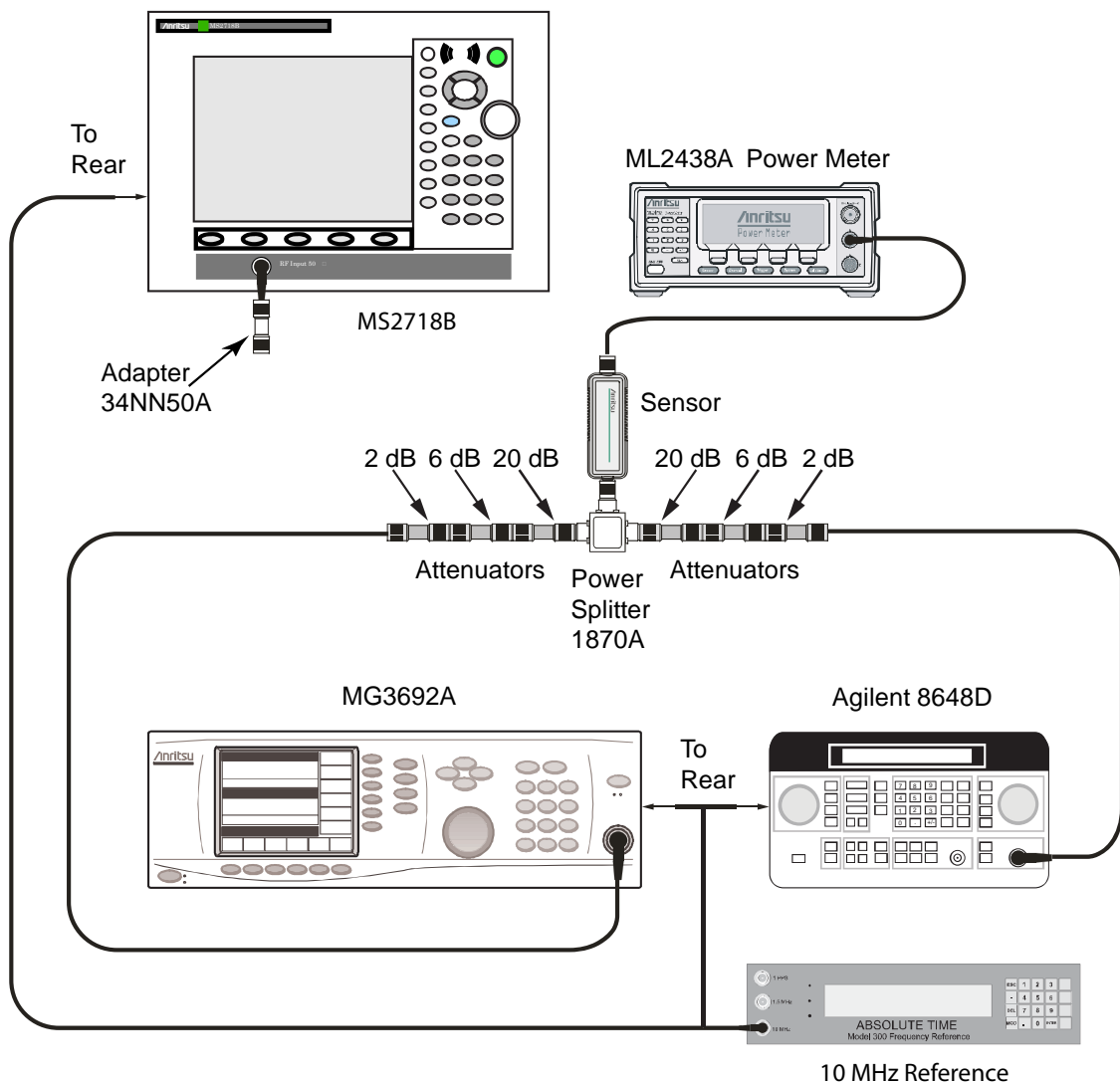


Figure 2-1. Third Order Intercept Verification (2400 MHz) Setup

3. Set the Agilent 8648D Signal Generator RF to OFF (“RF OFF” appears on the right side of the display).
4. On the ML2438A power meter, set the calibration factor of the power sensor to 2.4 GHz.
5. Connect the power sensor to the splitter output, and adjust the power of the MG3692x (to approximately +16 dBm) so that -20 dBm appears at the splitter output.
6. Turn off the RF of the MG3692x Synthesized Signal Generator.

7. On the Agilent 8648D Signal Generator, turn on the RF and adjust the RF amplitude (to approximately +16 dBm) so that -20 dBm appears at the splitter output.
8. Set the MS2718B, MS2719B to Spectrum Analyzer mode, then press **Shift** and press **Preset** (1) to preset the MS2718B, MS2719B, then set up the MS2718B, MS2719B as follows:
 Center Frequency: 2400.151 MHz
 Span: 100 Hz
 RBW: 30 Hz
 VBW: 1 Hz
 Reference Level: -15 dBm
 Atten Lvl: 0 dB
 Pre-amp: OFF
9. Press the **Shift** key and the **Sweep** (3) key. Press **Detection**, and press **RMS** (red dot appears on the label).
10. Disconnect the power sensor from the output of the splitter, and connect the splitter output to the MS2718B, MS2719B Spectrum Analyzer RF In connector through the Anritsu Model 34NN50A adapter as shown in [Figure 2-2](#).

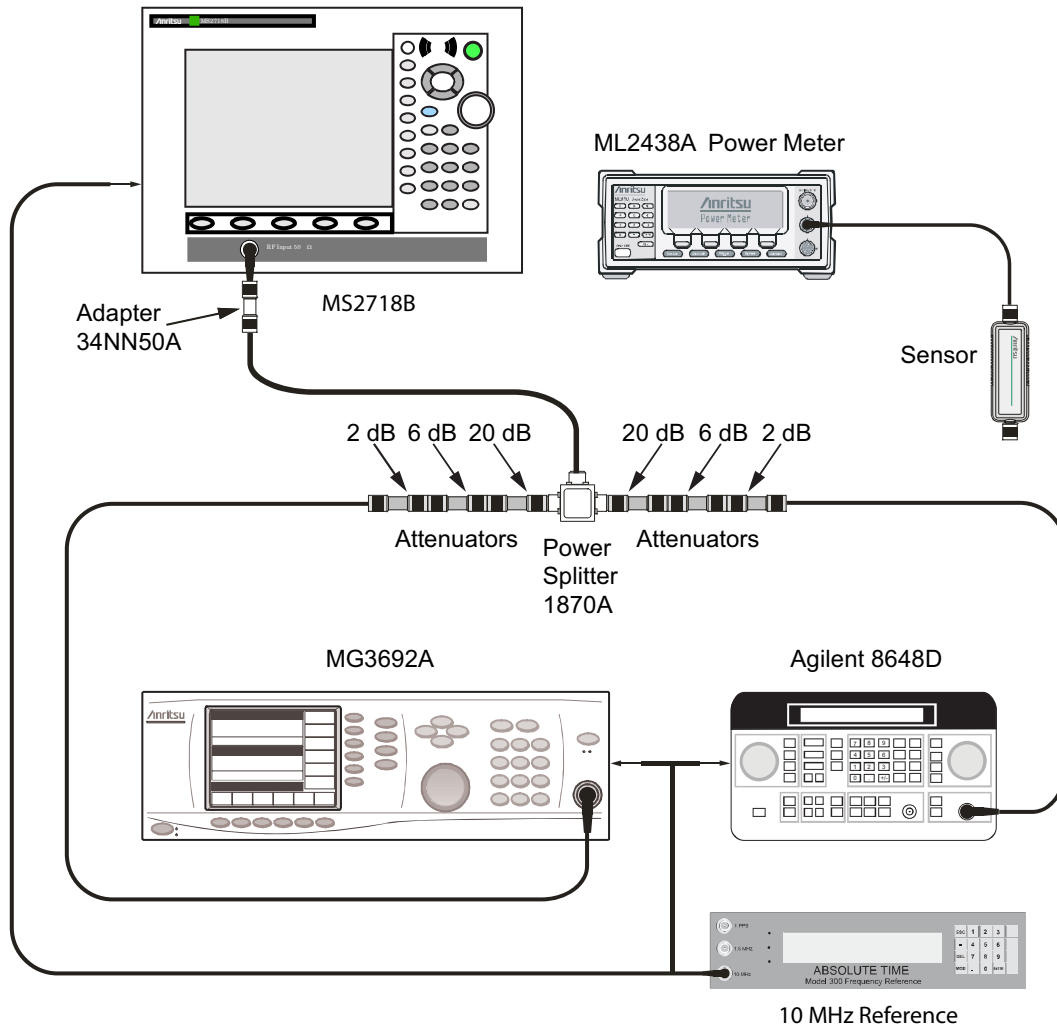


Figure 2-2. Third Order Intercept 2400 MHz Test Setup

11. Turn on the RF of both the MG3692x and the 8648D.
12. Press the **Shift** key and then the **Trace** (5) key. Press Trace A Operations, and set # of Averages to 2.
13. After 2 sweeps have occurred (“Trace Count 2/2” appears on the left of the display), turn on a marker and press **Marker to Peak**. Record the amplitude of the signal at 2400.151 MHz in [Table A-6](#).
14. Change the Center Frequency of the MS2718B, MS2719B to 2399.851 MHz. Record the amplitude of this signal in [Table A-6](#) for use in the TOI calculation.
15. Determine which signal is larger (2399.851 MHz or 2400.151 MHz). Use the larger value for “max” in the following formula in order to calculate the TOI for 2400 MHz (refer to the following example calculation):

$$\text{TOI} = -20 + [(-20 - \text{“max”}) / 2] \text{ dBm}$$

Example: assuming “max” of -90 dBm

$$\text{TOI} = -20 + [(-20 - (-90)) / 2] = +15 \text{ dBm}$$

16. Record the 2400 MHz TOI calculated measurement in the test record in [Table A-7](#).

2-6 Displayed Average Noise Level (DANL)

The following test can be used to verify the Displayed Average Noise Level of the MS2718B, MS2719B. This test is performed using the RMS detection mode, first with pre-amp on, then with pre-amp off.

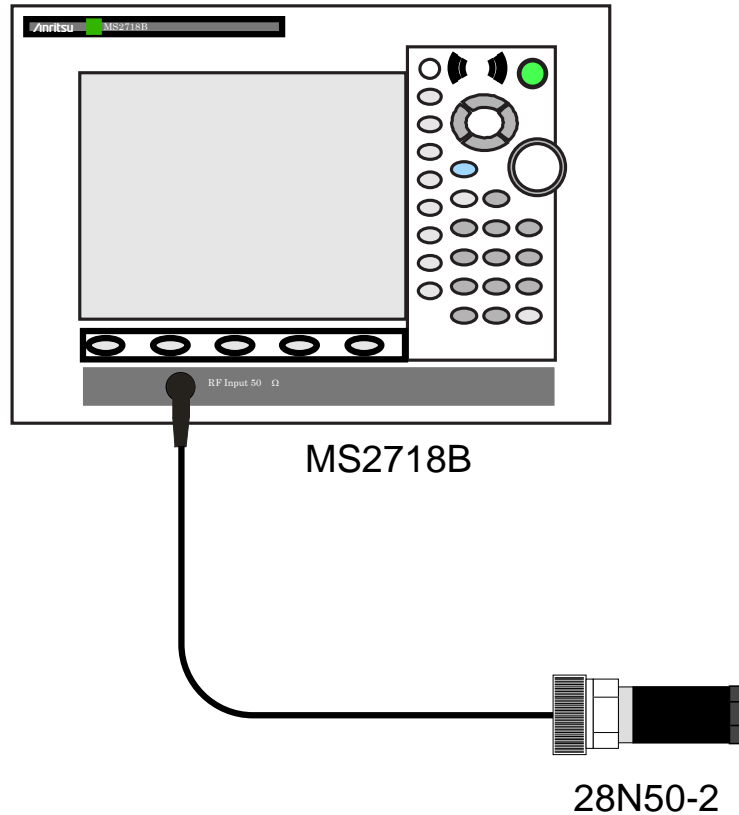


Figure 2-3. Displayed Average Noise Level Test Setup

Procedure:

1. Connect the 28N50-2 50 Ohm termination to the MS2718B, MS2719B Spectrum Analyzer RF In as shown in [Figure 2-3](#).
2. Set the MS2718B, MS2719B to Spectrum Analyzer mode, and then press **Shift** and press **Preset** (1) and then press the **Preset** softkey to preset the MS2718B, MS2719B.
3. Press the **Amplitude** soft key.
4. Set **Atten Lvl** to 0 dB and then set the **Reference Level** to -50 dBm.
5. Press the **Pre-amp On/Off** soft key to turn it ON.
6. Press the **Shift** key and then press the **Sweep** (3) key. Press **Detection**, then press **RMS** (red dot appears on the **RMS** label).
7. Press the **BW** soft key. Select an **RBW** value of 100 kHz.
8. Enter the **Start** and **Stop** frequencies into the MS2718B, MS2719B from the table into the test record in [Table A-8](#).
9. Set **VBW** to 1 kHz and wait until 1 sweep has completed.
10. Press the **Marker** key and press **Peak Search**.
11. Record the **Marker** reading in the **Measured** (100 kHz) column of the test record in [Table A-8](#), “**Spectrum Analyzer DANL with Preamp On**”.

12. Repeat Step 8 through Step 11 for the other frequencies on the list. Change the VBW setting as indicated in [Table A-8, "Spectrum Analyzer DANL with Preamp On"](#).
13. For each measured 100 kHz value in the chart ([Table A-8](#)), convert the value to 1 Hz RBW value by subtracting 50 dB.
(For example, if the marker shows a value of -110 dBm at 100 kHz RBW, then the computed value at 1 Hz RBW is -160 dBm.)
14. Enter the computed values into the test record.
15. Press the Amplitude soft key and set the pre-amp to OFF.
16. Set the Reference Level to -20 dBm.
17. Repeat Step 8 through Step 14 for the pre-amp off measurements.
18. Enter the computed 1 Hz RBW values into the test record in [Table A-9, "Spectrum Analyzer DANL with Preamp Off"](#).

2-7 Residual Spurious Response

The following test verifies the residual spurious response of the Spectrum Analyzer. This test is performed using the positive peak detection mode. This test has two parts:

- “Residual Spurious Test with Preamp On”
- “Residual Spurious Test with Preamp Off”

Residual Spurious Test with Preamp On

Procedure:

1. Connect the 28N50-2 50 Ohm termination to the Spectrum Analyzer RF In connector.
2. Set the MS2718B, MS2719B to Spectrum Analyzer mode, and then press **Shift** and press **Preset** (1) and then press the **Preset** softkey to preset the MS2718B, MS2719B.
3. Press the **Amplitude** key, then press the **Reference Level** soft key.
4. Use the keypad to enter -40 and press the **dBm** soft key.
5. Press the **Atten Lvl** soft key and enter 0, then press the **dB** soft key.
6. Ensure that the **Pre-Amp On/Off** soft key is in the **On** position. If the pre-amp is off, then press the **Pre-Amp On/Off** soft key to turn it on.
7. Press the **Shift** key and then press the **Sweep** (3) key. Then press the **Detection** soft key, and then press the **Peak** soft key.
8. Press the **BW** key and press the **RBW** soft key.
9. Use the keypad to enter 10 and press the **kHz** soft key.
10. Press the **VBW** soft key and use the keypad to enter 1, then press the **kHz** soft key.
11. Press the **Freq** key and press the **Start Freq** soft key.
12. Use the keypad to enter 100, and then press the **kHz** soft key.
13. Press the **Stop Freq** soft key, enter 10, and then press the **MHz** soft key.
14. Wait until one sweep is completed.
15. Press the **Marker** key and press the **Peak Search** soft key.
16. Verify that the Marker 1 amplitude reading is ≤ -100 dBm and record it in the test records under Residual Spurious Test with Preamp On in [Table A-10](#), if required.

Note

If a spur occurs with amplitude larger than -100 dBm, then wait another full sweep and observe whether the spur occurs at the same point on the second sweep. If the spur does not occur at the same point on the second sweep, then the spur on the first sweep was not real.

17. Repeat Step 11 through Step 16 for the other Start and Stop frequencies that are listed in the test record in [Table A-10](#).

Residual Spurious Test with Preamp Off

Procedure:

1. Connect the 28N50-2 50 Ohm termination to the Spectrum Analyzer RF In connector.
2. Set the MS2718B, MS2719B to Spectrum Analyzer mode, and then press **Shift** and press **Preset** (1) to preset the MS2718B, MS2719B.
3. Press the **Amplitude** key, then press the Reference Level soft key.
4. Use the keypad to enter -40 and press the dBm soft key.
5. Press the Atten Lvl soft key and enter 0, then press the dB soft key.
6. Ensure that the Pre-Amp On/Off soft key is in the Off position. If the preamp is on, then press the Pre-Amp On/Off soft key to turn it off.
7. Press the **Shift** key and then press the **Sweep** (3) key, then press the Detection soft key and then the Peak soft key.
8. Press the **Freq** key, and press the Start Freq soft key.
9. Use the keypad to enter 100 and press the kHz soft key.
10. Press the Stop Freq soft key, enter 10 and press the MHz soft key.
11. Press the **BW** key and press the RBW soft key.
12. Use the keypad to enter 3 and press the kHz soft key.
13. Press the VBW soft key and use the keypad to enter 300, then press the Hz soft key.
14. Wait until one sweep is completed.
15. Press the **Marker** key and press the Peak Search soft key.
16. Record the Marker 1 amplitude reading and verify that it is ≤ -90 dBm in the test records under Residual Spurious Test with Preamp Off in [Table A-11](#), if required.

Note

If a spur occurs with amplitude larger than -90 dBm, then wait another full sweep and observe whether the spur occurs at the same point on the second sweep. If the spur does not occur at the same point on the second sweep, then the spur on the first sweep was not real.

17. Repeat Step 8 through Step 16 for the other Start and Stop frequencies that are listed in the test record in [Table A-11](#).

2-8 Input Related Spurious (IRS) Signals

The following test verifies the input related spurious signals of the Spectrum Analyzer in Anritsu Model MS2718B, MS2719B Economy Spectrum Analyzer.

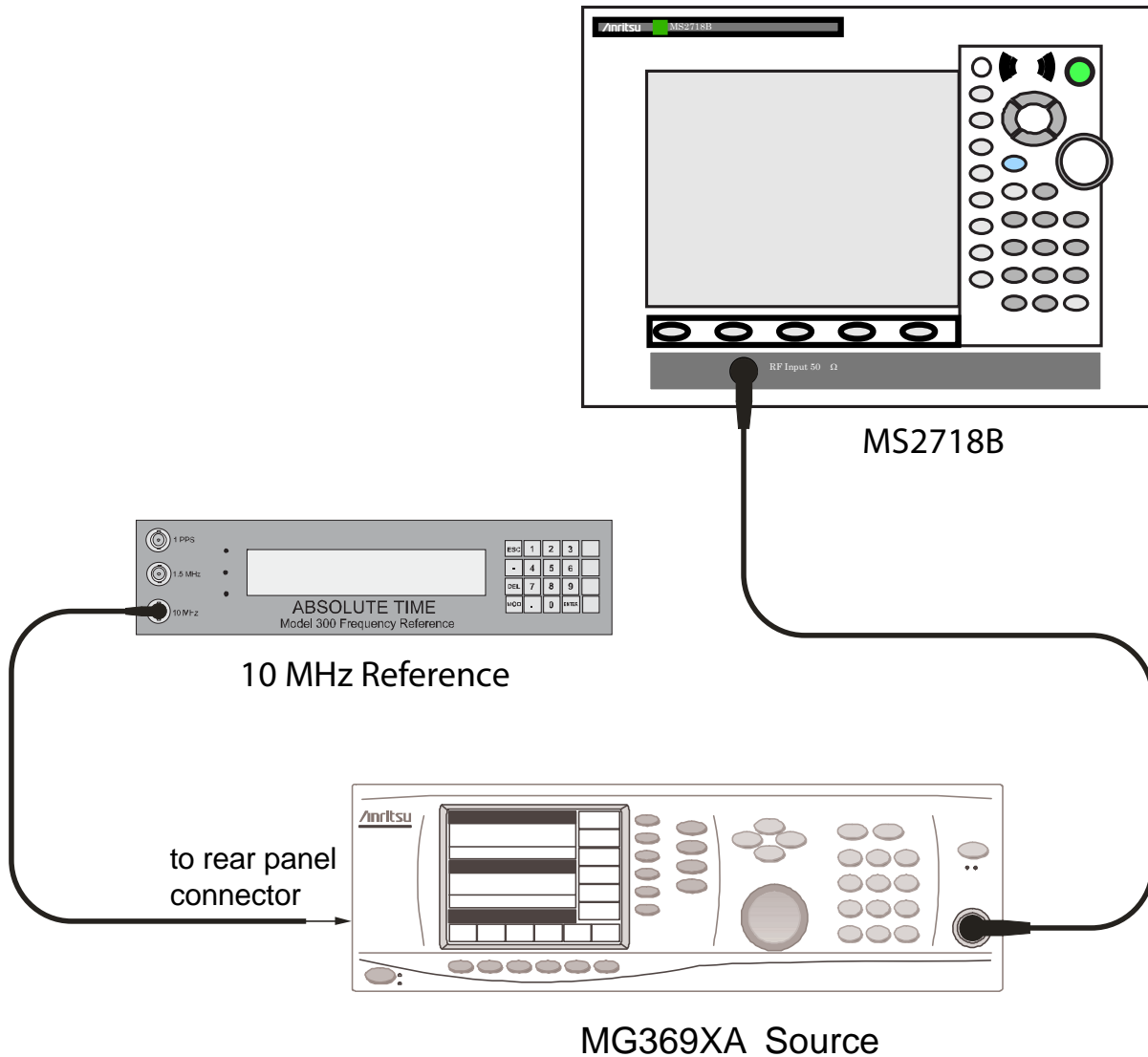


Figure 2-4. Input Related Spurious Signals Test Setup

Procedure:

1. Connect the 10 MHz reference source to the MG3692x Synthesized Signal Generator as shown in [Figure 2-4](#).
2. Connect the output of the Synthesized Signal Generator to the MS2718B, MS2719B Economy Spectrum Analyzer RF In connector.

1000 MHz Input Related Spurious Check

3. Set the MG3692x output to 1000 MHz CW, with an RF output level of -30 dBm.
4. Set the MS2718B, MS2719B to Spectrum Analyzer mode, and then press **Shift** and press **Preset** (1) to preset the MS2718B, MS2719B.
5. Press the **Amplitude** key, then press the Reference Level soft key.

6. Use the keypad to enter -27 and press the dBm soft key.
7. Press the Atten Lvl soft key and enter 0, then press the dB soft key.
8. Press the **Shift** key and then press the **Sweep** (3) key. Then press the **Detection** soft key, and then press the **Peak** soft key.
9. Press the **Freq** key and press the **Center Freq** soft key.
10. Use the keypad to enter 1000 and press the MHz soft key.
11. Press the **Span** key. Use the keypad to enter 2 and press the MHz soft key.
12. Press the **BW** key and press the RBW soft key.
13. Use the keypad to enter 10 and press the kHz soft key.
14. Press the VBW soft key and use the keypad to enter 100, then press the Hz soft key.
15. Wait until one sweep is completed.
16. Press the **Marker** key and press the **Peak Search** soft key.
17. Record the Marker 1 amplitude reading for 1000 MHz into the “Measured Input Signal Level” column of the test record in [Table A-12](#).
18. Press the **Freq** key and press the **Start Freq** soft key.
19. Use the keypad to enter 719 and press the MHz soft key.
20. Press the **Stop Freq** soft key, enter 721, and press the MHz soft key.
21. Press the **Marker** key and press the **Peak Search** soft key.
22. Record the Marker 1 amplitude reading into the “Measured Spur Level” column of the test record in [Table A-12](#).
23. Calculate the input related spurious level by subtracting the above Marker 1 reading in Step 22 from the Marker 1 reading in Step 17. Record the result into the “Calculated IRS” column of the test record in [Table A-12](#).
24. Verify that the calculated result is ≤ -60 dBc.

3275 MHz Input Related Spurious Check

25. Set the MG3692x output to 3275 MHz, with an RF output level of -30 dBm.
26. On the MS2718B, MS2719B, press the **Freq** key and press the **Center Freq** soft key.
27. Use the keypad to enter 3275 and press the MHz soft key.
28. Press the **BW** key and press the RBW soft key.
29. Use the keypad to enter 10 and press the kHz soft key.
30. Press the VBW soft key and use the keypad to enter 1, then press the kHz soft key.
31. Wait until one sweep is completed.
32. Press the **Shift** key and then press the **Trace** (5) key. Press the **Trace A Operations** soft key.
33. Press the **# of Averages** soft key. Use the keypad to enter 5, and then press the **Enter** key.
34. Wait until the Trace Count displays 5/5.
35. Press the **Marker** key and press the **Peak Search** soft key.
36. Record the amplitude at 3275 MHz into the “Measured Input Signal Level” column of the test record in [Table A-12](#).
37. Press the **Freq** key and press the **Start Freq** soft key.
38. Use the keypad to enter 2425 and press the MHz soft key.

39. Press the **Stop Freq** soft key, enter 3274, and press the **MHz** soft key.
40. Press the **Shift** key and then press the **Trace** (5) key. Press the **Trace A Operations** soft key.
41. Press the **# of Averages** soft key, use the keypad to enter 5, and then press the **Enter** key.
42. Wait until the **Trace Count** displays 5/5.
43. Press the **Marker** key and press the **Peak Search** soft key.
44. Record the **Marker 1** amplitude reading into the “**Measured Spur Level**” column of the test records in [Table A-12](#).
45. Calculate the input related spurious level by subtracting the **Marker 1** reading in Step 44 (above) from the **Marker 1** reading in Step 36. Record the result into the “**Calculated IRS**” column of the test record in [Table A-12](#).
46. Verify that the calculated result is ≤ -50 dBc.
47. Repeat Step 36 through Step 46, setting a start frequency of 3276 MHz and a stop frequency of 4125 MHz.

8000 MHz Input Related Spurious Check

48. Set the MG3692x output to 8000 MHz, with an RF output level of -30 dBm.
49. Press the **Freq** key and press the **Center Freq** soft key.
50. Use the keypad to enter 8000 and press the **MHz** soft key.
51. Press the **BW** key and press the **RBW** soft key.
52. Use the keypad to enter 1 and press the **kHz** soft key.
53. Press the **VBW** soft key and use the keypad to enter 100, then press the **Hz** soft key.
54. Wait until one sweep is completed.
55. Press the **Shift** key and then press the **Trace** (5) key. Press the **Trace A Operations** soft key.
56. Press the **# of Averages** soft key, use the keypad to enter 5, and then press the **Enter** key.
57. Wait until the **Trace Count** displays 5/5.
58. Press the **Marker** key and press the **Peak Search** soft key.
59. Record the amplitude at 8000 MHz into the “**Measured Input Signal Level**” column of the test record in [Table A-12](#).
60. Press the **Freq** key and press the **Start Freq** soft key.
61. Use the keypad to enter 7719 and press the **MHz** soft key.
62. Press **Stop Freq** soft key, enter 7721, and press the **MHz** soft key.
63. Press the **Shift** key and then press the **Trace** (5) key. Press the **Trace A Operations** soft key.
64. Press the **# of Averages** soft key, use the keypad to enter 5, and then press the **Enter** key.
65. Wait until the **Trace Count** displays 5/5.
66. Press the **Marker** key and press the **Peak Search** soft key.
67. Record the **Marker 1** amplitude reading into the “**Measured Spur Level**” column of the test records in [Table A-12](#).
68. Calculate the input related spurious level by subtracting the **Marker 1** reading in Step 67 (above) from the **Marker 1** reading in Step 59. Record the result into the “**Calculated IRS**” column of the test record in [Table A-12](#).
69. Verify that the calculated result is ≤ -60 dBc.

15000 MHz Input Related Spurious Check (for MS2719B only)

70. Set the MG3692x output to 15000 MHz, with an RF output level of -30 dBm.
71. Press the **Freq** key and press the Center Freq soft key.
72. Use the keypad to enter 15000 and press the MHz soft key.
73. Press the **Shift** key and then press the **Trace** (5) key. Press the Trace A Operations soft key.
74. Press the # of Averages soft key, use the keypad to enter 5, and then press the **Enter** key.
75. Wait until the Trace Count displays 5/5.
76. Press the **Marker** key and press the Peak Search soft key.
77. Record the amplitude at 15000 MHz into the “Measured Input Signal Level” column of the test record in [Table A-12](#)
78. Press the **Freq** key and press the Start Freq soft key.
79. Use the keypad to enter 14719 and press the MHz soft key.
80. Press Stop Freq soft key, enter 14721, and press the MHz soft key.
81. Press the **Shift** key and then press the **Trace** (5) key. Press the Trace A Operations soft key.
82. Press the # of Averages soft key, use the keypad to enter 5, and then press the **Enter** key.
83. Wait until the Trace Count displays 5/5.
84. Press the **Marker** key and press the Peak Search soft key.
85. Record the Marker 1 amplitude reading into the “Measured Spur Level” column of the test records in [Table A-12](#).
86. Calculate the input related spurious level by subtracting the Marker 1 reading in Step 85 (above) from the Marker 1 reading in Step 77. Record the result into the “Calculated IRS” column of the test record in [Table A-12](#).
87. Verify that the calculated result is ≤ -60 dBc.

2-9 Absolute Amplitude Accuracy

The tests in this section verify the absolute amplitude accuracy of the Anritsu Model MS2718B, MS2719B Economy Spectrum Analyzer. This test has 3 parts:

- “A. 50 MHz Amplitude Accuracy Verification Test”
- “B. Amplitude Accuracy Across Frequency Verification Test”
- “C. 9 kHz to 100 kHz Amplitude Accuracy Verification Test”

A. 50 MHz Amplitude Accuracy Verification Test

Test Setup Components Characterization:

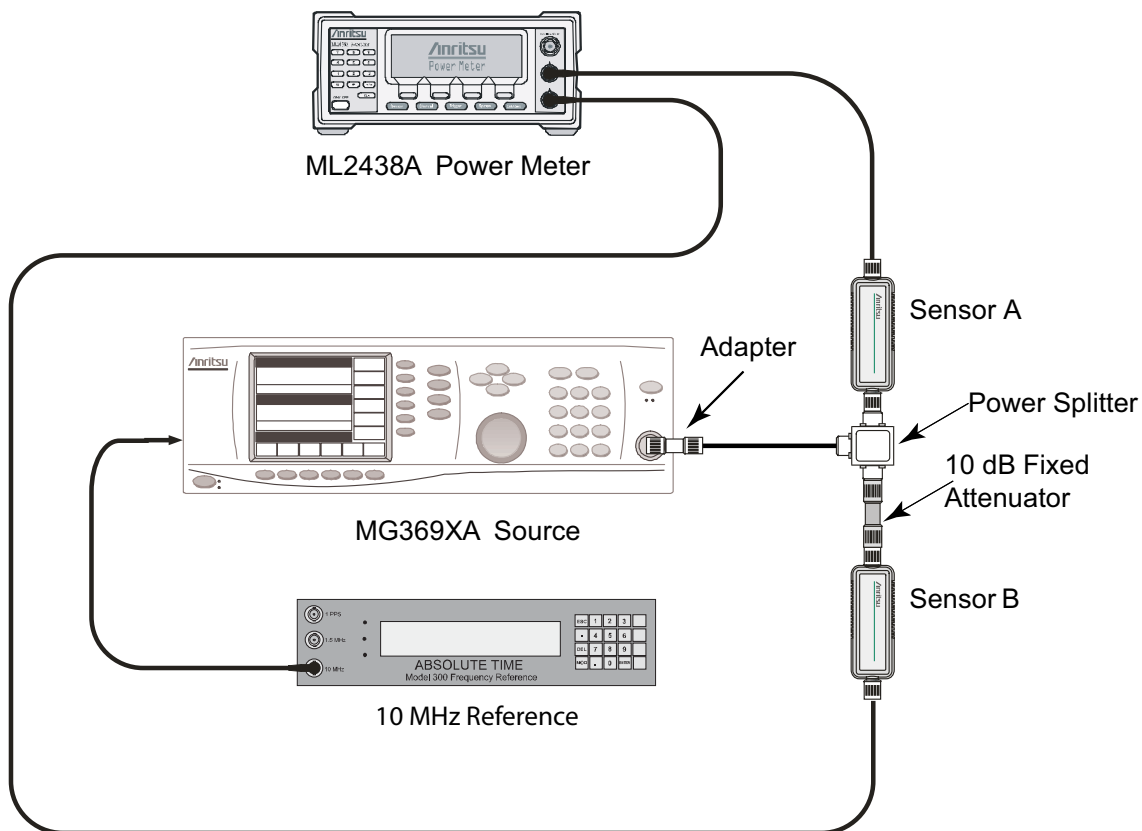


Figure 2-5. 50 MHz Amplitude Accuracy Verification Setup

1. Connect both MA2442D power sensors to the power meter and calibrate the sensors.
2. Connect the 10 MHz Reference source to the 10 MHz Ref In connector of the MG3692x Synthesized Signal Generator.
3. Connect the model 1870A power splitter to the MG3692x output, and connect Sensor B to one of the power splitter outputs (Refer to [Figure 2-5](#)).
4. Install the 10 dB Fixed Attenuator to the other power splitter output, and then connect Sensor A to the end of the Attenuator.
5. Set the frequency of the MG3692x to 50 MHz.
6. Set the power meter to display both Channel A and Channel B. Press the **Sensor** key, the **Cal Factor** soft key, and then the **Freq** soft key. Use the keypad to enter the value matching the frequency of MG3692x as the input signal frequency, which sets the power meter to the proper power sensor calibration factor. Repeat for Channel B. Press the **System** key to display the power reading.

7. Adjust the power level of the MG3692x to get a reading on Sensor A that matches the power level in the first column of the chart in [Table A-13](#).
8. Record the Sensor B reading into the Sensor B Reading column in the chart in [Table A-13](#).
9. Repeat Step 7 and Step 8 for the other power levels in the first column, and record the Sensor B readings into the second column in [Table A-13](#).

Test Procedure:

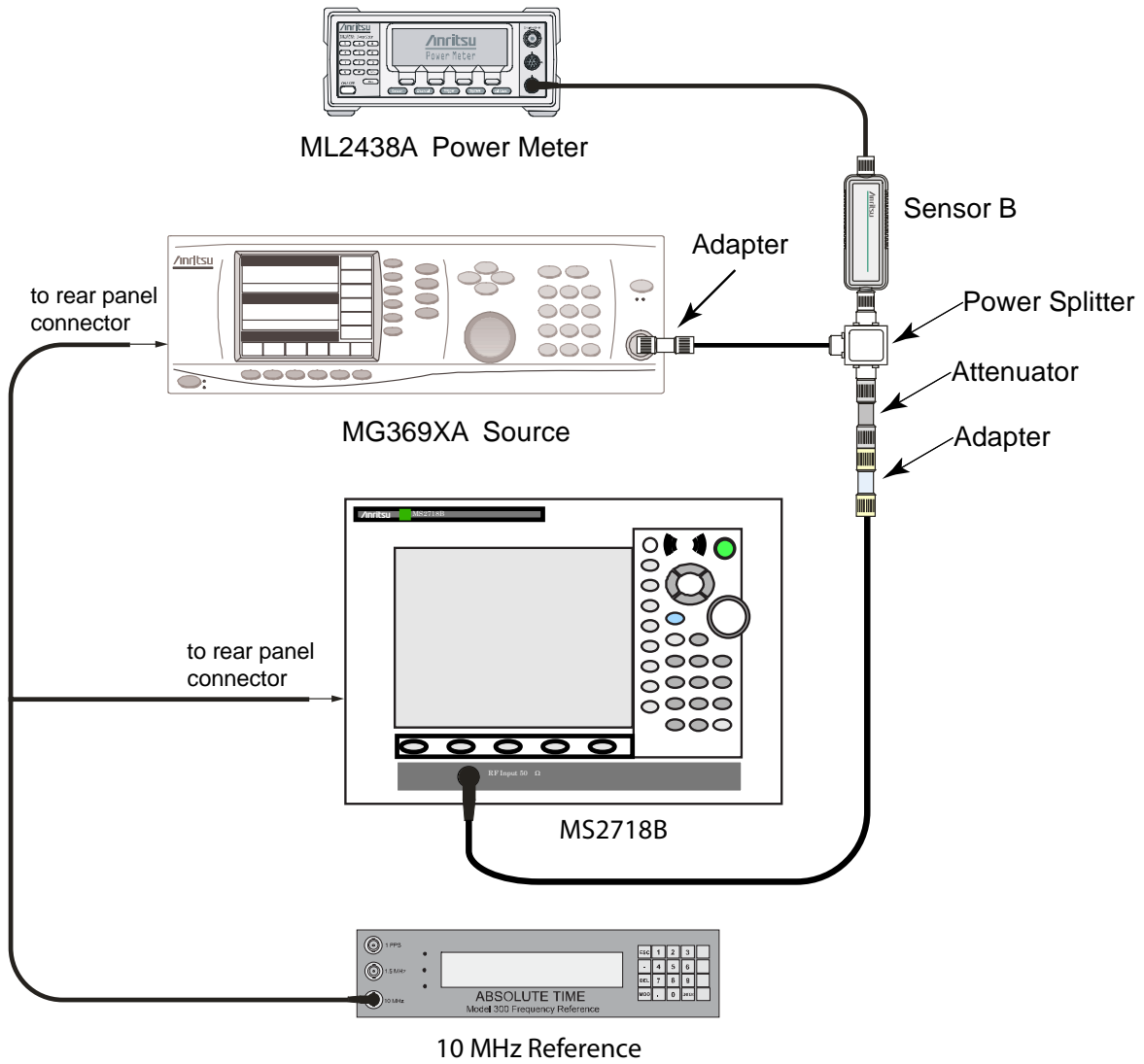


Figure 2-6. 50 MHz Amplitude Accuracy Verification Test Setup

1. Connect the equipment as shown in [Figure 2-6](#).

Note	In order to maintain test setup integrity, do not disconnect Sensor B, the power splitter, or the fixed attenuator.
-------------	---

2. Set the MS2718B, MS2719B to Spectrum Analyzer mode, and then press **Shift** and press **Preset (1)** to preset the MS2718B, MS2719B.
3. Set the MS2718B, MS2719B Center Frequency to 50 MHz.
4. Set the Span to 10 kHz.
5. Press the **BW** soft key and set the VBW to 10 Hz.
6. Set the RBW to 1 kHz.
7. Press the **Amplitude** soft key and set the Reference Level to 10 dBm.
8. Set the **Atten Lvl** to 30 dB.
9. Adjust the MG3692x power level so that the power meter Sensor B matches the Sensor B value that is shown on the characterization chart ([Table A-13](#)) in the previous section.
10. Press the **Marker** key and press the **Peak Search** soft key.
11. Record the Marker 1 amplitude reading into the test record in the [Table A-14](#).
12. Repeat Step 9 through Step 11 for the other power levels in the test record in [Table A-14](#). Change Reference Level and Atten Lvl settings as required.

B. Amplitude Accuracy Across Frequency Verification Test

Test Setup Component Characterization:

1. Connect both MA2442D power sensors to the power meter, and calibrate the sensors.
2. Connect the equipment as shown in [Figure 2-5 on page 2-18](#).
3. Set the MG3692x Frequency to 10.1 MHz.
4. Set the power meter to display both Channel A and Channel B. Press the **Sensor** key, the **Cal Factor** soft key, and then the **Freq** soft key. Use the keypad to enter the value matching the frequency of MG3692x as the input signal frequency, which sets the power meter to the proper power sensor calibration factor. Repeat for Channel B. Press the **System** key to display the power reading.
5. Adjust the MG3692x output level so that the Sensor A reading is $-2 \text{ dBm} \pm 0.1 \text{ dB}$.
6. Record the Sensor B reading into the -2 dBm column in the Characterization chart ([Table A-15, “Characterization Chart for Amplitude Accuracy Across Frequency”](#)).
7. Adjust the MG3692x output level so that the Sensor A reading is $-30 \text{ dBm} \pm 0.1 \text{ dB}$.
8. Record the Sensor B reading into the -30 dBm column in the Characterization chart ([Table A-15](#)).
9. Repeat Step 3 through Step 8 for all of the frequencies that are listed in the Characterization chart ([Table A-15](#)).

Test Procedure:

1. Connect the equipment as shown in [Figure 2-6](#)

Note To maintain test setup integrity, do not disconnect Sensor B, the power splitter, or the fixed attenuator.

2. Set the MS2718B, MS2719B to Spectrum Analyzer mode, and then press **Shift** and press **Preset** (1) to preset the MS2718B, MS2719B.
3. Press the **BW** soft key. Then set the RBW to 1 kHz and the VBW to 10 Hz.
4. Press the **Span** soft key and set span to 10 kHz.
5. Set the MG3692x frequency to 10.1 MHz CW.
6. Set the MG3692x output to -20 dBm .
7. Set the power meter to display Channel B. Press the **Sensor** key, the **Cal Factor** soft key, and then the **Freq** soft key. Use the keypad to enter the value matching the frequency of MG3692x as the input signal frequency, which sets the power meter to the proper power sensor calibration factor. Press the **System** key to display the power reading.
8. Adjust the MG3692x output power so that the power meter displays a reading that matches the Sensor B reading on the characterization chart ([Table A-15](#)) for -30 dBm .
9. On the MS2718B, MS2719B, press the **Amplitude** soft key, then set the Reference Level to -20 dBm .
10. Press the **Freq** soft key and press the **Center Freq** soft key.
11. Enter 10.1 MHz (or the next frequency from [Table A-15](#)).
12. Press the **Amplitude** soft key, then set the **Atten Lvl** to 0 dB.
13. Press the **Marker** key and press the **Peak Search** soft key.
14. Record the Marker 1 amplitude reading into the test records in [Table A-16, “Amplitude Accuracy with Pre-Amp Off — at 10.1 MHz”](#).
15. Verify that the Marker 1 amplitude reading is within specification.
16. Repeat Step 12 through Step 15 for **Atten Lvl** of 5 dB, 10 dB, and 20 dB.

17. Adjust the MG3692x output power so that the power meter displays a reading that matches the Sensor B reading on the characterization chart (Table A-15) for -2 dBm.
18. On the MS2718B, MS2719B, press the Amplitude soft key, then set the Reference Level to 10 dBm.
19. Repeat Step 12 through Step 15 for Atten Lvl of 30 dB, 40 dB, 50 dB, and 60 dB.
20. Repeat Step 12 through Step 19 for all the frequencies in the test records in Table A-17, “Amplitude Accuracy with Pre-Amp Off — at 50 MHz” through Table A-38, “Amplitude Accuracy with Pre-Amp Off — at 18000 MHz (MS2719B only)”.

C. 9 kHz to 100 kHz Amplitude Accuracy Verification Test

Test Setup Characterization:

1. Connect the equipment as shown in [Figure 2-7](#). Ensure that the voltmeter (DVM) is set to read AC volt.

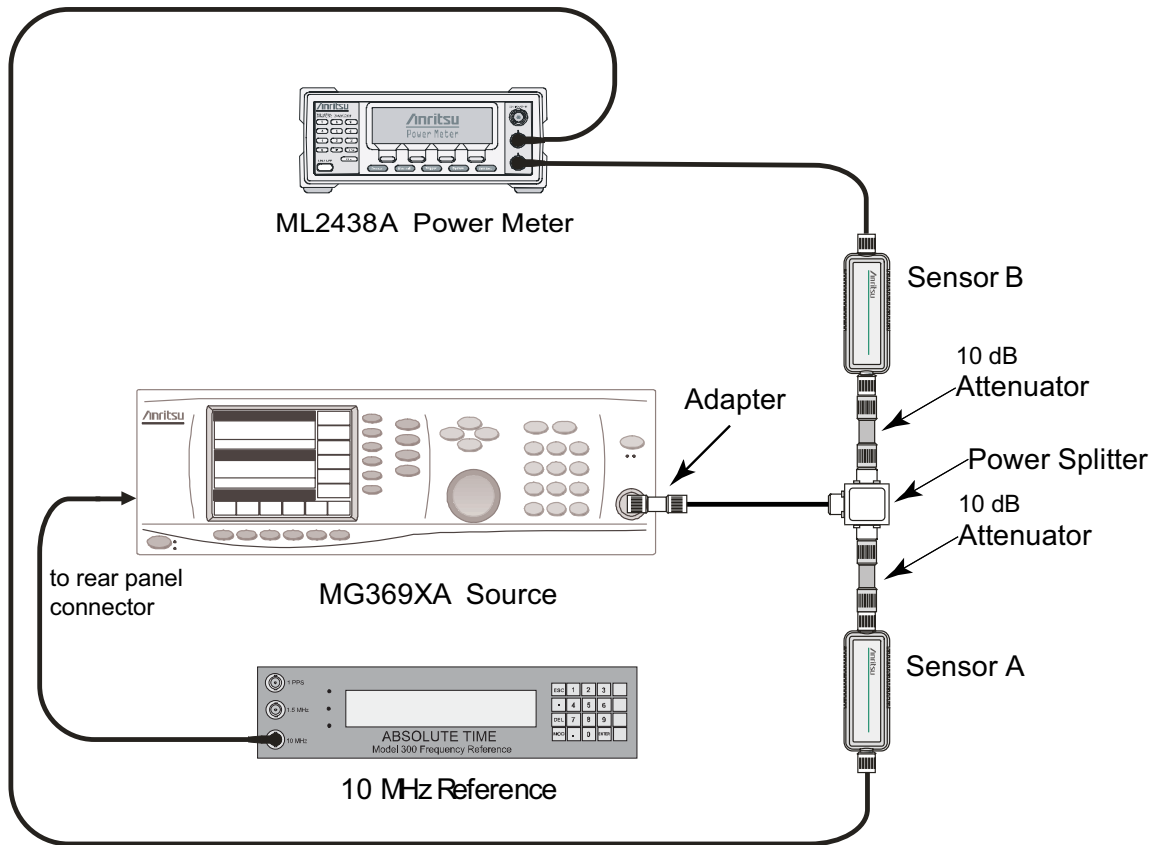


Figure 2-7. Test Setup for Power Adjustment

Note Power Sensor A and Power Sensor B must be capable of measuring down to 100 kHz.

2. Set the MG3692x frequency to 100 kHz CW, and set output power to approximately -5 dBm.
3. Adjust the MG3692x output power so that Power Sensor B reads -20 dBm ± 0.1 dB on the power meter.
4. Remove the Power Sensor B from the 10 dB attenuator and attach the N female end of the T3449 test fixture to the 10 dB attenuator through an N male to N male adapter. The BNC output of the T3449 should also be connected to the AC voltmeter voltage input via a BNC male to BNC male coaxial cable and a BNC female to banana plug adapter.

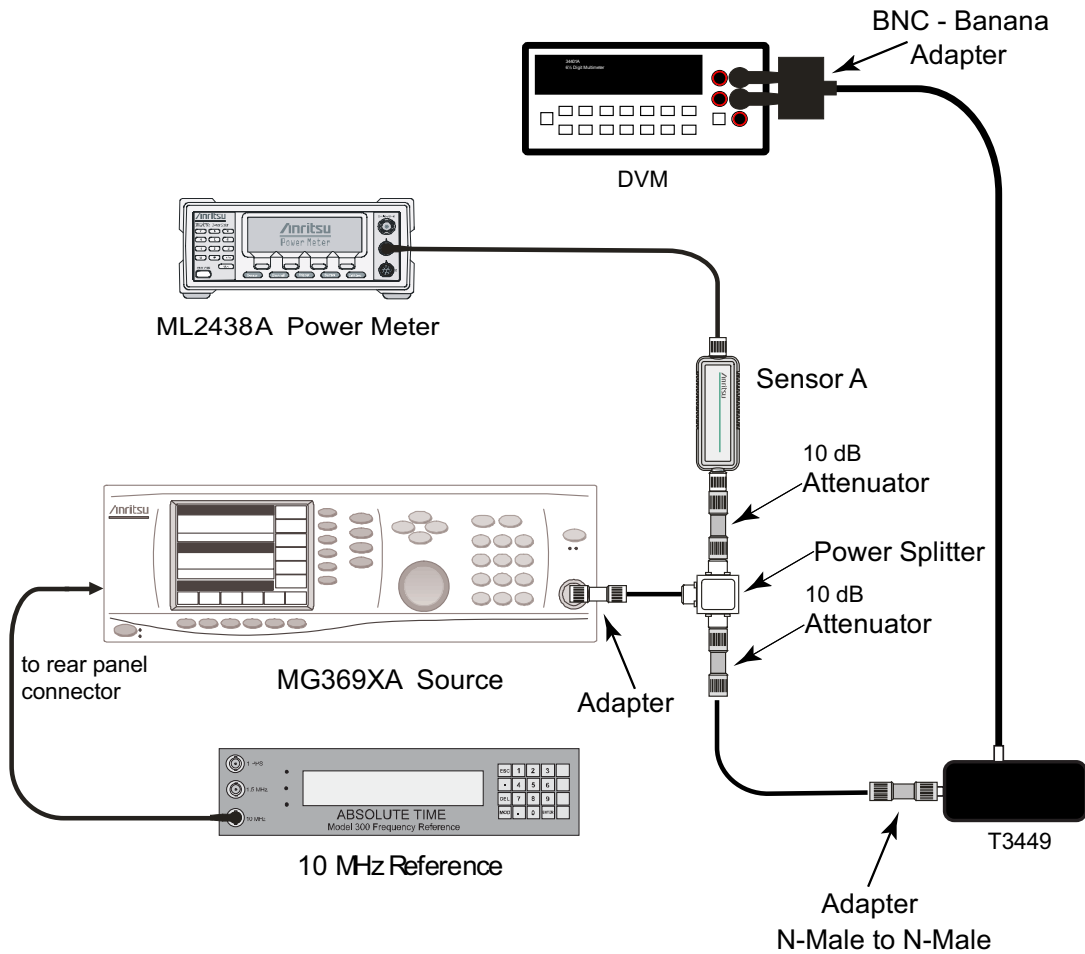


Figure 2-8. Test Setup for Voltage Measurement

5. Set the AC voltmeter to measure AC Volt rms. The measured voltage should read 23.315 mV \pm 0.5 mV. Record the measured value into the Vm1 box in the characterization chart in [Table A-39](#).
6. While keeping the MG3692x output power unchanged, set the frequency to 9.5 kHz and record the measured voltage to the Vm2 column in the characterization chart in [Table A-40](#).
7. Convert the measured voltage to calculated power (power in, or P_{in}) in dBm by using the following formula and the correction factor in [Table A-40](#):

$$P_{in} = (20 * \text{Log}_{10} (V_{m2}/V_{m1}) + \text{correction factor})$$

8. Enter the result into the characterization chart ([Table A-40](#)) as well as into the test record in [Table A-41](#).
9. Repeat Step 6 to Step 8 for frequencies of 55 kHz and 95 kHz, using [Table A-40](#), [Table A-42](#), and [Table A-43](#).
10. Remove the T3449 Test Fixture from the adapter.

Procedure:

1. Set the MS2718B, MS2719B to Spectrum Analyzer mode, and then press **Shift** and press **Preset (1)** to preset the MS2718B, MS2719B.
2. Press the **BW** soft key. Then set the RBW to 1 kHz, and set the VBW to 10 Hz.
3. Press the **Span** soft key and set span to 10 kHz.
4. Press the **Amplitude** soft key. Then set the Reference Level to -20 dBm and set the **Atten Lvl** to 0 dB.
5. Connect the MS2718B, MS2719B to the test setup, as shown in [Figure 2-9](#).

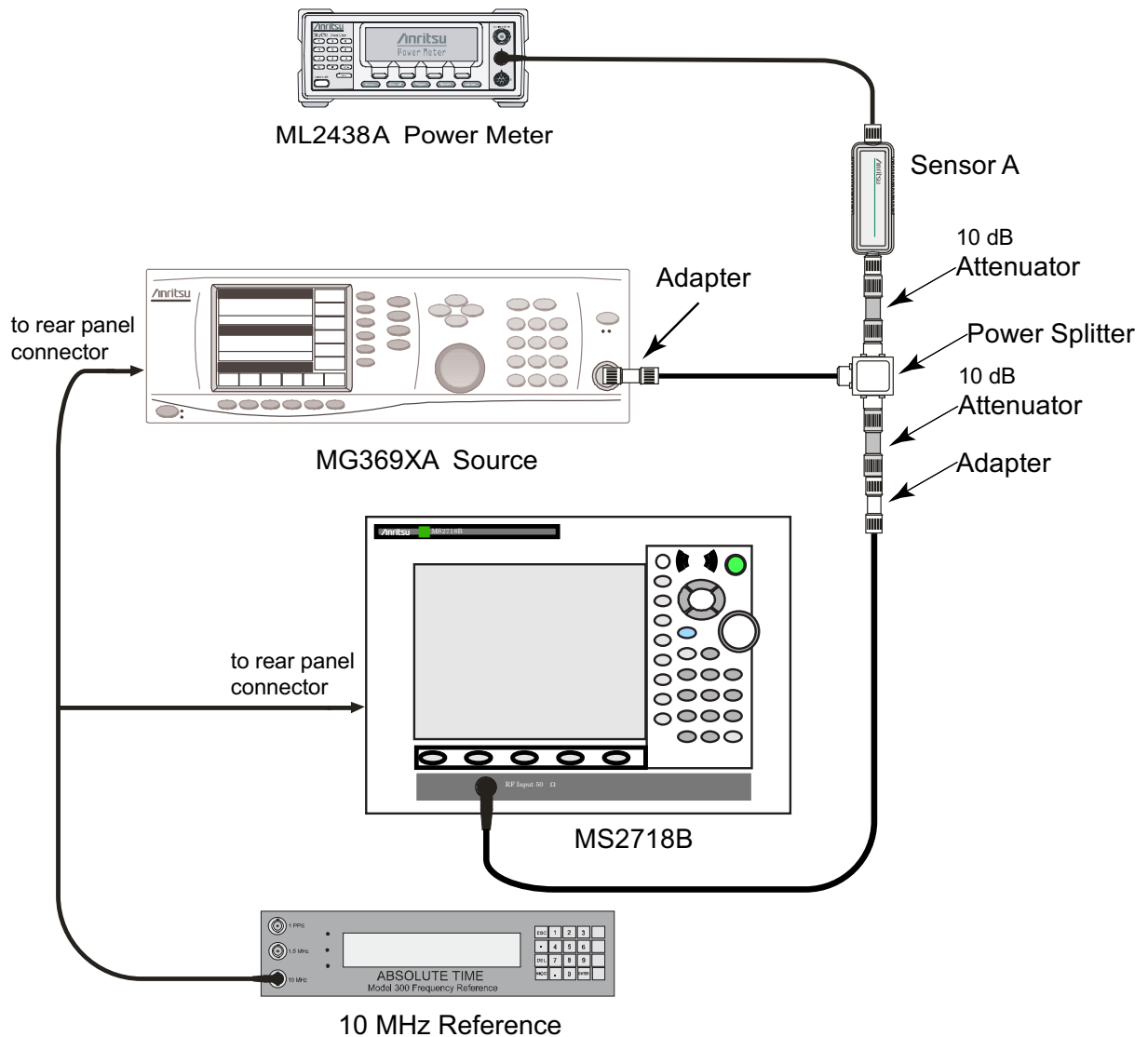


Figure 2-9. Test Setup for 9 kHz to 100 kHz Amplitude Accuracy Verification

6. Set the MG3692x frequency to 9.5 kHz. **Do not adjust** the output power.
7. On the MS2718B, MS2719B, press the **Freq** soft key and press the **Center Freq** soft key. Enter 9.5 kHz.
8. Press the **Marker** key and press the **Peak Search** soft key.
9. Record the Marker 1 amplitude reading into the test record in [Table A-41](#).

10. Subtract the P_{in} value from the Marker 1 reading and record the result into the Error column in the test record in [Table A-41](#).
11. Verify that the error is within the specification.
12. Repeat Step 6 through Step 11 for the other frequencies (55 Hz and 95 Hz) and record the results into the test records in [Table A-42](#), and [Table A-43](#).

2-10 RF Input VSWR Verification

This test verifies the Spectrum Analyzer RF Input VSWR of the Anritsu Model MS2718B, MS2719B Economy Spectrum Analyzer.

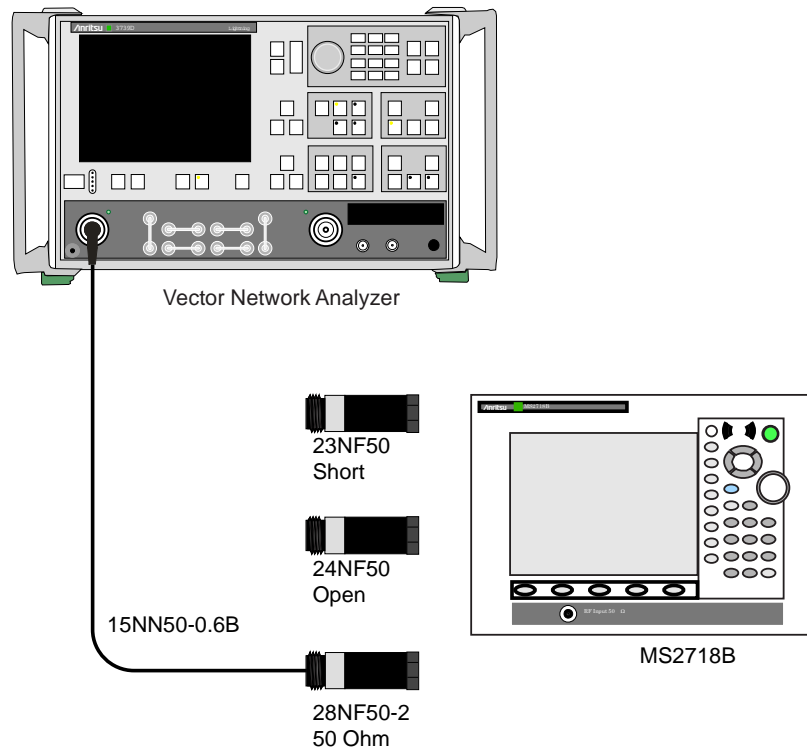


Figure 2-10. RF Input VSWR Calibration Setup

Procedure:

1. On the Anritsu Model 37x47x VNA, install an Anritsu Model 34NKF50 adapter on Port 1. Install a 15NNF50-1.5B cable on Port 1 of the Model 37x47x VNA so that the test port (open end of cable) is the male connector. Refer to [Figure 2-10](#).
2. On the VNA, press the **Default Program** key twice to reset the VNA. Allow time for the VNA to default.
3. Press the **Setup Menu** key. Then set the Start Frequency to 40 MHz, and set the Stop Frequency to 13 GHz for the MS2718B, or set the Stop Frequency to 18 GHz for the MS2719B.
4. Press the **CH1** key.
5. Press the **Channel Menu** key. Select Single Channel. Press the **Graph Type** key, and select SWR.
6. Insert the 1.44 MByte floppy disk from the Cal Kit into the floppy disk drive of the VNA. Press the **Utility Menu** key and select Cal Component Utilities, then select Install Kit Information from Floppy disk. Allow the file to load from the disk.
7. Press the **Begin Cal** key and make the following selections:
 - Next Cal Step / Reflection Only / Port 1 Only / Normal (1601 pts max) /
 - Next Cal Step / Port 1 Connector = Type N (M) / Start Cal
8. Perform the calibration at the end of the cable as prompted by the VNA, using the female components from the calibration kit.

Note During calibration, **do not insert** any adapters between the cable and the female components from the calibration kit.

9. After the calibration is complete, make sure that the LED on the **Apply Cal** key is ON.
10. Press the **Set Scale** key and set the Resolution to 0.5 (x1). Set the Reference Value to 1.5 (x1).
11. Press the **Limits** key, turn on the Upper Limit, and set the upper limit to 2.0 (x1).
12. Press the **Marker Menu** key and then make the following selections:
 - Set Display Markers to ON.
 - Press the **Readout Marker** key.
 - Set Marker 1 to ON.
13. Set the MS2718B, MS2719B to Spectrum Analyzer mode, then press **Shift** and press **Preset** (1) to preset the MS2718B, MS2719B, then set up the MS2718B, MS2719B as follows:
 - Set the Atten Lvl to 10 dB
 - Set the Sweep to Single
14. Connect the MS2718B, MS2719B Spectrum Analyzer RF In connector to the end of the 15NN50-1.5B cable where the calibration was performed, as shown in [Figure 2-11](#).

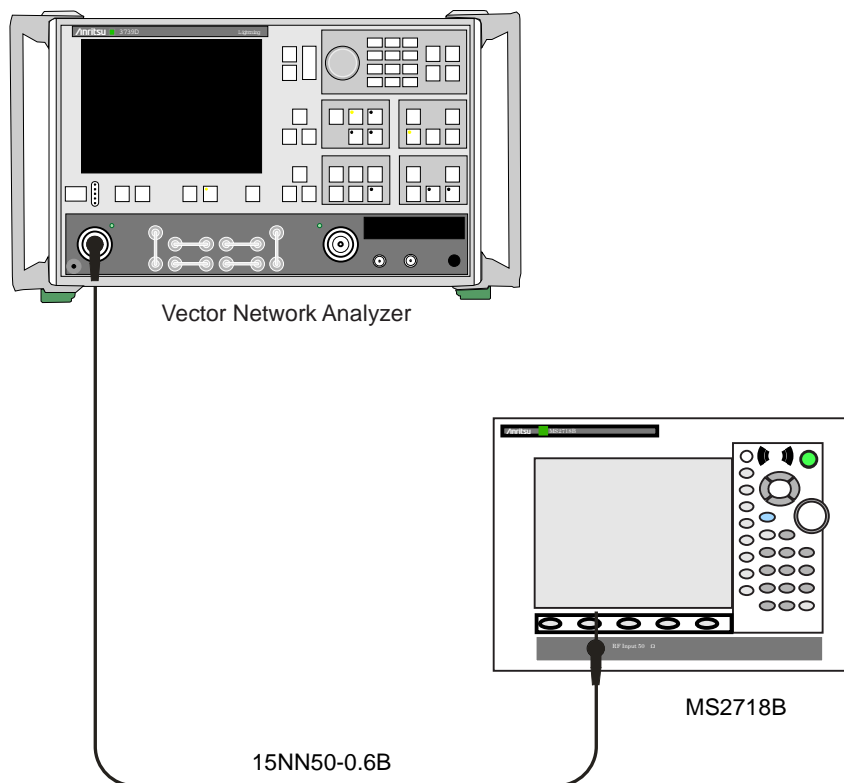


Figure 2-11. RF Input VSWR Test Setup

15. Verify that the measurement data reading falls completely under the Limit Line.
 16. On the Anritsu Model 37x47x VNA, press the **Marker Menu** key. Select Marker to Peak and then Marker to Max.
 17. Read the maximum value and record it into the test record in [Table A-44](#).
 18. Change the MS2718B, MS2719B Atten Lvl to 20 dB (as in Step 13) and repeat Step 16 and Step 17.
 19. Change the MS2718B, MS2719B Atten Lvl to 60 dB (as in Step 18) and repeat Step 16 and Step 17.
- This completes the tests for the Spectrum Analyzer mode of the MS2718B, MS2719B.

Chapter 3 — Performance Verification, Installed Options

The procedures in this chapter are used to verify the performance of the installed options in Anritsu MS2718B, MS2719B Spectrum Analyzers. Spectrum Analyzer verification procedures are detailed in [Chapter 2](#).

Blank performance verification test records are provided in [Appendix A](#). These blank test records should be copied before use.

IMPORTANT

Before making any measurement, ensure that all equipment has been operating for at least 30 minutes to allow the internal circuitry to warm up and stabilize.

3-1 GSM/GPRS/EDGE Signal Analyzer Option Verification

(Option 40 or Option 41 or both)

The tests in this section verify that the optional GSM/GPRS/EDGE Signal Analyzer functions correctly in Anritsu Model MS2718B or Model MS2719B Economy Spectrum Analyzer.

- “GSM Burst Power, Frequency Error, and Phase Error Tests (Option 40)”
- “EDGE Burst Power, Frequency Error, and Residual Error Tests (Option 41)”

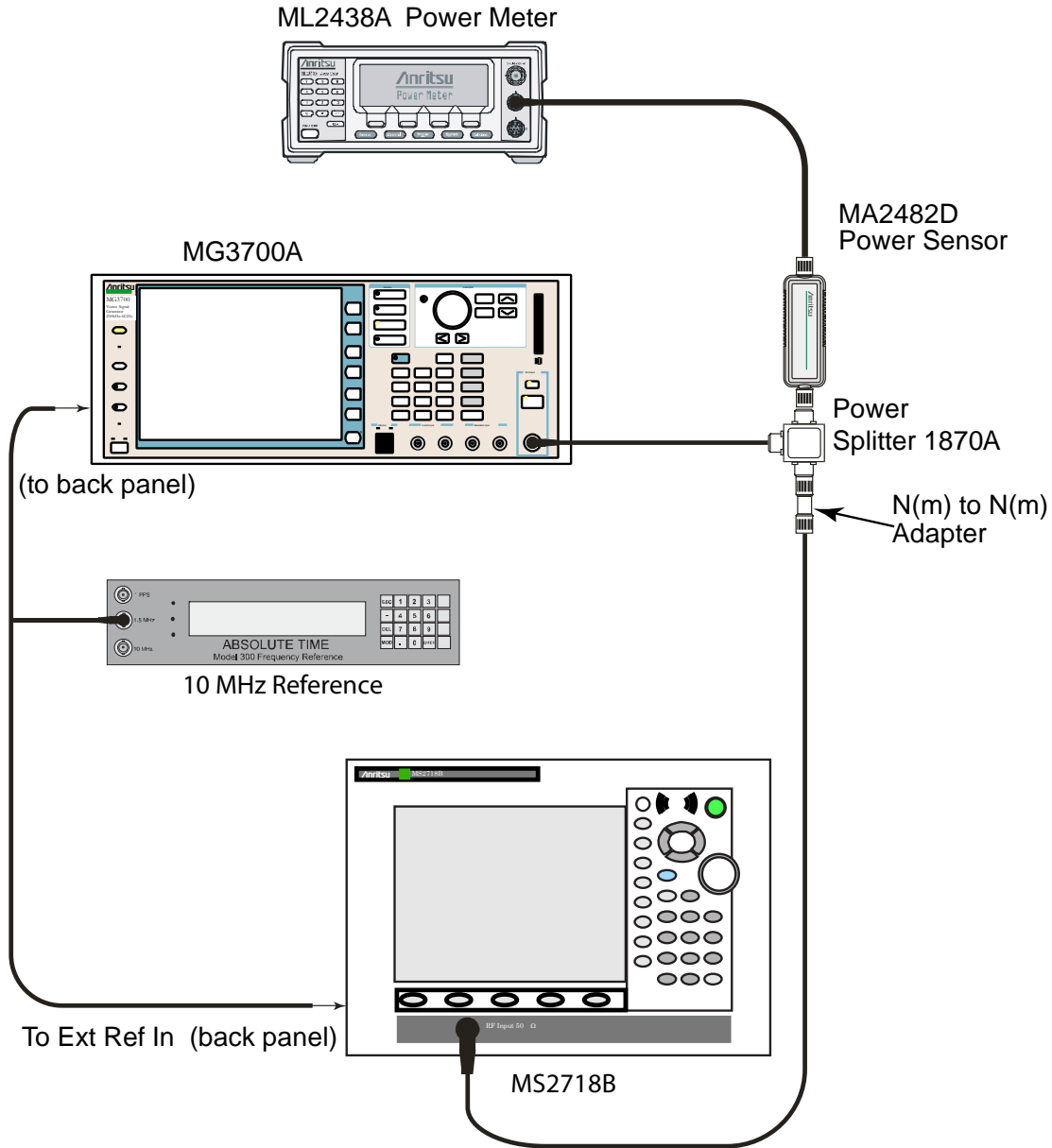


Figure 3-1. GSM/GPRS/EDGE Signal Analyzer Test Setup

Set up Procedure:

1. Connect the equipment as shown in [Figure 3-1](#).
2. Calibrate the power sensor prior to connecting to the power splitter.
3. On the power meter, press the Sensor key, the Cal Factor soft key, and then the Freq soft key. Use the keypad to enter 850 MHz as the input signal frequency, which sets the power meter to the proper power sensor calibration factor. Press the System key to display the power reading.
4. Set the MS2718B or MS2719B mode to GSM/GPRS/EDGE Signal Analyzer. Press **Shift** and press **Preset** (1) to preset the MS2718B, MS2719B.

GSM Burst Power, Frequency Error, and Phase Error Tests (Option 40)

Test Procedure:

1. On the MG3700A, press the Preset key (Yellow key on the upper left hand side).
2. Press the Down Arrow key or turn the knob to select Yes.
3. Press the **Set** key.

Note The MG3700A has two Set keys, and they both have the same function.
--

4. Press the (F1) soft key to select “Load File to Memory”
5. Press the (F1) soft key again to select “Select Package”
6. Using the Down Arrow key, step through the selection list until the “GSM” option is highlighted.
7. Press the Set key.
8. Press the (F6) soft key “Return”
9. Press the Set key. The “Select Package” box will appear. Use the rotary knob to highlight “GSM” and press the Set key to select.
10. Another File List will appear. Use the rotary knob to select “GsmBurst_1slot” and press the Set key to select.
11. Press the MOD On/Off key to turn the Modulation LED on and verify that the “Playing” indicator in the center of the LCD is flashing.
12. Press the Frequency key and enter 850 MHz.
13. Press the Level key, enter -10, and press the dBm soft key.
14. Adjust the MG3700A output so that the power meter reads -10 dBm \pm 0.2 dB.
15. On the MS2718B or MS2719B, press the Frequency soft key and enter 850 MHz as Center Frequency.
16. Press the Measurements soft key and select GSM/EDGE Summary (a red dot will appear on the label).
17. For MS2718B or MS2719B with Option 40 (GSM/GPRS/EDGE RF Measurements), subtract the displayed Burst Power value from the power meter reading in Step 14. Then record the calculated Burst Power error and the displayed value of Freq Error into the test record in [Appendix A](#) in the section labeled “At 850 MHz, -10 dBm Level, TCH Pattern” in [Table A-45](#), “Option 40 GSM/GPRS/EDGE RF Measurements”.
18. For MS2718B or MS2719B with Option 41 (GSM/GPRS/EDGE Demodulator), record the displayed Phase Err RMS (deg) into the “At 850 MHz, -10 dBm Level, TCH Pattern” chart in the test record in [Table A-46](#), “Option 41 GSM/GPRS/EDGE Demodulator”.
19. Verify that the measured values in Step 17 or Step 18 (or both) are within specifications.
20. On the MG3700A, change the selected signal pattern to “GsmBurst_8slot”.

21. Adjust the Level of the MG3700A so that the power meter reads $-50 \text{ dBm} \pm 0.2 \text{ dB}$. Then wait 15 seconds to allow the MS2718B or MS2719B to update its measured results.
22. For MS2718B or MS2719B with Option 40 (GSM/GPRS/EDGE RF Measurements), subtract the displayed Burst Power value from the power meter reading in Step 21. Then record the calculated Burst Power error and the displayed value of Freq Error into the test record in [Appendix A](#) in the section labeled “At 850 MHz, -50 dBm Level, TCH ALL Pattern” in [Table A-45](#), “Option 40 GSM/GPRS/EDGE RF Measurements”.
23. For MS2718B or MS2719B with Option 41 (GSM/GPRS/EDGE Demodulator), record the displayed Phase Err RMS (deg) into the “At 850 MHz, -50 dBm Level, TCH ALL Pattern” chart in the test record in [Table A-46](#).
24. Verify that the measured values in Step 22 or Step 23 (or both) are within specifications.
25. Change the frequency of MG3700A to 1800 MHz.
26. On the power meter, press the Sensor key, the Cal Factor soft key, and then the Freq soft key. Use the keypad to enter 1800 MHz as the input signal frequency, which sets the power meter to the proper power sensor calibration factor. Press the System key to display the power reading.
27. Adjust the level of the MG3700A so that the power meter reads $-10 \text{ dBm} \pm 0.2 \text{ dB}$.
28. On the MS2718B or MS2719B, set the Center Freq to 1800 MHz. Then wait 15 seconds to allow the MS2718B or MS2719B to update its measured results.
29. For MS2718B or MS2719B with Option 40 (GSM/GPRS/EDGE RF Measurements), subtract the displayed Burst Power value from the power meter reading in Step 27. Then record the calculated Burst Power error and the displayed value of Freq Error into the “At 1800 MHz, -10 dBm Level, TCH ALL Pattern” chart in the test record in [Table A-45](#).
30. For MS2718B or MS2719B with Option 41 (GSM/GPRS/EDGE Demodulator), record the displayed Phase Err RMS (deg) into the “At 1800 MHz, -10 dBm Level, TCH ALL Pattern” chart in the test record in [Table A-46](#).
31. Verify that the measured values in Step 29 or Step 30 (or both) are within specifications.
32. On the MG3700A, change the selected pattern to “GsmBurst_1slot”.
33. Adjust the level of the MG3700A so that the power meter reads $-50 \text{ dBm} \pm 0.2 \text{ dB}$. Then wait 15 seconds to allow the MS2718B or MS2719B to update its measured results.
34. For MS2718B or MS2719B with Option 40 (GSM/GPRS/EDGE RF Measurements), subtract the displayed Burst Power value from the power meter reading in Step 33. Then record the calculated Burst Power error and the displayed value of Freq Error into the “At 1800 MHz, -50 dBm Level, TCH Pattern” chart in the test record in [Table A-45](#).
35. For MS2718B or MS2719B with Option 41 (GSM/GPRS/EDGE Demodulator), record the displayed Phase Err RMS (deg) into the “At 1800 MHz, -50 dBm Level, TCH Pattern” chart in the test record in [Table A-46](#).
36. Verify that the measured values in Step 34 or Step 35 (or both) are within specifications.

EDGE Burst Power, Frequency Error, and Residual Error Tests (Option 41)

Test Procedure:

1. Ensure that the equipment settings are unchanged from the previous test. Refer to [Figure 3-1](#).
2. On the MG3700A, change the selected pattern to “DL_MCS-9_1SLOT”.
3. Adjust the level of the MG3700A so that the power meter reads $-50 \text{ dBm} \pm 0.2 \text{ dB}$. Then wait 15 seconds to allow the MS2718B or MS2719B to update its measured results.
4. For MS2718B or MS2719B with Option 40 (GSM/GPRS/EDGE RF Measurements), subtract the displayed Burst Power value from the power meter reading in Step 3. Then record the calculated Burst Power error and the displayed value of Freq Error into the “At 1800 MHz, -50 dBm Level, DL_MCS-9_1SLOT Pattern” chart in the test record in [Table A-45](#).

5. For MS2718B or MS2719B with Option 41 (GSM/GPRS/EDGE Demodulator), record the displayed EVM (rms) into the “At 1800 MHz, -50 dBm Level, DL_MCS-9_1SLOT Pattern” chart in the test record in [Table A-46](#).
6. Verify that the measured values in Step 4 or Step 5 (or both) are within specifications.
7. On the MG3700A, change the selected pattern to “DL_MCS-9_4SLOT”.
8. Adjust the level of the MG3700A so that the power meter reads $-10 \text{ dBm} \pm 0.2 \text{ dB}$. Then wait 15 seconds to allow the MS2718B or MS2719B to update its measured results.
9. For MS2718B or MS2719B with Option 40 (GSM/GPRS/EDGE RF Measurements), subtract the displayed Burst Power value from the power meter reading in Step 8. Then record the calculated Burst Power error and the displayed value of Freq Error into the “At 1800 MHz, -10 dBm Level, DL_MCS-9_4SLOT Pattern” chart in the test record in [Table A-45](#).
10. For MS2718B or MS2719B with Option 41 (GSM/GPRS/EDGE Demodulator), record the displayed EVM (rms) into the “At 1800 MHz, -10 dBm Level, DL_MCS-9_4SLOT Pattern” chart in the test record in [Table A-46](#).
11. Verify that the measured values in Step 9 or Step 10 (or both) are within specifications.
12. Change the frequency of MG3700A to 850 MHz.
13. On the power meter, press the Sensor key, the Cal Factor soft key, and then the Freq soft key. Use the keypad to enter 850 MHz as the input signal frequency, which sets the power meter to the proper power sensor calibration factor. Press the System key to display the power reading.
14. Adjust the level of the MG3700A so that the power meter reads $-50 \text{ dBm} \pm 0.2 \text{ dB}$.
15. On the MS2718B or MS2719B, set the Center Freq to 850 MHz. Then wait 15 seconds to allow the MS2718B or MS2719B to update its measured results.
16. For MS2718B or MS2719B with Option 40 (GSM/GPRS/EDGE RF Measurements), record the displayed values of Burst Power and Freq Error into the “At 850 MHz, -50 dBm Level, DL_MCS-9_4SLOT Pattern” chart in the test record in [Table A-45](#).
17. For MS2718B or MS2719B with Option 41 (GSM/GPRS/EDGE Demodulator), record the displayed EVM (rms) into the “At 850 MHz, -50 dBm Level, DL_MCS-9_4SLOT Pattern” chart in the test record in [Table A-46](#).
18. Verify that the measured values in Step 9 or Step 10 (or both) are within specifications.
19. On the MG3700A, change the selected pattern to “DL_MCS-9_1SLOT”.
20. Adjust the level of the MG3700A so that the power meter reads $-10 \text{ dBm} \pm 0.2 \text{ dB}$. Then wait 15 seconds to allow the MS2718B or MS2719B to update its measured results.
21. For MS2718B or MS2719B with Option 40 (GSM/GPRS/EDGE RF Measurements), record the displayed values of Burst Power and Freq Error into the “At 850 MHz, -10 dBm Level, DL_MCS-9_1SLOT Pattern” chart in the test record in [Table A-45](#).
22. For MS2718B or MS2719B with Option 41 (GSM/GPRS/EDGE Demodulator), record the displayed EVM (rms) into the “At 850 MHz, -10 dBm Level, DL_MCS-9_1SLOT Pattern” chart in the test record in [Table A-46](#).
23. Verify that the measured values in Step 21 or Step 22 (or both) are within specifications.

3-2 CDMA Signal Analyzer Option Verification

Options 42 or 43 or both

The tests in this section verify the optional CDMA Signal Analyzer functions in Anritsu Model MS2718B, MS2719B Economy Spectrum Analyzer.

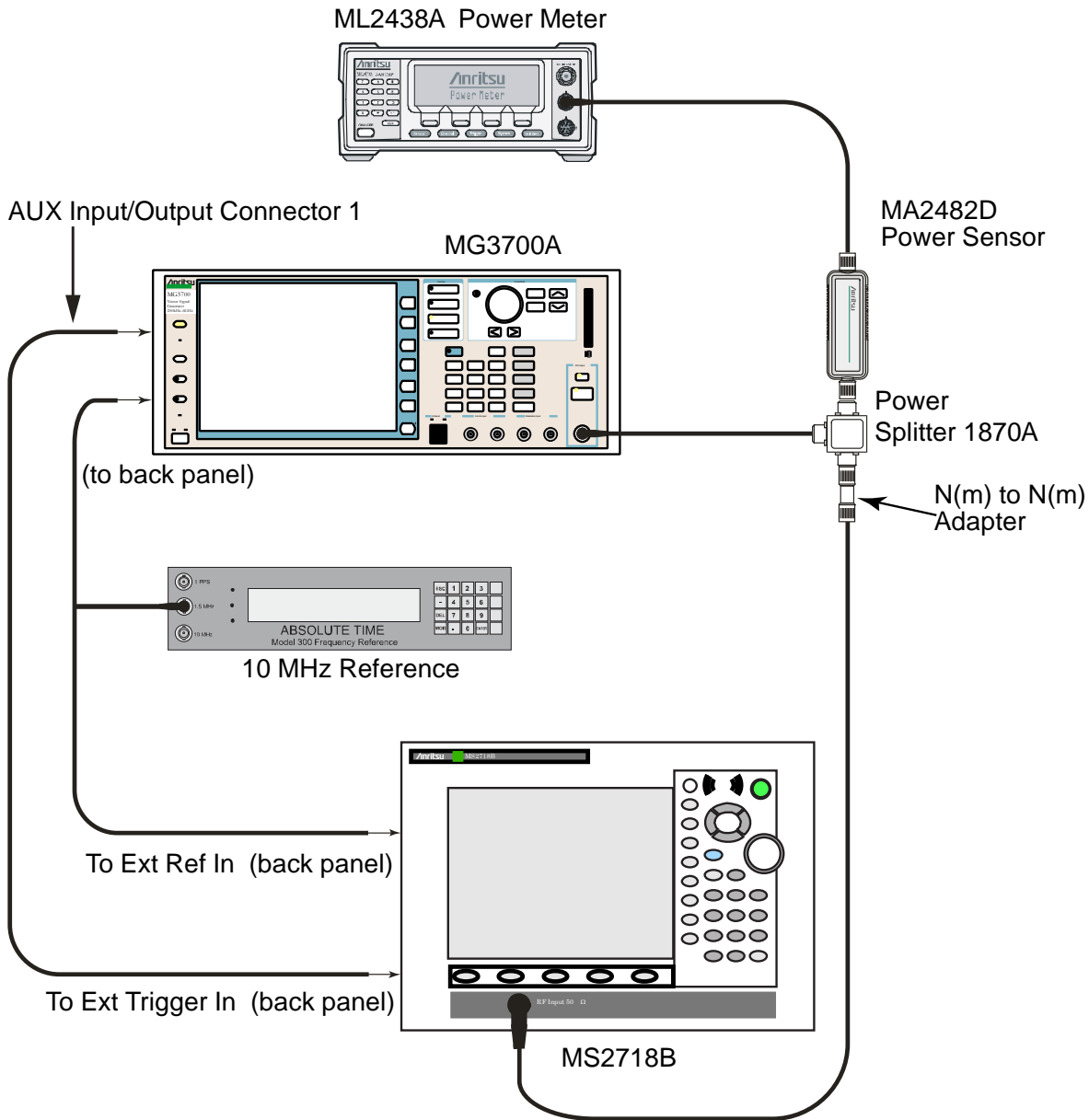


Figure 3-2. CDMA Signal Analyzer Test Setup

Set up Procedure

1. Connect the equipment as shown in [Figure 3-2](#).
2. Calibrate the power sensor prior to connecting to the power splitter.
3. On the power meter, press the Sensor key, the Cal Factor soft key, and then the Freq soft key. Use the keypad to enter 870.03 MHz as the input signal frequency, which sets the power meter to the proper power sensor calibration factor. Press the System key to display the power reading.
4. Set the MS2718B, MS2719B mode to CDMA Signal Analyzer. Press **Shift** and press **Preset** (1) to preset the MS2718B, MS2719B.

cdmaOne Channel Power, Frequency Error, Rho, and Tau Tests

Test Procedure:

1. On the MG3700A, press the Preset key (Yellow key on the upper left hand side).
2. Press the Down Arrow key or turn the knob to select Yes.
3. Press the **Set** key.

Note The MG3700A has two Set keys, and they both have the same function.
--

4. Press the (F1) soft key to select “Load File to Memory”
5. Press the (F1) soft key again to select “Select Package”
6. Using the **Down Arrow** key step through the selection list until the “CDMA2000” option is highlighted.
7. Press the Set key.
8. Press the (F6) soft key “Return”
9. Press the Set key. The “Select Package” box will appear. Use the rotary knob to highlight “CDMA2000” and press the Set key to select.
10. Another File List will appear. Use the rotary knob to select “FWD_RC1-2_9channel” and press the Set key to select.
11. Press the MOD On/Off key to turn the Modulation LED on and verify that the “Playing” indicator in the center of the LCD is flashing.
12. Press the Frequency key, enter 870.03 MHz.
13. Press the Level key, enter –30 and press the dBm soft key.
14. Adjust the MG3700A output so that the power meter reads –30 dBm ± 0.2 dB.
15. On the MS2718B, MS2719B, press the Frequency soft key and enter 870.03 MHz as Center Frequency.
16. Press the Measurements soft key and select CDMA Summary (a red dot will appear on the label).
17. Press the Setup soft key and select PN Setup. Then change PN Trigger to Ext by pressing the PN Trigger soft key twice. Then wait 15 seconds to allow the MS2718B, MS2719B to update its measured results.
18. For MS2718B, MS2719B with Option 42 (CDMA RF Measurements), subtract the displayed Channel Power value from the power meter reading in Step 14. Then record the calculated Channel Power error into the test record in [Appendix A](#) in the section labeled “[At 870.03 MHz, –30 dBm Level, cdmaOne](#)” in [Table A-47, “Option 42 CDMA RF Measurements”](#).
19. For MS2718B, MS2719B with Option 43 (cdmaOne and CDMA2000 1xRTT Demodulator), record the displayed Freq Error, Rho, and Tau into the test record in the section labeled “[At 870.03 MHz, –30 dBm Level, cdmaOne](#)” in [Table A-48, “Option 43 cdmaOne and CDMA2000 1xRTT Demodulator”](#).
20. Verify that the measured values in Step 18 or Step 19 (or both) are within specifications.

21. On the power meter, press the Sensor key, the Cal Factor soft key, and then the Freq soft key. Use the keypad to enter 1930 MHz as the input signal frequency, which sets the power meter to the proper power sensor calibration factor. Press the System key to display the power reading.
22. Set the MG3700A Frequency to 1930.05 MHz.
23. Adjust the MG3700A output so that the power meter reads $-30 \text{ dBm} \pm 0.2 \text{ dB}$.
24. On the MS2718B, MS2719B, press the Frequency soft key and enter 1930.05 MHz as Center Frequency. Then wait 15 seconds to allow the MS2718B, MS2719B to update its measured results.
25. For MS2718B, MS2719B with Option 42 (CDMA RF Measurements), subtract the displayed Channel Power value from the power meter reading in Step 23. Then record the calculated Channel Power error into the test record in the section labeled “At 1930.05 MHz, $-30 \text{ dBm Level, cdmaOne}$ ” in Table A-47, “Option 42 CDMA RF Measurements”.
26. For MS2718B, MS2719B with Option 43 (cdmaOne and CDMA2000 1xRTT Demodulator), record the displayed Freq Error, Rho, and Tau into the test record in the section labeled “At 1930.05 MHz, $-30 \text{ dBm Level, cdmaOne}$ ” in Table A-48, “Option 43 cdmaOne and CDMA2000 1xRTT Demodulator”.
27. Verify that the measured values in Step 25 or Step 26 (or both) are within specifications.

CDMA2000 Channel Power, Frequency Error, Rho, and Tau Tests

Test Procedure:

1. Ensure that the equipment settings are unchanged from the previous test. Refer to Figure 3-2.
2. On the MG3700A, change the selected pattern to “FWD_RC3-5_9channel”.
3. Adjust the level of the MG3700A so that the power meter reads $-30 \text{ dBm} \pm 0.2 \text{ dB}$. Then wait 15 seconds to allow the MS2718B, MS2719B to update its measured results.
4. For MS2718B, MS2719B with Option 42 (CDMA RF Measurements), subtract the displayed Channel Power value from the power meter reading in Step 3. Then record the calculated Channel Power error into the test record in the section labeled “At 1930.05 MHz, $-30 \text{ dBm Level, CDMA2000}$ ” in Table A-47.
5. For MS2718B, MS2719B with Option 43 (cdmaOne and CDMA2000 1xRTT Demodulator), record the displayed Freq Error, Rho, and Tau into the test record in the section labeled “At 1930.05 MHz, $-30 \text{ dBm Level, CDMA2000}$ ” in Table A-48.
6. Verify that the measured values in Step 4 or Step 5 (or both) are within specifications.
7. On the power meter, press the Sensor key, the Cal Factor soft key, and then the Freq soft key. Use the keypad to enter 870.03 MHz as the input signal frequency, which sets the power meter to the proper power sensor calibration factor. Press the System key to display the power reading.
8. Set the MG3700A Frequency to 870.03 MHz.
9. Adjust the MG3700A output so that the power meter reads $-30 \text{ dBm} \pm 0.2 \text{ dB}$.
10. On the MS2718B, MS2719B, press the Frequency soft key and enter 870.03 MHz as Center Frequency. Then wait 15 seconds to allow the MS2718B, MS2719B to update its measured results.
11. For MS2718B, MS2719B with Option 42 (CDMA RF Measurements), subtract the displayed Channel Power value from the power meter reading in Step 9. Then record the calculated Channel Power error into the test record in the section labeled “At 870.03 MHz, $-30 \text{ dBm Level, CDMA2000}$ ” in Table A-47.
12. For MS2718B, MS2719B with Option 43 (cdmaOne and CDMA2000 1xRTT Demodulator), record the displayed Freq Error, Rho, and Tau into the test record in the section labeled “At 870.03 MHz, $-30 \text{ dBm Level, CDMA2000}$ ” in Table A-48.
13. Verify that the measured values in Step 11 or Step 12 (or both) are within specifications.

3-3 WCDMA/HSDPA Signal Analyzer Option Verification

WCDMA/HSDPA Signal Analyzer Option Verification (Option 44 and Option 45 or Option 65)

The tests in this section can be used to verify the functionality of the WCDMA/HSDPA Signal Analyzer mode of the Anritsu Model MS2718B, MS2719B Economy Spectrum Analyzer. The tests include:

- “WCDMA Absolute Power Accuracy Verification (Option 44)”
- “WCDMA Occupied Bandwidth (OBW) Verification (Option 44)”
- “WCDMA RF Channel Power Accuracy and ACLR Verification (Option 44)”
- “HSDPA RF Channel Power Accuracy and ACLR Verification (Option 44)”
- “Error Vector Magnitude (EVM) Verification (Option 45 or Option 65)”

WCDMA Absolute Power Accuracy Verification (Option 44)

This test verifies the WCDMA absolute power accuracy in WCDMA/HSDPA Signal Analyzer Mode.

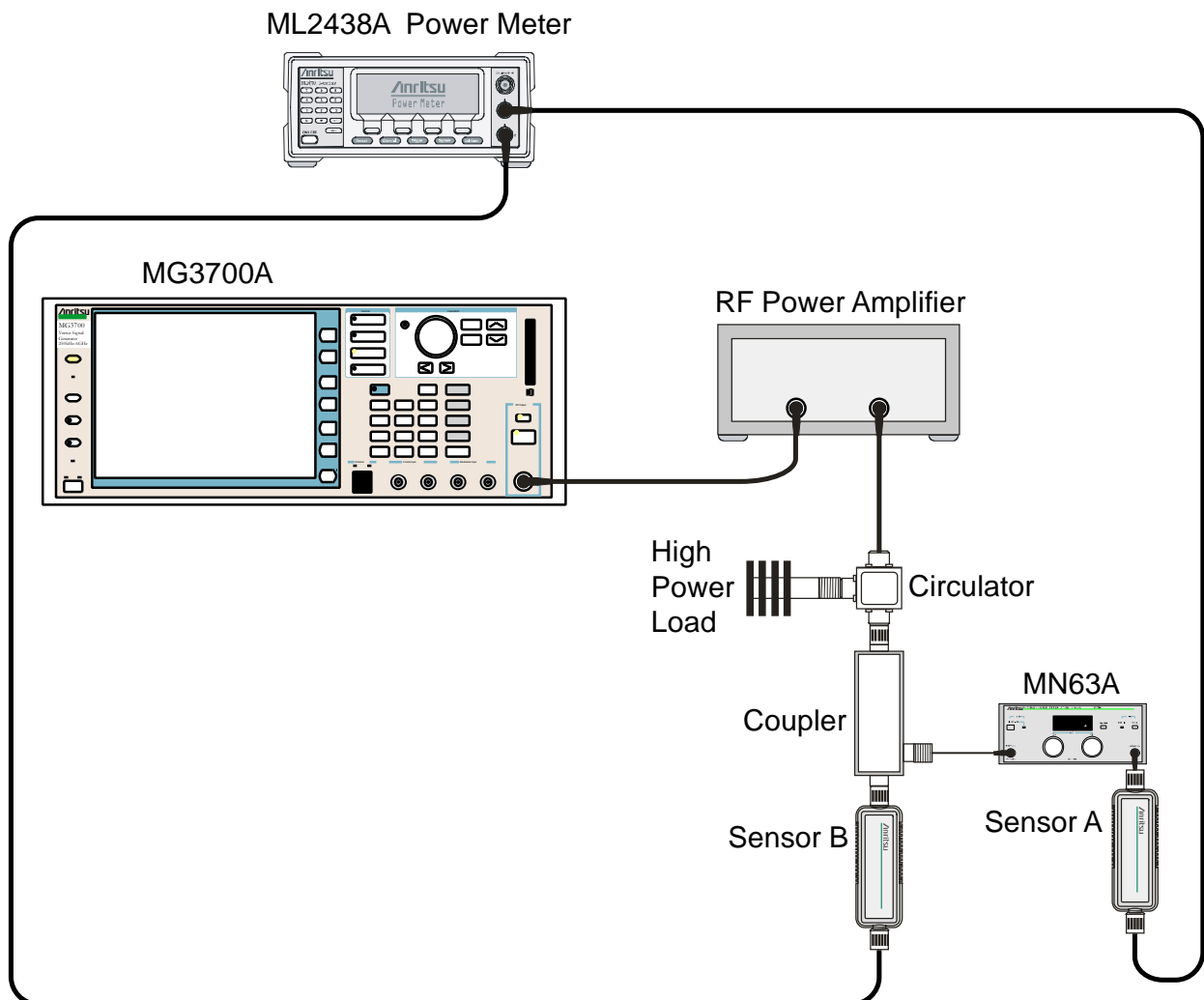


Figure 3-3. WCDMA Absolute Power Accuracy Verification — Characterization Setup

1. Connect the MG3700A, RF power amplifier, attenuator, power meter, and sensors as shown in [Figure 3-3](#).

2. Turn on the MG3700A, the RF amplifier, the attenuator, and the power meter.
3. Connect the power sensors to the power meter and then calibrate the sensors.
4. Press the **On/Off** key to turn on the MS2718B, MS2719B and wait until the measurement display appears. Then press the **Shift** key and press the **Mode** (9) key to activate the mode selection menu.
5. Use the **Up/Down** arrow keys to select WCDMA and press the **Enter** key.
6. Press the **Shift** key, the **Preset** (1) key, and then the Preset soft key.
7. On the MG3700A, press the **Preset** key (Yellow key on the upper left hand side).
8. Press the **Down Arrow** key to select Yes.
9. Press the **Set** key.

Note The MG3700A has two Set keys, and they both have the same function.
--

10. Press the (F1) soft key to select Load File to Memory.
11. Press the (F1) soft key again to select Select Package.
12. Using the **Down Arrow** key, step through the selection list until the W-CDMA(BS Tx test) option is highlighted.
13. Press the **Set** key.
14. Press the (F6) soft key (Return).
15. Press the **Set** key.
16. Using the **Down Arrow** key, step through the selection list until the TestModel_1_16DPCH option is highlighted.
17. Press the **Set** key.
18. Press the **MOD On/Off** key and verify that the Modulation indicator on the display is On.
19. Press the **Frequency** key, enter 881.5, then press the MHz soft key.
20. Press the **Level** key, enter -28, and press the dBm soft key.
21. Use the knob to adjust the power level so that Sensor B reads +10 dBm.
22. Set the MN63A attenuator to 0 dB.
23. Record the Sensor A reading (PMA.10) in [Table A-49, "Sensor A and Sensor B Reading Components Characterization at 881.5 Mhz"](#). This reading should be approximately -20 dBm.
24. Record the Sensor B reading (PMB.10) in [Table A-49](#).
25. Calculate $\Delta 1$, which is the error of the coupler output port deviation from ideal +10 dBm by using the following formula:

$$\Delta 1 \text{ (dB)} = (10 \text{ dBm} - \text{PMB.10})$$
26. Record the $\Delta 1$ value in [Table A-49](#).
27. Calculate the accurate value (PMA.10C) of Sensor A reading for coupler port output of +10 dBm by using the following formula:

$$\text{PMA.10C} = \text{PMA.10} + \Delta 1$$
28. Record the calculated value in [Table A-49](#).
29. Set the MN63A attenuator to 18 dB and record the Sensor A reading (PMA.18) in [Table A-49](#).
30. Calculate the accurate attenuation value by using the following formula:

$$\text{ATT.18} = (\text{PMA.10} - \text{PMA.18})$$
31. Record the calculated value in [Table A-49](#).

32. Turn off the RF output of the MG3700A.
33. Disconnect the coupler from Sensor B and connect the coupler to the MS2718B, MS2719B, referring to Figure 3-4.

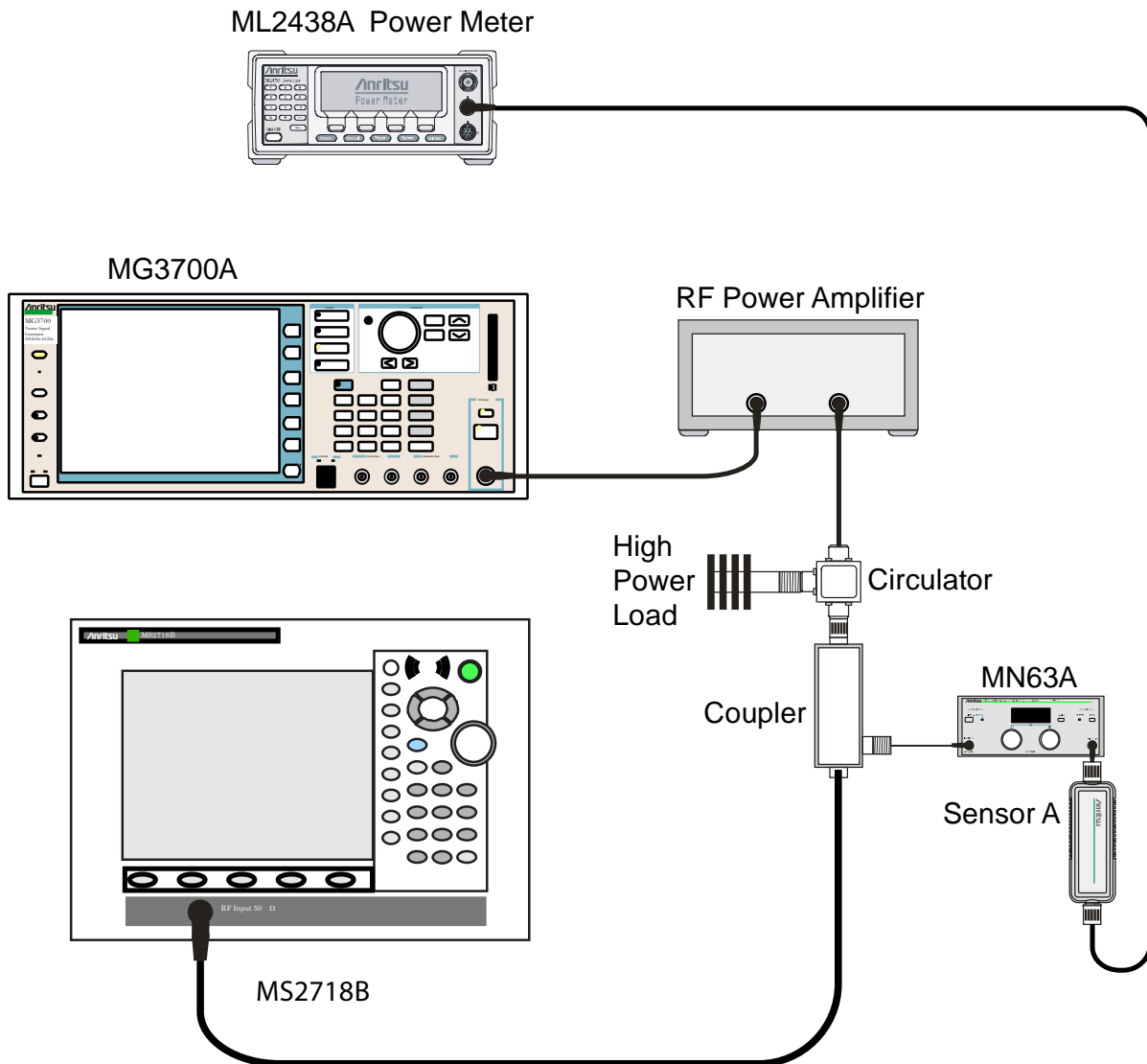


Figure 3-4. WCDMA Absolute Power Accuracy Verification — Measurement Setup

34. Set the MN63A attenuator to 0 dB.
35. On the MS2718B, MS2719B, press the Center Freq soft key, enter 881.5, and then press the **Enter** key.
36. Press the Measurements soft key, then the RF Measurement soft key, then the Spectrum soft key.
37. On the MG3700A, turn on the RF output and use the knob to adjust power level to read the value of PMA.10C on Sensor A in Table A-49.
38. Record the MG3700A power level setting (MG3700A.10) in Table A-50, “Power Level Setting Components Characterization at 881.5 Mhz”.
39. On the MS2718B, MS2719B, press the **Amplitude** key and then press the Adjust Range soft key.
40. Record the channel power reading in the “Measured Power” column of the test record in Table A-51, “WCDMA Absolute Power Accuracy”.

41. Use the following formula to calculate the absolute power accuracy of the MS2718B, MS2719B at +10 dBm:

$$\text{Error} = \text{Measured Power} - (+10)$$

42. Record the calculated value in the “Error” column of the test record in [Table A-51](#) and verify that it is within specification.
43. Turn off the RF output of the MG3700A.
44. Set the MN63A attenuator to 18 dB.
45. Calculate the value of the MG3700A setting (MG3700A.28) for +28 dBm Test Level by using the following formula and pre-recorded values from [Table A-50](#) and [Table A-51](#):

$$\text{MG3700A.28} = \text{MG3700A.10} + \text{ATT.18}$$

46. Record the calculated value in [Table A-50](#).
47. On the MG3700A, turn on the RF output and use the knob to adjust power level to the recorded MG3700A.28 value in [Table A-50](#).
48. On the MS2718B, MS2719B, press the **Amplitude** key and then press the Adjust Range soft key.
49. Record the channel power reading in the “Measured Power” column for +28 dBm Test Level in the test record in [Table A-51](#).
50. Use the following formula to calculate the absolute power accuracy of the MS2718B, MS2719B at +28 dBm:

$$\text{Error} = \text{Measured Power} - (+28)$$

51. Record the calculated value in the “Error” column of the test record in [Table A-51](#) and verify that it is within specification.
52. Turn off the RF output of the MG3700A.
53. Set the MN63A attenuator to 0 dB.
54. Set power level of the MG3700A to –38 dBm.
55. Calculate the value of the Sensor A reading (PMA–10 in [Table A-50](#)) for –10 dBm Test Level by using the value of PMA.10C in [Table A-49](#), “[Sensor A and Sensor B Reading Components Characterization at 881.5 Mhz](#)” and by using the following formula:

$$\text{PMA-10} = \text{PMA.10C} - 20$$

56. Record the calculated value in [Table A-50](#), “[Power Level Setting Components Characterization at 881.5 Mhz](#)”.
57. Turn on the RF output and use the knob to adjust power level to read the value of PMA–10 on Sensor A, as recorded in [Table A-50](#).
58. On the MS2718B, MS2719B, press the **Amplitude** key and then press the Adjust Range soft key.
59. Record channel power reading in the “Measured Power” column for –10 dBm Test Level in the test record in [Table A-51](#).
60. Use the following formula to calculate the absolute power accuracy of the MS2718B, MS2719B at –10 dBm:

$$\text{Error} = \text{Measured Power} - (-10)$$

61. Record the calculated value in the “Error” column of the test record in [Table A-51](#) and verify that it is within specification.
62. Turn off the RF output of the MG3700A.
63. Set the MN63A attenuator to 0 dB.
64. Decrease the power level of the MG3700A by 10 dB.

65. Calculate the value of the Sensor A reading (PMA-20) for -20 dBm Test Level by using the value of PMA.10C in [Table A-49](#) and by using the following formula:

$$\text{PMA-20} = \text{PMA.10C} - 30$$

66. Record the calculated value in [Table A-50](#), “Power Level Setting Components Characterization at 881.5 Mhz”.
67. Turn on the RF output and use the knob to adjust power level to read the value of PMA-20 on Sensor A, as recorded in [Table A-50](#).
68. On the MS2718B, MS2719B, press the **Amplitude** key and then press the Adjust Range soft key.
69. Record channel power reading in the “Measured Power” column of the test record in [Table A-51](#), “WCDMA Absolute Power Accuracy”.
70. Turn off the RF output of the MG3700A.
71. Use the following formula to calculate the absolute power accuracy of MS2718B, MS2719B at -20 dBm:
- $$\text{Error} = \text{Measured Power} - (-20)$$
72. Record the calculated value in the “Error” column of the test record in [Table A-51](#) and verify that it is within specification.

WCDMA Occupied Bandwidth (OBW) Verification (Option 44)

The tests in this section can be used to verify the WCDMA occupied bandwidth in WCDMA/HSDPA Signal Analyzer Mode.

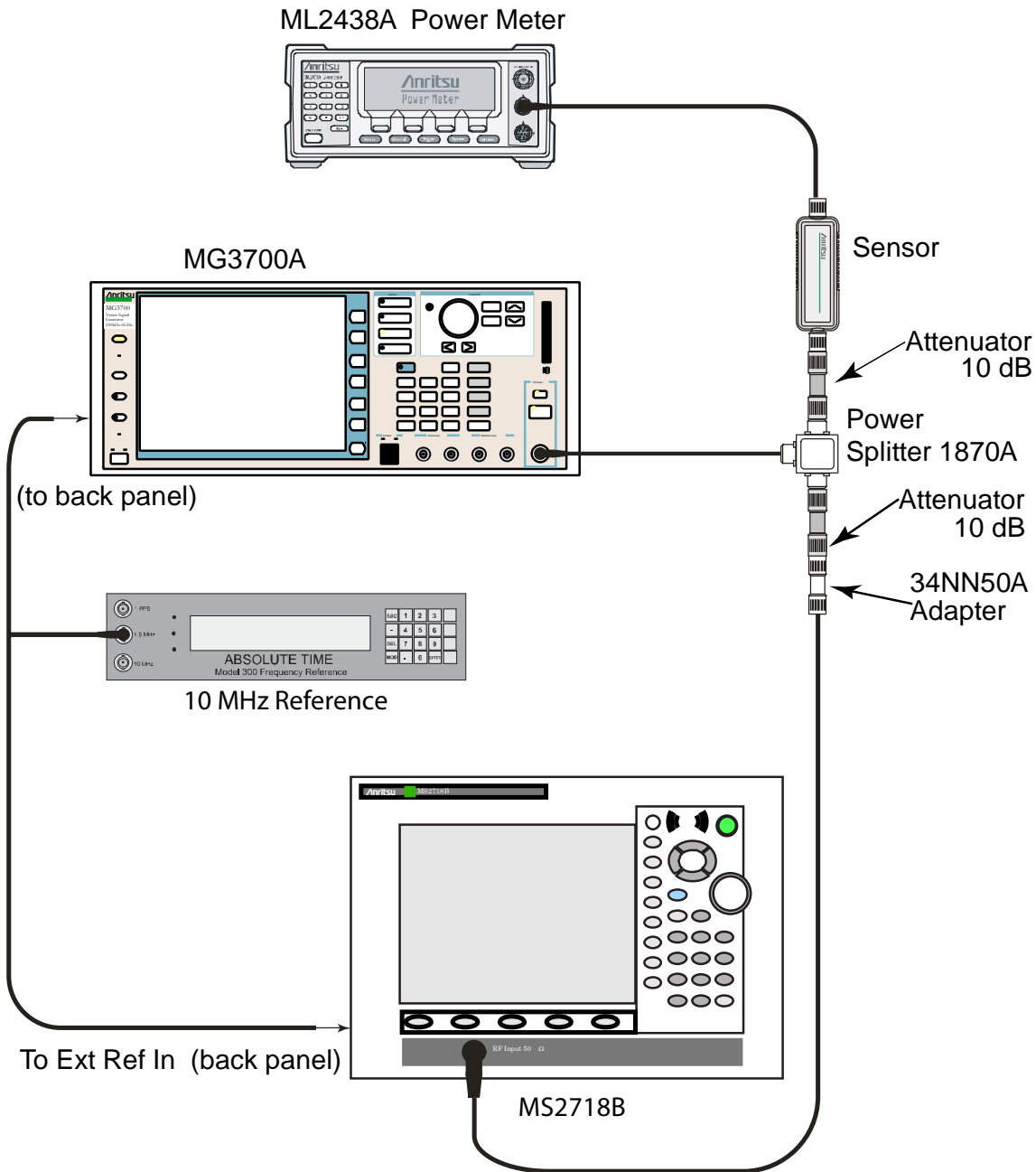


Figure 3-5. WCDMA OBW Verification Test Setup

Procedure:

1. Turn on the MG3700A Vector Signal Generator and the ML2438A power meter.
2. Connect the power sensor to the power meter and calibrate the sensor.
3. Connect the MG3700A, splitter, attenuator, sensor, and power meter as shown in [Figure 3-5](#).
4. Press the **On/Off** key to turn on the MS2718B, MS2719B and wait until the measurement display appears. Then press the **Shift** key, and then press the **Mode** (9) key to activate the mode selection menu.

5. Use the **Up/Down** arrow keys to select WCDMA and press the **Enter** key.
6. Press the **Shift** key, the **Preset** (1) key, and then the Preset soft key.
7. On the MG3700A, press the **Preset** key (Yellow key on the upper left hand side).
8. Press the **Down Arrow** key to select Yes.
9. Press the **Set** key.

Note The MG3700A has two **Set** keys, and they both have the same function.

10. Press the (F1) soft key to select Load File to Memory.
11. Press the (F1) soft key again to select Select Package.
12. Using the **Down Arrow** key, step through the selection list until the W-CDMA(BS Tx test) option is highlighted.
13. Press the **Set** key.
14. Press the (F6) soft key (Return).
15. Press the **Set** key.
16. Using the **Down Arrow** key, step through the selection list until the TestModel_1_16DPCH option is highlighted.
17. Press the **Set** key.
18. Press the MOD On/Off key and verify that the Modulation indicator on the display is ON.
19. Press the **Frequency** key, then enter one of the frequencies from [Table A-52](#), “WCDMA Occupied Bandwidth (OBW)” starting with 881.5, and press the MHz soft key.
20. Press the **Level** key, then enter -2 and press the dBm key.
21. Use the knob to adjust the power level so that the power meter reads -20 dBm. Record the reading in the “Power Meter Reading” column of [Table A-52](#).
22. On the MS2718B, MS2719B, press the Center Frequency soft key, enter one of the frequencies from [Table A-52](#) starting with 881.5, then press the **Enter** key.
23. Press the Measurements soft key, then the RF Measurement soft key, and press the Channel Spectrum soft key.
24. Press the **Amplitude** key, then press the Adjust Range soft key.
25. Record the OBW reading in the “OBW” column of the test record in [Table A-52](#) and verify that it is within 4.2 MHz \pm 100 kHz.
26. Repeat Step 19 through Step 25 for the other frequencies in [Table A-52](#).

WCDMA RF Channel Power Accuracy and ACLR Verification (Option 44)

The tests in this section can be used to verify the WCDMA RF Channel Power Accuracy and ACLR Accuracy in WCDMA/HSDPA Signal Analyzer Mode.

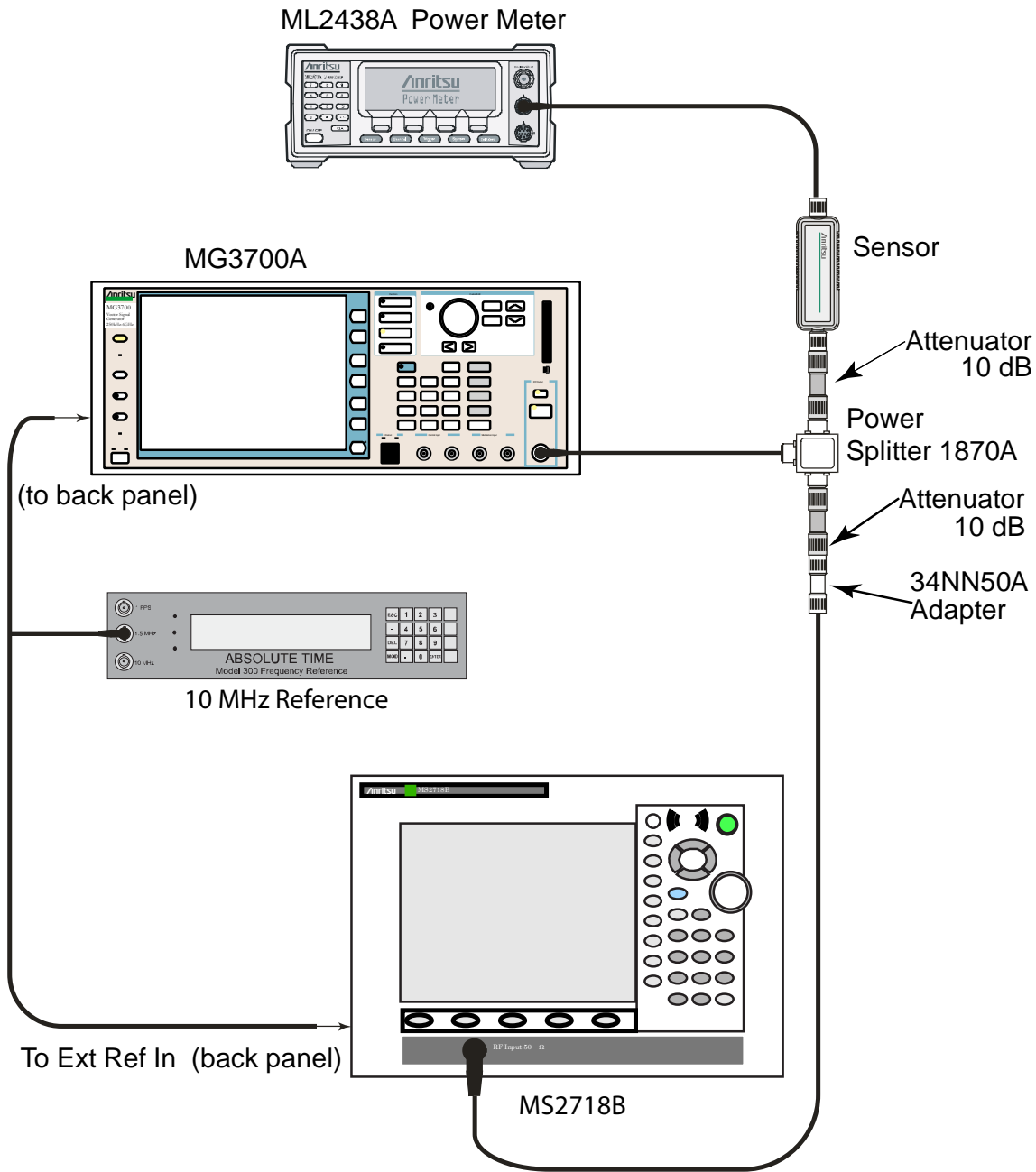


Figure 3-6. WCDMA RF Channel Power Accuracy and ACLR Verification Test Setup

Procedure:

1. Turn on the MG3700A Vector Signal Generator and the ML2438A power meter.
2. Connect the power sensor to the power meter and calibrate the sensor.
3. Connect the MG3700A, splitter, attenuator, power meter, and sensor as shown in [Figure 3-5 on page 3-14](#).
4. Press the **On/Off** key to turn on the MS2718B, MS2719B and wait until the measurement display appears. Then press the **Shift** key, and then press the **Mode** (9) key to activate the mode selection menu.
5. Use the **Up/Down** arrow keys to select WCDMA and press the **Enter** key.
6. Press the **Shift** key, the **Preset** (1) key, and then the **Preset** soft key.
7. On the MG3700A, press the **Preset** key (Yellow key on the upper left hand side).
8. Press the **Down Arrow** key to select Yes.
9. Press the **Set** key.

Note The MG3700A has two Set keys, and they both have the same function.
--

10. Press the (F1) soft key to select Load File to Memory.
11. Press the (F1) soft key again to select Select Package.
12. Using the **Down Arrow** key, step through the selection list until the W-CDMA(BS Tx test) option is highlighted.
13. Press the **Set** key.
14. Press the (F6) soft key (Return).
15. Press the **Set** key.
16. Using the **Down Arrow** key step through the selection list until the TestModel_1_16DPCH option is highlighted.
17. Press the **Set** key.
18. Press the **MOD On/Off** key and verify that the Modulation indicator on the display is ON.
19. Press the **Frequency** key, then enter 881.5, and press the MHz soft key.
20. Press the **Level** key, then enter -2 and press the dBm soft key.
21. Use the knob to adjust the power meter to read -20 dBm and record the Power Meter reading in the “Power Meter Reading” column of the test record in [Table A-53, “WCDMA RF Channel Power Accuracy”](#).
22. On the MS2718B, MS2719B, press the Center Frequency soft key, enter 881.5, and then press the **Enter** key.
23. Press the Measurements soft key, then press the RF Measurement soft key and press the ACLR soft key.
24. Press the **Amplitude** key, then press the Adjust Range soft key.
25. Record the measured CH 1 power in dBm into the “Measured RF Channel Power” column of the test record in [Table A-53](#).
26. Calculate the RF Channel Power Error using the following formula:

$$\text{RF Channel Power Error (dB)} = \text{Measured RF Channel Power} - 0.246 - \text{Power Meter reading}$$
27. Record calculated value to the “RF CH Power Error” column of the test record in [Table A-53](#) and verify that it is within specifications (± 1.25 dB).
28. Record all four measured Adjacent Channel Leakage Ratios in dB at -10 MHz Offset, -5 MHz Offset, +5 MHz Offset, and +10 MHz Offset in the “Measured ACLR” column of the test record in [Table A-54, “WCDMA ACLR Accuracy”](#).

29. Calculate the ACLR Error at -10 MHz Offset and +10 MHz Offset using the following formula:

$$\text{ACLR Error at } -10 \text{ or } +10 \text{ MHz Offset} = 10 \text{ LOG}_{10} (10^{(-50/10)} + 10^{(\text{Measured_ACLR}/10)}) - (-50) \text{ dB}$$

30. Record in the calculated results to the corresponding cells in the “Calculated ACLR Error” column into the test record in [Table A-54](#) and verify that it is within specification.

31. Calculate the ACLR Error at -5 MHz Offset and +5 MHz Offset using the following formula:

$$\text{ACLR Error at } -5 \text{ or } +5 \text{ MHz Offset} = 10 \text{ LOG}_{10} (10^{(-45/10)} + 10^{(\text{Measured_ACLR}/10)}) - (-45) \text{ dB}$$

32. Record in the calculated results to the corresponding cells in the “Calculated ACLR Error” column into the test record in [Table A-54](#) and verify that it is within specification.

33. Repeat Step 19 through Step 32 for the other frequencies in [Table A-54](#).

HSDPA RF Channel Power Accuracy and ACLR Verification (Option 44)

The tests in this section can be used to verify the RF Channel Power Accuracy and ACLR Accuracy for HSDPA signals in WCDMA/HSDPA Signal Analyzer Mode.

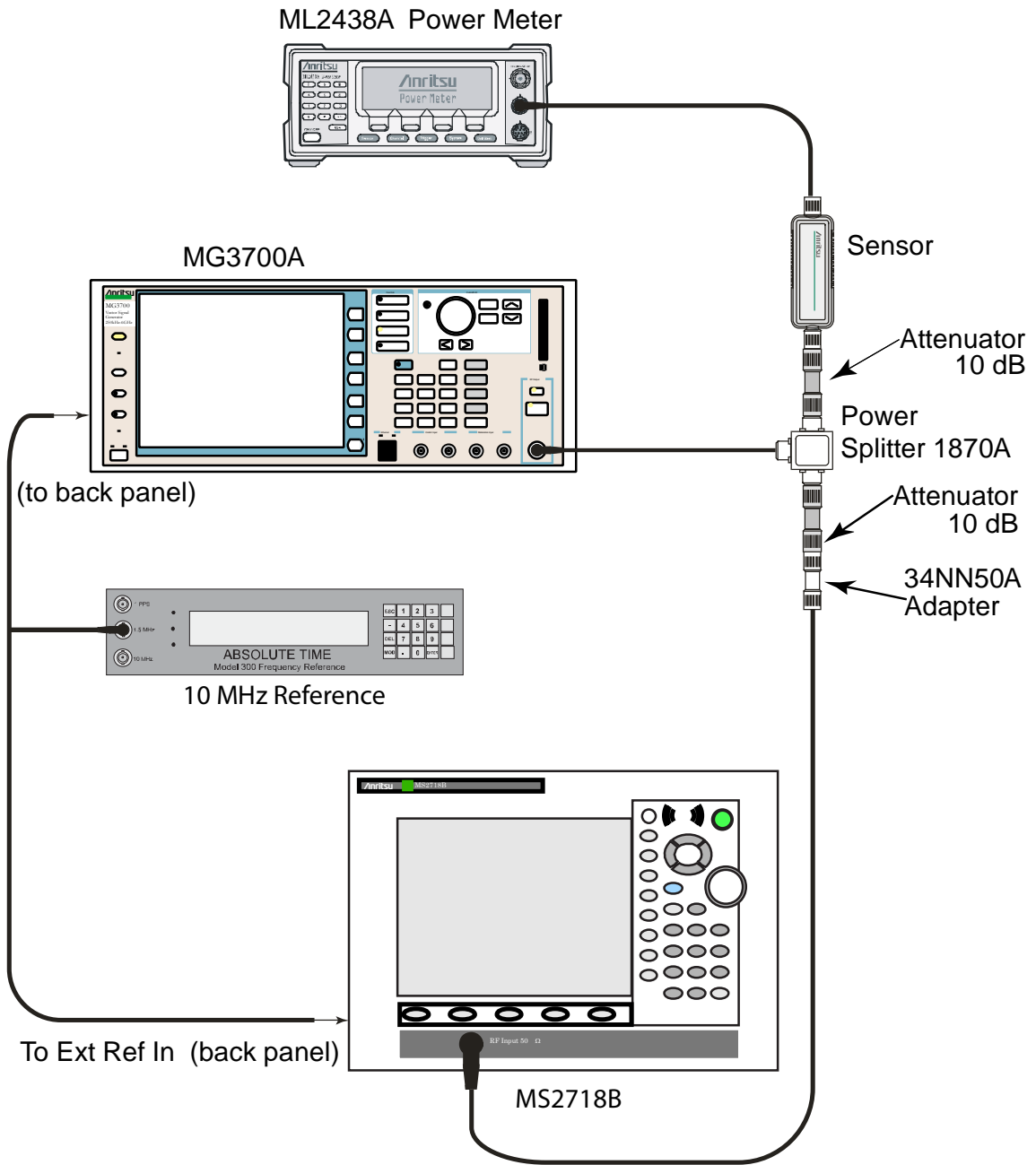


Figure 3-7. HSDPA RF Channel Power Accuracy and ACLR Verification Test Setup

Procedure:

1. Turn on the MG3700A Vector Signal Generator and the ML2438A power meter.
2. Connect the power sensor to the power meter and calibrate the sensor.
3. Connect the MG3700A, splitter, attenuator, power meter, and sensor according to [Figure 3-5, “WCDMA OBW Verification Test Setup”](#) on page 3-14.
4. Press the **On/Off** key to turn on the MS2718B, MS2719B and wait until the measurement display appears. Then press the **Shift** key, and then press the **Mode** (9) key to activate the mode selection menu.
5. Use the **Up/Down** arrow keys to select WCDMA and press the **Enter** key.
6. Press the **Shift** key, the **Preset** (1) key, and then the Preset soft key.
7. On the MG3700A, press the **Preset** key (Yellow key on the upper left hand side).
8. Press the **Down Arrow** key to select Yes.
9. Press the **Set** key.

Note The MG3700A has two **Set** keys, and they both have the same function.

10. Press the (F1) soft key to select Load File to Memory.
11. Press the (F1) soft key again to select Select Package.
12. Using the **Down Arrow** key step through the selection list until the W-CDMA(BS Tx test) option is highlighted.
13. Press the **Set** key.
14. Press the (F6) soft key (Return).
15. Press the **Set** key.
16. Using the **Down Arrow** key step through the selection list until the TestModel_5_8HSPDSCH option is highlighted.
17. Press the **Set** key.
18. Press the **MOD On/Off** key and verify that the Modulation indicator on the display is ON.
19. Press the **Frequency** key, then enter 2680.5, and press the MHz soft key.
20. Press the **Level** key, then enter -2, and press the dBm soft key.
21. Use the knob to adjust the power meter to read -20 dBm and record the Power Meter reading in the “Power Meter Reading” column of the test record in [Table A-55, “HSDPA RF Channel Power Accuracy”](#).
22. On the MS2718B, MS2719B, press the Center Frequency soft key, enter 2680.5, and then press the **Enter** key.
23. Press the Measurements soft key, then press the RF Measurement soft key and press ACLR.
24. Press the **Amplitude** key, then press the Adjust Range soft key.
25. Record the measured CH 1 power in dBm to the “Measured RF Channel Power” column of the test record in [Table A-55](#).
26. Calculate the RF Channel Power Error using the following formula:

$$\text{RF Channel Power Error (dB)} = \text{Measured RF Channel Power} - 0.246 - \text{Power Meter reading}$$
27. Record calculated value to the “RF CH Power Error” column in the test record in [Table A-55](#) and verify that it is within specifications (± 1.25 dB).
28. Record all four measured Adjacent Channel Leakage Ratios in dB at -10 MHz Offset, -5 MHz Offset, +5 MHz Offset, and +10 MHz Offset into the Measured ACLR column of the test record in [Table A-56, “HSDPA ACLR Accuracy”](#).

29. Calculate the ACLR Error at -10 MHz Offset and +10 MHz Offset by using the following formula:

$$\text{ACLR Error at } -10 \text{ or } +10 \text{ MHz Offset} = 10 \text{ LOG}_{10} (10^{(-50/10)} + 10^{(\text{Measured_ACLR}/10)}) - (-50) \text{ dB}$$

30. Record the calculated results in the corresponding cells in the “Calculated ACLR Error” column of the test record in [Table A-56](#) and verify that they are within specification.

31. Calculate the ACLR Error at -5 MHz Offset and +5 MHz Offset by using the following formula:

$$\text{ACLR Error at } -5 \text{ or } +5 \text{ MHz Offset} = 10 \text{ LOG}_{10} (10^{(-45/10)} + 10^{(\text{Measured_ACLR}/10)}) - (-45) \text{ dB}$$

32. Record the calculated results in the corresponding cells in the “Calculated ACLR Error” column of the test record in [Table A-56](#) and verify that they are within specification.

Error Vector Magnitude (EVM) Verification (Option 45 or Option 65)

The tests in this section can be used to verify the functionality of the WCDMA Demodulator or the HSDPA Demodulator of the WCDMA/HSDPA Signal Analyzer in the Anritsu MS2718B, MS2719B Economy Spectrum Analyzer.

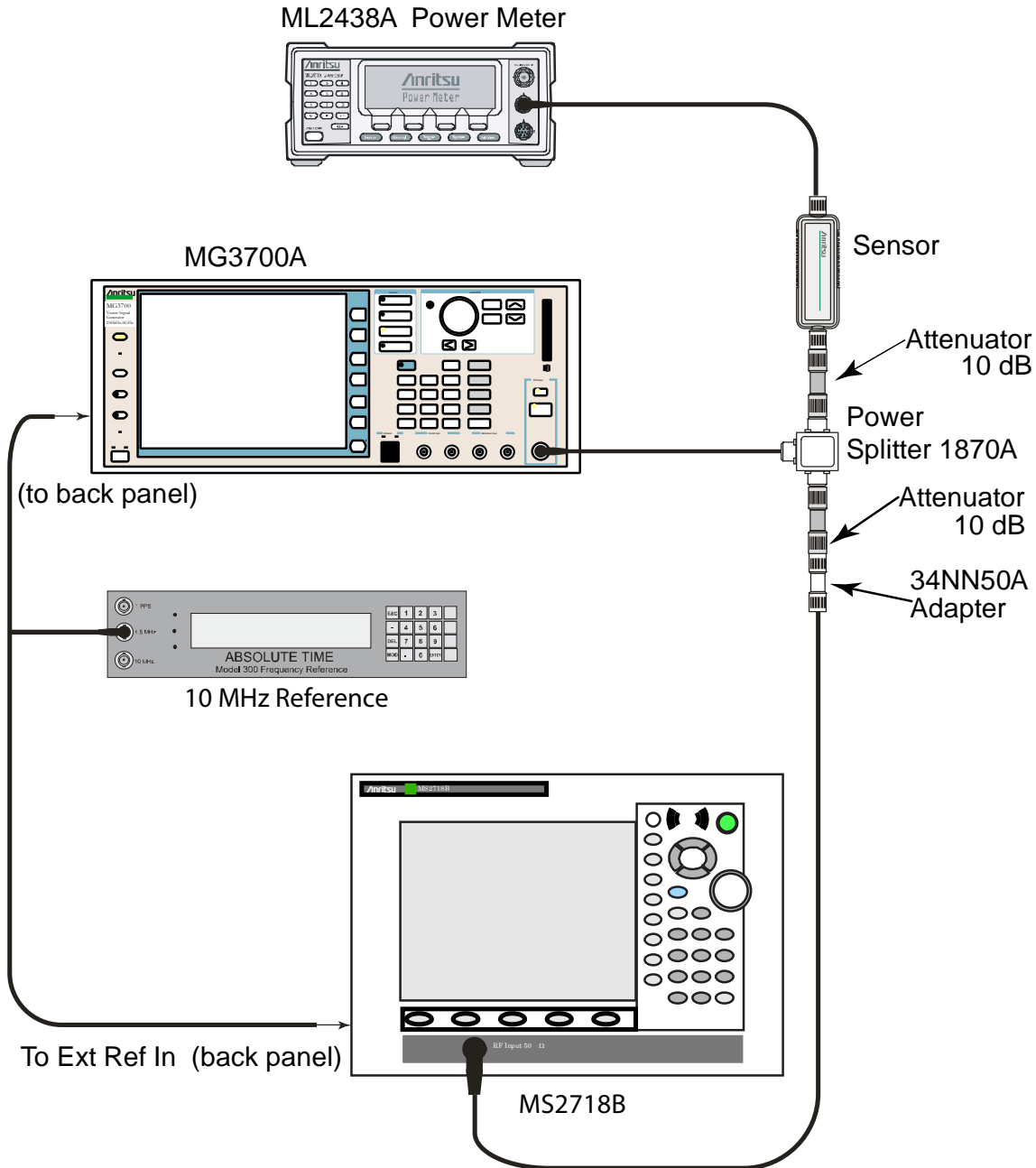


Figure 3-8. Error Vector Magnitude (EVM) Verification Test Setup

Procedure:

1. Turn on the MG3700A Vector Signal Generator and the ML2438A power meter.
2. Connect the power sensor to the power meter and calibrate the sensor.
3. Connect the MG3700A, splitter, attenuator, power meter, and sensor as shown in [Figure 3-5, “WCDMA OBW Verification Test Setup” on page 3-14](#).
4. Press the **On/Off** key to turn on the MS2718B, MS2719B and wait until the measurement display appears. Then press the **Shift** key, and then press the **Mode** (9) key to activate the mode selection menu.
5. Use the **Up/Down** arrow keys to select WCDMA and press the **Enter** key.
6. Press the **Shift** key, the **Preset** (1) key, and then the **Preset** soft key.
7. On the MG3700A, press the **Preset** key (Yellow key on the upper left hand side).
8. Press the **Down Arrow** key to select Yes.
9. Press the **Set** key.

Note The MG3700A has two Set keys, and they both have the same function.
--

10. Press the (F1) soft key to select Load File to Memory.
11. Press the (F1) soft key again to select Select Package.
12. Using the **Down Arrow** key, step through the selection list until the W-CDMA(BS Tx test) option is highlighted.
13. Press the **Set** key.
14. Press the (F6) soft key (Return).
15. Press the **Set** key.
16. Using the **Down Arrow** key, step through the selection list until the TestModel_4_opt option is highlighted.
17. Press the **Set** key.
18. Press the **MOD On/Off** key and verify that the Modulation indicator on the display is ON.
19. Press the **Frequency** key, then enter 1962.5, and press the MHz soft key.
20. Press the **Level** key, then enter -2, and press the dBm key.
21. Use the knob to adjust the power meter to read -20 dBm.
22. On the MS2718B, MS2719B, press the Center Frequency soft key, enter 1962.5, and then press the MHz soft key.
23. Press the Measurements soft key, then press the Demodulator soft key, and press the Modulation Summary soft key.
24. Press the Setup soft key, then press the Auto Scrambling soft key to turn it ON.
25. Press the Max Spreading Factor soft key to set it to 512.
26. Press the **Amplitude** key, then press the Adjust Range soft key.
27. Record the EVM reading to the test record in [Table A-57, “WCDMA Error Vector Magnitude \(EVM\) \(Test Model 4, Option 45 or Option 65\)”](#) and verify that it is within $\pm 2.5\%$.
28. This completes the EVM test for MS2718B, MS2719B with Option 45 and completes the first EVM test for MS2718B, MS2719B with Option 65.

For MS2718B, MS2719B with Option 65:

29. On the MG3700A, press the **Preset** key (Yellow key on the upper left hand side).
30. Press the **Down Arrow** key to select Yes.
31. Press the **Set** key.

Note The MG3700A has two Set keys, and they both have the same function.
--

32. Press the (F1) soft key to select Load File to Memory.
33. Press the (F1) soft key again to select Select Package.
34. Using the **Down Arrow** key step through the selection list until the W-CDMA(BS Tx test) option is highlighted.
35. Press the **Set** key.
36. Press the (F6) soft key (Return).
37. Press the **Set** key.
38. Using the **Down Arrow** key step through the selection list until the TestModel_5_8HSPDSCH option is highlighted.
39. Press the **Set** key.
40. Press the **MOD On/Off** key and verify that the Modulation indicator on the display is ON.
41. Press the **Frequency** key, then enter 1962.5, and press the MHz soft key.
42. Press the **Level** key, then enter -2, and press the dBm key.
43. Use the knob to adjust the power meter to read -20 dBm.
44. On the MS2718B, MS2719B, press the Center Frequency soft key, enter 1962.5, and then press the MHz soft key.
45. Press the Measurements soft key, then press the Demodulator soft key, and press the Modulation Summary soft key.
46. Press the Setup soft key, then press the Auto Scrambling soft key to turn it ON.
47. Press the Max Spreading Factor soft key to set it to 512.
48. Press the **Amplitude** key, then press the Adjust Range soft key.
49. Record the EVM reading to the test record in [Table A-58, “HSDPA Error Vector Magnitude \(EVM\) \(Test Model 5, Option 65\)”](#) and verify that it is within $\pm 2.5\%$.
50. This completes the two EVM tests for MS2718B, MS2719B with Option 65.

Fixed WiMAX Channel Power Accuracy Test (Options 46)

The tests in this section verify the Channel Power Accuracy of the optional Fixed WiMAX Signal Analyzer in Model MS271xB Economy Spectrum Analyzer.

Procedure

1. Connect the MA2482D Power Sensor to the power meter and zero the meter.
2. Set the cal factor frequency of the power sensor to 2600.5 MHz.
3. Connect the Power Sensor, 1870A splitter, 10 dB attenuators (quantity 2), as shown in [Figure 3-9](#).
4. Set the MG3700A as follows:
 - a. Press the yellow **Preset** button (answer **yes** to the question).
 - b. Press the **Set** key.
 - c. Press the F1 soft key to select Load File to Memory.
 - d. Press the F1 soft key again to select Select Package.
 - e. Using the down arrow key step through the selection list until WiMax is highlighted.
 - f. Press the **Set** key.
 - g. Press the Return (F6) soft key.
 - h. Press the **Set** key. The Select Package list box will appear. Again select WiMax and the **Set** key.
 - i. Another file list will appear. Select (highlight) Mx10g32.
 - j. Press the **Set** key.
 - k. Press the **MOD On/Off** key and verify that the LED is on. Ensure that the “Playing” indicator is displaying the moving pattern.
 - l. Press the **Frequency** key, then enter 2600.5 MHz.
 - m. Press the **Level** key, then enter 2 dBm. Turn the output On.
5. Adjust the MG3700A level setting with the knob so that the power meter reads $-15.0 \text{ dBm} \pm 0.2 \text{ dBm}$.
6. Set the MS271xB to Fixed WiMax Signal Analyzer Mode and preset the unit.
7. Set the MS271xB as follows:
 - a. Press the Freq soft key and set the center frequency to 2600.5 MHz.
 - b. Press the Setup soft key and set the Bandwidth to 10 MHz.
 - c. Press the CP Ratio soft key (under the Setup soft key) and set the CP Ratio to 1/32.
 - d. Press the Measurements soft key and select RF, then select Power vs. Time.
8. Record the MS271xB Channel Power (RSSI) reading to the **Measured Channel Power (RSSI)** column in [Table A-59, “Fixed WiMAX Channel Power Accuracy”](#).
9. Calculate the Channel Power Error by subtracting the MS271xB “Channel Power (RSSI)” reading from the power meter reading in step 5. Record the result to the **Error** column in the [Table A-59, “Fixed WiMAX Channel Power Accuracy”](#).
10. Verify that the error is within specification.
11. Adjust the MG3700A level setting to approximately -33 dBm so that the power meter reads -50.0 dBm .
12. Record the MS271xB Channel Power (RSSI) reading to the **Measured Channel Power (RSSI)** column of [Table A-59, “Fixed WiMAX Channel Power Accuracy”](#).
13. Calculate the Channel Power Error by subtracting the MS271xB “Channel Power (RSSI)” reading from the power meter reading in step 11. Record the result to the **Error** column in [Table A-59, “Fixed WiMAX Channel Power Accuracy”](#).
14. Verify that the error is within specification.

15. Set the cal factor frequency of the power sensor to 3600.5 MHz.
16. Set the MG3700A frequency to 3600.5 MHz.
17. Change the center frequency of MS271xB to 3600.5 MHz.
18. Measure the Channel Power (RSSI) for both -15 and -50 dBm and then record the measured result and calculated error in [Table A-59, “Fixed WiMAX Channel Power Accuracy”](#).
19. Verify that the error is within specification.
20. Set the cal factor frequency of the power sensor to 5600.5 MHz.
21. Set MG3700A Frequency to 5600.5 MHz.
22. Change the center frequency of MS271xB to 5600.5 MHz.
23. Repeat steps 18 to 19.

Fixed WiMAX Residual EVM and Frequency Error Tests (Option 47)

The tests in this section verify the Residual EVM and Frequency Error of the optional Fixed WiMAX Signal Analyzer in Model MS271xB Economy Spectrum Analyzer.

Procedure

1. Connect the MA2482D Power Sensor to the power meter and zero the meter.
2. Set the cal factor frequency of the power sensor to 2600.5 MHz.
3. Connect the Power Sensor, 1870A splitter, 10 dB attenuators (quantity 2), as shown in [Figure 3-9 on page 3-25](#).
4. Set the MG3700A as follows:
 - a. Press the yellow **Preset** button (answer yes to the question).
 - b. Press the **Set** key.
 - c. Press the F1 soft key to select Load File to Memory.
 - d. Press the F1 soft key again to select Select Package.
 - e. Using the Down Arrow key step through the selection list until WiMax is highlighted.
 - f. Press the **Set** key.
 - g. Press the Return (F6) soft key.
 - h. Press the **Set** key. The Select Package list box will appear. Again select WiMax and the **Set** key.
 - i. Another file list will appear. Select (highlight) Mx10g32.
 - j. Press the **Set** key.
 - k. Press the **MOD On/Off** key and verify that the LED is on. Ensure that the “Playing” indicator is displaying the moving pattern.
 - l. Press the **Frequency** key, then enter 2600.5 MHz.
 - m. Press the **Level** key, then enter 2 dBm. Turn the output On.
5. Adjust the MG3700A level setting with the knob so that the power meter reads -15.0 dBm \pm 0.2 dBm.
6. Set the MS271xB to Fixed WiMax Signal Analyzer Mode and preset the unit.
7. Set the MS271xB as follows:
 - a. Press the Freq soft key and set the center frequency to 2600.5 MHz.
 - b. Press the Setup soft key and set the Bandwidth to 10 MHz.
 - c. Press the CP Ratio soft key (under the Setup soft key) and set the CP Ratio to 1/32.
 - d. Press the Measurements soft key and select Demodulator, then select Modulation Summary.

8. Record the MS271xB EVM(rms) reading to the **EVM(rms)** column in [Table A-60, “Fixed WiMAX Residual EVM”](#).
9. Verify that the measured EVM is within specification.
10. Adjust the MG3700A Level setting to approximately -33 dBm so that the power meter reads -50.0 dBm.
11. Record the MS271xB EVM(rms) reading to the **EVM(rms)** column in [Table A-60, “Fixed WiMAX Residual EVM”](#).
12. Verify that the measured EVM is within specification.
13. Record the MS271xB Freq Error reading to [Table A-60, “Fixed WiMAX Residual EVM”](#).
14. Verify that the measured frequency error is within specification.
15. Set the cal factor frequency of the power sensor to 3600.5 MHz.
16. Set the MG3700A frequency to 3600.5 MHz.
17. Change the center frequency of the MS271xB to 3600.5 MHz.
18. Measure the EVM(rms) for both -15 and -50 dBm and then record the measured results to [Table A-60, “Fixed WiMAX Residual EVM”](#).
19. Verify that the measured EVM is within specification.
20. Set the cal factor frequency of the power sensor to 5600.5 MHz.
21. Set the MG3700A frequency to 5600.5 MHz.
22. Adjust the MG3700A level setting with the knob so that the power meter reads -15.0 dBm ± 0.2 dBm.
23. Change the center frequency of the MS271xB to 5600.5 MHz.
24. Record the MS271xB EVM(rms) reading to the **EVM(rms)** column in [Table A-60, “Fixed WiMAX Residual EVM”](#).
25. Verify that the measured EVM is within specification.
26. Adjust the MG3700A level setting to approximately -33 dBm so that the power meter reads -50.0 dBm ± 0.2 dBm.
27. Record the MS271xB EVM(rms) reading to the **EVM(rms)** column in [Table A-60, “Fixed WiMAX Residual EVM”](#).
28. Verify that the measured EVM is within specification.
29. Record the MS271xB frequency error reading to [Table A-60, “Fixed WiMAX Residual EVM”](#).
30. Verify that the measured frequency error is within the specification.

TD-SCDMA Signal Analyzer Verification (Option 60 and/or 61)

Procedure

1. Calibrate the power sensor prior to connecting to the power splitter.
2. Connect the equipment as shown in [Figure 3-10](#).
3. On the power meter, press the **Sensor** key, the Cal Factor soft key, and then the Freq soft key. Use the keypad to enter 2010 MHz as the input signal frequency, which sets the power meter to the proper power sensor cal factor. Press the **System** key to display the power reading.
4. Set the power meter to Averaging, Moving and 256 samples.
5. Set the MS271XB to TD-SCDMA Signal Analyzer mode and preset the unit.
6. On the MG3700A, press the **Preset** key (yellow key on the upper left hand side).
7. Press the down arrow key or turn the knob to select Yes.
8. Press the **Set** key.

Note The TD-SCDMA pattern requires a Waveform Data license MX370001A that must be purchased.

Note Both Set keys on the MG3700A perform the same function.
--

9. Press the F1 soft key to select Load File to Memory.
10. Press the F1 soft key again to select Select Package.
11. Using the down arrow key step through the selection list until the TD-SCDMA(MX370001A) option is highlighted.
12. Press the **Set** key.
13. Press the Return (F6) soft key.
14. Press the **Set** key. The Select Package box will appear. Use the rotary knob to highlight TD-SCDMA(MX370001A) and press the **Set** key to select.
15. Another file list will appear. Use the rotary knob to select rmc-P-CCPCH_bs_dl and press the **Set** key to select.
16. Press the **MOD On/Off** key to turn the Modulation LED on and verify the “Playing” indicator in the center of the LCD is flashing.
17. Press the **Frequency** key, enter 2010 MHz.
18. Press the **Level** key, enter -20 and press the dBm soft key.
19. Adjust the MG3700A output so that the power meter reads -45 dBm ± 0.5 dB.
20. On the MS271XB, press the Frequency soft key and enter 2010 MHz as center frequency.
21. Press the Measurements soft key and select TD-SCDMA Summary (a red dot will appear on the label).
22. Press the Setup soft key and select PN Setup. Then change PN Trigger to Ext by pressing the PN Trigger soft key twice. Then wait 15 seconds to allow the MS271XB to update its measured results.
23. For MS271XB with Option 60 (TD-SCDMA RF Measurements), subtract the displayed channel power value from the power meter reading in step 14. Then record the calculated channel power error to [Table A-62, “TD-SCDMA for Units with Option 60, 61 Installed Only \(at 2010 MHz, -45 dBm Level\)”](#).
24. For MS271XB with Option 61 (TD-SCDMA Demodulator), record the displayed frequency error, EVM and Tau to [Table A-62, “TD-SCDMA for Units with Option 60, 61 Installed Only \(at 2010 MHz, -45 dBm Level\)”](#).
25. Verify that the measured values in step 23 and/or step 24 are within specifications.

3-6 EVDO Signal Analyzer Option Verification

Options 62 or 63 or both

The tests in this section verify the optional EVDO Signal Analyzer functions in Anritsu Model MS2718B or Model MS2719B Economy Spectrum Analyzer.

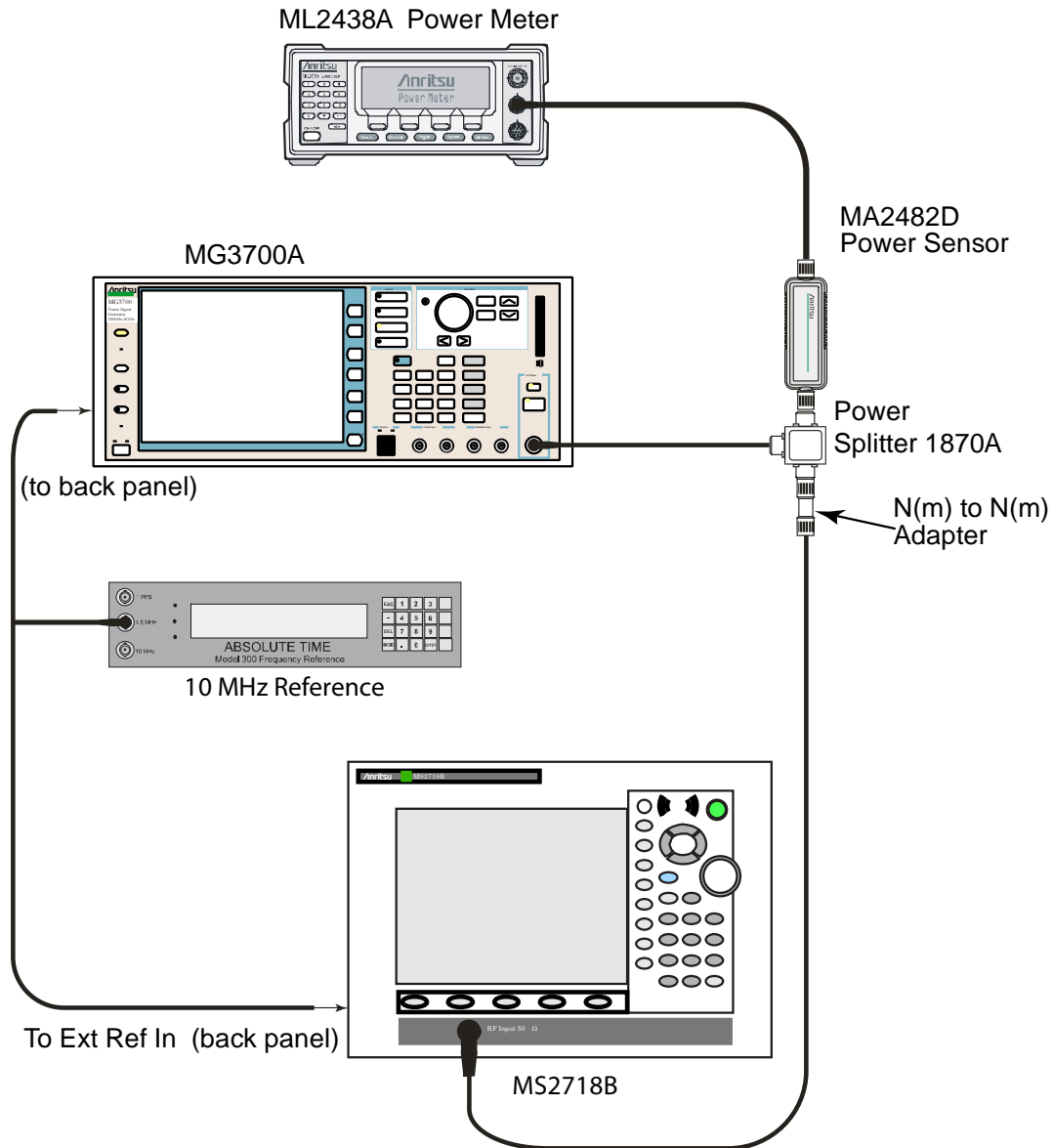


Figure 3-11. EVDO Signal Analyzer Test Setup

Set up Procedure:

1. Connect the equipment as shown in [Figure 3-11](#).
2. Calibrate the power sensor prior to connecting to the power splitter.
3. On the power meter, press the Sensor key, the Cal Factor soft key, and then the Freq soft key. Use the keypad to enter 870.03 MHz as the input signal frequency, which sets the power meter to the proper power sensor calibration factor. Press the System key to display the power reading.
4. Set the MS2718B, MS2719B mode to EVDO Signal Analyzer. Preset the unit.

8-PSK Modulation Channel Power, Frequency Error, Rho, and Tau Tests

Test Procedure:

1. On the MG3700A, press the **Preset** key (Yellow key on the upper left hand side).
2. Press the **Down Arrow** key or turn the knob to select Yes.
3. Press the **Set** key.

Note The MG3700A has two **Set** keys, and they both have the same function.

4. Press the (F1) soft key to select Load File to Memory.
5. Press the (F1) soft key again to select Select Package.
6. Using the **Down Arrow** key step through the selection list until the CDMA2000_1xEV-DO option is highlighted.
7. Press the **Set** key.
8. Press the (F6) soft key Return.
9. Press the **Set** key. The “Select Package” box will appear. Use the rotary knob to highlight CDMA2000_1xEV-DO and press the **Set** key to select.
10. Another File List will appear. Use the rotary knob to select FWD_921_6KBPS_2SLOT and press the **Set** key to select.
11. Press the **MOD On/Off** key to turn the Modulation LED on and verify that the “Playing” indicator in the center of the LCD is flashing.
12. Press the **Frequency** key, enter 870.03 MHz.
13. Press the **Level** key, enter -30 and press the dBm soft key.
14. Adjust the MG3700A output so that the power meter reads - 50 dBm \pm 0.2 dB.
15. On the MS2718B, MS2719B, press the Frequency soft key and enter 870.03 MHz as Center Frequency.
16. Press the Measurements soft key and select EVDO Summary (a red dot will appear on the label).
17. Press the Setup soft key and select PN Setup. Then change PN Trigger to Ext by pressing the PN Trigger soft key twice. Then wait 15 seconds to allow the MS2718B, MS2719B to update its measured results.
18. For MS2718B, MS2719B with Option 62 (EVDO RF Measurements), subtract the displayed Channel Power value from the power meter reading that was set in Step 14. Then record the calculated Channel Power error into the test record in [Appendix A](#) in the section labeled “At 870.03 MHz, -50 dBm Level, 921.6 kps 8-PSK Modulation” in [Table A-63](#), “Option 62 EVDO RF Measurements”.
19. For MS2718B, MS2719B with Option 63 (EVDO Demodulator), record the displayed Freq Error, Rho Pilot, and Tau into the test record in the section labeled “At 870.03 MHz, -50 dBm Level, 921.6 kps 8-PSK Modulation” in [Table A-64](#), “Option 63 EVDO Demodulator”.
20. Verify that the measured values in Step 18 or Step 19 (or both) are within specifications.

QPSK Modulation Channel Power, Frequency Error, Rho, and Tau Tests

Test Procedure:

1. Ensure that the equipment settings are unchanged from the previous test.
2. On the MG3700A, change the selected pattern to “FWD_38_4KBPS_16SLOT”.
3. On the power meter, press the Sensor key, the Cal Factor soft key, and then the Freq soft key. Use the keypad to enter 1930 MHz as the input signal frequency, which sets the power meter to the proper power sensor calibration factor. Press the System key to display the power reading.
4. Set the MG3700A Frequency to 1930.05 MHz.
5. Adjust the MG3700A output so that the power meter reads $0 \text{ dBm} \pm 0.2 \text{ dB}$.
6. On the MS2718B, MS2719B, press the Frequency soft key and enter 1930.05 MHz as Center Frequency. Then wait 15 seconds to allow the MS2718B, MS2719B to update its measured results.
7. For MS2718B, MS2719B with Option 62 (EVDO RF Measurements), subtract the displayed Channel Power value from the power meter reading in Step 5. Then record the calculated Channel Power error into the test record in [Appendix A](#) in the section labeled “At 1930.05 MHz, 0 dBm Level, 38.4 kps QPSK Modulation” in [Table A-63](#), “Option 62 EVDO RF Measurements”.
8. For MS2718B, MS2719B with Option 63 (EVDO Demodulator), record the displayed Freq Error, Rho Pilot, and Tau into the test record in the section labeled “At 1930.05 MHz, 0 dBm Level, 38.4 kps QPSK Modulation” in [Table A-64](#), “Option 63 EVDO Demodulator”.
9. Verify that the measured values in Step 7 or Step 8 (or both) are within specifications.

16-QAM Modulation Channel Power, Frequency Error, Rho and Tau Tests

Test Procedure:

1. Ensure that the equipment settings are unchanged from the previous test. The power sensor Cal Factor frequency should still be at 1930 MHz, the MG3700A frequency and MS2718B, MS2719B Center Frequency should still be at 1930.05 MHz.
2. On the MG3700A, change the selected pattern to “FWD_2457_6KBPS_1SLOT”.
3. Adjust the MG3700A output so that the power meter reads $-50 \text{ dBm} \pm 0.2 \text{ dB}$.
4. Then wait 15 seconds to allow the MS2718B, MS2719B to update its measured results.
5. For MS2718B, MS2719B with Option 62 (EVDO RF Measurements), subtract the displayed Channel Power value from the power meter reading in Step 3. Then record the calculated Channel Power error into the test record in the section labeled “At 1930.05 MHz, -50 dBm Level, 2457.6 kps 16-QAM Modulation” in [Table A-63](#).
6. For MS2718B, MS2719B with Option 63 (EVDO Demodulator), record the displayed Freq Error, Rho Pilot, and Tau into the test record in the section labeled “At 1930.05 MHz, -50 dBm Level, 2457.6 kps 16-QAM Modulation” in [Table A-64](#).
7. Verify that the measured values in Step 5 or Step 6 (or both) are within specifications.

Idle Slot Channel Power, Frequency Error, Rho, and Tau Tests

Test Procedure:

1. Ensure that the equipment settings are unchanged from the previous test. The power sensor Cal Factor frequency should still be at 1930 MHz, the MG3700A frequency and MS2718B, MS2719B Center Frequency should still be at 1930.05 MHz.
2. On the MG3700A, change the selected pattern to “FWD_IDLE”.
3. Adjust the MG3700A output so that the power meter reads $-50 \text{ dBm} \pm 0.2 \text{ dB}$.
4. Then wait 15 seconds to allow the MS2718B, MS2719B to update its measured results.
5. For MS2718B, MS2719B with Option 62 (EVDO RF Measurements), subtract the displayed Channel Power value from the power meter reading in Step 3. Then record the calculated Channel Power error into the test record in the section labeled “At 1930.05 MHz, -50 dBm Level, Idle Slot” in Table A-63, “Option 62 EVDO RF Measurements”.
6. For MS2718B, MS2719B with Option 63 (EVDO Demodulator), record the displayed Freq Error, Rho Pilot, and Tau into the test record in the section labeled “At 1930.05 MHz, -50 dBm Level, Idle Slot” in Table A-64, “Option 63 EVDO Demodulator”.
7. Verify that the measured values in Step 5 or Step 6 (or both) are within specifications.
8. On the power meter, press the Sensor key, the Cal Factor soft key, and then the Freq soft key. Use the keypad to enter 870.03 MHz as the input signal frequency, which sets the power meter to the proper power sensor calibration factor. Press the System key to display the power reading.
9. Set the MG3700A Frequency to 870.03 MHz.
10. Adjust the MG3700A output so that the power meter reads $-10 \text{ dBm} \pm 0.2 \text{ dB}$.
11. On the MS2718B, MS2719B, press the Frequency soft key and enter 870.03 MHz as Center Frequency. Then wait 15 seconds to allow the MS2718B, MS2719B to update its measured results.
12. For MS2718B, MS2719B with Option 62 (EVDO RF Measurements), subtract the displayed Channel Power value from the power meter reading in Step 10. Then record the calculated Channel Power error into the test record in the section labeled “At 870.03 MHz, -10 dBm Level, Idle Slot” in Table A-63.
13. For MS2718B, MS2719B with Option 63 (EVDO Demodulator), record the displayed Freq Error, Rho Pilot, and Tau into the test record in the section labeled “At 870.03 MHz, -10 dBm Level, Idle Slot” in Table A-64.
14. Verify that the measured values in Step 12 or Step 13 (or both) are within specifications.

Channel Power Accuracy (10 MHz Bandwidth and 10 ms Frame Length)

5. Set the MG3700A as follows:
 - a. Press the yellow Preset button (answer yes to the question).
 - b. Press the Set key
 - c. Press the (F1) soft key to select “Load File to Memory”
 - d. Press the (F1) soft key again to select “Select Package”
 - e. Using the **Down Arrow** key step through the selection list until “mWiMax” is highlighted.
 - f. Press the Set key.
 - g. Press the (F6) soft key “Return”
 - h. Press the Set key. The “Select Package” list box will appear. Again select “mWiMax” and Set.
 - i. Another file list will appear. Select (highlight) “10m1024g8_0_10_cap”.
 - j. Press the Set key.
 - k. Press the MOD On/Off key and verify that the LED is on. Ensure that the “playing” indicator is displaying the moving pattern.
 - l. Press the Frequency key, then enter 2600.5 MHz.
 - m. Press the Level key, then enter 2 dBm. Turn the output on.
6. Adjust the MG3700A Level setting with the knob so that the power meter reads $-15.0 \text{ dBm} \pm 0.2 \text{ dB}$.
7. Set the MS2718B, MS2719B to Mobile WiMax Signal Analyzer Mode and preset the unit.
8. Set the MS2718B, MS2719B as follows:
 - a. Press the Freq soft key and set the Center Freq to 2600.5 MHz
 - b. Press the Setup soft key and set the Bandwidth to 10 MHz.
 - c. Press the Frame Length soft key and set the Frame Length to 10 ms.
 - d. Press the Measurements soft key and select RF, then select Power vs. Time
9. Record the MS2718B, MS2719B Channel Power (RSSI) reading into the test record in [Appendix A](#) in the column labeled “**Measured Channel Power (RSSI)**” (row labeled 2600.5 MHz, -15 dBm) in [Table A-65](#), “**Mobile WiMAX Channel Power Accuracy (10 MHz Bandwidth and 10 ms Frame Length)**”.
10. Calculate the Channel Power Error by subtracting the MS2718B, MS2719B “Channel Power (RSSI)” reading from the power meter reading in Step 6. Record the result into the test record in the column labeled “**Error**” (row labeled 2600.5 MHz, -15 dBm) in [Table A-65](#).
11. Verify that the error is within specification.
12. Adjust the MG3700A Level setting to approximately -33 dBm so that the power meter reads $-50.0 \text{ dBm} \pm 0.2 \text{ dB}$.
13. Record the MS2718B, MS2719B Channel Power (RSSI) reading into the test record in the column labeled “**Measured Channel Power (RSSI)**” (row labeled 2600.5 MHz, -50 dBm) in [Table A-65](#).
14. Calculate the Channel Power Error by subtracting the MS2718B, MS2719B “Channel Power (RSSI)” reading from the power meter reading that was recorded in Step 13. Record the result into the test record in the column labeled “**Error**” (row labeled 2600.5 MHz, -50 dBm) in [Table A-65](#).
15. Verify that the error is within specification.
16. Set the calibration factor frequency of the power sensor to 3600.5 MHz.
17. Set MG3700A Frequency to 3600.5 MHz.
18. Change the Center Frequency of MS2718B, MS2719B to 3600.5 MHz.

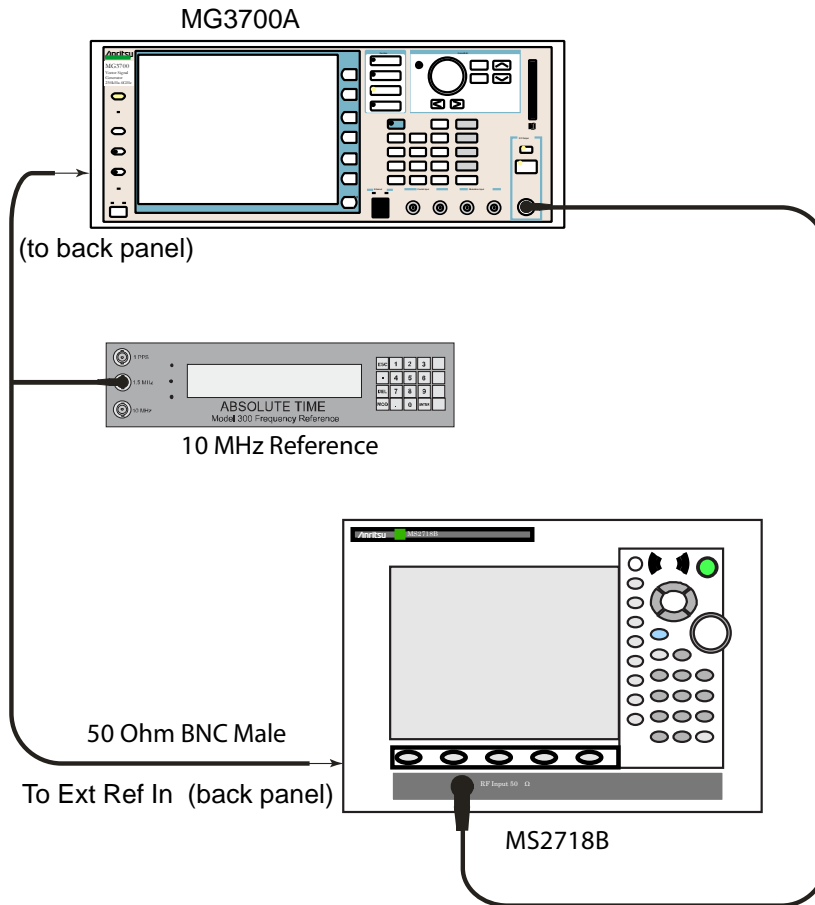
19. Measure the Channel Power (RSSI) for both -15 dBm and -50 dBm and then record the measured result and calculated error into the test record in the column labeled “Measured Channel Power (RSSI)” and in the column labeled “Error” (rows labeled 3600.5 MHz) in [Table A-65](#).
20. Verify that the error is within specification.

Channel Power Accuracy (5 MHz Bandwidth and 5 ms Frame Length)

21. Set the MG3700A as follows:
 - a. Press the yellow Preset button (answer yes to the question).
 - b. Press the Set key
 - c. Press the (F1) soft key to select “Load File to Memory”
 - d. Press the (F1) soft key again to select “Select Package”
 - e. Using the **Down Arrow** key step through the selection list until “mWiMax” is highlighted.
 - f. Press the Set key.
 - g. Press the (F6) soft key “Return”
 - h. Press the Set key. The “Select Package” list box will appear. Again select “mWiMax” and Set.
 - i. Another file list will appear. Select (highlight) “5m512g8_2_5_cap”.
 - j. Press the Set key.
 - k. Press the MOD On/Off key and verify that the LED is on. Ensure that the “playing” indicator is displaying the moving pattern.
 - l. Press the Frequency key, then enter 2600.5 MHz.
 - m. Press the Level key, then enter 2 dBm. Turn the output on.
22. Adjust the MG3700A Level setting with the knob so that the power meter reads -15.0 dBm \pm 0.2 dB.
23. Set the MS2718B, MS2719B to Mobile WiMax Signal Analyzer Mode and preset the unit.
24. Set the MS2718B, MS2719B as follows:
 - a. Press the Freq soft key and set the Center Freq to 2600.5 MHz.
 - b. Press the Setup soft key and set the Bandwidth to 5 MHz.
 - c. Press the Frame Length soft key and set the Frame Length to 5 ms.
 - d. Press the Measurements soft key and select RF, then select Power vs. Time.
25. Repeat Step 9 through Step 20, recording the results into the test record in [Table A-66](#), “Mobile WiMAX Channel Power Accuracy (5 MHz Bandwidth and 5 ms Frame Length)”.

Mobile WiMAX Residual EVM and Frequency Error Tests (Option 67)**Procedure:**

1. Connect the 10 MHz Reference to the 10 MHz/5 MHz Ref Input of the MG3700A and to the Ext Ref In of the MS2718B, MS2719B as shown in [Figure 3-13](#).

**Figure 3-13.** Mobile WiMAX Residual EVM and Frequency Error Test Setup

2. Connect the RF Out of the MG3700A to the Spectrum Analyzer RF In connector of the MS2718B, MS2719B.

Residual EVM and Frequency Error (10 MHz Bandwidth and 10 ms Frame Length)

3. Set the MG3700A as follows:
 - a. Press the yellow Preset button (answer yes to the question).
 - b. Press the Set key
 - c. Press the (F1) soft key to select “Load File to Memory”
 - d. Press the (F1) soft key again to select “Select Package”
 - e. Using the **Down Arrow** key step through the selection list until “mWiMax” is highlighted.
 - f. Press the Set key.
 - g. Press the (F6) soft key “Return”
 - h. Press the Set key. The “Select Package” list box will appear. Again select “mWiMax” and Set.
 - i. Another file list will appear. Select (highlight) “10m1024g8_0_10_cap”.
 - j. Press the Set key.
 - k. Press the MOD On/Off key and verify that the LED is on. Ensure that the “playing” indicator is displaying the moving pattern.
 - l. Press the Frequency key, then enter 2600.5 MHz.
 - m. Press the Level key, then enter –15 dBm. Turn the output on.
4. Set the MS2718B, MS2719B to Mobile WiMax Signal Analyzer Mode and preset the unit.
5. Set the MS2718B, MS2719B as follows:
 - a. Press the Freq soft key and set the Center Freq to 2600.5 MHz
 - b. Press the Setup soft key and set the Bandwidth to 10 MHz.
 - c. Press the CP Ratio soft key (under the Setup soft key) and set the CP Ratio to 1/8.
 - d. Press the Frame Length soft key and set the Frame Length to 10 ms.
 - e. Press the Demod soft key and set Demod to FCH.
 - f. Press the Measurements soft key and select Demodulator, then select Modulation Summary.
6. Record the MS2718B, MS2719B EVM (rms) reading into the test record in [Appendix A](#) in the column labeled “EVM (rms)” (row labeled 2600.5 MHz, –15 dBm) in [Table A-67](#), “Mobile WiMAX Residual EVM (10 MHz Bandwidth and 10 ms Frame Length)”.
7. Verify that the measured EVM is within specification.
8. Set the MG3700A Level to –50.0 dBm.
9. Record the MS2718B, MS2719B EVM (rms) reading into the “EVM (rms)” column (row labeled 2600.5 MHz, –50 dBm) in [Table A-67](#).
10. Verify that the measured EVM is within specification.
11. On the MS2718B, MS2719B, press the Setup soft key and set Demod to Auto.
12. Record the MS2718B, MS2719B Freq Error reading into the “Frequency Error” column (row labeled 2600.5 MHz, –50 dBm) in [Table A-68](#), “Mobile WiMAX Frequency Error (10 MHz Bandwidth and 10 ms Frame Length)”.
13. Verify that the measured Freq Error is within specification.
14. Set MG3700A Frequency to 3600.5 MHz.
15. On the MS2718B, MS2719B, change the Center Frequency to 3600.5 MHz.
16. Press the Setup soft key and set Demod to FCH.
17. Measure the EVM (rms) for both –15 dBm and –50 dBm and then record the measured results into the “EVM (rms)” column (rows labeled 3600.5 MHz) in [Table A-67](#).

18. Verify that the measured EVM is within specification.
19. Repeat Step 11 through Step 13 to measure the Frequency Error at – 50 dBm, recording the reading into the “[Frequency Error](#)” column (row labeled 3600.5 MHz, –50 dBm) in [Table A-68](#).

Residual EVM and Frequency Error (5 MHz Bandwidth and 5 ms Frame Length)

20. Set the MG3700A as follows:
 - a. Press the yellow Preset button (answer yes to the question).
 - b. Press the Set key
 - c. Press the (F1) soft key to select “Load File to Memory”
 - d. Press the (F1) soft key again to select “Select Package”
 - e. Using the **Down Arrow** key step through the selection list until “mWiMax” is highlighted.
 - f. Press the Set key.
 - g. Press the (F6) soft key “Return”
 - h. Press the Set key. The “Select Package” list box will appear. Again select “mWiMax” and Set.
 - i. Another file list will appear. Select (highlight) “5m512g8_2_5_cap”.
 - j. Press the Set key.
 - k. Press the MOD On/Off key and verify that the LED is on. Ensure that the “playing” indicator is displaying the moving pattern.
 - l. Press the Frequency key, then enter 2600.5 MHz.
 - m. Press the Level key, then enter –15 dBm. Turn the output on.
21. Set the MS2718B, MS2719B as follows:
 - a. Press the Freq soft key and set the Center Freq to 2600.5 MHz
 - b. Press the Setup soft key and set the Bandwidth to 5 MHz.
 - c. Press the CP Ratio soft key (under the Setup soft key) and set the CP Ratio to 1/8.
 - d. Press the Frame Length soft key and set the Frame Length to 5ms.
 - e. Press the Demod soft key and set Demod to FCH.
 - f. Press the Measurements soft key and select Demodulator, then select Modulation Summary.
22. Repeat Step 6 through Step 19, recording the MS2718B, MS2719B EVM (rms) and Frequency Error readings into the test records in [Appendix A](#) in [Table A-69](#), “[Mobile WiMAX Residual EVM \(5 MHz Bandwidth and 5 ms Frame Length\)](#)” and [Table A-70](#), “[Mobile WiMAX Frequency Error \(5 MHz Bandwidth and 5 ms Frame Length\)](#)”.

Chapter 4 — Adjustment

Introduction

This chapter contains the adjustment procedure for calibrating the MS2718B, MS2719B Economy Spectrum Analyzer if the results of any verification tests are not within specifications.

4-1 Internal Reference Frequency Adjustment

Use this procedure to adjust the Internal Reference frequency if the MS2718B, MS2719B fails the Spectrum Analyzer Frequency Accuracy verification test.

Procedure:

1. Connect the external 10 MHz Reference to the Anritsu MG3692x Synthesized Signal Generator as shown in [Figure 4-1](#).

Note Do not connect the external 10 MHz Reference to the MS2718B, MS2719B.

2. Connect the MG3692x output to the Spectrum Analyzer RF In of the MS2718B, MS2719B.

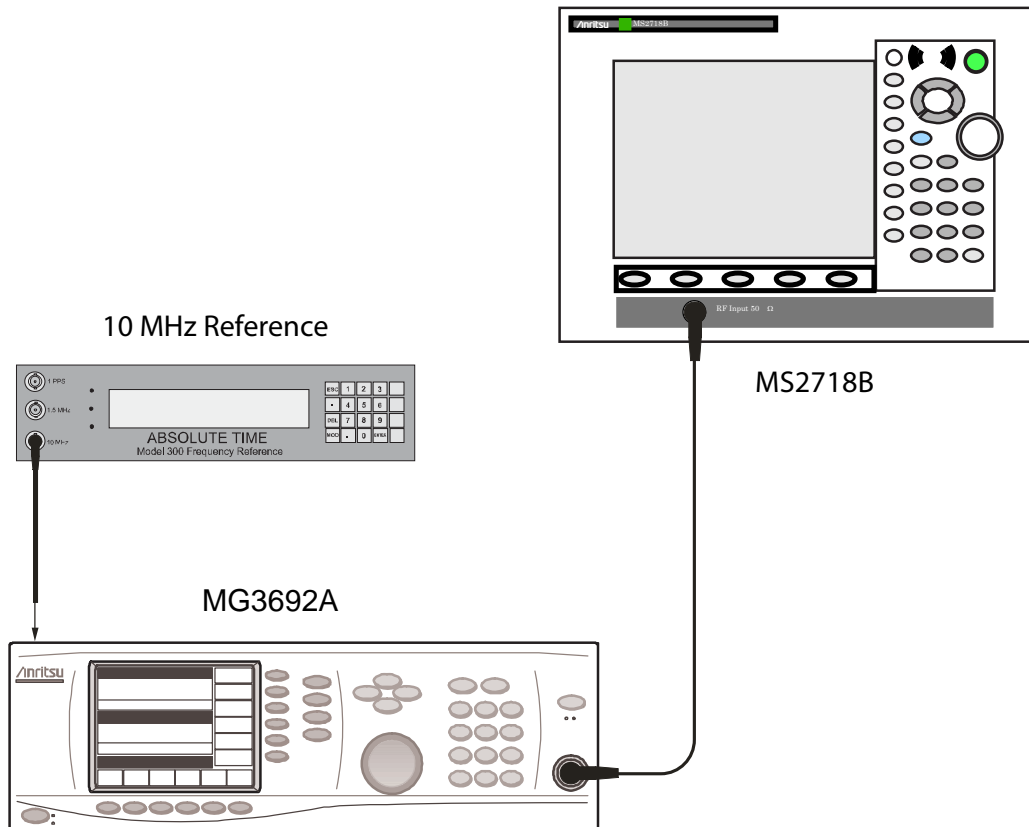


Figure 4-1. Internal Reference Frequency Adjustment Setup

3. Set the MS2718B, MS2719B to Spectrum Analyzer mode, then press **Shift** and press **Preset** (1) to preset the MS2718B, MS2719B.
4. Set the MG3692x output to 7 GHz with an RF output level of -30 dBm.

5. On the MS2718B, MS2719B, press the Amplitude soft key and set the Reference Level to -10 dBm.
6. Set the Atten Lvl to 0 dB.
7. Press the Freq soft key and set the Center Freq to 7.0 GHz.
8. Press the Span soft key and enter 10 kHz.
9. Press the BW soft key and set the RBW to 100 Hz.
10. Press the VBW soft key and set to 30 Hz.
11. Press and hold the **Shift** key and simultaneously press three soft keys together (from the top, the 4th, 6th, and 8th unmarked vertical keys below the **Esc** key) in order to enter into the Economy Spectrum Analyzer Service Mode (Figure 4-2).

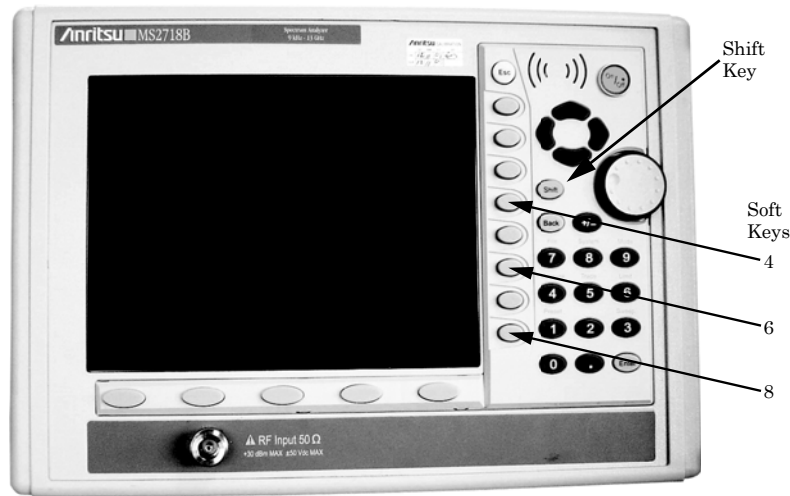


Figure 4-2. Service Mode Key Combination on MS2718B, MS2719B

12. Press the Service Menu soft key, then the APP Service soft key.
13. Press the Calibration soft key, then the 10 MHz Ref soft key.
14. Use the **Up/Down** arrow keys or the rotary knob to slowly adjust the displayed signal to the center of the display. Allow the signal to stabilize between adjustments, and repeat as necessary.
15. To exit Service Mode, turn off the MS2718B, MS2719B and then turn it back on.

Chapter 5 — Removal and Replacement

5-1 Introduction

Only qualified personnel should open the case and replace internal assemblies. Assemblies that are shown in the replaceable parts list are typically the only items that may be replaced. Because they are highly fragile, items that must be soldered may not be replaced without specialized training. Removing RF shields from PC boards or adjusting screws on or near the shields may detune sensitive RF circuits and will result in degraded instrument performance.

Caution

An Electrostatic Discharge (ESD) safe work area and proper ESD handling procedures (that conform to ANSI/ESD S20.20-1999 or ANSI/ESD S20.20-2007) are mandatory to avoid ESD damage when handling subassemblies or components found in the MS2718B, MS2719B.

Additional information pertaining to ESD can be found at the ESD Association Web site:

<http://www.esda.org/s2020.html>

5-2 Fuse

This procedure describes removing and replacing the power line fuses. The fuses are located within the power input module. The fuses can be replaced without opening the enclosure. The MS2718B, MS2719B line fuse value is printed on the rear panel next to the power connector. Refer to [Table 1-3 on page 1-5](#) for the replacement part number.

Warning

Before changing the fuse, always remove the power cord from the power outlet. You risk receiving a fatal electric shock if the fuse is replaced with the power cord connected. Always use a new fuse of the type and rating that are specified by the fuse markings on the rear panel of the instrument.

1. Before replacing the line fuse, turn off the rear panel power switch and disconnect the MS2718B, MS2719B from the power source.
2. Place the MS2718B, MS2719B upright on a static protected work surface.
3. Using a small flat-blade screwdriver, carefully pry under the tab above the rear panel power switch to open the cover and gain access to the fuse holders as shown in the [Figure 5-1](#).

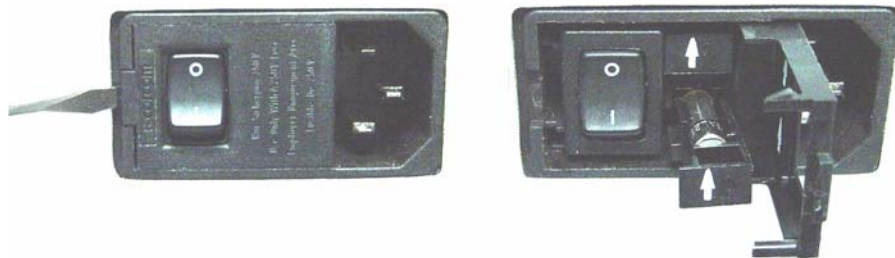


Figure 5-1. Fuse Holder within Input Module

- Slide the fuse holder straight out of the power input module, then remove the fuse from the fuse holder as shown in [Figure 5-2](#).

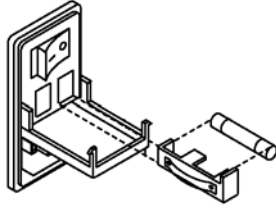


Figure 5-2. Removing Fuse from Fuse Holder

- If the fuse is defective, then replace the fuse with a new fuse of the type and rating that are specified by the fuse markings on the rear panel of the instrument.
- Reinstall the fuse holder in the rear panel power input module.
- Close the cover to secure the fuse holder in place. The cover will close with an audible snap.

5-3 Enclosure

This procedure provides instructions for opening the enclosure (case). Except for fuse replacement ([Section 5-2](#)), all maintenance operations require opening the outer enclosure.

Ensure that all work is performed at a static-safe work area. Part numbers for all replaceable parts are found in [Table 1-3 on page 1-5](#).

Before opening the case, Anritsu Company strongly recommends that all internally saved files be saved to a PC by using the Master Software Tools utility program or that they be copied to a USB memory drive or an external CF card on the MS2718B, MS2719B. In the event that the Main PCB needs to be replaced, this will prevent permanent loss of these internally saved files.

The handles and feet must be removed before the outer enclosure (case) can be separated from the chassis.



Figure 5-3. Benchtop MS2718B

Rack-mounted instruments have two mounting brackets, each held by two screws. These mounting brackets may be left attached to the front panel bezel.



Figure 5-4. Rack-Mounting Brackets

1. In order to release the outer enclosure from the chassis, remove the larger screw (green head) from the green insert of each foot (1 screw each) and from the green insert on the side of each handle (2 screws on each handle). The smaller screws of the feet (center image in [Figure 5-5](#)) are attached to the enclosure only and can remain when the chassis is removed. The smaller screws in the handles hold the green plastic insert to the handle, and they need not be removed in order to release the chassis from the enclosure. The front panel bezel (metal ring) can slide off when the handles have been removed. Place the MS2718B, MS2719B face up on a static protected work surface and lift the front panel bezel straight up and off the enclosure.



Figure 5-5. Foot Screws



Figure 5-6. Handle Screws

- Remove the 4 screws from the bottom of the outer enclosure and the 10 screws from the back panel, as shown in [Figure 5-7](#).

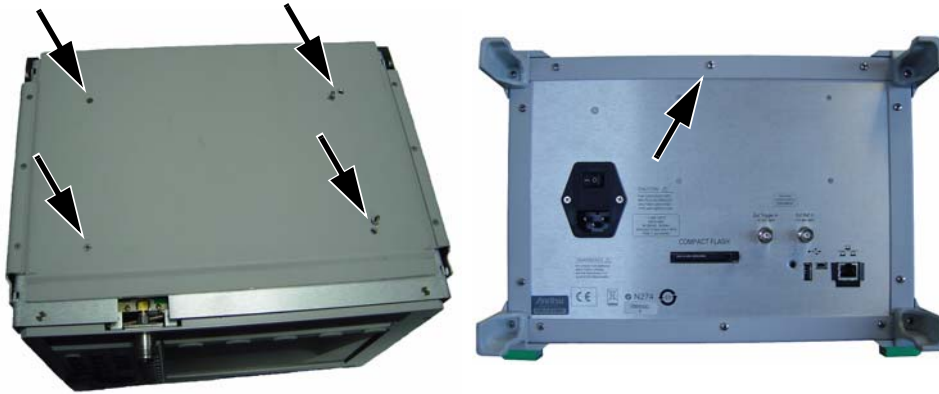


Figure 5-7. Screws that Hold Chassis within Outer Enclosure

- Slide the chassis from the outer enclosure.

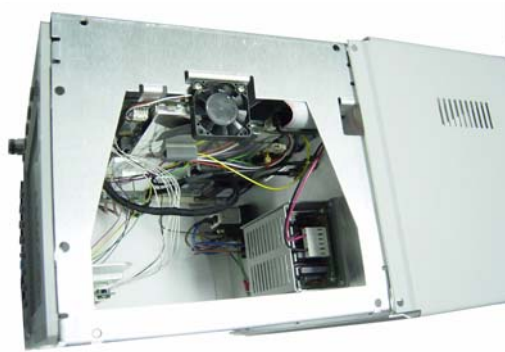


Figure 5-8. Removing Chassis from Outer Enclosure

Replacement of the chassis into the enclosure is the reverse of the removal, with the following caution:

When replacing the screws in the handles and feet (refer to [Figure 5-5](#) and [Figure 5-6](#)), the green-headed screws (that pass through the green plastic parts to secure the handles and feet to the enclosure) are engaged by threaded PIM nuts that are pressed into the interior side of the enclosure. These PIM nuts can be easily dislodged by too much inward pressure along the axis of the screws or by any off-center torque such as might be caused by cross-threading. The maximum torque for these screws is 6.2 in-lb.

Caution	Be especially carefully with these handle and feet screws. If a PIM nut breaks loose, then the entire outer enclosure must be replaced.
----------------	---

5-4 Battery

Main PCB Real Time Clock (RTC) Battery

This procedure describes removing and replacing the RTC battery on the Main PCB (motherboard).

Refer to [Figure 5-9](#) for the location of this battery. Refer to [Table 1-3 on page 1-5](#) for the replacement part number.

The chassis must be removed from the outer enclosure in order to gain access to the battery. Refer to section [“Enclosure” on page 5-2](#). The battery is located on the Main PCB near the external memory Compact Flash (CF) card.

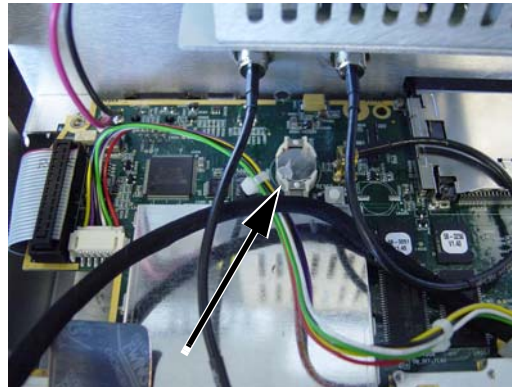


Figure 5-9. RTC Battery on Main PCB

1. With the chassis upright on a static protected work surface, remove the old battery and clean away any remaining RTV compound.
2. Install the new battery with the positive side (+) facing up. Apply 2 small drops of RTV compound in order to bridge the top of the battery and the holder as an extra precaution to hold the battery securely in place.

5-5 Power Input Module with Switch

This procedure describes removing and replacing the power input module, which contains a receptacle, switch, EMI filter, and fuse holders. The power input module is found in the replacement parts list as “EMI filter”. Refer to [Table 1-3 on page 1-5](#) for the replacement part number.

The chassis must be removed from the outer enclosure in order to remove and replace the power input module. Refer to section [“Enclosure” on page 5-2](#). The input module is mounted to the rear panel with two screws. The inside portion contains a grounding lead and a plug for the internal power supply.

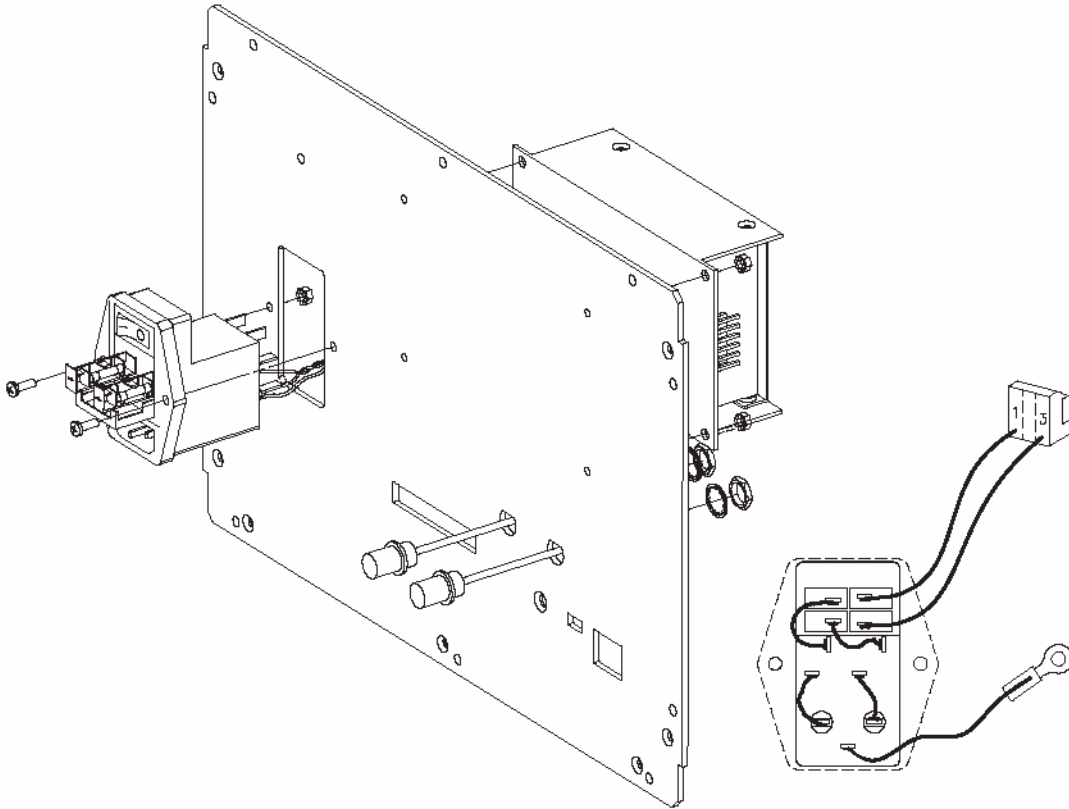


Figure 5-10. Power Input Module Mounting Details

1. Disconnect the power cord from the power input module.
2. Remove the outer enclosure as described in section [“Enclosure” on page 5-2](#).
3. With the chassis upright on a static protected work surface, disconnect the internal power plug from the internal power supply and disconnect the ground lead from the grounding post (refer to [Figure 5-11](#)).
4. Remove the mounting nuts and screws and withdraw the input module from the rear panel.
5. Install the new power input module, tighten the nuts, and connect the ground lead and the internal power plug for the power supply.

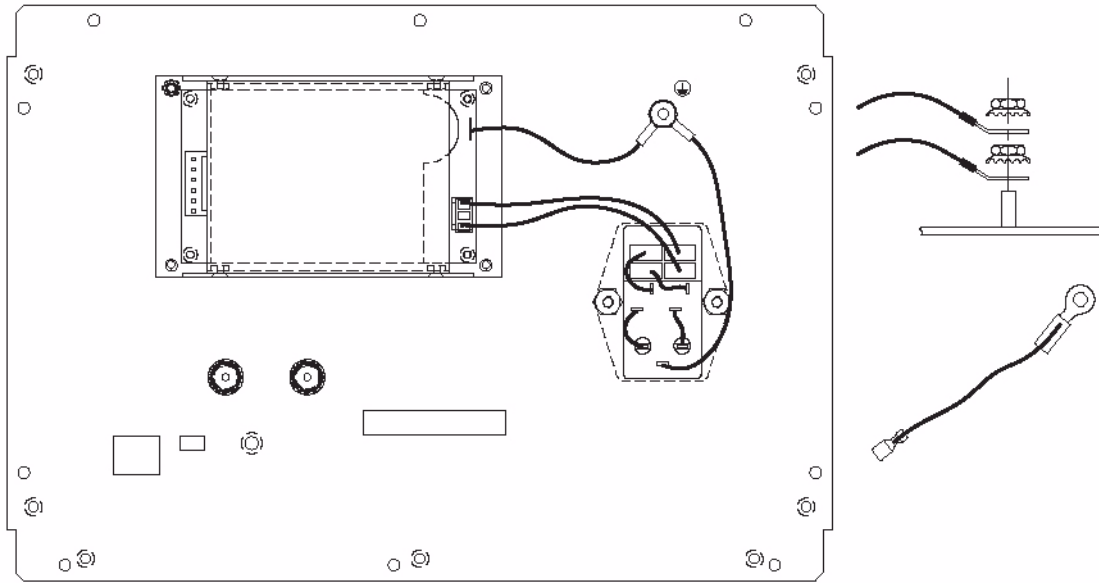


Figure 5-11. Power Input Module, Connections

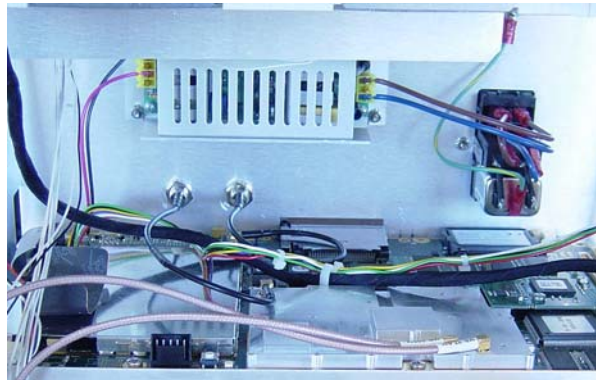


Figure 5-12. Power Input Module, Interior view

5-6 Fan

This procedure describes removing and replacing the fan assembly. To gain access to the fan, the chassis must be removed from the outer enclosure, as described in [Section 5-3, “Enclosure”](#). Refer to [Table 1-3 on page 1-5](#) for the replacement part number.

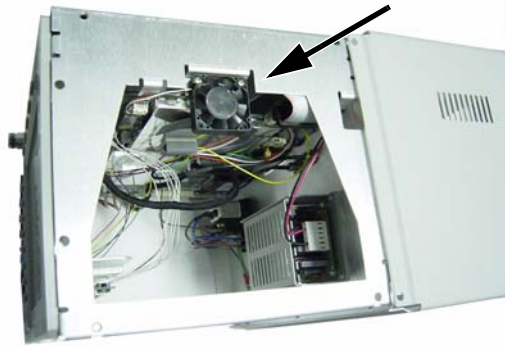


Figure 5-13. Fan on Left Side of Chassis

1. With the chassis upright on a static protected work surface, disconnect the fan power plug from J1002 of the Main PCB (motherboard). Refer to the arrow in [Figure 5-14](#).
2. Remove the 2 screws that secure the bottom edge of the fan to the chassis and withdraw the fan assembly.
3. Replace the fan by attaching the new fan to the chassis and connecting the power plug to the Main PCB.

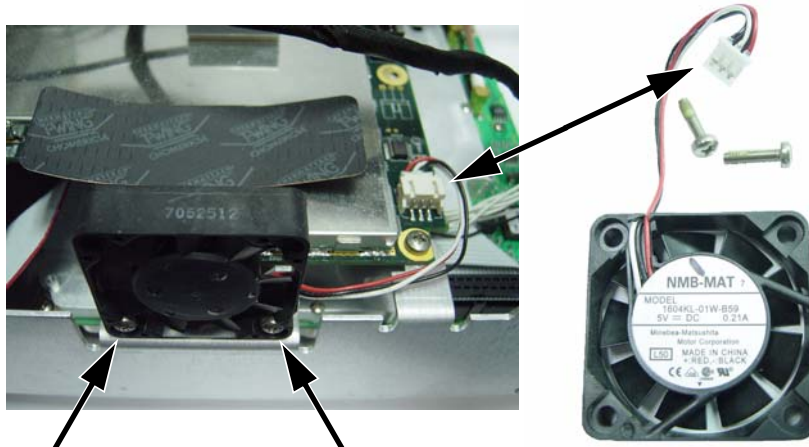


Figure 5-14. Fan Assembly, Mounted and Removed

5-7 Power Supply

This procedure describes removing and replacing the internal power supply. To gain access to the power supply, the chassis must be removed from the outer enclosure, as described in [Section 5-3, “Enclosure”](#). Refer to [Table 1-3 on page 1-5](#) for the replacement part number.

The power supply is mounted on the interior of the rear panel with 4 screws and 4 nuts.

1. Disconnect the power cord from the power input module.
2. With the chassis upright on a static protected work surface, disconnect the power outlet plug from the left side of the power supply (the plug with 2 wires soldered to the motherboard), and disconnect the power inlet plug and the grounding wire from the right side of the power supply (the wires from the power input module). Disconnect the grounding wire from the chassis ground screw. Refer to [Figure 5-15](#).

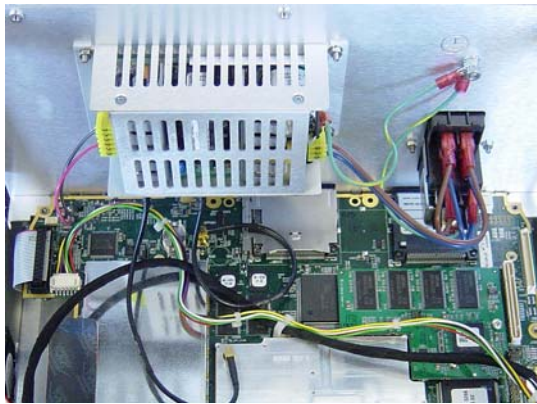


Figure 5-15. Power Supply Mounted on Rear Panel

3. Remove the 4 nuts and screws and withdraw the power supply from the chassis.



Figure 5-16. Power Supply Removed

4. Replace the power supply as a unit. Do not attempt repair.
5. Install the new power supply with the 4 screws and nuts.
6. Attach the power outlet plug, the power inlet plug, and the grounding wire.

5-8 Backlight Driver PCB for LCD

This procedure describes removing and replacing the backlight driver PCB. To gain access to this PCB, the chassis must be removed from the outer enclosure, as described in [Section 5-3, “Enclosure”](#). Refer to [Table 1-3 on page 1-5](#) for the replacement part number.

1. With the chassis upright on a static protected work surface, unplug the backlight inverter cable connector from the backlight driver PCB. This connector is on the right edge (facing the front panel, as in normal instrument operation) of the PCB. Refer to [Figure 5-17](#).
2. Using a tool such as tweezers or a knife blade, gently unplug the cable from the backlight driver PCB to the motherboard (main PCB). This connector is on the bottom side of the backlight driver PCB, and the other end is on the bottom side of the main PCB at J4005. Access is restricted by the backlight driver PCB mounting bracket. Use care when disconnecting.

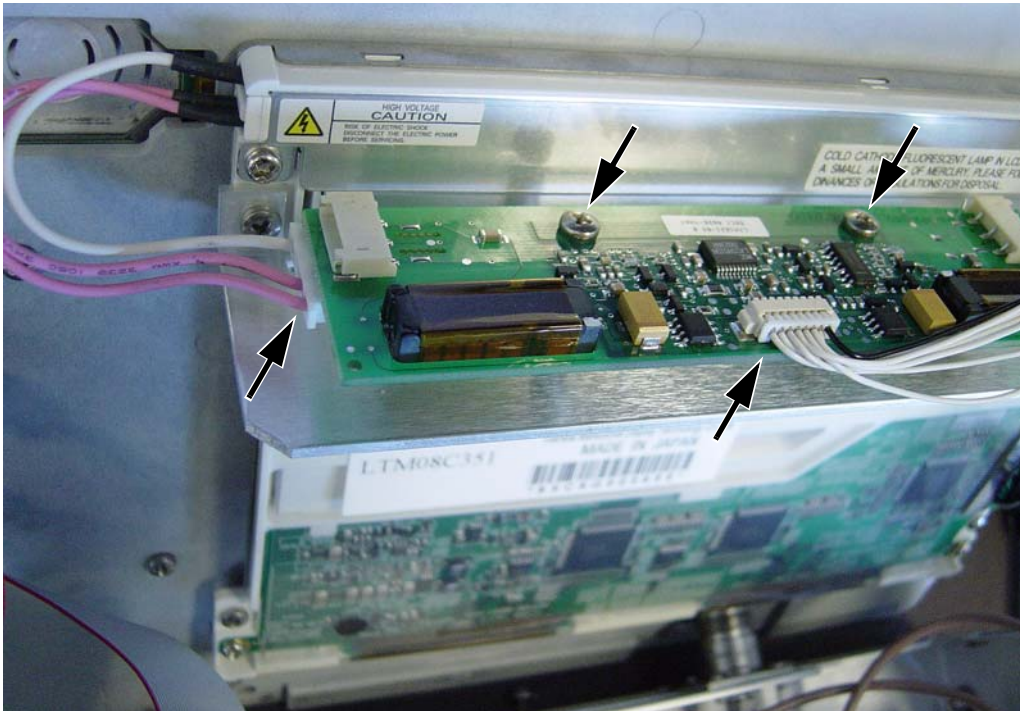


Figure 5-17. Backlight Driver PCB Connections

3. Remove the 2 screws (refer to [Figure 5-17](#) and [Figure 5-18](#)) that hold the PCB to the mounting bracket.

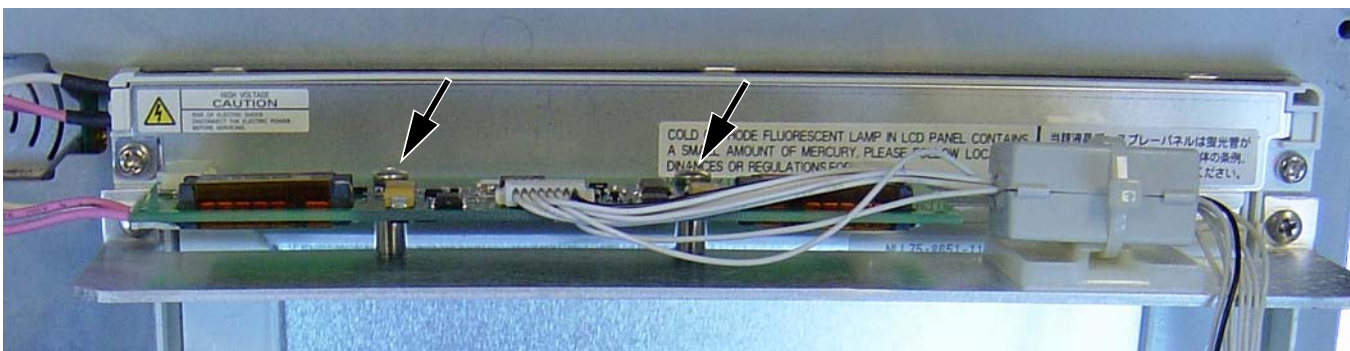


Figure 5-18. Backlight Driver PCB Screws

4. Replace the PCB, tighten the 2 screws, and plug in the connectors.

5-9 Front Panel Assembly

This procedure describes removing the front panel from the chassis. Before removing the front panel, the chassis must be removed from the outer enclosure, as described in [Section 5-3, “Enclosure”](#).

The instrument front panel is held by 4 screws (refer to [Figure 5-19](#)). It must be removed in order to remove the Main PCB (mother board) or the LCD Display.

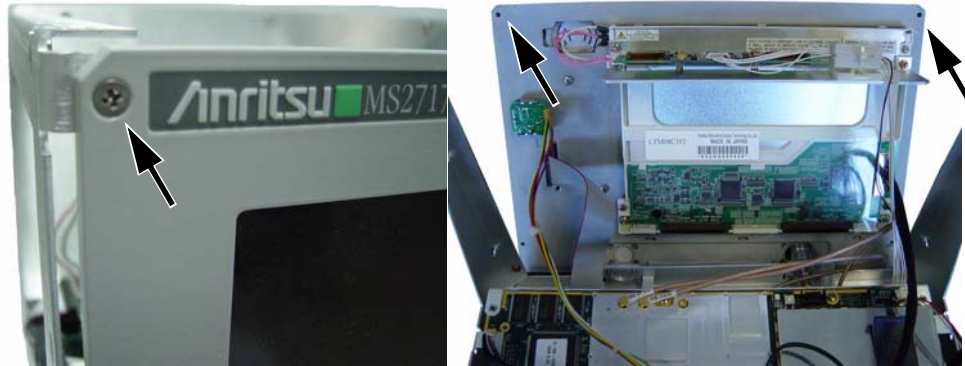


Figure 5-19. Exterior and Interior of Front Panel

1. With the chassis face up on a static protected work surface, remove the 4 screws from the corners of the front panel and support the front panel without straining the cables that are still connected within the chassis.



Figure 5-20. Front Panel Loose with Cables Attached

2. Disconnect the following 4 cables before separating the front panel from the chassis:

- a. The cable from the backlight driver PCB to the Main PCB.

Using a tool such as tweezers or a knife blade, gently unplug the cable from the center of the backlight driver PCB. Access is restricted by the backlight driver PCB mounting bracket. Use care when disconnecting. The other end of this cable is connected on the bottom side of the Main PCB at J4005.

The noise filter (ferrite core) is attached to the PCB mounting bracket with a cable tie, which must be cut.

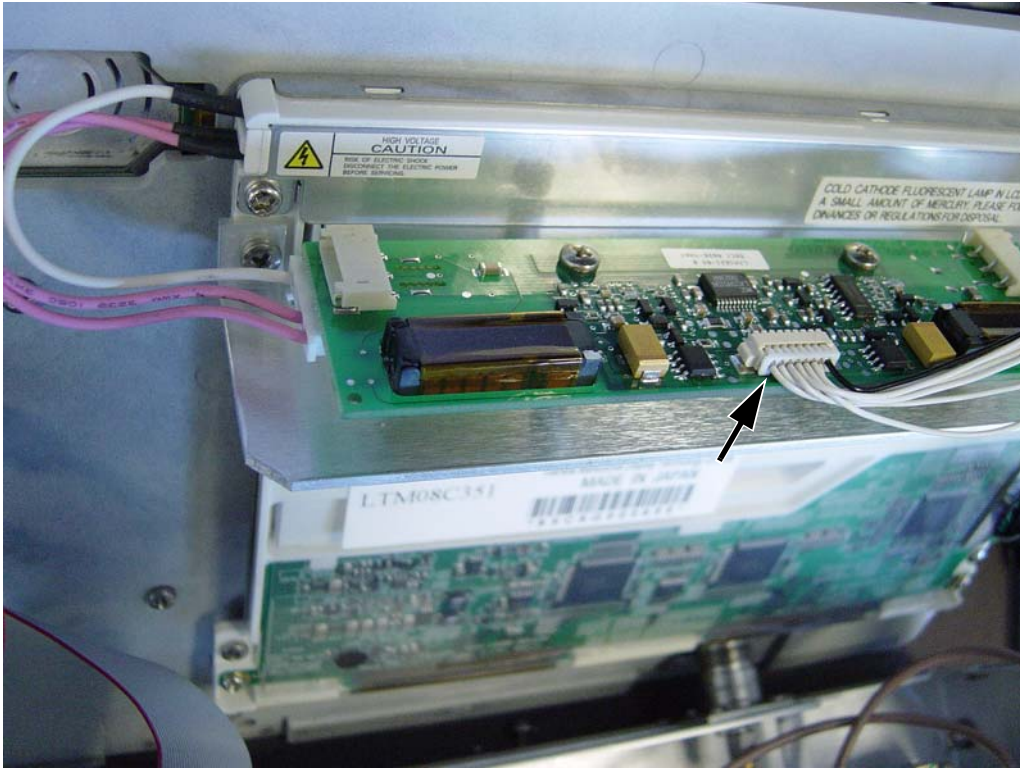


Figure 5-21. Backlight Cable Connector

- b. The cable from the Rotary Knob to the Main PCB.

Disconnect the end at the left-rear corner of the Main PCB at J5010. Refer to [Figure 5-22](#).

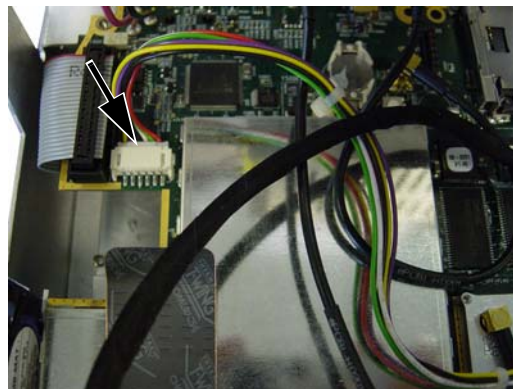


Figure 5-22. Rotary Knob Connector at Main PCB (J5010)

- c. The cable from the keypad to the Main PCB.

Disconnect the end behind the keypad. The other end is on the bottom side of the Main PCB at J5006. Refer to [Figure 5-23](#).

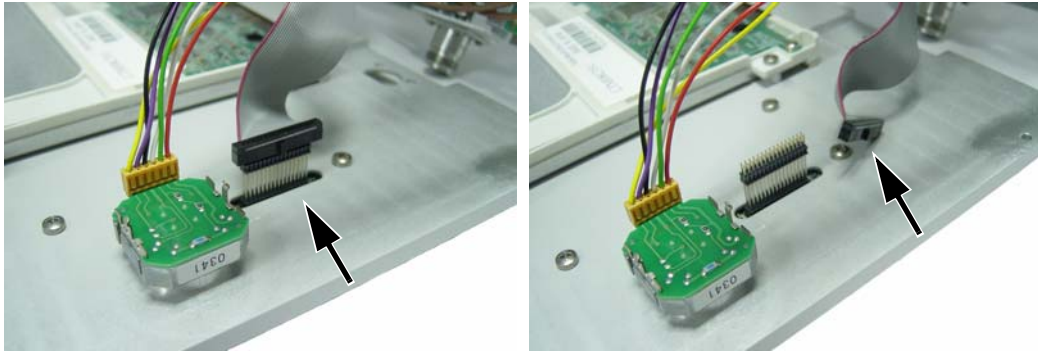


Figure 5-23. Keypad Cable Connector

- d. The cable from the LCD to the Main PCB.

Disconnect either end. The cable connects to J4003 on the top side of the Main PCB.

Note The LCD is static sensitive.

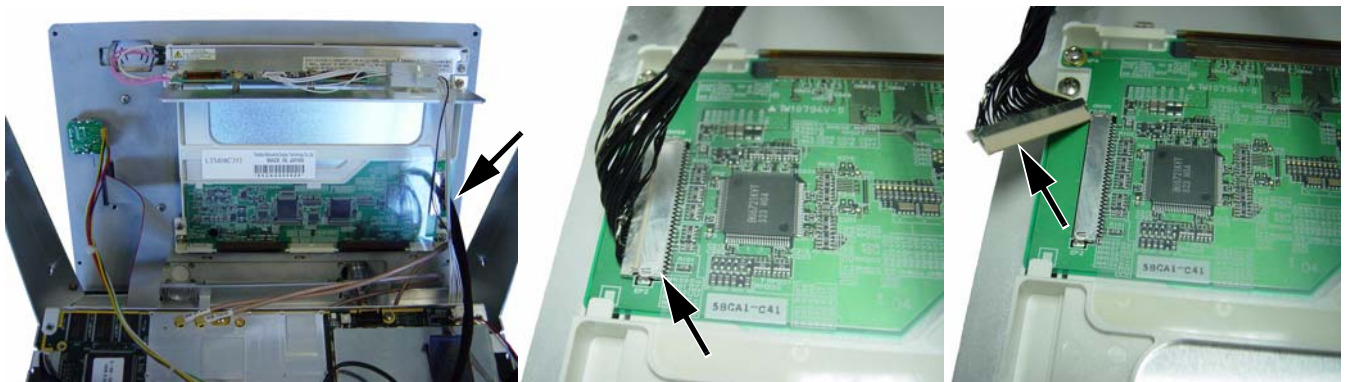


Figure 5-24. LCD Cable Connector at LCD and at J4003 on Main PCB

3. The front panel can now be separated from the chassis. Installation is the reverse of removal.

5-10 LCD Display

This procedure describes removing and replacing the color LCD display. The front panel must be removed from the chassis before removing the LCD display (refer to [Section 5-9, “Front Panel Assembly”](#)). Refer to [Table 1-3 on page 1-5](#) for the replacement part number.

Note The LCD is static sensitive.

1. With the front panel face down on a static protected work surface, unplug the backlight inverter cable from the end of the backlight driver PCB, release the noise filter (220 Ohm ferrite core) from the backlight driver PCB support bracket (cut the cable tie), and unplug the cable from the SPA PCB to the center of the backlight driver PCB (refer to [Figure 5-25](#))

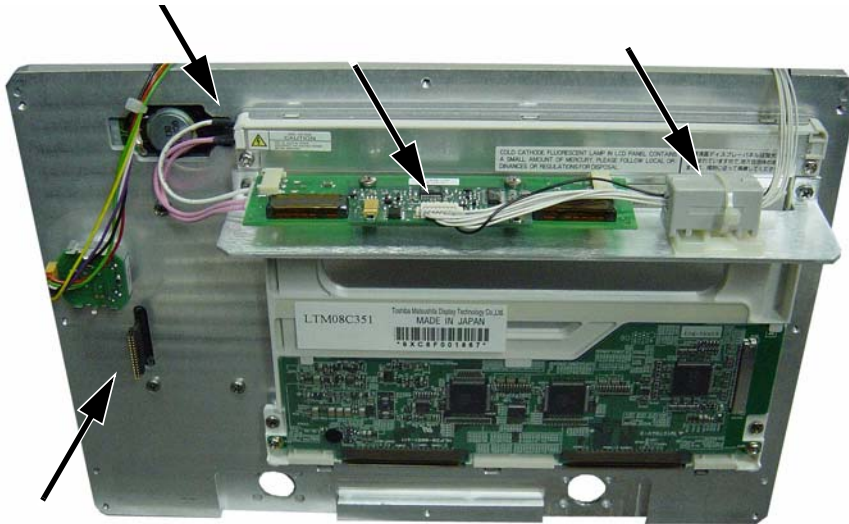


Figure 5-25. Front Panel, Separated

2. Unplug the ribbon cable from the SPA PCB to the keypad (at the keypad), and unplug the rotary knob cable at connector J5010 of the main PCB (near the fan, refer to [Figure 5-36](#)).
3. With the front panel face down, remove the upper 2 screws that attach the backlight driver PCB support bracket to the front panel. These 2 screws also attach the LCD to the front panel. Lift out the support bracket with the backlight driver PCB still attached (refer to [Figure 5-27](#)).



Figure 5-26. Support Bracket for Backlight Driver PCB

4. Remove the 2 screws that attach the lower edge of the LCD to the front panel (refer to [Figure 5-27](#)).

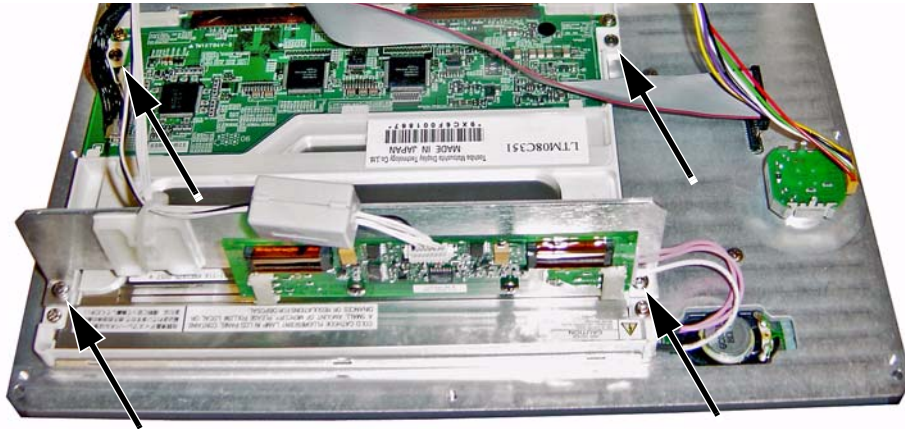


Figure 5-27. Front Panel – LCD Attachment Screws

5. With the front panel face down, lift off the LCD and backlight together. Take care to leave the plastic LCD protective cover and surrounding gaskets undisturbed. When ordering a new LCD, the backlight is already attached.



Figure 5-28. LCD Display with Backlight Attached

Installation

6. When installing a new LCD display, ensure that the rubber gasket strips (as shown in [Figure 5-29](#)) are properly aligned in the front panel gasket channels (grooves) that surround the plastic protective cover for the LCD. Replace any missing or damaged gasket strips.



Figure 5-29. Front Panel Gaskets for LCD Display

7. Align the new LCD display carefully to start the 2 lower screws. Then attach the backlight driver PCB and its mounting bracket with the 2 upper screws.
8. Reconnect cables and complete the installation in the reverse order of removal. A new cable tie must be used to reattach the noise filter to the backlight driver PCB mounting bracket.

5-11 Numeric Keypad

This procedure provides instructions for removing and replacing the numeric keypad rubber membrane and PCB. To gain access to these parts, the chassis must be removed from the outer enclosure, as described in section “Enclosure” on page 5-2. The keypad assembly is supplied as a single part. Refer to [Table 1-3 on page 1-5](#) for the replacement part number.

1. Place the chassis face up on a static protected work surface and unplug (at the keypad connector) the cable from the keypad to the Main PCB.

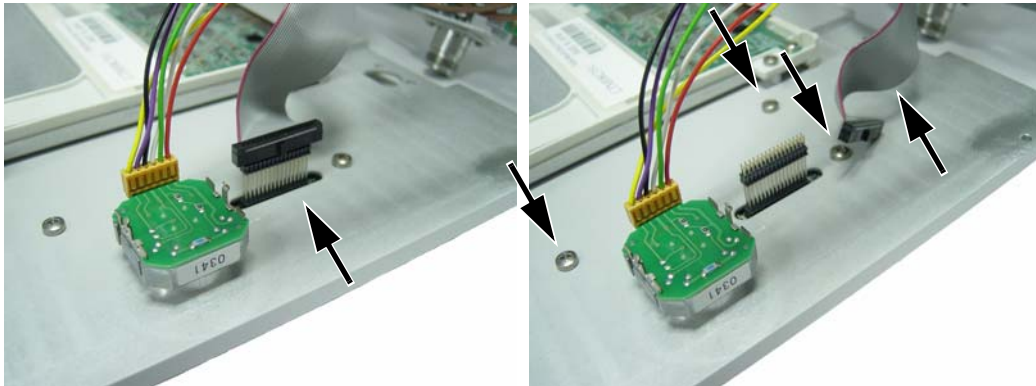


Figure 5-30. Keypad Mounting Screws and Cable Connector

2. The keypad bezel is held to the case with 3 screws on the inside (visible in [Figure 5-30](#)). The rotary knob is not connected to the keypad and need not be disturbed. Using a screwdriver, remove the screws while supporting the metal keypad bezel, and then carefully remove the bezel. This exposes the keypad rubber membrane.

Caution	The numeric keypad PCB is held in place by the rubber membrane and the bezel that was just removed. To avoid stress on the Mode key flexible switchpad, ensure that the numeric keypad PCB assembly is supported until the connector at J2 (lower left corner) has been disconnected.
----------------	---

3. Skip to Step 5 if you are replacing the numeric keypad PCB. If replacing only the keypad rubber membrane, then the connector at J2 **is not disconnected**. Carefully lift the speaker enough to pull away the keypad rubber membrane.
4. Replacement of the keypad rubber membrane is the reverse of removal, with the following cautions:
 - a. Use care when adjusting the keypad rubber membrane under the speaker.
 - b. Take care to properly orient the rubber membrane so that the rubber pins are aligned with the keypad switches on the PCB.
5. If replacing the PCB, then disconnect the Mode key flexible switchpad from J2 of the numeric keypad PCB (lower left corner, refer to [Figure 5-31](#)) by carefully lifting the locking tab on connector J2 to release the flexible switchpad. This type of connector typically has non-corrosive RTV adhesive on the connector to maintain the connection securely.

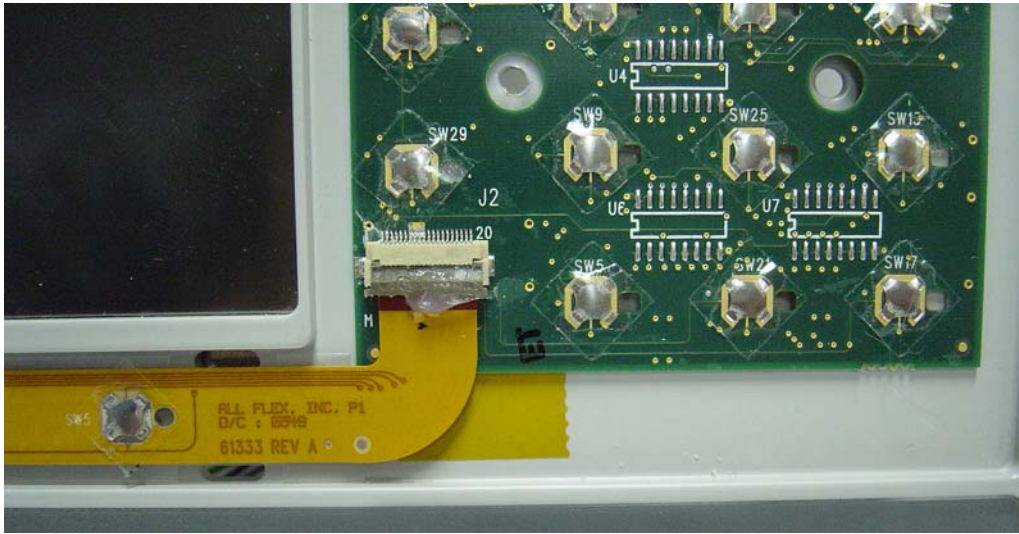


Figure 5-31. Connector J2

6. The numeric keypad may now be removed from the MS2718B, MS2719B.
7. Remove the numeric keypad rubber membrane by carefully lifting the speaker and pulling the membrane off the keypad PCB.

Caution

The speaker is held to the PCB by only the fragile connecting wires. Use care not to damage the speaker wires when removing or replacing the keypad rubber membrane or the PCB.



Figure 5-32. Numeric Keypad Rubber Membrane

8. Replacement of the PCB is the reverse of removal, with the following cautions:
 - a. Ensure that the clear insulator sheet is aligned between the PCB and the metal front panel.
 - b. Use care when adjusting the keypad rubber membrane under the speaker and aligning the rubber buttons to the keypad PCB switches.
 - c. Apply non-corrosive RTV adhesive on connector J2 to maintain the connection securely.

5-12 Mode Function Keypad

This procedure provides instructions for removing and replacing the Mode function keypad, which is a flexible switchpad. Before removing the Mode function keypad, the numeric keypad bezel must be removed, as described in Step 2 of [Section 5-11](#). To gain access to these parts, the chassis must be removed from the outer enclosure, as described in [Section 5-3, “Enclosure”](#). The keypad assembly is supplied as a single part. Refer to [Table 1-3 on page 1-5](#) for the replacement part number.



Figure 5-33. Front Panel Keypads

1. Place the chassis face up on a static protected work surface. After the metal numeric keypad bezel has been removed, disconnect the Mode key flexible switchpad from J2 of the numeric keypad PCB (lower left corner, refer to [Figure 5-31](#)) by carefully lifting the locking tab on connector J2 to release the flexible switchpad. This type of connector typically has non-corrosive RTV adhesive on the connector to maintain the connection securely.
2. The plastic bezel that surrounds the Mode function keypad is held in place by 6 locking spring tabs. Remove the plastic bezel by using a small flat-blade screwdriver or knife blade to press gently on the 6 plastic spring tabs and lift the bezel. The bezel has 3 tabs on the top edge and 3 tabs on the bottom edge. Begin with either top or bottom.



Figure 5-34. Keypads and Bezels, Front Panel

3. Lift off the Mode keypad rubber membrane.
4. Gently lift the flexible switchpad to expose the attachment strip, which is held to the front panel by tape. Pull off the tape to release the flexible switchpad.
5. Reverse the above steps to install the replacement assembly, with the following cautions:
 - a. Ensure that the clear insulator sheet is aligned between the flexible switchpad and the metal front panel.
 - b. Take care to properly orient the rubber membrane so that the rubber pins are aligned with the flexible switchpad switches.
 - c. Verify that all 6 locking tabs are fully seated into the main body of the front panel when reinstalling the Mode keypad plastic bezel.
 - d. Apply non-corrosive RTV adhesive on connector J2 to maintain the connection securely.

5-13 Main PCB

Note The Main PCB assembly (Motherboard) and the Spectrum Analyzer module (SPA PCB assembly) are always replaced as a set. Main and Spectrum Analyzer PCB assemblies are calibrated (adjusted) as a set at the factory.

This part of the procedure provides instructions for removing and replacing the Main PCB (Motherboard). To gain access to both the Main PCB and the SPA PCB, the chassis must be removed from the outer enclosure, as described in [Section 5-3, “Enclosure”](#), and the front panel must be removed as described in [Section 5-9, “Front Panel Assembly”](#). Refer to [Table 1-3 on page 1-5](#) for the replacement part number.

Note If Option 9 is installed, then leave the Option 9 PCB on the Main PCB when returning the PCB assemblies to the factory for repair.

1. Push the external compact flash (CF) card ejector button to the IN position in order to avoid interference between the button and the rear panel when removing the PCB from the chassis.
2. Disconnect the following cables before removing the front panel screws:

- a. The cable from the backlight driver PCB to the Main PCB.

Disconnect the end at the backlight driver PCB. The other end is on the bottom side of the Main PCB at J4005.

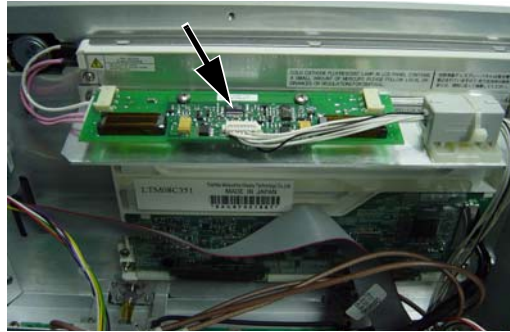


Figure 5-35. Backlight Cable Connector

- b. The cable from the Rotary Knob to the Main PCB.

Caution The rotary switch is Static Sensitive.

Disconnect the end at the left-rear corner of the Main PCB at J5010 (Refer to [Figure 5-36](#)).

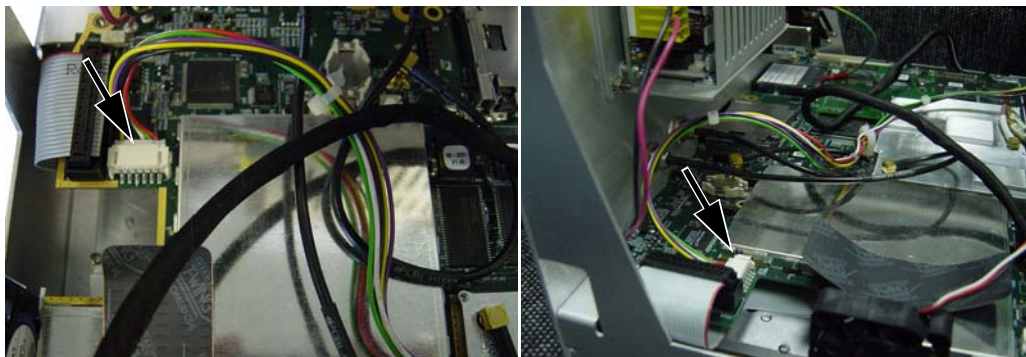


Figure 5-36. Rotary Knob Connector J5010 at Main PCB

- c. The cable from the keypad to the Main PCB.

Disconnect the end behind the keypad. The other end is on the bottom of the Main PCB at J5006.

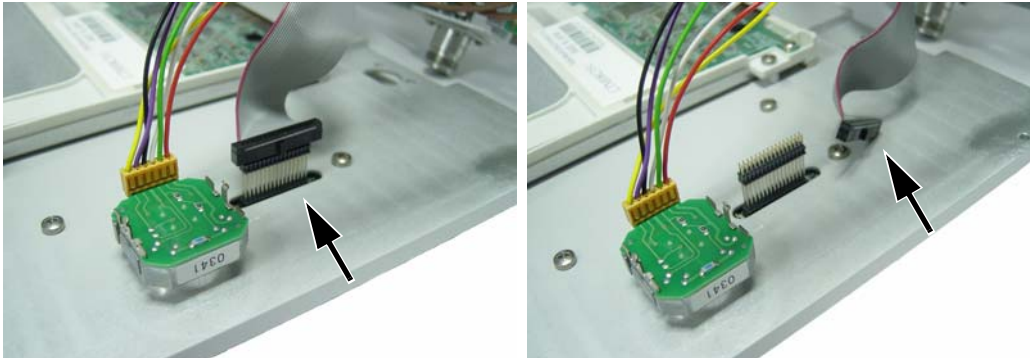


Figure 5-37. Keypad Cable Connector

- d. The cable from the LCD to the Main PCB.

Disconnect either end. The cable connects to J4003 on the Main PCB.

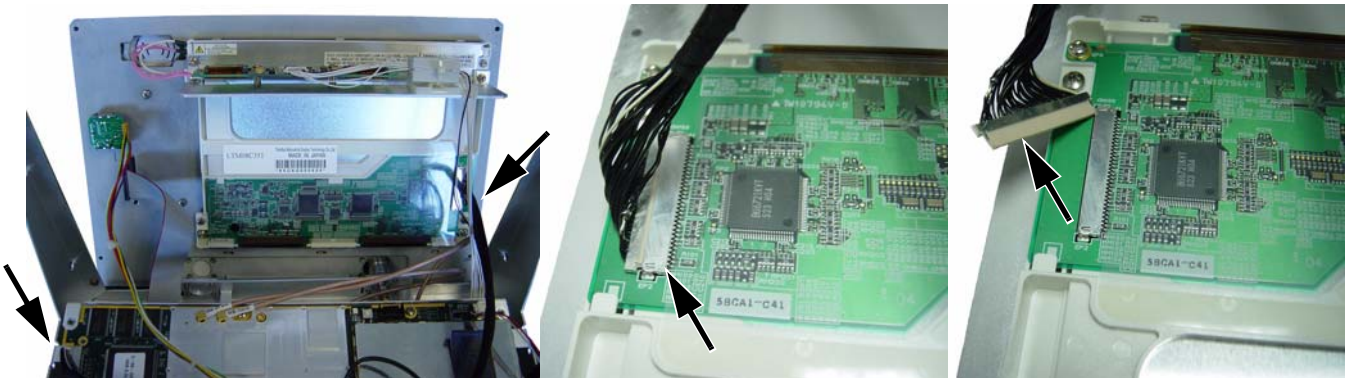


Figure 5-38. LCD Cable Connector at LCD

- e. The cable to the fan.

Disconnect at J1002 on the Main PCB. Refer to [Figure 5-14](#).

- f. The cable that connects the Main PCB to the Spectrum Analyzer (SPA) PCB.

Disconnect the cable that connects the Main PCB to the SPA PCB. The connector is at the left-rear corner of the Main PCB at J4005. Refer to [Figure 5-39](#).

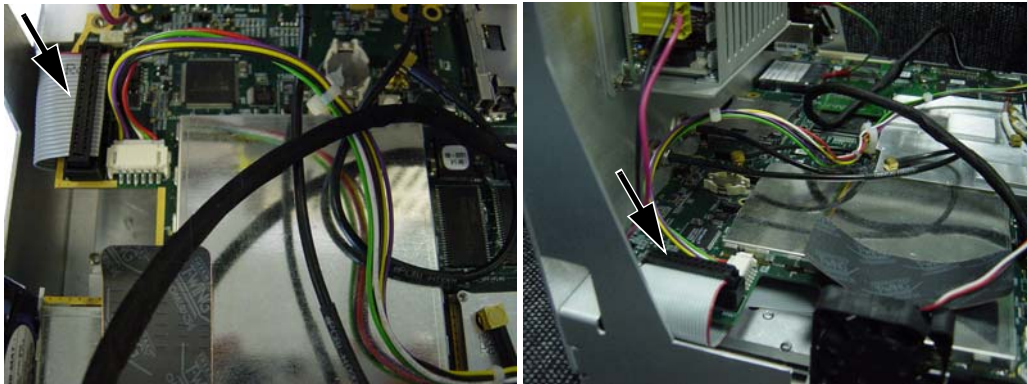


Figure 5-39. Cable Connector from Main PCB to SPA PCB

- g. Unplug (from the Main PCB) the two RF cables that come from the SPA PCB. These cables are plugged into the top of the Main PCB with snap-in MCX connectors. Also unplug the Ext Ref In and the Ext Trigger In cables (from the back panel) from the Main PCB (these 2 cables also have MCX connectors).
- h. Unplug the connector from the power supply to the Main PCB. Refer to [Figure 5-40](#).

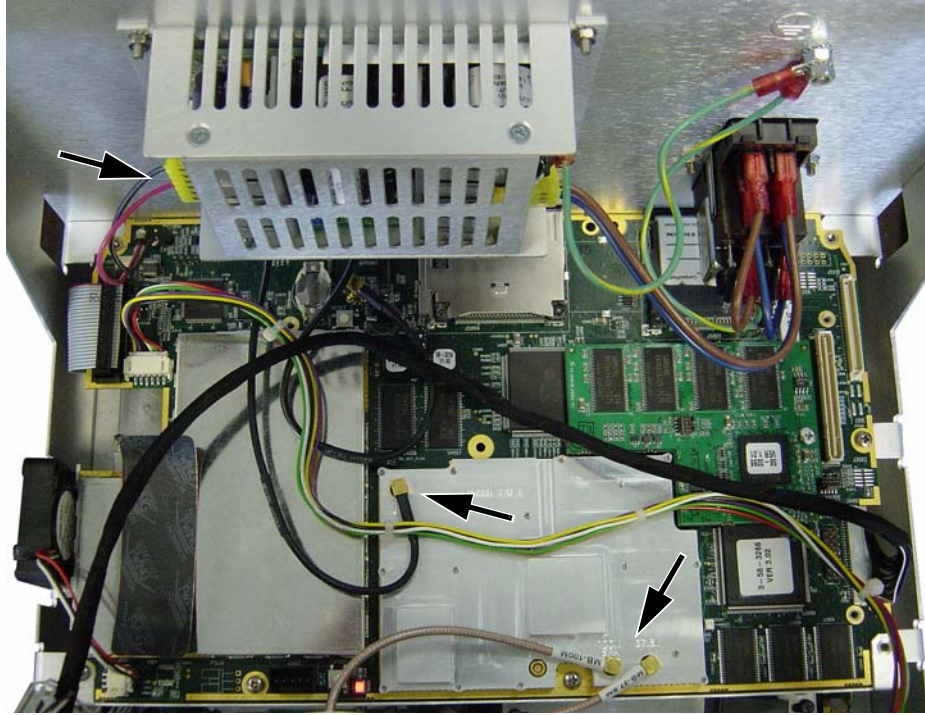


Figure 5-40. MCX Connectors to Main PCB

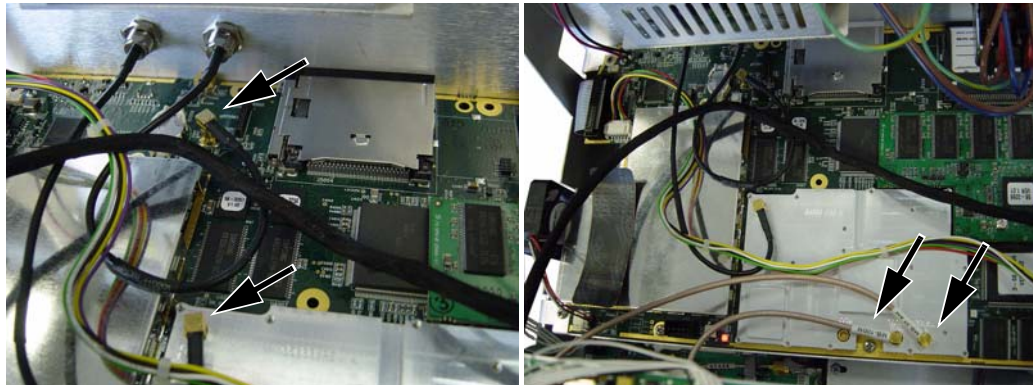


Figure 5-41. MCX Connectors for Ext Trigger In, Ext Ref In, and SPA

3. Remove the 5 screws around the edge of the Main PCB, as shown in [Figure 5-42](#), to release the board from the chassis.

Caution Do not remove or adjust any smaller screws that pass through the RF shields.

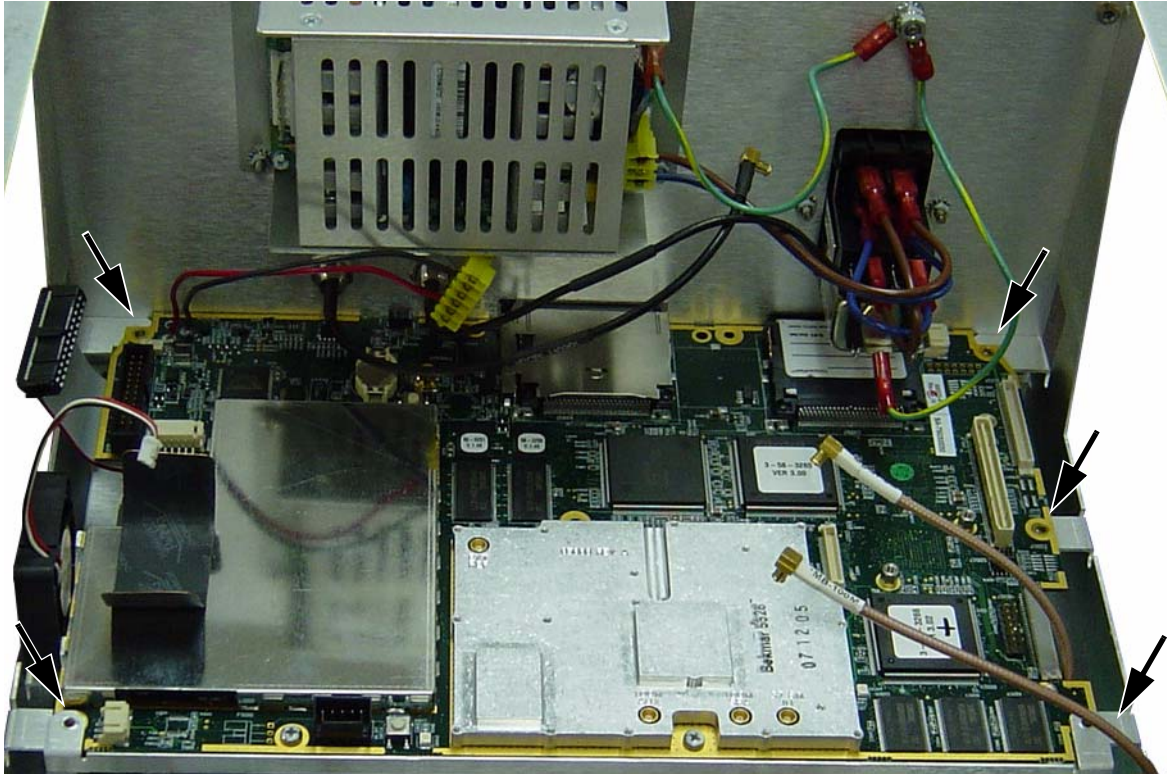


Figure 5-42. Main PCB Mounting Screws – Left and Right Edges

4. Carefully lift the main PCB from the chassis. Avoid contact with other components.
5. Disconnect the 2 cables that were left attached to the underside of the Main PCB:
 - a. Disconnect the numeric keypad cable at J5006.
 - b. Disconnect the Backlight driver PCB cable at J4005.
6. If your MS2718B, MS2719B has Option 9 installed, then leave the Option 9 PCB on the main PCB when returning the PCB set to the factory for repair.
7. Installation is the reverse of removal. Refer to [“Important Notes Regarding Reassembly of Main PCB and SPA PCB:”](#) on page 5-25.

5-14 SPA PCB

Note The Main PCB assembly (Motherboard) and the Spectrum Analyzer module (SPA PCB assembly) are always replaced as a set. Main and Spectrum Analyzer PCB assemblies are calibrated (adjusted) as a set at the factory.

This part of the procedure provides instructions for removing and replacing the SPA PCB. To gain access to the SPA PCB, the chassis must be removed from the outer enclosure, as described in [Section 5-3, “Enclosure”](#), the front panel must be removed as described in [Section 5-9, “Front Panel Assembly”](#), and the Main PCB must be removed, as described in [Section 5-13, “Main PCB”](#). Refer to [Table 1-3 on page 1-5](#) for the replacement part number.

1. After the Main PCB has been removed, remove the 4 corner screws that attach the SPA PCB to the chassis. The RF In connector remains attached to the SPA PCB.

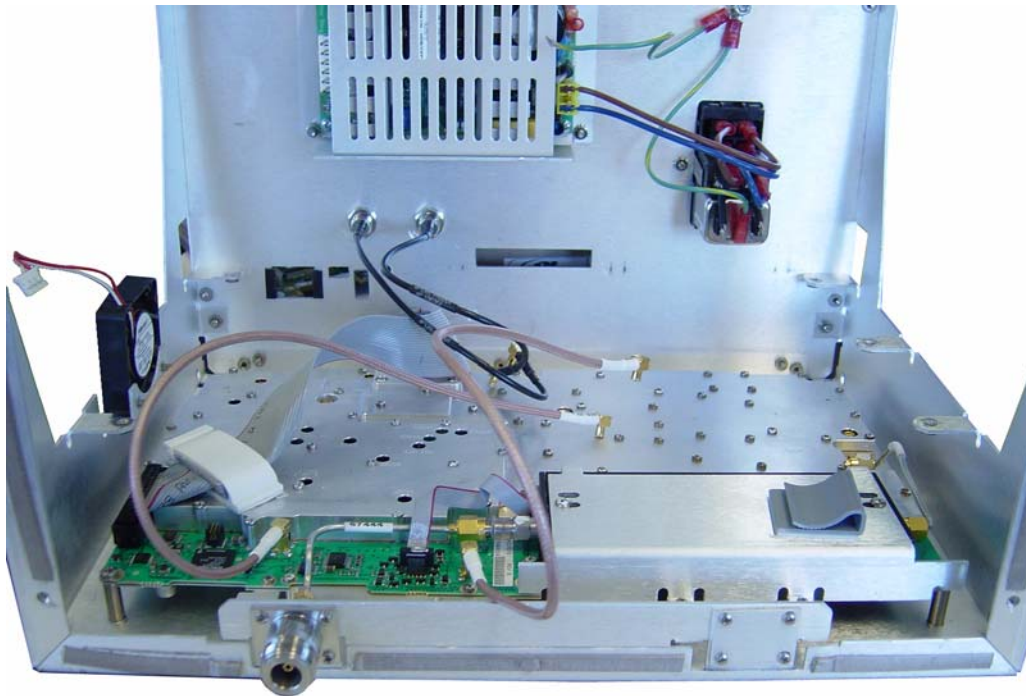


Figure 5-43. SPA PCB in Chassis

2. Carefully lift the SPA PCB from the chassis. Avoid contact with other components.
3. Disconnect the cables that were left attached to the SPA PCB:
 - a. Unplug the two RF cables for 37.8 MHz IN and 100 MHz SPA.
 - b. Unplug the cable that attaches the SPA PCB to the Main PCB.
4. Replacement of the Main PCB and the Spectrum Analyzer PCB is the opposite of removal, with the following precautions:

Important Notes Regarding Reassembly of Main PCB and SPA PCB:

- a. Ensure that all wires and cables are correctly routed before reassembling the unit.
- b. If the front panel type N connector (RF In) has been disconnected or loosened, then use a maximum torque of 8 in-lb when tightening the connector on the SPA PCB.

Appendix A Test Records

This appendix provides test records that can be used to record the performance of the MS2718B, MS2719B. Anritsu Company recommends that you make a copy of the following test record pages and document the measurements each time a Performance Verification is performed. Continuing to document this process each time it is performed will provide a detailed history of the instrument performance.

MS2718B, Firmware Revision: _____ Operator: _____ Date: _____
MS2719B

Serial Number: _____ Options: _____

Frequency Accuracy

Table A-1. Spectrum Analyzer Frequency Accuracy

Frequency	Measured Value	Error	Error Specification
1 GHz	GHz	Hz	±300 Hz
12 GHz	GHz	Hz	±3.6 kHz (MS2718B only)
19 GHz	GHz	Hz	±5.7 kHz (MS2719B only)

Table A-2. Spectrum Analyzer SSB Phase Noise Verification, 900 MHz

Offset Frequency	Measured Value	Specification
10 kHz	dBc/Hz	≤ -95 dBc/Hz
20 kHz	dBc/Hz	≤ -95 dBc/Hz
30 kHz	dBc/Hz	≤ -95 dBc/Hz
100 kHz	dBc/Hz	≤ -97 dBc/Hz
1 MHz	dBc/Hz	≤ -105 dBc/Hz
10 MHz	dBc/Hz	≤ -120 dBc/Hz

Table A-3. Spectrum Analyzer SSB Phase Noise Verification, 19 GHz

Offset Frequency	Measured Value	Specification
10 kHz	dBc/Hz	≤ -91 dBc/Hz
20 kHz	dBc/Hz	≤ -91 dBc/Hz
30 kHz	dBc/Hz	≤ -91 dBc/Hz
100 kHz	dBc/Hz	≤ -93 dBc/Hz
1 MHz	dBc/Hz	≤ -102 dBc/Hz
10 MHz	dBc/Hz	≤ -116 dBc/Hz

MS2718B, Firmware Revision: _____ Operator: _____ Date: _____
MS2719B

Serial Number: _____ Options: _____

Resolution Bandwidth Accuracy

Table A-4. Spectrum Analyzer Resolution Bandwidth (RBW) Accuracy Test

RBW Setting	Span	VBW	Measured OBW	Specification
3 MHz	4.5 MHz	Auto	Hz	2.7 MHz to 3.3 MHz
1 MHz	1.5 MHz	Auto	Hz	900 kHz to 1.1 MHz
300 kHz	450 kHz	Auto	Hz	270 kHz to 330 kHz
100 kHz	150 kHz	Auto	Hz	90 kHz to 110 kHz
30 kHz	45 kHz	Auto	Hz	27 kHz to 33 kHz
10 kHz	15 kHz	Auto	Hz	9 kHz to 11 kHz
3 kHz	4.5 kHz	Auto	Hz	2.7 kHz to 3.3 kHz
1 kHz	2 kHz	Auto	Hz	900 Hz to 1.1 kHz
300 Hz	450 Hz	Auto	Hz	270 Hz to 330 Hz
100 Hz	150 Hz	Auto	Hz	90 Hz to 110 Hz
30 Hz	50 Hz	3 Hz	Hz	27 Hz to 33 Hz
10 Hz	30 Hz	3 Hz	Hz	9 Hz to 11 Hz
1 Hz	10 Hz	3 Hz	Hz	0.9 Hz to 1.1 Hz

MS2718B, Firmware Revision: _____ Operator: _____ Date: _____
MS2719B

Serial Number: _____ Options: _____

Second Harmonic Distortion

Table A-5. Spectrum Analyzer Second Harmonic Distortion

Frequency	Measured Value	2 nd Harmonic Distortion	Specification
50.1 MHz	dBm		
100.2 MHz	dBm	dBc	-50 dBc max

TOI

Table A-6. Measured Amplitude to Find "max" for TOI Calculation

TOI Test Freq	Measured Amplitude	Check Mark for "max"
2400.151 MHz	dBm	
2399.851 MHz	dBm	

Calculation:

$$\text{Calculated TOI} = -20 + [(-20 - \text{max}) / 2] \text{ dBm}$$

Table A-7. Spectrum Analyzer Third Order Intercept (TOI)

TOI Freq	Calculated Measurement	Specification
2400 MHz	dBm	$\geq +12$ dBm

MS2718B, Firmware Revision: _____ Operator: _____ Date: _____
 MS2719B

Serial Number: _____ Options: _____

Displayed Average Noise Level (DANL)

Table A-8. Spectrum Analyzer DANL with Preamp On

Start Freq	Stop Freq	RBW	VBW	Measured DANL for 100 kHz RBW	Calculated DANL for 1 Hz RBW	1 Hz Specification
10 MHz	1.0 GHz	100 kHz	1 kHz	dBm	dBm	≤ -159 dBm
1 GHz	3 GHz	100 kHz	1 kHz	dBm	dBm	≤ -156 dBm
3 GHz	4 GHz	100 kHz	300 Hz	dBm	dBm	≤ -154 dBm

Table A-9. Spectrum Analyzer DANL with Preamp Off

Start Freq	Stop Freq	RBW	VBW	Measured DANL for 100 kHz RBW	Calculated DANL for 1 Hz RBW	1 Hz Specification
10 MHz	4 GHz	100 kHz	1 kHz	dBm	dBm	≤ -139 dBm
4 GHz	10 GHz	100 kHz	1 kHz	dBm	dBm	≤ -136 dBm
10 GHz	11 GHz	100 kHz	300 Hz	dBm	dBm	≤ -130 dBm
11 GHz	13 GHz	100 kHz	300 Hz	dBm	dBm	≤ -127 dBm
13 GHz	20 GHz	100 kHz	300 Hz	dBm	dBm	≤ -136 dBm

MS2718B, Firmware Revision: _____ Operator: _____ Date: _____
 MS2719B

Serial Number: _____ Options: _____

Spectrum Analyzer Residual Spurious Response

Table A-10. Spectrum Analyzer Residual Spurious (Pre Amp ON)

Start Freq	Stop Freq	Measured Values	Specification
100 kHz	10 MHz	dBm	≤ -100 dBm
10 MHz	1.0 GHz	dBm	≤ -100 dBm
1 GHz	2 GHz	dBm	≤ -100 dBm
2 GHz	3 GHz	dBm	≤ -100 dBm
3 GHz	4 GHz	dBm	≤ -100 dBm

Table A-11. Spectrum Analyzer Residual Spurious (Pre Amp OFF)

Start Freq	Stop Freq	RBW	VBW	Measured Values	Specification
9 kHz	100 kHz	300 Hz	30 Hz	dBm	≤ -90 dBm
100 kHz	10 MHz	3 kHz	300 Hz	dBm	≤ -90 dBm
10 MHz	2 GHz	100 kHz	10 kHz	dBm	≤ -90 dBm
2 GHz	3.675 GHz	30 kHz	3 kHz	dBm	≤ -90 dBm
3.675 GHz	5.35 GHz	30 kHz	3 kHz	dBm	≤ -90 dBm
5.35 GHz	7.65 GHz	10 kHz	3 kHz	dBm	≤ -90 dBm
7.65 GHz	9.2 GHz	3 kHz	300 Hz	dBm	≤ -90 dBm
9.2 GHz	11.1 GHz	1 kHz	100 Hz	dBm	≤ -90 dBm
11.1 GHz	12.5 GHz	3 kHz	100 Hz	dBm	≤ -90 dBm
12.5 GHz	13 GHz	1 kHz	100 Hz	dBm	≤ -90 dBm
13 GHz	15.5 GHz	10 kHz	1 kHz	dBm	≤ -85 dBm
15.5 GHz	16 GHz	10 kHz	1 kHz	dBm	≤ -85 dBm
16 GHz	17 GHz	10 kHz	1 kHz	dBm	≤ -85 dBm
17 GHz	18.5 GHz	10 kHz	1 kHz	dBm	≤ -85 dBm
18.5 GHz	20 GHz	10 kHz	1 kHz	dBm	≤ -85 dBm

MS2718B, Firmware Revision: _____ Operator: _____ Date: _____
MS2719B

Serial Number: _____ Options: _____

Spectrum Analyzer Input-Related Spurious Verification

A. Input-Related Spurious

Measured Input Signal Level for -30 dBm input at 1000 MHz, 3275 MHz, 8000 MHz, and 15000 MHz

Note The 15000 MHz measurement is for the Anritsu Model MS2719B only.
--

Table A-12. Input-Related Spurious Verification at 1000 MHz, 3275 MHz, 8000 MHz, and 15000 MHz

Test Freq	Start Freq	Stop Freq	Measured Input Signal Level	Measured Spur Level	Calculated IRS	Specification
1000 MHz	719 MHz	721 MHz	dBm	dBm	dBc	-60 dBc max
3275 MHz	2425 MHz	3274 MHz	dBm	dBm	dBc	-50 dBc max
3275 MHz	3276 MHz	4125 MHz	dBm	dBm	dBc	-50 dBc max
8000 MHz	7719 MHz	7721 MHz	dBm	dBm	dBc	-60 dBc max
15000 MHz	14719 MHz	14721 MHz	dBm	dBm	dBc	-60 dBc max

MS2718B, Firmware Revision: _____ Operator: _____ Date: _____
 MS2719B

Serial Number: _____ Options: _____

Amplitude Accuracy Verification

50 MHz Amplitude Accuracy

Table A-13. Characterization Chart for 50 MHz Amplitude Accuracy Verification

Test Power Level @ 50 MHz	Required Sensor B Reading
0 dBm	dBm
-4 dBm	dBm
-10 dBm	dBm
-14 dBm	dBm
-20 dBm	dBm
-24 dBm	dBm
-30 dBm	dBm
-34 dBm	dBm
-40 dBm	dBm
-44 dBm	dBm
-50 dBm	dBm

B. 50 MHz Amplitude Accuracy Verification

Table A-14. 50 MHz Amplitude Accuracy Verification

Input Power Level	Reference Level	Input Attenuation Level	Marker 1 Measured Reading	Specification
0 dBm	+10 dBm	30 dB	dBm	± 0.7 dB
-4 dBm	+10 dBm	30 dB	dBm	± 0.7 dB
-10 dBm	0 dBm	20 dB	dBm	± 0.7 dB
-14 dBm	0 dBm	20 dB	dBm	± 0.7 dB
-20 dBm	-10 dBm	10 dB	dBm	± 0.7 dB
-24 dBm	-10 dBm	10 dB	dBm	± 0.7 dB
-30 dBm	-20 dBm	0 dB	dBm	± 0.7 dB
-34 dBm	-20 dBm	0 dB	dBm	± 0.7 dB
-40 dBm	-30 dBm	0 dB	dBm	± 0.7 dB
-44 dBm	-30 dBm	0 dB	dBm	± 0.7 dB
-50 dBm	-40 dBm	0 dB	dBm	± 0.7 dB

MS2718B, Firmware Revision: _____ Operator: _____ Date: _____
MS2719B

Serial Number: _____ Options: _____

Amplitude Accuracy Across Frequency

Table A-15. Characterization Chart for Amplitude Accuracy Across Frequency

Sensor B	Required Sensor B Reading for -2 dBm	Required Sensor B Reading for -30 dBm
10.1 MHz	dBm	dBm
50 MHz	dBm	dBm
100 MHz	dBm	dBm
500 MHz	dBm	dBm
1000 MHz	dBm	dBm
2000 MHz	dBm	dBm
3000 MHz	dBm	dBm
4000 MHz	dBm	dBm
5000 MHz	dBm	dBm
6000 MHz	dBm	dBm
7000 MHz	dBm	dBm
8000 MHz	dBm	dBm
9000 MHz	dBm	dBm
10000 MHz	dBm	dBm
11000 MHz	dBm	dBm
12000 MHz	dBm	dBm
12999.99 MHz (MS2718B only)	dBm	dBm
13000 MHz (MS2719B only)	dBm	dBm
(MS2719B) 14000 MHz	dBm	dBm
(MS2719B) 15000 MHz	dBm	dBm
(MS2719B) 16000 MHz	dBm	dBm
(MS2719B) 17000 MHz	dBm	dBm
(MS2719B) 18000 MHz	dBm	dBm

MS2718B, Firmware Revision: _____ Operator: _____ Date: _____
MS2719B

Serial Number: _____ Options: _____

Amplitude Accuracy with Pre-Amp Off

Table A-16. Amplitude Accuracy with Pre-Amp Off — at 10.1 MHz

Input Power	Atten Level	Marker 1 Reading	Specification
-30 dBm	0 dB		±1.3 dB
-30 dBm	5 dB		±1.3 dB
-30 dBm	10 dB		±1.3 dB
-30 dBm	20 dB		±1.3 dB
-2 dBm	30 dB		±1.3 dB
-2 dBm	40 dB		±1.3 dB
-2 dBm	50 dB		±1.3 dB
-2 dBm	60 dB		±1.3 dB

Table A-17. Amplitude Accuracy with Pre-Amp Off — at 50 MHz

Input Power	Atten Level	Marker 1 Reading	Specification
-30 dBm	0 dB		±1.3 dB
-30 dBm	5 dB		±1.3 dB
-30 dBm	10 dB		±1.3 dB
-30 dBm	20 dB		±1.3 dB
-2 dBm	30 dB		±1.3 dB
-2 dBm	40 dB		±1.3 dB
-2 dBm	50 dB		±1.3 dB
-2 dBm	60 dB		±1.3 dB

MS2718B, Firmware Revision: _____ Operator: _____ Date: _____
 MS2719B

Serial Number: _____ Options: _____

Amplitude Accuracy with Pre-Amp Off

Table A-18. Amplitude Accuracy with Pre-Amp Off — at 100 MHz

Input Power	Atten Level	Marker 1 Reading	Specification
-30 dBm	0 dB		±1.3 dB
-30 dBm	5 dB		±1.3 dB
-30 dBm	10 dB		±1.3 dB
-30 dBm	20 dB		±1.3 dB
-2 dBm	30 dB		±1.3 dB
-2 dBm	40 dB		±1.3 dB
-2 dBm	50 dB		±1.3 dB
-2 dBm	60 dB		±1.3 dB

Table A-19. Amplitude Accuracy with Pre-Amp Off — at 500 MHz

Input Power	Atten Level	Marker 1 Reading	Specification
-30 dBm	0 dB		±1.3 dB
-30 dBm	5 dB		±1.3 dB
-30 dBm	10 dB		±1.3 dB
-30 dBm	20 dB		±1.3 dB
-2 dBm	30 dB		±1.3 dB
-2 dBm	40 dB		±1.3 dB
-2 dBm	50 dB		±1.3 dB
-2 dBm	60 dB		±1.3 dB

Table A-20. Amplitude Accuracy with Pre-Amp Off — at 1000 MHz

Input Power	Atten Level	Marker 1 Reading	Specification
-30 dBm	0 dB		±1.3 dB
-30 dBm	5 dB		±1.3 dB
-30 dBm	10 dB		±1.3 dB
-30 dBm	20 dB		±1.3 dB
-2 dBm	30 dB		±1.3 dB
-2 dBm	40 dB		±1.3 dB
-2 dBm	50 dB		±1.3 dB
-2 dBm	60 dB		±1.3 dB

MS2718B, Firmware Revision: _____ Operator: _____ Date: _____
MS2719B

Serial Number: _____ Options: _____

Amplitude Accuracy with Pre-Amp Off

Table A-21. Amplitude Accuracy with Pre-Amp Off — at 2000 MHz

Input Power	Atten Level	Marker 1 Reading	Specification
-30 dBm	0 dB		±1.3 dB
-30 dBm	5 dB		±1.3 dB
-30 dBm	10 dB		±1.3 dB
-30 dBm	20 dB		±1.3 dB
-2 dBm	30 dB		±1.3 dB
-2 dBm	40 dB		±1.3 dB
-2 dBm	50 dB		±1.3 dB
-2 dBm	60 dB		±1.3 dB

Table A-22. Amplitude Accuracy with Pre-Amp Off — at 3000 MHz

Input Power	Atten Level	Marker 1 Reading	Specification
-30 dBm	0 dB		±1.3 dB
-30 dBm	5 dB		±1.3 dB
-30 dBm	10 dB		±1.3 dB
-30 dBm	20 dB		±1.3 dB
-2 dBm	30 dB		±1.3 dB
-2 dBm	40 dB		±1.3 dB
-2 dBm	50 dB		±1.3 dB
-2 dBm	60 dB		±1.3 dB

Table A-23. Amplitude Accuracy with Pre-Amp Off — at 4000 MHz

Input Power	Atten Level	Marker 1 Reading	Specification
-30 dBm	0 dB		±1.3 dB
-30 dBm	5 dB		±1.3 dB
-30 dBm	10 dB		±1.3 dB
-30 dBm	20 dB		±1.3 dB
-2 dBm	30 dB		±1.3 dB
-2 dBm	40 dB		±1.3 dB
-2 dBm	50 dB		±1.3 dB
-2 dBm	60 dB		±1.3 dB

MS2718B, Firmware Revision: _____ Operator: _____ Date: _____
MS2719B

Serial Number: _____ Options: _____

Amplitude Accuracy with Pre-Amp Off

Table A-24. Amplitude Accuracy with Pre-Amp Off — at 5000 MHz

Input Power	Atten Level	Marker 1 Reading	Specification
-30 dBm	0 dB		±2.8 dB
-30 dBm	5 dB		±2.8 dB
-30 dBm	10 dB		±2.8 dB
-30 dBm	20 dB		±2.8 dB
-2 dBm	30 dB		±2.8 dB
-2 dBm	40 dB		±2.8 dB
-2 dBm	50 dB		±2.8 dB
-2 dBm	60 dB		±2.8 dB

Table A-25. Amplitude Accuracy with Pre-Amp Off — at 6000 MHz

Input Power	Atten Level	Marker 1 Reading	Specification
-30 dBm	0 dB		±2.8 dB
-30 dBm	5 dB		±2.8 dB
-30 dBm	10 dB		±2.8 dB
-30 dBm	20 dB		±2.8 dB
-2 dBm	30 dB		±2.8 dB
-2 dBm	40 dB		±2.8 dB
-2 dBm	50 dB		±2.8 dB
-2 dBm	60 dB		±2.8 dB

Table A-26. Amplitude Accuracy with Pre-Amp Off — at 7000 MHz

Input Power	Atten Level	Marker 1 Reading	Specification
-30 dBm	0 dB		±2.8 dB
-30 dBm	5 dB		±2.8 dB
-30 dBm	10 dB		±2.8 dB
-30 dBm	20 dB		±2.8 dB
-2 dBm	30 dB		±2.8 dB
-2 dBm	40 dB		±2.8 dB
-2 dBm	50 dB		±2.8 dB
-2 dBm	60 dB		±2.8 dB

MS2718B, Firmware Revision: _____ Operator: _____ Date: _____
MS2719B

Serial Number: _____ Options: _____

Amplitude Accuracy with Pre-Amp Off

Table A-27. Amplitude Accuracy with Pre-Amp Off — at 8000 MHz

Input Power	Atten Level	Marker 1 Reading	Specification
-30 dBm	0 dB		±2.8 dB
-30 dBm	5 dB		±2.8 dB
-30 dBm	10 dB		±2.8 dB
-30 dBm	20 dB		±2.8 dB
-2 dBm	30 dB		±2.8 dB
-2 dBm	40 dB		±2.8 dB
-2 dBm	50 dB		±2.8 dB
-2 dBm	60 dB		±2.8 dB

Table A-28. Amplitude Accuracy with Pre-Amp Off — at 9000 MHz

Input Power	Atten Level	Marker 1 Reading	Specification
-30 dBm	0 dB		±2.8 dB
-30 dBm	5 dB		±2.8 dB
-30 dBm	10 dB		±2.8 dB
-30 dBm	20 dB		±2.8 dB
-2 dBm	30 dB		±2.8 dB
-2 dBm	40 dB		±2.8 dB
-2 dBm	50 dB		±2.8 dB
-2 dBm	60 dB		±2.8 dB

Table A-29. Amplitude Accuracy with Pre-Amp Off — at 10000 MHz

Input Power	Atten Level	Marker 1 Reading	Specification
-30 dBm	0 dB		±2.8 dB
-30 dBm	5 dB		±2.8 dB
-30 dBm	10 dB		±2.8 dB
-30 dBm	20 dB		±2.8 dB
-2 dBm	30 dB		±2.8 dB
-2 dBm	40 dB		±2.8 dB
-2 dBm	50 dB		±2.8 dB
-2 dBm	60 dB		±2.8 dB

MS2718B, Firmware Revision: _____ Operator: _____ Date: _____
MS2719B

Serial Number: _____ Options: _____

Amplitude Accuracy with Pre-Amp Off

Table A-30. Amplitude Accuracy with Pre-Amp Off — at 11000 MHz

Input Power	Atten Level	Marker 1 Reading	Specification
-30 dBm	0 dB		±2.8 dB
-30 dBm	5 dB		±2.8 dB
-30 dBm	10 dB		±2.8 dB
-30 dBm	20 dB		±2.8 dB
-2 dBm	30 dB		±2.8 dB
-2 dBm	40 dB		±2.8 dB
-2 dBm	50 dB		±2.8 dB
-2 dBm	60 dB		±2.8 dB

Table A-31. Amplitude Accuracy with Pre-Amp Off — at 12000 MHz

Input Power	Atten Level	Marker 1 Reading	Specification
-30 dBm	0 dB		±2.8 dB
-30 dBm	5 dB		±2.8 dB
-30 dBm	10 dB		±2.8 dB
-30 dBm	20 dB		±2.8 dB
-2 dBm	30 dB		±2.8 dB
-2 dBm	40 dB		±2.8 dB
-2 dBm	50 dB		±2.8 dB
-2 dBm	60 dB		±2.8 dB

Table A-32. Amplitude Accuracy with Pre-Amp Off — at 12999.99 MHz (MS2718B only)

Input Power	Atten Level	Marker 1 Reading	Specification
-30 dBm	0 dB		±2.8 dB
-30 dBm	5 dB		±2.8 dB
-30 dBm	10 dB		±2.8 dB
-30 dBm	20 dB		±2.8 dB
-2 dBm	30 dB		±2.8 dB
-2 dBm	40 dB		±2.8 dB
-2 dBm	50 dB		±2.8 dB
-2 dBm	60 dB		±2.8 dB

MS2718B, Firmware Revision: _____ Operator: _____ Date: _____
MS2719B

Serial Number: _____ Options: _____

Amplitude Accuracy with Pre-Amp Off

Table A-33. Amplitude Accuracy with Pre-Amp Off — at 13000 MHz (MS2719B only)

Input Power	Atten Level	Marker 1 Reading	Specification
-30 dBm	0 dB		±2.8 dB
-30 dBm	5 dB		±2.8 dB
-30 dBm	10 dB		±2.8 dB
-30 dBm	20 dB		±2.8 dB
-2 dBm	30 dB		±2.8 dB
-2 dBm	40 dB		±2.8 dB
-2 dBm	50 dB		±2.8 dB
-2 dBm	60 dB		±2.8 dB

Table A-34. Amplitude Accuracy with Pre-Amp Off — at 14000 MHz (MS2719B only)

Input Power	Atten Level	Marker 1 Reading	Specification
-30 dBm	0 dB		±2.8 dB
-30 dBm	5 dB		±2.8 dB
-30 dBm	10 dB		±2.8 dB
-30 dBm	20 dB		±2.8 dB
-2 dBm	30 dB		±2.8 dB
-2 dBm	40 dB		±2.8 dB
-2 dBm	50 dB		±2.8 dB
-2 dBm	60 dB		±2.8 dB

Table A-35. Amplitude Accuracy with Pre-Amp Off — at 15000 MHz (MS2719B only)

Input Power	Atten Level	Marker 1 Reading	Specification
-30 dBm	0 dB		±2.8 dB
-30 dBm	5 dB		±2.8 dB
-30 dBm	10 dB		±2.8 dB
-30 dBm	20 dB		±2.8 dB
-2 dBm	30 dB		±2.8 dB
-2 dBm	40 dB		±2.8 dB
-2 dBm	50 dB		±2.8 dB
-2 dBm	60 dB		±2.8 dB

MS2718B, Firmware Revision: _____ Operator: _____ Date: _____
MS2719B

Serial Number: _____ Options: _____

Amplitude Accuracy with Pre-Amp Off

Table A-36. Amplitude Accuracy with Pre-Amp Off — at 16000 MHz (MS2719B only)

Input Power	Atten Level	Marker 1 Reading	Specification
-30 dBm	0 dB		±2.8 dB
-30 dBm	5 dB		±2.8 dB
-30 dBm	10 dB		±2.8 dB
-30 dBm	20 dB		±2.8 dB
-2 dBm	30 dB		±2.8 dB
-2 dBm	40 dB		±2.8 dB
-2 dBm	50 dB		±2.8 dB
-2 dBm	60 dB		±2.8 dB

Table A-37. Amplitude Accuracy with Pre-Amp Off — at 17000 MHz (MS2719B only)

Input Power	Atten Level	Marker 1 Reading	Specification
-30 dBm	0 dB		±2.8 dB
-30 dBm	5 dB		±2.8 dB
-30 dBm	10 dB		±2.8 dB
-30 dBm	20 dB		±2.8 dB
-2 dBm	30 dB		±2.8 dB
-2 dBm	40 dB		±2.8 dB
-2 dBm	50 dB		±2.8 dB
-2 dBm	60 dB		±2.8 dB

Table A-38. Amplitude Accuracy with Pre-Amp Off — at 18000 MHz (MS2719B only)

Input Power	Atten Level	Marker 1 Reading	Specification
-30 dBm	0 dB		±2.8 dB
-30 dBm	5 dB		±2.8 dB
-30 dBm	10 dB		±2.8 dB
-30 dBm	20 dB		±2.8 dB
-2 dBm	30 dB		±2.8 dB
-2 dBm	40 dB		±2.8 dB
-2 dBm	50 dB		±2.8 dB
-2 dBm	60 dB		±2.8 dB

MS2718B, Firmware Revision: _____ Operator: _____ Date: _____
 MS2719B

Serial Number: _____ Options: _____

9 kHz to 100 kHz Amplitude Accuracy

Characterization for 9 kHz to 100 kHz Amplitude Accuracy Verification

–20 dBm Reference Voltage (Vm1), at 100 kHz

Table A-39. Vm1 Measurement

Vm1	Specification
mV	23.315 mV ±0.5 mV

Table A-40. Characterization Chart for 9 kHz to 100 kHz Amplitude Accuracy Verification

Freq	Measured Vm2	Correction Factor	Calculated P _{in}
9.5 kHz	mV	0.047 dB	dBm
55 kHz	mV	0.002 dB	dBm
95 kHz	mV	0.000 dB	dBm

Calculation:

$$P_{in} = (20 * \text{Log}_{10} (Vm2 / Vm1) + \text{correction factor})$$

9 kHz to 100 kHz Amplitude Accuracy Verification

Table A-41. Amplitude Accuracy Verification at 9.5 kHz

Calculated P _{in}	Marker 1 Reading	Error	Error Specification
dBm	dBm	dB	±1.3 dB

Table A-42. Amplitude Accuracy Verification at 55 kHz

Calculated P _{in}	Marker 1 Reading	Error	Error Specification
dBm	dBm	dB	±1.3 dB

Table A-43. Amplitude Accuracy Verification at 95 kHz

Calculated P _{in}	Marker 1 Reading	Error	Error Specification
dBm	dBm	dB	±1.3 dB

MS2718B, Firmware Revision: _____ Operator: _____ Date: _____
MS2719B

Serial Number: _____ Options: _____

Spectrum Analyzer RF Input VSWR Verification

Table A-44. Spectrum Analyzer RF Input VSWR Verification

Attenuation	VSWR	Specification
10 dB		< 2.0:1
20 dB		< 2.0:1
60 dB		< 2.0:1

MS2718B, Firmware Revision: _____ Operator: _____ Date: _____
MS2719B

Serial Number: _____ Options: _____

Option 40 GSM/GPRS/EDGE RF Measurements

Table A-45. Option 40 GSM/GPRS/EDGE RF Measurements

Error Type	Measured Value	Specification
At 850 MHz, -10 dBm Level, TCH Pattern		
Burst Power Error	dB	±1.5 dB
Frequency Error	Hz	±10 Hz
At 850 MHz, -50 dBm Level, TCH ALL Pattern		
Burst Power Error	dB	±1.5 dB
Frequency Error	Hz	±10 Hz
At 1800 MHz, -10 dBm Level, TCH ALL Pattern		
Burst Power Error	dB	±1.5 dB
Frequency Error	Hz	±10 Hz
At 1800 MHz, -50 dBm Level, TCH Pattern		
Burst Power Error	dB	±1.5 dB
Frequency Error	Hz	±10 Hz
At 1800 MHz, -50 dBm Level, DL_MCS-9_1SLOT Pattern		
Burst Power Error	dB	±1.5 dB
Frequency Error	Hz	±10 Hz
At 1800 MHz, -10 dBm Level, DL_MCS-9_4SLOT Pattern		
Burst Power Error	dB	±1.5 dB
Frequency Error	Hz	±10 Hz
At 850 MHz, -50 dBm Level, DL_MCS-9_4SLOT Pattern		
Burst Power Error	dB	±1.5 dB
Frequency Error	Hz	±10 Hz
At 850 MHz, -10 dBm Level, DL_MCS-9_1SLOT Pattern		
Burst Power Error	dB	±1.5 dB
Frequency Error	Hz	±10 Hz

MS2718B, Firmware Revision: _____ Operator: _____ Date: _____
MS2719B

Serial Number: _____ Options: _____

Option 41 GSM/GPRS/EDGE Demodulator

Table A-46. Option 41 GSM/GPRS/EDGE Demodulator

Error Type	Measured Value	Specification
At 850 MHz, -10 dBm Level, TCH Pattern		
Phase Err RMS (Deg)	Deg	≤ 1 Deg
At 850 MHz, -50 dBm Level, TCH ALL Pattern		
Phase Err RMS (Deg)	Deg	≤ 1 Deg
At 1800 MHz, -10 dBm Level, TCH ALL Pattern		
Phase Err RMS (Deg)	Deg	≤ 1 Deg
At 1800 MHz, -50 dBm Level, TCH Pattern		
Phase Err RMS (Deg)	Deg	≤ 1 Deg
At 1800 MHz, -50 dBm Level, DL_MCS-9_1SLOT Pattern		
EVM RMS	Deg	≤ 1 Deg
At 1800 MHz, -10 dBm Level, DL_MCS-9_4SLOT Pattern		
EVM RMS	Deg	≤ 1 Deg
At 850 MHz, -50 dBm Level, DL_MCS-9_4SLOT Pattern		
EVM RMS	Deg	≤ 1 Deg
At 850 MHz, -10 dBm Level, DL_MCS-9_1SLOT Pattern		
EVM RMS	Deg	≤ 1 Deg

MS2718B, Firmware Revision: _____ Operator: _____ Date: _____
 MS2719B

Serial Number: _____ Options: _____

Option 42 CDMA RF Measurements

Table A-47. Option 42 CDMA RF Measurements

Error Type	Measured Value	Specification
At 870.03 MHz, -30 dBm Level, cdmaOne		
Channel Power Error	dB	±1.5 dB
At 1930.05 MHz, -30 dBm Level, cdmaOne		
Channel Power Error	dB	±1.5 dB
At 1930.05 MHz, -30 dBm Level, CDMA2000		
Channel Power Error	dB	±1.5 dB
At 870.03 MHz, -30 dBm Level, CDMA2000		
Channel Power Error	dB	±1.5 dB

Option 43 cdmaOne and CDMA2000 1xRTT Demodulator

Table A-48. Option 43 cdmaOne and CDMA2000 1xRTT Demodulator

Parameter	Measured Value	Specification
At 870.03 MHz, -30 dBm Level, cdmaOne		
Frequency Error	Hz	±20 Hz
Rho		$0.99 \leq x \leq 1$
Tau	µs	±1 µs
At 1930.05 MHz, -30 dBm Level, cdmaOne		
Frequency Error	Hz	±20 Hz
Rho		$0.99 \leq x \leq 1$
Tau	µs	±1 µs
At 1930.05 MHz, -30 dBm Level, CDMA2000		
Frequency Error	Hz	±20 Hz
Rho		$0.99 \leq x \leq 1$
Tau	µs	±1 µs
At 870.03 MHz, -30 dBm Level, CDMA2000		
Frequency Error	Hz	±20 Hz
Rho		$0.99 \leq x \leq 1$
Tau	µs	±1 µs

MS2718B, Firmware Revision: _____ Operator: _____ Date: _____
MS2719B

Serial Number: _____ Options: _____

WCDMA/HSDPA Signal Analyzer Verification

(Option 44, Option 45 and/or Option 65)

Table A-49. Sensor A and Sensor B Reading Components Characterization at 881.5 Mhz

PMA.10	PMB.10	Δ1	PMA.10C	PMA.18	ATT.18
dBm	dBm	dB	dBm	dBm	dB

Calculations:

$$\Delta 1 \text{ (dB)} = (10 \text{ dBm} - \text{PMB.10})$$

$$\text{PMA.10C} = \text{PMA.10} + \Delta 1$$

$$\text{ATT.18} = (\text{PMA.10} - \text{PMA.18})$$

Table A-50. Power Level Setting Components Characterization at 881.5 Mhz

MG3700A.10 Setting	MG3700A.28 Setting	PMA-10	PMA-20
dBm	dBm	dBm	dBm

Calculations:

$$\text{MG3700A.28} = \text{MG3700A.10} + \text{ATT.18}$$

$$\text{PMA-10} = \text{PMA.10C} - 20$$

$$\text{PMA-20} = \text{PMA.10C} - 30$$

MS2718B, Firmware Revision: _____ Operator: _____ Date: _____
MS2719B

Serial Number: _____ Options: _____

Option 44

A. WCDMA and HSDPA RF Measurements

Table A-51. WCDMA Absolute Power Accuracy

Test Level	Measured Power	Error	Error Specification
+28 dBm	dBm	dB	±1.25 dB
+10 dBm	dBm	dB	±1.25 dB
-10 dBm	dBm	dB	±1.25 dB
-20 dBm	dBm	dB	±1.25 dB

Calculations:

$$\text{Error} = \text{Measured Power} - (+10)$$

$$\text{Error} = \text{Measured Power} - (+28)$$

$$\text{Error} = \text{Measured Power} - (-10)$$

$$\text{Error} = \text{Measured Power} - (-20)$$

B. WCDMA Occupied Bandwidth (OBW) Verification

Table A-52. WCDMA Occupied Bandwidth (OBW)

Frequency	Power Meter Reading	OBW	Specification
881.5 MHz	dBm		4.2 MHz ±100 kHz
1962.5 MHz	dBm		4.2 MHz ±100 kHz
2680.5 MHz	dBm		4.2 MHz ±100 kHz

MS2718B, Firmware Revision: _____ Operator: _____ Date: _____
 MS2719B

Serial Number: _____ Options: _____

C. WCDMA RF Channel Power Accuracy and ACLR Verification

Table A-53. WCDMA RF Channel Power Accuracy

Frequency	Power Meter Reading	Measured RF Channel Power	RF CH Power Error	Error Specification
881.5 MHz	dBm	dBm	dB	±1.25 dB max
1962.5 MHz	dBm	dBm	dB	±1.25 dB max
2680.5 MHz	dBm	dBm	dB	±1.25 dB max

Calculations:

$$\text{RF Channel Power Error (dB)} = \text{Measured RF Channel Power} - 0.246 - \text{Power Meter reading}$$

Table A-54. WCDMA ACLR Accuracy

Frequency / Offset	Measured ACLR	Calculated ACLR Error	Error Specification
881.5/-10 MHz	dB	dB	±0.8 dB
881.5/-5 MHz	dB	dB	±0.8 dB
881.5/5 MHz	dB	dB	±0.8 dB
881.5/10 MHz	dB	dB	±0.8 dB
1962.5/-10 MHz	dB	dB	±0.8 dB
1962.5/-5 MHz	dB	dB	±0.8 dB
1962.5/5 MHz	dB	dB	±0.8 dB
1962.5/10 MHz	dB	dB	±0.8 dB
2680.5/-10 MHz	dB	dB	±1.0 dB
2680.5/-5 MHz	dB	dB	±1.0 dB
2680.5/5 MHz	dB	dB	±1.0 dB
2680.5/10 MHz	dB	dB	±1.0 dB

Calculations:

$$\text{ACLR Error at } -10 \text{ or } +10 \text{ MHz Offset} = 10 \text{ LOG}_{10}(10^{(-50/10)} + 10^{(\text{Measured_ACLR}/10)}) - (-50) \text{ dB}$$

$$\text{ACLR Error at } -5 \text{ or } +5 \text{ MHz Offset} = 10 \text{ LOG}_{10}(10^{(-45/10)} + 10^{(\text{Measured_ACLR}/10)}) - (-45) \text{ dB}$$

MS2718B, Firmware Revision: _____ Operator: _____ Date: _____
 MS2719B

Serial Number: _____ Options: _____

C. HSPDA RF Channel Power Accuracy and ACLR Verification

Table A-55. HSDPA RF Channel Power Accuracy

Frequency	Power Meter Reading	Measured RF Channel Power	RF CH Power Error	Error Specification
2680.5 MHz	dBm	dBm	dB	±1.25 dB max

Calculations:

$$\text{RF Channel Power Error (dB)} = \text{Measured RF Channel Power} - 0.246 - \text{Power Meter reading}$$

Table A-56. HSDPA ACLR Accuracy

Frequency / Offset	Measured ACLR	Calculated ACLR Error	Error Specification
2680.5/-10 MHz	dB	dB	±1.0 dB
2680.5/-5 MHz	dB	dB	±1.0 dB
2680.5/5 MHz	dB	dB	±1.0 dB
2680.5/10 MHz	dB	dB	±1.0 dB

Calculations:

$$\text{ACLR Error at } -10 \text{ or } +10 \text{ MHz Offset} = 10 \text{ LOG}_{10} (10^{(-50/10)} + 10^{(\text{Measured_ACLR}/10)}) - (-50) \text{ dB}$$

$$\text{ACLR Error at } -5 \text{ or } +5 \text{ MHz Offset} = 10 \text{ LOG}_{10} (10^{(-45/10)} + 10^{(\text{Measured_ACLR}/10)}) - (-45) \text{ dB}$$

MS2718B, Firmware Revision: _____ Operator: _____ Date: _____
MS2719B

Serial Number: _____ Options: _____

Option 45 WCDMA Demodulator and Option 65 WCDMA/HSDPA Demodulator

Error Vector Magnitude (Test Model 4, Option 45 or Option 65)

Table A-57. WCDMA Error Vector Magnitude (EVM) (Test Model 4, Option 45 or Option 65)

Frequency	EVM	Specification
1962.5 MHz	%	≤ 2.5%

Table A-58. HSDPA Error Vector Magnitude (EVM) (Test Model 5, Option 65)

Frequency	EVM	Specification
1962.5 MHz	%	≤ 2.5%

Option 46 Fixed WiMAX RF Measurements

Table A-59. Fixed WiMAX Channel Power Accuracy

Frequency	Input Power	Measured Channel Power (RSSI)	Error	Error Specification
2600.5 MHz	-15 dBm	dBm	dB	±1.5 dB
2600.5 MHz	-50 dBm	dBm	dB	±1.5 dB
3600.5 MHz	-15 dBm	dBm	dB	±1.5 dB
3600.5 MHz	-50 dBm	dBm	dB	±1.5 dB
5600.5 MHz	-15 dBm	dBm	dB	±1.5 dB
5600.5 MHz	-50 dBm	dBm	dB	±1.5 dB

MS2718B, Firmware Revision: _____ Operator: _____ Date: _____
 MS2719B

Serial Number: _____ Options: _____

Option 47 Fixed WiMAX Residual EVM

Table A-60. Fixed WiMAX Residual EVM

Frequency	Power	BW	EVM (rms)	Specification
2600.5 MHz	-15 dBm	10 MHz	%	≤ 3.5%
2600.5 MHz	-50 dBm	10 MHz	%	≤ 3.5%
3600.5 MHz	-15 dBm	10 MHz	%	≤ 3.5%
3600.5 MHz	-50 dBm	10 MHz	%	≤ 3.5%
5600.5 MHz	-15 dBm	10 MHz	%	≤ 3.5%
5600.5 MHz	-50 dBm	10 MHz	%	≤ 3.5%

Option 47 Fixed WiMAX Frequency Error

Table A-61. Fixed WiMAX Frequency Error

Frequency	Power	Frequency Error Reading	Error Specification
2600.5 MHz	-50 dBm	Hz	± 260.05 Hz
5600.5 MHz	-50 dBm	Hz	± 560.05 Hz

Option 60 (TD-SCDMA RF Measurements) and Option 61 (TD-SCDMA Demodulator)

Table A-62. TD-SCDMA for Units with Option 60, 61 Installed Only (at 2010 MHz, -45 dBm Level)

Parameter	Specification	Opt. 60 Measured Value	Opt. 61 Measured Value
Channel Power (Error)	±1.0 dB	dB	
EVM	< 3%		%
Frequency Error	±20 Hz		Hz
Tau	±0.1 μs		μs

MS2718B, Firmware Revision: _____ Operator: _____ Date: _____
MS2719B

Serial Number: _____ Options: _____

Option 62 EVDO RF Measurements

Table A-63. Option 62 EVDO RF Measurements

Error Type	Measured Value	Specification
At 870.03 MHz, -50 dBm Level, 921.6 kps 8-PSK Modulation		
Channel Power Error	dB	±1.5 dB
At 1930.05 MHz, 0 dBm Level, 38.4 kps QPSK Modulation		
Channel Power Error	dB	±1.5 dB
At 1930.05 MHz, -50 dBm Level, 2457.6 kps 16-QAM Modulation		
Channel Power Error	dB	±1.5 dB
At 1930.05 MHz, -50 dBm Level, Idle Slot		
Channel Power Error	dB	±1.5 dB
At 870.03 MHz, -10 dBm Level, Idle Slot		
Channel Power Error	dB	±1.5 dB

MS2718B, Firmware Revision: _____ Operator: _____ Date: _____
MS2719B

Serial Number: _____ Options: _____

Option 63 EVDO Demodulator

Table A-64. Option 63 EVDO Demodulator

Parameter	Measured Value	Specification
At 870.03 MHz, -50 dBm Level, 921.6 kps 8-PSK Modulation		
Frequency Error	Hz	± 20 Hz
Rho		$0.99 \leq x \leq 1$
Tau	μs	± 1 μs
At 1930.05 MHz, 0 dBm Level, 38.4 kps QPSK Modulation		
Frequency Error	Hz	± 20 Hz
Rho		$0.99 \leq x \leq 1$
Tau	μs	± 1 μs
At 1930.05 MHz, -50 dBm Level, 2457.6 kps 16-QAM Modulation		
Frequency Error	Hz	± 20 Hz
Rho		$0.99 \leq x \leq 1$
Tau	μs	± 1 μs
At 1930.05 MHz, -50 dBm Level, Idle Slot		
Frequency Error	Hz	± 20 Hz
Rho		$0.99 \leq x \leq 1$
Tau	μs	± 1 μs
At 870.03 MHz, -10 dBm Level, Idle Slot		
Frequency Error	Hz	± 20 Hz
Rho		$0.99 \leq x \leq 1$
Tau	μs	± 1 μs

MS2718B, Firmware Revision: _____ Operator: _____ Date: _____
MS2719B

Serial Number: _____ Options: _____

Option 66 Mobile WiMAX RF Measurements

Table A-65. Mobile WiMAX Channel Power Accuracy (10 MHz Bandwidth and 10 ms Frame Length)

Frequency	Input Power	Measured Channel Power (RSSI)	Error	Specification
2600.5 MHz	-15 dBm	dBm	dB	±1.5 dB
2600.5 MHz	-50 dBm	dBm	dB	±1.5 dB
3600.5 MHz	-15 dBm	dBm	dB	±1.5 dB
3600.5 MHz	-50 dBm	dBm	dB	±1.5 dB

Table A-66. Mobile WiMAX Channel Power Accuracy (5 MHz Bandwidth and 5 ms Frame Length)

Frequency	Input Power	Measured Channel Power (RSSI)	Error	Specification
2600.5 MHz	-15 dBm	dBm	dB	±1.5 dB
2600.5 MHz	-50 dBm	dBm	dB	±1.5 dB
3600.5 MHz	-15 dBm	dBm	dB	±1.5 dB
3600.5 MHz	-50 dBm	dBm	dB	±1.5 dB

MS2718B, Firmware Revision: _____ Operator: _____ Date: _____
MS2719B

Serial Number: _____ Options: _____

Option 67 Mobile WiMAX Demodulator

Table A-67. Mobile WiMAX Residual EVM (10 MHz Bandwidth and 10 ms Frame Length)

Frequency	Power	BW	EVM (rms)	Specification
2600.5 MHz	-15 dBm	10 MHz	%	≤ 3.0%
2600.5 MHz	-50 dBm	10 MHz	%	≤ 3.0%
3600.5 MHz	-15 dBm	10 MHz	%	≤ 3.0%
3600.5 MHz	-50 dBm	10 MHz	%	≤ 3.0%

Table A-68. Mobile WiMAX Frequency Error (10 MHz Bandwidth and 10 ms Frame Length)

Frequency	Power	Frequency Error	Specification
2600.5 MHz	-50 dBm	Hz	±52.01 Hz (±0.02 ppm)
3600.5 MHz	-50 dBm	Hz	±72.01 Hz (±0.02 ppm)

Table A-69. Mobile WiMAX Residual EVM (5 MHz Bandwidth and 5 ms Frame Length)

Frequency	Power	BW	EVM (rms)	Specification
2600.5 MHz	-15 dBm	5 MHz	%	≤ 3.0%
2600.5 MHz	-50 dBm	5 MHz	%	≤ 3.0%
3600.5 MHz	-15 dBm	5 MHz	%	≤ 3.0%
3600.5 MHz	-50 dBm	5 MHz	%	≤ 3.0%

Table A-70. Mobile WiMAX Frequency Error (5 MHz Bandwidth and 5 ms Frame Length)

Frequency	Power	Frequency Error	Specification
2600.5 MHz	-50 dBm	Hz	±52.01 Hz (±0.02 ppm)
3600.5 MHz	-50 dBm	Hz	±72.01 Hz (±0.02 ppm)

J4003, LCD	5-22
J4005, backlight driver PCB	5-21
J4005, SPA PCB to motherboard	5-22
J5006, keypad	5-22
J5010, rotary knob	5-21

O

option	
44, HSDPA	
channel power verification	3-19
44, WCDMA	
absolute power accuracy	3-9
channel power verification	3-16
OBW verification	3-14
45, EVM verification	3-22
65, EVM test	3-24
65, EVM verification	3-22
signal analyzer	
CDMA	3-6
GSM/GPRS/EDGE	3-2
WCDMA/HSDPA	3-9

P

parts list	1-5
performance	
absolute amplitude accuracy	2-18
CDMA verification	3-6
DANL	2-10
EVDO verification	3-31
frequency accuracy	2-2
GSM/GPRS/EDGE verification	3-2
IRS signals	2-14
Mobile WiMAX verification	3-35
residual spurious response	2-12
RF input VSWR verification	2-27
second harmonic distortion	2-6
SSB phase noise verification	2-3
TOI verification	2-7
WCDMA/HSDPA verification	3-9

power conditioner (EMI filter)	5-6
power input module	5-6

R

recommended test equipment	1-2
removal and replacement	
backlight driver PCB	5-10
battery, RTC	5-5
enclosure-chassis	5-2
fan	5-8
front panel	5-11
front panel bezel	5-3
fuse	5-1
J2 connector	5-17
J2 connector image	5-18
keypad	
mode function	5-19
numeric	5-17
LCD display	5-14
Main PCB	5-21
mode function keypad	5-19
numeric keypad	5-17
power input module	5-6
power supply	5-9
SPA PCB	5-25
repairs, service centers	1-7
replacement parts list	1-5
RTV adhesive	5-5, 5-17, 5-18, 5-20

S

Safety Symbols	
For Safety	Safety-2
In Manuals	Safety-1
On Equipment	Safety-1
service centers	1-7
setup	
absolute amplitude	
50 MHz test	2-19
50 MHz verify	2-18
9 kHz power adj	2-23
9 kHz test	2-25
9 kHz verify	2-19
9 kHz volt measure	2-24
EVM test	3-22
HSDPA Channel Power test	3-19
interference ref freq adjustment	4-1
TOI test	
600 MHz	2-8
TOI verify	
600 MHz	2-7
WCDMA Channel Power test	3-16
WCDMA OBW test	3-14
WCDMA test	3-11
WCDMA verify	3-9

T

test equipment recommended 1-2
tests not within specifications 4-1
troubleshooting 1-6

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