

VectorStar™ ME7838x4/x4X Series Multiport Broadband/Banded Vector Network Analyzers

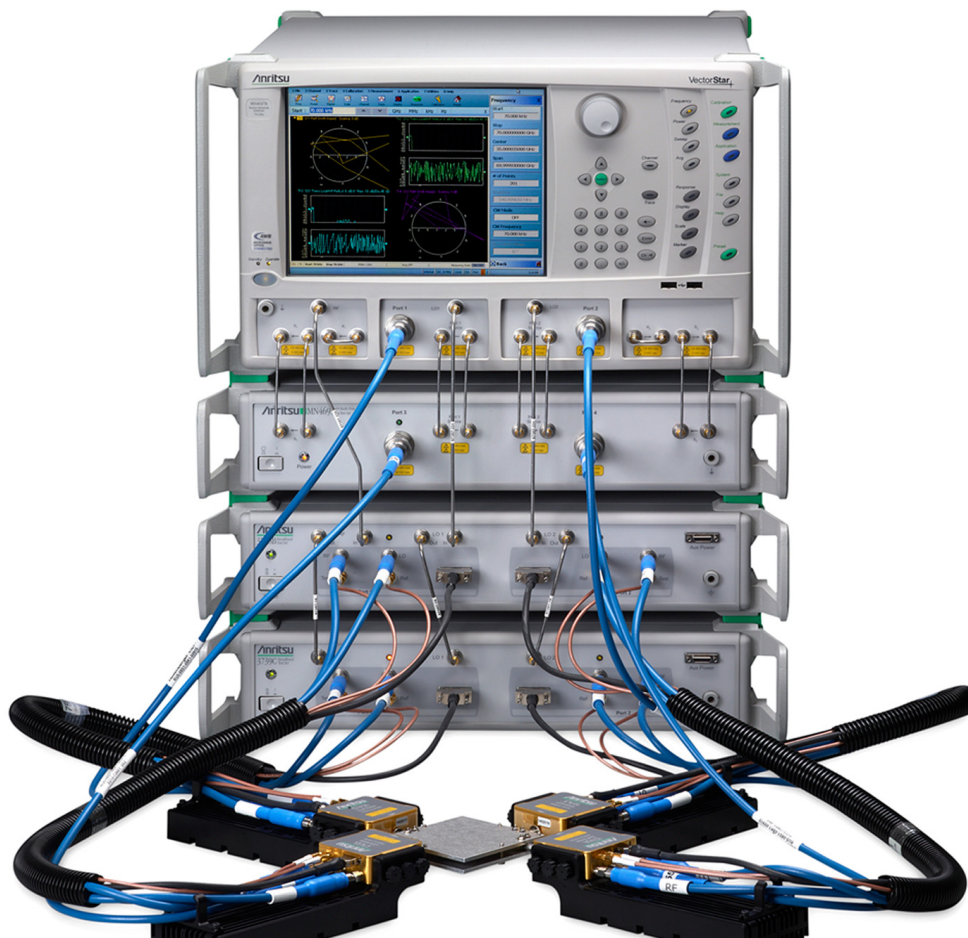
High Performance Modular Broadband/Banded mmWave Vector Network Analyzer (VNA) Multiport Measurement System

ME7838A4/A4X, 70 kHz to 110 (125) GHz

ME7838E4/E4X, 70 kHz to 110 GHz

ME7838D4, 70 kHz to 145 (150) GHz

ME7838G4, 70 kHz to 220 (226) GHz



Anritsu

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Chapter 1 — System Overview

1-1 Introduction

This manual provides instructions for setup and initial test of the VectorStar™ ME7838x4/x4X Multiport Broadband/Banded Millimeter Wave Vector Network Analyzer (VNA) System. The chapters are:

- **Chapter 1 — System Overview**

Provides an overview of the system, its major part numbers, options, and components.

- **Chapter 2 — System Assembly**

Describes the general assembly instructions and cabling procedures for the system.

- **Chapter 3 — ME7838x4/x4X Initial System Checkout**

Provides an initial system checkout for a completely assembled system. Also provides a quick checkout of the PC control system via the IEEE-488 GPIB interface. Once this procedure is complete, the system is ready for full calibration and system performance verification.

- **Appendix A — ME7838x4/x4X Series Multiport Specifications**

Provides a section tab for the

- VectorStar ME7838A4 Broadband/Banded mmWave VNA Technical Data Sheet – 11410-00704
- VectorStar ME7838AX/A4X Broadband/Banded mmWave VNA Technical Data Sheet – 11410-02825
- VectorStar ME7838D4 Broadband/Banded mmWave VNA Technical Data Sheet – 11410-01099
- VectorStar ME7838E4/E4X Broadband/Banded mmWave VNA Technical Data Sheet – 11410-02827
- VectorStar ME7838G4 Broadband/Banded mmWave VNA Technical Data Sheet – 11410-01196
- Other documents as required

See [Table 1-4, “ME7838x4/x4X Multiport Broadband/mmWave VNA System Components,”](#) on page 1-12 for a listing of each standard and optional configuration.

1-2 ME7838x4/x4X Series Multiport System Main Components

ME7838x4/x4X Broadband Systems

The ME7838x4/x4X Broadband Multiport system consists of the following components:

- MS4647A (ME7838A4/D4/E4 only) or MS4647B VNA with Option 007 (Receiver Offset), Option 070 (70 kHz Low End Frequency Extension), Option 08x (Modular Broadband Connection Capability)
- MN4697C Multiport Test Set
- 3736B Broadband Test Set
- 3739C Broadband Test Set
- Four 3743A/AX, 3743E/EX, MA25300A, or MA25400A mmWave Modules
- Front and rear panel cables

ME7838x4/x4X Banded Systems

The ME7838x4/x4X Banded Multiport system consists of the following components:

- MS4644A (ME7838A4/D4/E4 only) or MS4644B – or – MS4645A (ME7838A4/D4/E4 only) or MS4645B VNA with Option 082/083
- MN4694C Multiport Test Set
- 3736B Broadband Test Set
- 3739C Broadband Test Set
- Four 3744A-EE, 3744A-EW, or four OML/VDI mmWave Modules
- Front and rear panel cables

1-3 System Component Identification

Figure 1-1 shows the ME7838A4/A4X Multiport System major components.

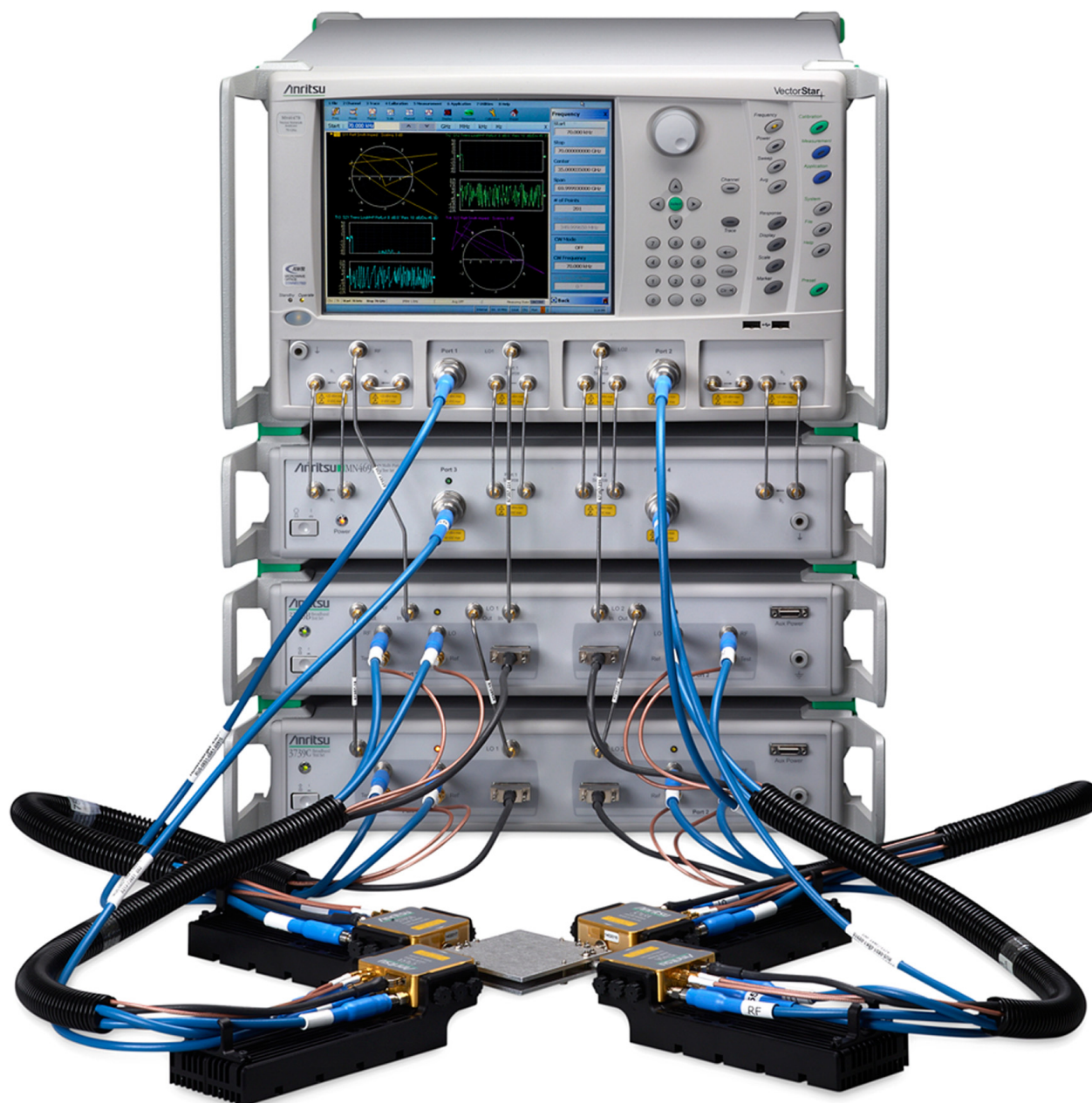


Figure 1-1. ME7838A4 Multiport System, with 3743A mmWave Modules

The ME7838A4/A4X, ME7838E4/E4X, ME7838D4, and ME7838G4 systems are the same except for the use of different mmWave Modules (3743A/AX/E/EX, MA25300A, or MA25400A respectively). The ME7838A4X system uses 3743AX modules and the ME7838E4X system uses 3743EX modules.

System Component and Front Panel Connector Identification

The ME7838x4/x4X Series Multiport System components and connectors are identified in [Figure 1-2](#) and [Table 1-1](#).

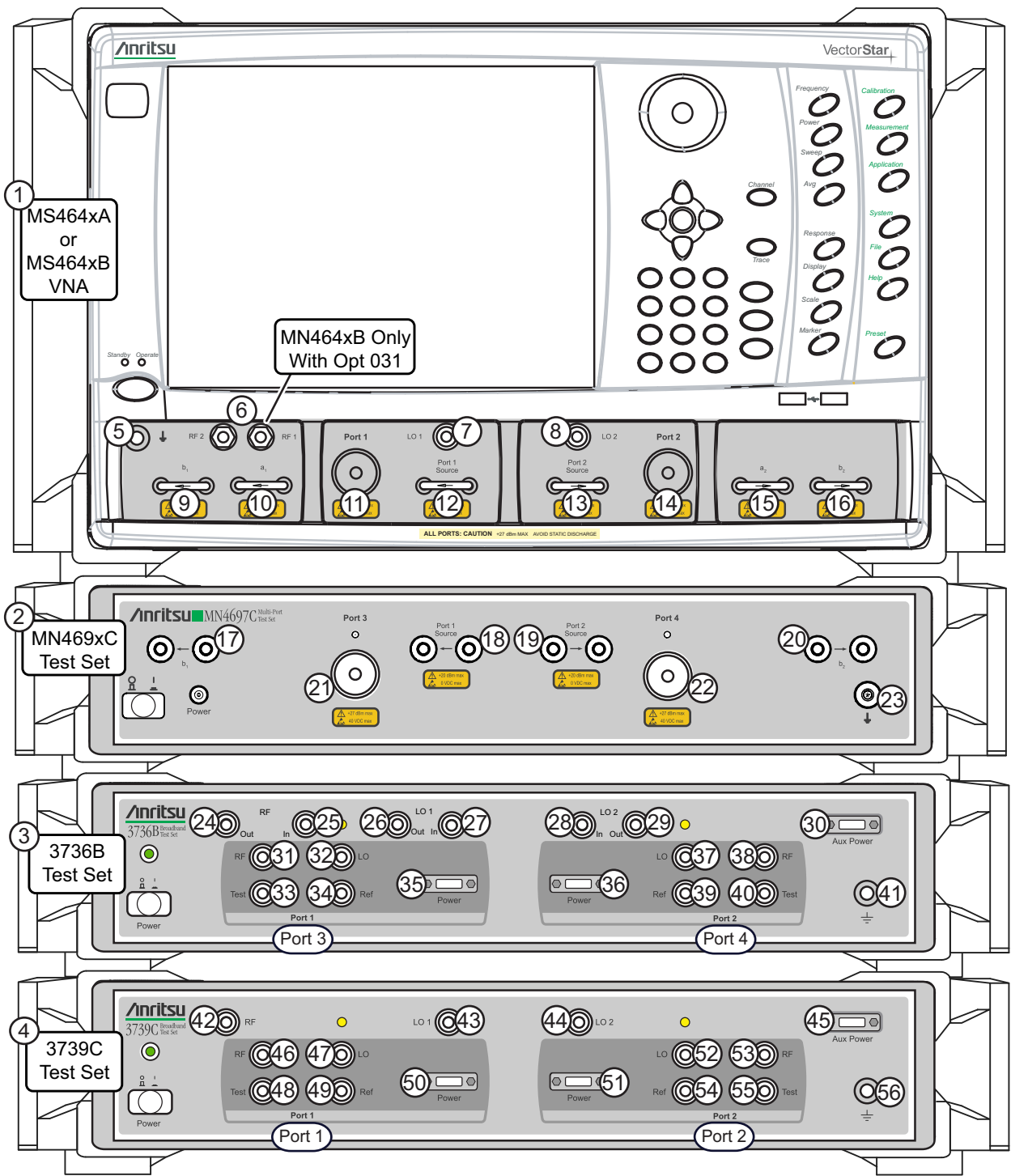


Figure 1-2. ME7838x4/x4X Series Multiport Components and Front Panel Connectors

Table 1-1. ME7838x4/x4XSeries Multiport Components and Front Panel Connectors

Index	Description	Index	Description
System Components		3736B Broadband Test Set (Continued)	
1	VectorStar MS464xA (ME7838A4/D4/E4 only) or MS464xB VNA	28	LO 2 Input
2	MN469xC – 4 Port Test Set	29	LO 2 Output
3	3736B Test Set	30	Aux Power Source
4	3739C Test Set	31	Port 3 RF
MS464xA/B VNA		32	Port 3 LO
5	Ground	33	Port 3 Test IF
6	RF Output • Single source port designated “RF” on MS464xA/B • Dual source ports designated “RF” 1 and “RF 2” on MS464xB only (with Option 031 Dual Source Architecture)	34	Port 3 Ref IF
7	LO 1 Output	35	Port 3 Power
8	LO 2 Output	36	Port 4 Power
9	b1 Direct Access Loop	37	Port 4 LO
10	a1 Direct Access Loop	38	Port 4 RF
11	Test Port 1	39	Port 4 Ref IF
12	Port 1 Source Direct Access Loop	40	Port 4 Test IF
13	Port 2 Source Direct Access Loop	41	Ground Port
14	Test Port 2	3739C Broadband Test Set	
15	a2 Direct Access Loop	42	RF Input
16	b2 Direct Access Loop	43	LO 1 Input
MN469xC Multiport Test Set		44	LO 2 Input
17	b1 Input/Output to VNA	45	Aux Power Source
18	Port 1 Source Input/Output to VNA	46	Port 1 RF
19	Port 2 Source Input/Output to VNA	47	Port 1 LO
20	b2 Input/Output to VNA	48	Port 1 Test IF
21	Test Port 3	49	Port 1 Ref IF
22	Test Port 4	50	Port 1 Power
23	Ground	51	Port 2 Power
3736B Broadband Test Set		52	Port 2 LO
24	RF Output	53	Port 2 RF
25	RF Input	54	Port 2 Ref IF
26	LO 1 Output	55	Port 2 Test IF
27	LO 1 Input	56	Ground

System Rear Panel Connector Identification (MS464xA VNA)

The ME7838x4/x4X Series Multiport System rear panel connectors are identified in [Figure 1-3](#) and [Table 1-2](#).

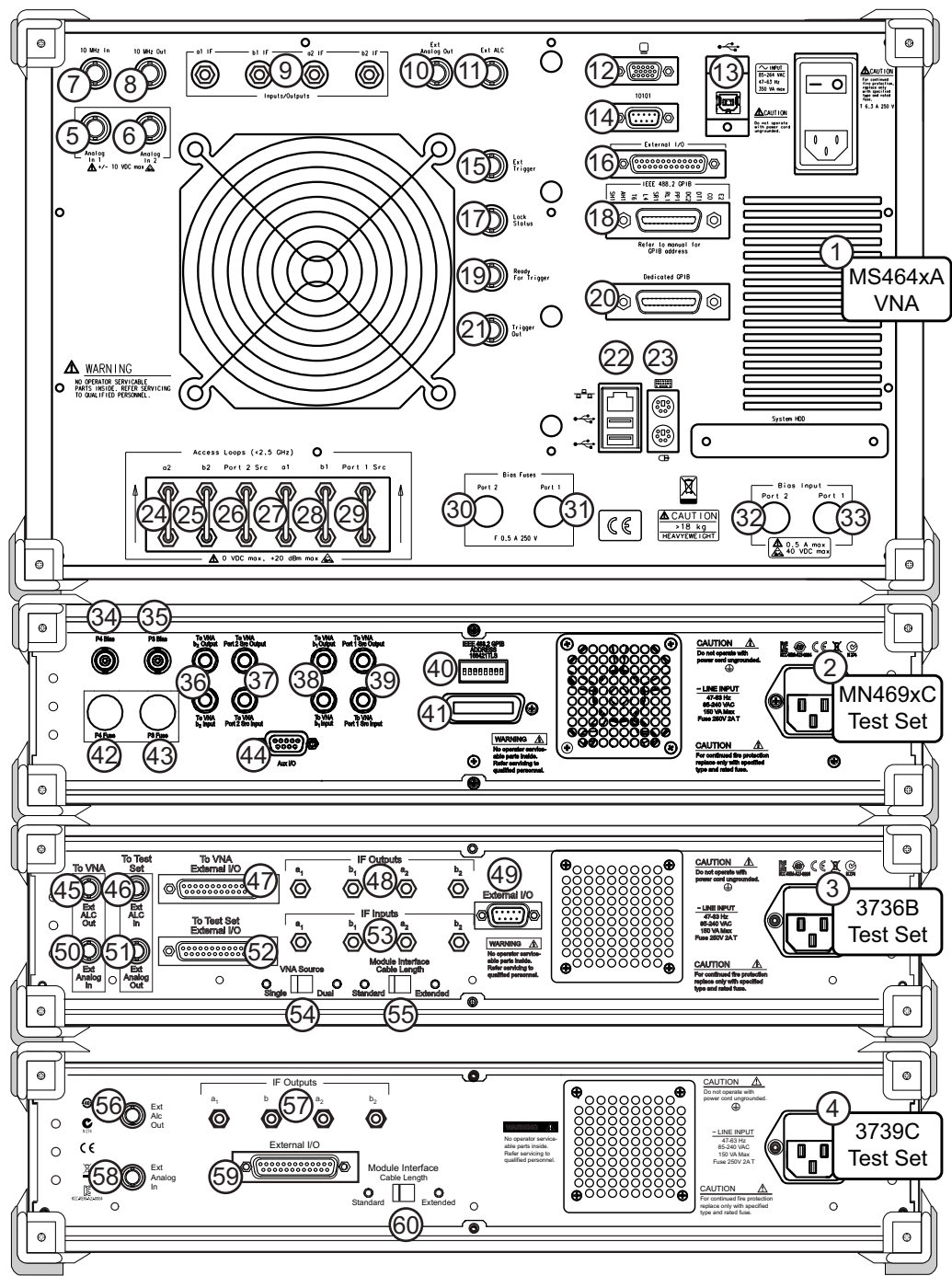


Figure 1-3. ME7838x4/x4X Multiport System Rear Panel Connector Identification (using MS464xA VNA)

Table 1-2. ME7838x4/x4X Series Multiport Components and Rear Panel Connectors (MS464xA VNA)

Index	Description	Index	Description
System		32	Bias Input – Port 2
1	VectorStar MS464xA VNA (ME7838A4/D4/E4 only)	33	Bias Input – Port 1
2	MN469xC 4 Port Test Set	MN469xC Multiport Test Set	
3	3736B Test Set	34	P4 Bias
4	3739C Test Set	35	P3 Bias
MS464xA VNA		36	b2 Input/Output to VNA
5	Analog In 1	37	Port 2 Src Input/Output to VNA
6	Analog In 2	38	b1 Input/Output to VNA
7	10 MHz In	39	Port 1 Src Input/Output to VNA
8	10 MHz Out	40	IEEE 488.2 GPIB Address
9	IF Inputs/Outputs a1, b1, a2, b2	41	IEEE 488.2 GPIB
10	External Analog Out	42	P4 Fuse
11	External ALC	43	P3 Fuse
12	External Monitor	44	Aux I/O Port
13	USB 2.0 Type B Port	3736B Broadband Test Set	
14	RS-232 Serial Port	45	External ALC Out – To VNA
15	Ext Trigger	46	External ALC In – To Test Set
16	External I/O Port	47	External I/O Port – To VNA
17	Lock Status	48	IF Outputs a1, b1, a2, b2
18	IEEE 488.2 GPIB Port	49	External I/O Port
19	Ready For Trigger	50	External Analog In – To VNA
20	Dedicated GPIB Port	51	External Analog Out – To Test Set
21	Trigger Out	52	External I/O Port – To Test Set
22	USB 2.0 Type A and Ethernet Ports	53	IF Inputs a1, b1 a2, b2
23	Keyboard and Mouse PS/2	54	VNA Single/Dual Source Switch
24	Access Port – a2	55	Module Interface Cable Length Switch
25	Access Port – b2	3739C Broadband Test Set	
26	Access Port – Port 2 Src	56	External ALC Out
27	Access Port – a1	57	IF Outputs a1, b1, a2, b2
28	Access Port – b1	58	External Analog In
29	Access Port – Port 1 Src	59	External I/O Port
30	Bias Fuse – Port 2	60	Module Interface Cable Length Switch
31	Bias Fuse – Port 1		

System Rear Panel Connector Identification (MS464xB VNA)

The ME7838x4/x4X Series Multiport System rear panel connectors are identified in [Figure 1-4](#) and [Table 1-3](#).

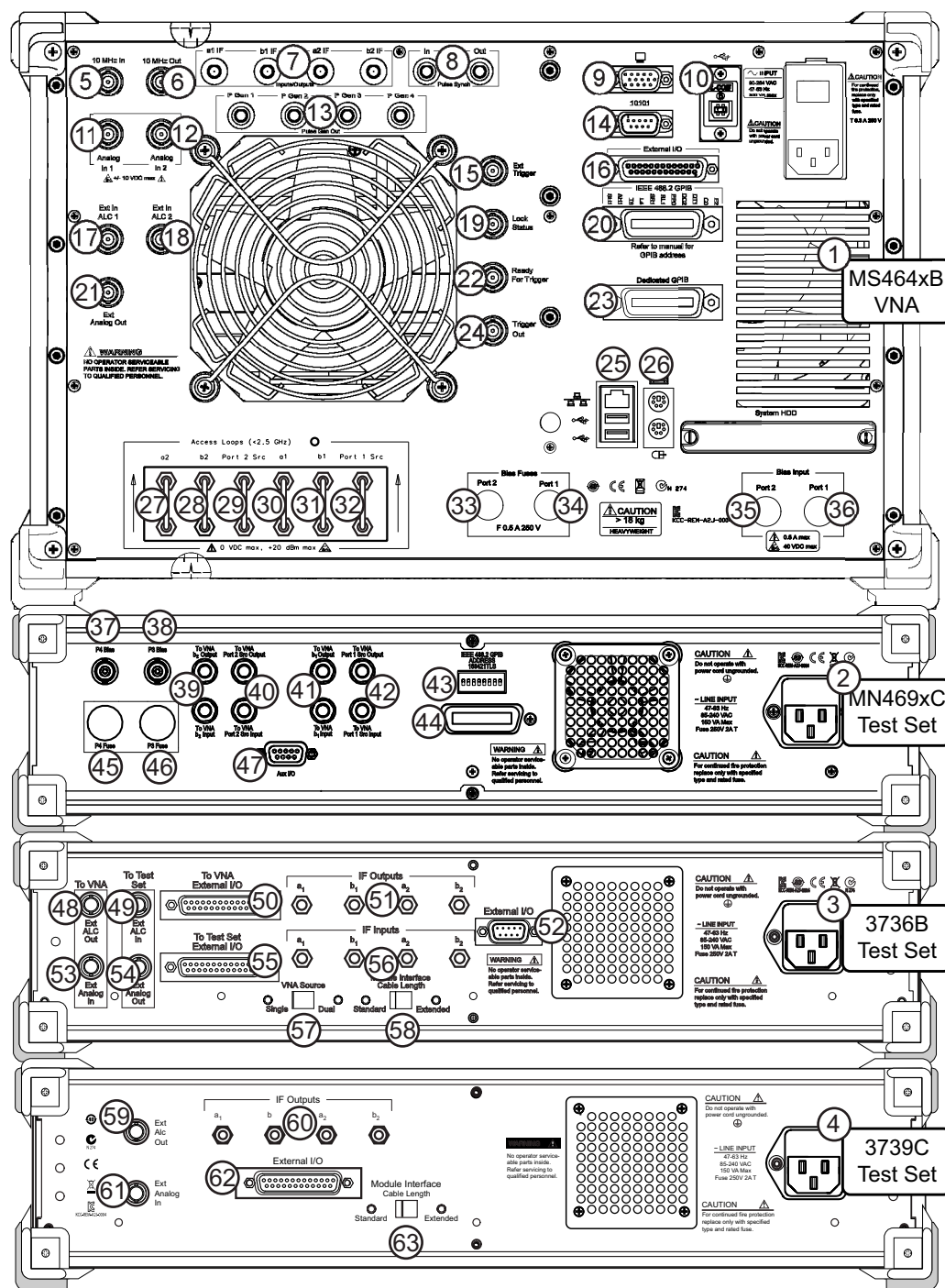


Figure 1-4. ME7838x4/x4X Multiport System Rear Panel Connector Identification (using MS464xB VNA)

Table 1-3. ME7838x4 Series Multiport Components and Rear Panel Connectors (MS464xB VNA)

Index	Description	Index	Description
System		33	Bias Fuse – Port 2
1	VectorStar MS464xB VNA	34	Bias Fuse – Port 1
2	MN469xC – MultiPort Test Set	35	Bias Input – Port 2
3	3736B Test Set	36	Bias Input – Port 1
4	3739C Test Set	MN469xC Multiport Test Set	
MS464xB VNA		37	P4 Bias
5	10 MHz In	38	P3 Bias
6	10 MHz Out	39	Lowband b2 Input/Output to VNA
7	IF Inputs/Outputs a1, b1, a2, b2	40	Lowband Port 2 Src Input/Output to VNA
8	Pulse Synch In/Out	41	Lowband b1 Input/Output to VNA
9	External Monitor	42	Lowband Port 1 Src Input/Output to VNA
10	USB 2.0 Type B Port	43	IEEE 488.2 GPIB Address
11	Analog In 1	44	IEEE 488.2 GPIB
12	Analog In 2	45	P4 Fuse
13	Pulse Gen Out – P Gen1/2/3/4	46	P3 Fuse
14	RS-232 Serial Port	47	Aux I/O Port
15	Ext Trigger	3736B Broadband Test Set	
16	External I/O Port	48	External ALC Out – To VNA
17	External In – ALC 1	49	External ALC In – To Test Set
18	External In – ALC 2	50	External I/O Port – To VNA
19	Lock Status	51	IF Outputs a1, b1, a2, b2
20	IEEE 488.2 GPIB Port	52	External I/O Port
21	External Analog Out	53	External Analog In – To VNA
22	Ready For Trigger	54	External Analog Out – To Test Set
23	Dedicated GPIB Port	55	External I/O Port – To Test Set
24	Trigger Out	56	IF Inputs a1, b1, a2, b2
25	USB 2.0 Type A and Ethernet Ports	57	VNA Single/Dual Source Switch
26	Keyboard and Mouse PS/2	58	Module Interface Cable Length Switch
27	Access Port – a2	3739C Broadband Test Set	
28	Access Port – b2	59	External ALC Out
29	Access Port – Port 2 Src	60	IF Outputs a1, b1, a2, b2
30	Access Port – a1	61	External Analog In
31	Access Port – b1	62	External I/O Port
32	Access Port – Port 1 Src	63	Module Interface Cable Length Switch

mmWave Modules

The 3743A/AX, 3743E/EX, MA25300A, or MA25400A connect to the 3736B and 3739C Test Set ports and to Test Port 1 through Test Port 4 on the MN4697C. The 3744A-xx mmWave Modules connect only to the ports on the 3736B and 3739C Test Sets.

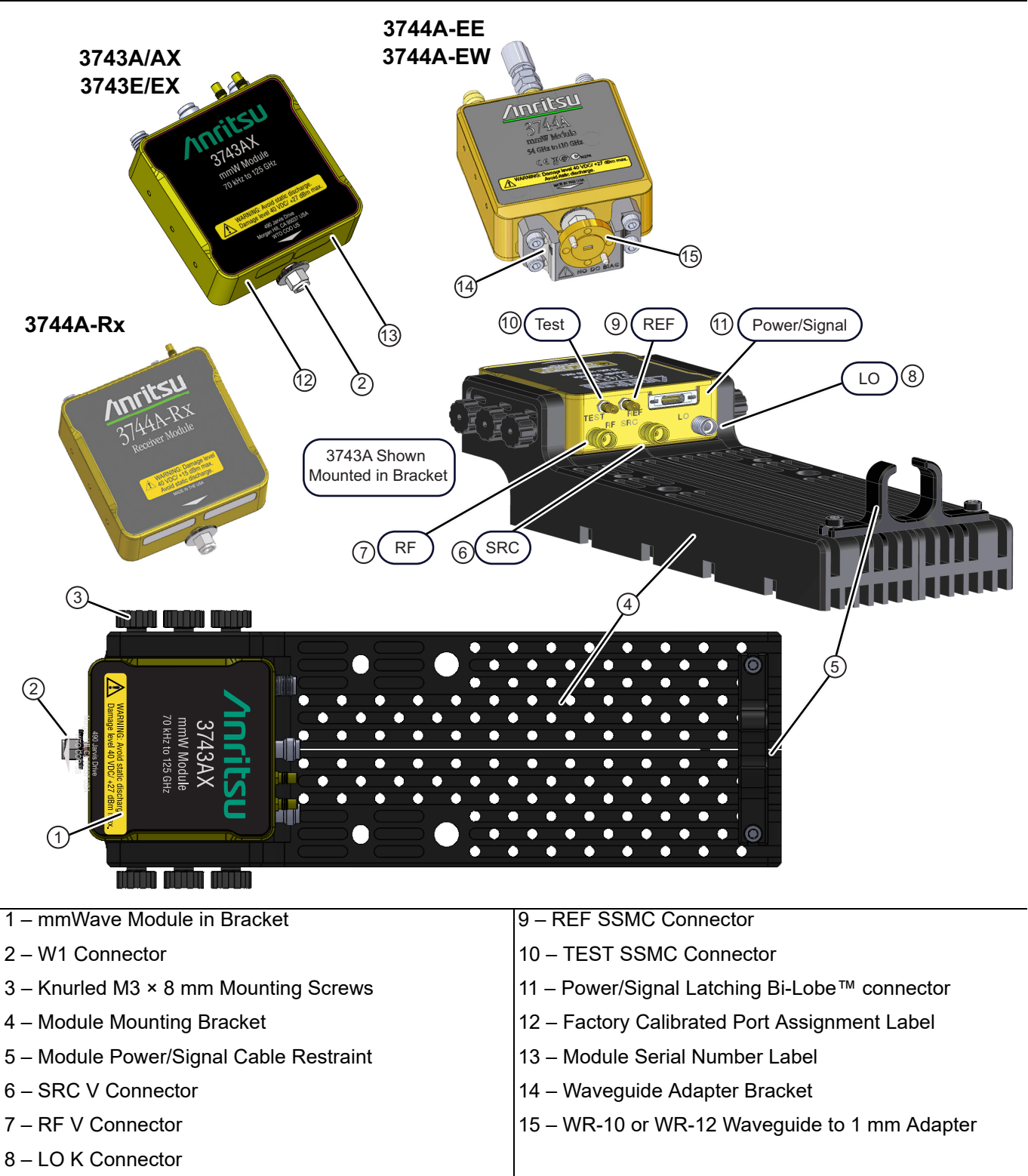
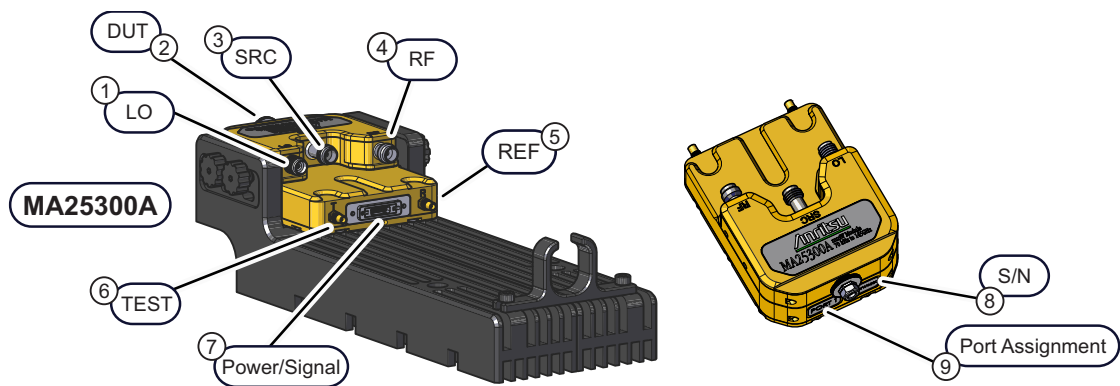
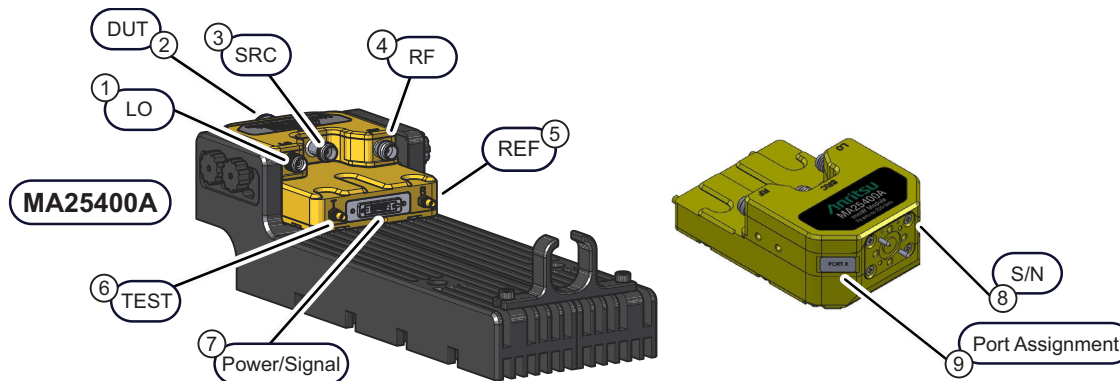


Figure 1-5. mmWave Modules in Brackets (1 of 2)



MA25300A Millimeter Wave Module in Bracket

- | | |
|----------------------|--|
| 1 – LO K Connector | 5 – REF SSMC Connector |
| 2 – 0.8 mm Connector | 6 – TEST SSMC Connector |
| 3 – SRC V Connector | 7 – Power/Signal Latching Bi-Lobe™ connector |
| 4 – RF V Connector | 8 – Module Serial Number Label |
| | 9 – Factory Calibrated Port Assignment Label |



MA25400A Millimeter Wave Module in Bracket

- | | |
|-------------------------------------|--|
| 1 – LO K Connector | 5 – REF SSMC Connector |
| 2 – 0.6 mm Coaxial Flange Connector | 6 – TEST SSMC Connector |
| 3 – SRC V Connector | 7 – Power/Signal Latching Bi-Lobe™ connector |
| 4 – RF V Connector | 8 – Module Serial Number Label |
| | 9 – Factory Calibrated Port Assignment Label |

Figure 1-5. mmWave Modules in Brackets (2 of 2)

Note

The left-side and right-side mmW modules are identical. The modules have the same connector orientation and sequence and can be used on either port. There is no module right-hand or left-hand orientation.

However, in the as-shipped configuration (except for the 3744A-Rx Module) each module is calibrated for a specific VNA serial number and a specific VNA Test Port. The module labels indicate the calibrated port assignment.

1-4 ME7838x4/x4X Series Configuration Part Numbers

The ME7838x4/x4X Series Multiport VNA system configuration uses different combinations of the components listed in the table below. Additional configuration information is available in the relevant technical data sheet. Refer to [Appendix A — ME7838x4/x4X Series Multiport Specifications](#) for the TDS part number.

Table 1-4. ME7838x4/x4X Multiport Broadband/mmWave VNA System Components (1 of 4)

Applicable ME7838x4/x4X System	Part Number	Description	Specifications
VNA Configuration			
ME7838x4/x4X	MS4647A (ME7838A4/D4/E4 only) MS4647B	VectorStar MS4647A/B Vector Network Analyzer (VNA) MS4647B required for ME7838A4X/E4X/G4 systems.	10 MHz to 70 GHz V (m) Test Ports
	MS4640A-007 MS4640B-007	Receiver Offset Option	—
	MS4640A-002 MS4640B-002	Time Domain Option	—
	MS4640A-070 MS4640B-070	70 kHz Low End Frequency Extension Option	70 kHz to 10 MHz • 70 kHz low end is specified for the option. • 40 kHz is allowed for the option.
ME7838A4/D4/G4 ^a	MS4647A-08x (ME7838A4/D4 only) MS4647B-08x	VectorStar MS4647A/B-081 VNA Broadband System Option MS4647B required for ME7838A4X/E4X/G4 systems.	Use Option 051, 061, or 062
	MS464xA-08x MS464xB-08x	VectorStar MS4644A/B-083 VNA Banded System Option	Use Option 051, 061, or 062
ME7838E4 ^b	MS4647A-08x MS4647B-08x	VectorStar MS4647A/B-087 VNA Broadband/Banded System Option	Use Option 051, 061, or 062
ME7838x4/x4X	MN4697C	Multiport Test Set (Broadband)	With front/rear panel interface cables
	MN4694C	Multiport Test Set (Banded)	With front/rear panel interface cables
	3736B	Broadband Test Set	With front/rear panel interface cables
	3739C	Broadband Test Set	With front/rear panel interface cables

Table 1-4. ME7838x4/x4X Multiport Broadband/mmWave VNA System Components (2 of 4)

Applicable ME7838x4/x4X System	Part Number	Description	Specifications
mmWave Modules			
ME7838G4	MA25400A	Broadband mmWave Module	70 kHz to 220 (226) GHz
ME7838D4	MA25300A	Broadband mmWave Module	70 kHz to 145 (150) GHz
ME7838A4/A4X	3743A/AX	Broadband mmWave Module	70 kHz to 110 (125) GHz
	3744A-EE	Banded mmWave Module	56 GHz to 95 GHz
	3744A-EW	Banded mmWave Module	65 GHz to 110 GHz
	3744A-Rx	Receiver Module	30 GHz to 110 GHz
ME7838E4/E4X	3743E/EX	Broadband mmWave Module	70 kHz to 110 GHz
	3744E-EE	Banded mmWave Module	56 GHz to 95 GHz
	3744E-EW	Banded mmWave Module	65 GHz to 110 GHz
	3744E-Rx	Receiver Module	30 GHz to 110 GHz
OML/VDI mmWave Frequency Extension Modules			
ME7838x4/x4X	VxxVNA2-xx	OM	50 GHz to 500 GHz
	WRxxxx	VDI	50 GHz to 750 GHz (1.1 THz)
Waveguide Adapter Kits			
ME7838x4/x4X	3-74394-1 ^c	Waveguide Accessory Kit, 3744A-EE and 3744A-EW	—
	SM6540	WG Adapter Kit, V Band	WR-15
	35WR12WF-EE	WG Adapter Kit, E Band	WR-12
	35WR10WF-EW	WG Adapter Kit, W Band	WR-10
	ME7838x4/x4X-SS 020	On-Site System Assembly and Verification	—

Table 1-4. ME7838x4/x4X Multiport Broadband/mmWave VNA System Components (3 of 4)

Applicable ME7838x4/x4X System	Part Number	Description	Specifications
Interconnect Cable Part Numbers			
ME7838x4/x4X	3-67357-18	K male-male semi-rigid cables	—
	3-67357-19	K male-male semi-rigid cables	—
	3-67357-38	K male-male semi-rigid cables	—
	3-67357-230	K male-male semi-rigid cables	—
	3-67357-231	K male-male semi-rigid cables	—
	3-67357-232	K male-male semi-rigid cables	—
	3-62109-142	V male-male semi-rigid cables	—
	3-62112-80	SMA male-male semi-rigid cables	—
	3-62112-81	SMA male-male semi-rigid cables	—
	3-73598-1	SMA male-male flexible cables	—
	3-80734	SMA male-male flexible cables	—
	3-75685-1	mmWave Module Interface Cables (for 3743A/AX/E/EX, 3744A-EE, 3744A-EW modules) Group of 5 cables for each port	—
	3-75685-2	OML Module Interface Cables Group of 4 cables for each port	—
		VDI Module Interface Cables Group of 4 cables for each port	—
	3-75685-3	mmWave Module Interface Cables (for 3744A-Rx modules) Group of 3 cables for each port	—
Coaxial Cable Option			
ME7838x4/x4X	806-206-R	1.85 mm Interconnect Cable	70 cm (24 inches) • V (m) to V (f) • 2 cables
	806-209-R	1.85 mm Interconnect Cable	91.5 cm (36 inches) • V (m) to V (f) • 2 cables

Table 1-4. ME7838x4/x4X Multiport Broadband/mmWave VNA System Components (4 of 4)

Applicable ME7838x4/x4X System	Part Number	Description	Specifications
MS464xA (ME7838A4/D4/E4 only) or MS464xB VNA Front Panel Options			
ME7838x4/x4X	MS4647A/B-051 MS4644A/B-051	Front Panel Loops	6 Front Panel Loops • Provides front and rear panel loops for b1, a1, Port 1 Source, Port 2 Source, a2, and b2
	MS4647A/B-061 MS4644A/B-061	Active Measurement Suite	2 Attenuators • Includes front and rear panel loops above with two (2) attenuators, bias tees in test set, gain compression, and efficiency measurement software.
	MS4647A/B-062 MS4644A/B-062	Active Measurement Suite	4 Attenuators • Includes front and rear panel loops above with four (4) attenuators, bias tees in test set, gain compression, and efficiency measurement software.

a.Option 85 is required if the VNA has Option 31.

b.Option 89 is required if the VNA has Option 31.

c. The 3-74394-1 Waveguide Accessory Kit comes without the adapter bracket, the waveguide to coax adapter, and the V210 termination. These items come already attached to the 3744A-EE and 3744A-EW mmW modules.

1-5 Calibration/Verification Kits

The Calibration and Verification Kit with Performance Verification Software is recommended in applications using coaxial cable. The kit comes with the calibration/verification hardware and the system performance verification software (PVS). The 0.8 mm kit is generally used with the ME7838D4/G4 systems and the 1mm kit is used with the ME7838A4/A4X and ME7838E4/E4X systems. For additional information, see:

- VectorStar 3656C W1 Calibration/Verification Kit and 2300-584-R PVS User Guide – 10410-00784
- VectorStar 3659 0.8 mm Calibration/Verification Kit and 2300-616-R PVS User Guide – 10410-00327

1-6 Performance Specifications

System performance specifications for the VectorStar™ ME7838x4 Broadband/Millimeter Wave VNA System are located at <http://www.anritsu.com> in the following data sheets:

- VectorStar ME7838A4 Broadband/Banded mmWave VNA Technical Data Sheet – 11410-00704
- VectorStar ME7838AX/A4X Broadband/Banded mmWave VNA Technical Data Sheet – 11410-02825
- VectorStar ME7838D4 Broadband/Banded mmWave VNA Technical Data Sheet – 11410-01099
- VectorStar ME7838E4 Broadband/Banded mmWave VNA Technical Data Sheet – 11410-01100
- VectorStar ME7838E4/E4X Broadband/Banded mmWave VNA Technical Data Sheet – 11410-02827
- VectorStar ME7838G4 Broadband/Banded mmWave VNA Technical Data Sheet – 11410-01196

1-7 VNA System Documentation List

The following documentation sets are available in support of the ME7838x4/x4X Series systems. All documents listed in this section are available at <http://www.anritsu.com>.

VectorStar ME7838x4 Series Multiport BB/mmWave VNA Measurement System

- VectorStar ME7838A4 Broadband/Banded mmWave VNA Technical Data Sheet – 11410-00704
- VectorStar ME7838AX/A4X Broadband/Banded mmWave VNA Technical Data Sheet – 11410-02825
- VectorStar ME7838D4 Broadband/Banded mmWave VNA Technical Data Sheet – 11410-01099
- VectorStar ME7838EX/E4X Broadband/Banded mmWave VNA Technical Data Sheet – 11410-02827
- VectorStar ME7838E4 Broadband/Banded mmWave VNA Technical Data Sheet – 11410-01100
- VectorStar ME7838G4 Broadband/Banded mmWave VNA Technical Data Sheet – 11410-01196
- VectorStar ME7838A4/A4X Series Multiport BB/mmWave Quick Start Guide (QSG) – 10410-00292
- VectorStar ME7838D4/G4 Series Multiport BB/mmWave Quick Start Guide (QSG) – 10410-00770
- VectorStar ME7838E4/E4X Series Multiport BB/mmWave Quick Start Guide (QSG) – 10410-00771
- VectorStar ME7838x4/x4X Series Multiport BB/mmWave Installation Guide (IG) – 10410-00734
- Broadband/Banded mmWave Module Reference Manual (RM) – 10410-00311

VectorStar™ MS464xA Series Vector Network Analyzer

- MS464xA Series VNA Technical Data Sheet – 11410-00432
- MS464xA Series VNA Operation Manual (OM) – 10410-00266
- MS464xA Series VNA Measurement Guide (MG) – 10410-00269
- MS464xA Series VNA Programming Manual (PM) – 10410-00267
- MS464xA Series VNA Help System (OM, PM, and MG) – 10450-00008
- MS464xA Series VNA Maintenance Manual (MM) – 10410-00268
- MS464xA Series VNA User Documentation Disc – 10920-00049

VectorStar™ MS464xB Series Vector Network Analyzer

- MS464xB Series VNA Technical Data Sheet – 11410-00611
- MS464xB Series VNA Operation Manual – 10410-00317
- MS464xB Series VNA Measurement Guide – 10410-00318
- MS464xB Series VNA User Interface Reference Manual – 10410-00319
- MS464xB Series VNA Maintenance Manual – 10410-00320
- MS464xB Series VNA Programming Manual – 10410-00322
- MS464xB Series VNA Programming Manual Supplement – 10410-00323
- MS464xB Series VNA User Help System – 10450-00040

VectorStar™ MN469xC Series Multiport VNA Measurement System

- MN469xC Series Multiport VNA Measurement System Technical Data Sheet – 11410-00777
- MN4690C Series Multiport Test Set Installation Guide – 10410-00737
- MN469xC Series Multiport Test Set Quick Start Guide – 10410-00738
- MN469xC Series Multiport Test Set Maintenance Manual – 10410-00730

Calibration, Verification, and System Performance Verification

- 36585K and 36585V Precision Auto Calibrator (AutoCal™) Module Reference Manual – 10410-00279
- 3650A, 3652A, and 3654D Mechanical Calibration Kit Reference Manual – 10410-00278
- 3666-1, 3668-1, 3669B-1 Verification Kits and 3-2300-527 Performance Verification Software (PVS) User Guide – 10410-00270
- 3666-1, 3668-1, 3669B-1 Verification Kits and 3-2300-527 PVS Quick Start Guide – 10410-00285
- VectorStar 3659 0.8 mm Calibration/Verification Kit and 2300-580-R PVS User Guide – 10410-00327
- VectorStar 3656B W1 Calibration/Verification Kit and Performance Verification Software User Guide – 10410-00286
- VectorStar 3656C W1 Calibration/Verification Kit and Performance Verification Software User Guide – 10410-00784

1-8 Related Documentation

Updated product information and documentation can be found on your product page:

<https://www.anritsu.com/test-measurement/products/ms4640b-series>

<https://www.anritsu.com/test-measurement/products/me7838x>

On this web page, you can select various tabs for more information about your instrument. Included is a Library tab that contains links to all the latest technical documentation related to this instrument.

1-9 Contacting Anritsu

To contact Anritsu, please visit:

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

From here, you can select the latest sales, select service and support contact information in your country or region, provide online feedback, complete a Talk to Anritsu form to have your questions answered, or obtain other services offered by Anritsu.

Updated product information can be found on the Anritsu web site:

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

Search for the product model number. The latest documentation is on the product page under the Library tab.

Example URL for MS464xB:

<https://www.anritsu.com/en-us/test-measurement/products/ms4640b-series>

Chapter 2 — System Assembly

2-1 Introduction

This chapter describes unpacking, assembly, and cabling procedures for the VectorStar™ ME7838x4/x4X Multiport Broadband/mmWave VNA Measurement Multiport System. The major system components are:

- VectorStar™ MS4647A or MS4647B VNA System, 70 kHz to 70 GHz, V Connectors (Broadband)
- VectorStar™ MS464xA or MS464xB VNA System, 70 kHz to 50 GHz, K Connectors (Banded)
- MN4697C Multiport Test Set (Broadband)
- MN4694C Multiport Test Set (Banded)
- 3736B Broadband Test Set
- 3739C Broadband Test Set
- Front and rear panel cables.
- 3743A/AX, 3743E/EX, MA25300A, or MA25400A Broadband mmWave Modules or 3744A-xx Banded mmWave Modules (4 each)
- Optional OML or VDI Frequency Extension Modules (4 each)
- Test Set to Module Connection Cables (4 sets)
- RF Connection Cables (4 each) – (used with Broadband mmWave modules only).

2-2 Assembly Notes

The following general assembly notes apply to the unpacking, installation, and assembly procedures:

- **Heavy**
The VectorStar™ VNA instrument is heavy. Use at least two people to lift the VNA and set it on top of the test sets.
- **Fragile RF Cables and Cable Loops**
The VNA instrument has fragile RF cables (such as the **Cable Loops**) connected to both the front and rear panels. Be careful not to bend these cables when handling the instrument.
- **V, K, SMA, and 3.5 mm Connectors**
Best practices recommend using an **Anritsu 01-201 8mm (5/16") Torque End Wrench** to tighten the 8 mm (5/16") ME7838x4 V, K, and SMA/3.5 mm connectors. The correct torque setting is 0.9 N·m (8 lbf in).
Use the torque wrench with an open end backing wrench. Best practices recommend using an **Anritsu 01-204 8 mm (5/16") End Wrench**.
- **W1 (1 mm) and 0.8 mm Connectors**
Best practices recommend using an **Anritsu 01-504 Torque End Wrench** to tighten the 6 mm nut on W1 connectors. The correct torque setting is 0.45 N·m (4 lbf in).
Use a 6 mm end wrench with the torque wrench above. Best practices recommend using an **Anritsu 01-505 6 mm/7mm Open End Wrench**.

- **0.6 mm Connectors**

The flange interface is based on a standard UG-387 waveguide flange and one connects to it by first lining up the alignment pins and then mating the flanges.

Standard captive waveguide screws are used with an exposed shank. This is useful since both mating flanges may have threaded holes. Thread the screws all the way into the mating flange (so the shank clears) before mating to the module. This simplifies assembly and avoids cross-threading.

Use a 6 N·cm torque wrench for these screws (one is in the accessory kit). Tighten in a star pattern (or slowly tighten opposite sides sequentially when using two screws).

- **SSMC Connectors**

For the 374xx, MA24300A, or MA25400A Modules, the **TEST** and **REF** connectors are SSMC-type connectors. Best practices recommend using an **Anritsu 01-529-R 4 mm (5/32") Torque End Wrench** set to 0.17 N·m (1.5 lbf in).

Alternatively, use a 4 mm (5/32") end wrench and carefully hand tighten to less than 0.17 N·m (1.5 lbf in).

- **Knurled-Head Thumbscrews on Module Mounting Brackets**

In the as-shipped module bracket configuration, each module is held into its bracket by six (6) knurled head M3 × 8 mm thumbscrews (M4 for the MA25300A or MA25400A modules), with three (3) on each side. Only use hand tightening for these screws. If the module is installed in a user-provided bracket, use hand tightening, make sure that between 5 and 6 mm of screw threads are engaged in the module body. Do not bottom out screws. Do not over torque.

- **GPIB and DB Connectors**

Tighten the connector screws with a flat blade screwdriver.

Note	For instructions on waveguide alignment on the 3744A-xx series mmWave modules, refer to 10410-00311, <i>VectorStar Broadband/Banded mmWave Modules Reference Manual</i> .
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Caution	To avoid connector damage or inaccurate measurements, before making any connections, review the 10100-00060-Connector Care Instruction Sheet. Observe connector torque requirements where indicated in this installation guide.
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Caution	Do not plug any ME7838x4/x4X power cords into main AC power source until all ME7838x4/x4X components are in place, interconnected, and ready for power-up.
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2-3 Required Tools

- **Anritsu 01-201 8mm (5/16") Torque Wrench** or equivalent rated at 0.9 N·m (8 lbf in) for SMA, K, and V connectors
- **Anritsu 01-204 8 mm (5/16") End Wrench** or equivalent
- **Anritsu 01-529-R 4 mm (5/32 in) Torque Wrench** or equivalent rated at 0.17 N·m (1.5 lbf in) for 374xx, MA25300A, or MA25400A Module SSMC connectors
- Small flat-blade **screwdriver**
- Phillips screwdriver
- **Anritsu 01-530-R Hex Torque Wrench** for flange screws on the 0.6mm coaxial flange connector on MA25400A modules only.

2-4 Unpacking the Instruments

Caution

A MS4647A/B VNA unit is heavy. To avoid personal injury, it must be lifted and maneuvered by at least two people during installation.

If mounting on a workbench surface, first position the 3739C Broadband Test Set with access to its front and rear panels. Stack the remaining test sets on top of one another, then finally the VNA.

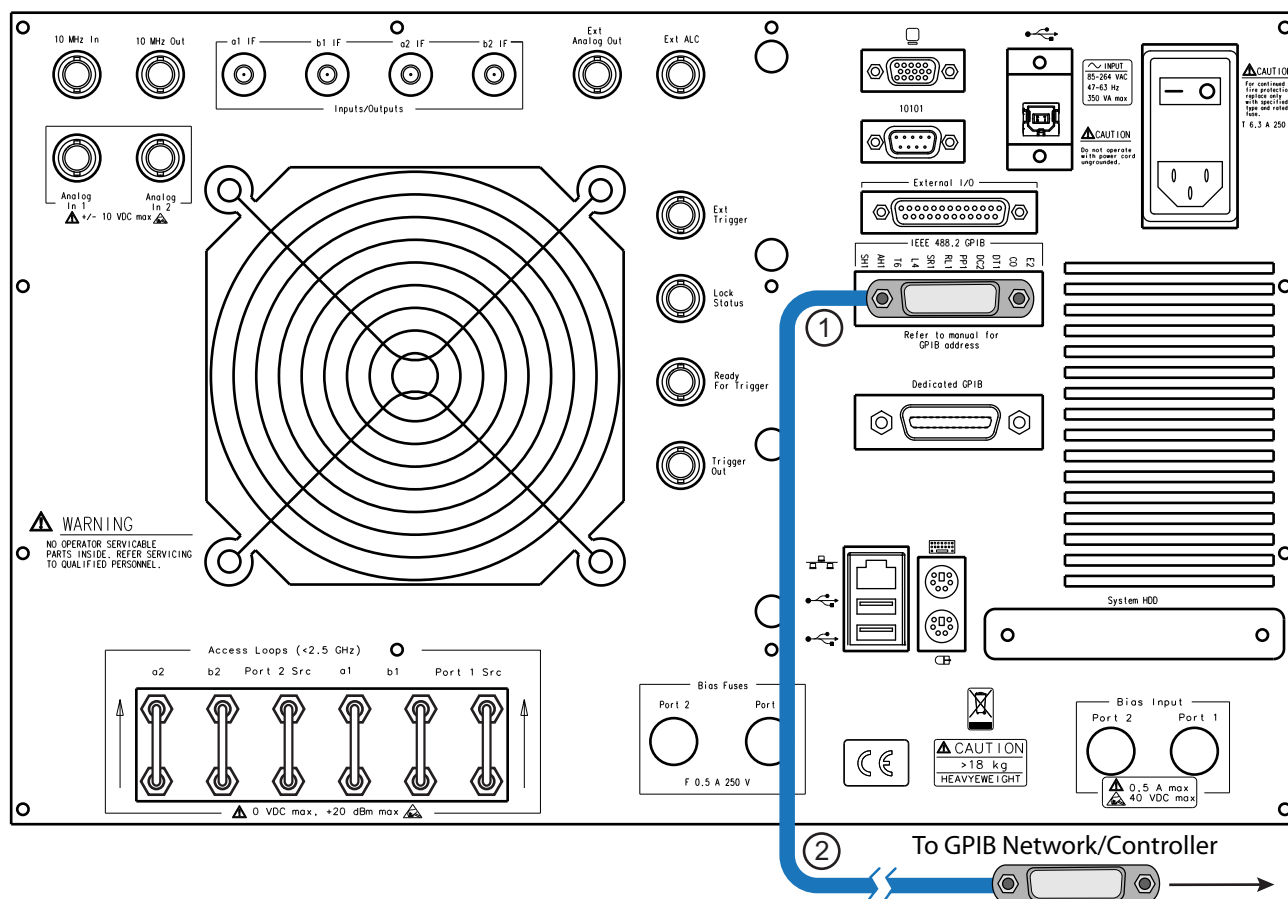
If mounting into rack or console, make sure the Test Sets have been installed, and that the rack/console is carefully positioned on a flat and level surface. If equipped, make sure any casters are locked. Use two people to lift the VNA unit and two to guide it into its shelf rails.

The test loops on the front and rear panels of the VNA are delicate. Be careful not to bump or bend the test loops.

Unpack the various components and set aside in a clean static-free environment. Note that the millimeter-Wave Modules come in separate shipping containers.

2-5 Rear Panel VNA GPIB Connection

If the VNA is to be controlled over a GPIB network by a PC or other GPIB controller, install the GPIB cable to the **IEEE 488.2 GPIB** rear panel connector. **Figure 2-1** shows an MS464xA rear panel. The connection is the same on both the MS464xA and MS464xB VNA.



- 1 – VNA Rear Panel – IEEE 488.2 GPIB Port – For operational control of VNA by external GPIB Controller.
 2 – GPIB Connector and Cable – To GPIB network and GPIB Controller.

Figure 2-1. Optional – MS464xA/B Rear Panel – IEEE 488.2 GPIB Port – Cable Connection

2-6 Rear Panel Connections Between System Components (MS464xA VNA)

In this section, connect the cables between the VNA and the Test Sets as shown in [Figure 2-2](#) and [Table 2-1](#).

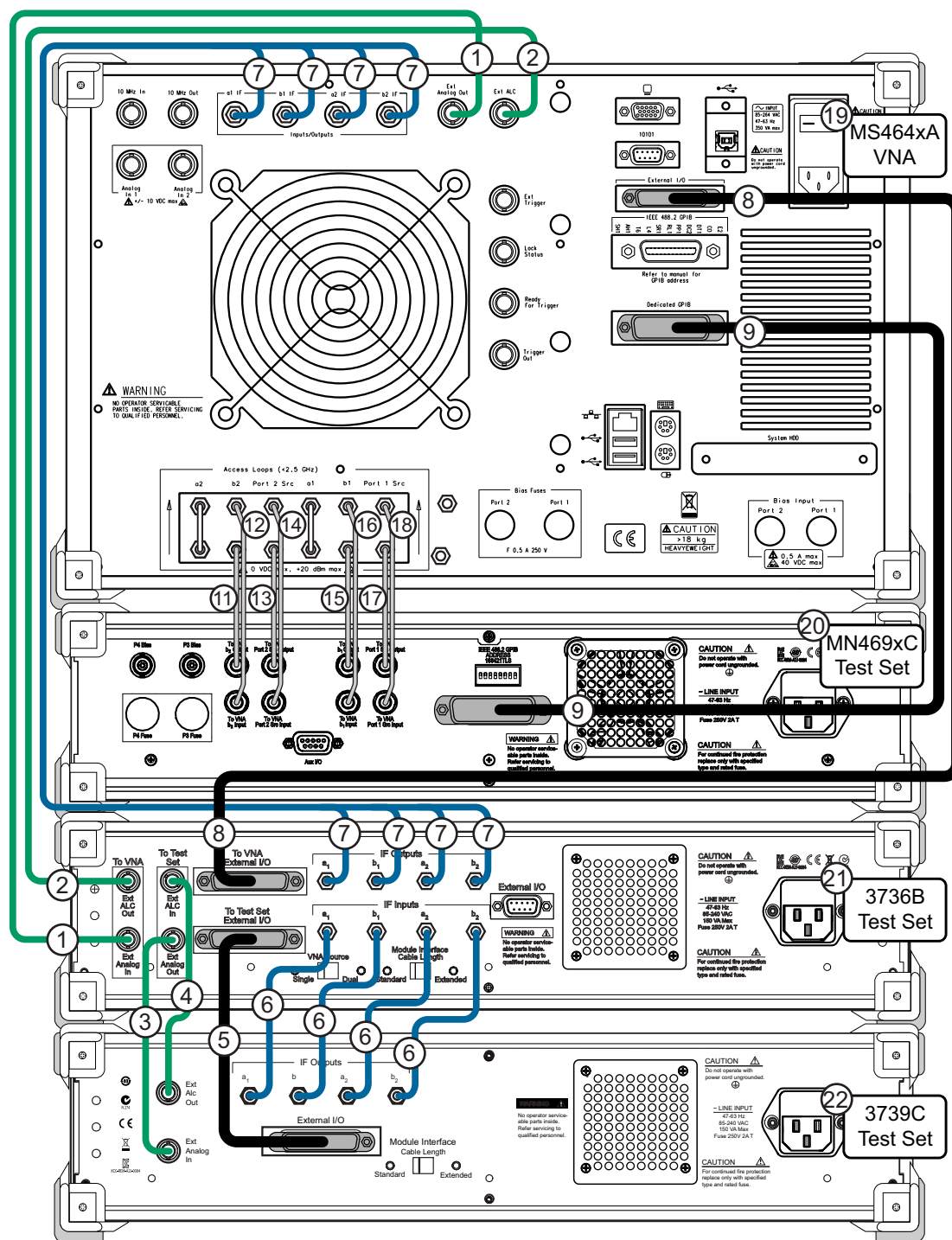


Figure 2-2. ME7838x4/x4X – Rear Panel Cable Connections (MS464xA VNA)

Table 2-1. ME7838x4/x4X Multiport Rear Panel Cable Connections (MS464xA) (1 of 2)

Index	Part Number	Cable Description	Connection From	Connection To
1	3-806-225	BNC (male-male), 24 in	MS464xA port labeled: Ext Analog Out	3736B port labeled: EXT ANALOG IN
2	3-806-225	BNC (male-male), 24 in	MS464xA port labeled: Ext ALC	3736B port labeled: EXT ALC OUT
3	3-806-225	BNC (male-male), 24 in	3736B port labeled: (To Test Set) EXT ANALOG OUT	3739C port labeled: EXT ANALOG IN
4	3-806-225	BNC (male-male), 24 in	3736B port labeled: (To Test Set) EXT ALC IN	3739C port labeled: EXT ALC OUT
5	3-73598-1 ^a (5 cable bundle)	DB-25	3736B port labeled: TO TEST SET EXTERNAL I/O	3739C port labeled: EXTERNAL I/O
6		SMA male-male flexible: 3-72243-1 3-72243-2 3-72243-3 3-72243-4	3736B ports labeled: (IF INPUTS) a1 b1 a2 b2	3739C ports labeled: (IF OUTPUTS) a1 b1 a2 b2
7		SMA male-male flexible: 3-72243-21 3-72243-22 3-72243-23 3-72243-24	MS464xA ports labeled: (Inputs/Outputs) a1 IF b1 IF a2 IF b2 IF	3736B ports labeled: (IF OUTPUTS) a1 IF b1 IF a2 IF b2 IF
8		DB-25	MS464xA port labeled: External I/O	3736B port labeled: TO VNA EXTERNAL I/O
9		GPIB, 1 m	MS464xA port labeled: Dedicated GPIB	MN469xC port labeled: IEEE 488.2 GPIB
11	3-62112-81 ^a	SMA male-male semi-rigid	MS464xA port labeled: b2 loop out	MN469xC port labeled: TO VNA b2 OUTPUT
12	3-62112-80 ^a	SMA male-male semi-rigid	MS464xA port labeled: b2 loop in	MN469xC port labeled: TO VNA b2 INPUT
13	3-62112-81 ^a	SMA male-male semi-rigid	MS464xA port labeled: P2 source loop out	MN469xC port labeled: TO VNA Port 2 Src OUTPUT
14	3-62112-80 ^a	SMA male-male semi-rigid	MS464xA port labeled: P2 source loop in	MN469xC port labeled: TO VNA Port 2 Src INPUT
15	3-62112-81 ^a	SMA male-male semi-rigid	MS464xA port labeled: b1 loop out	MN469xC port labeled: TO VNA b1 OUTPUT
16	3-62112-80 ^a	SMA male-male semi-rigid	MS464xA port labeled: b1 loop in	MN469xC port labeled: TO VNA b1 INPUT
17	3-62112-81 ^a	SMA male-male semi-rigid	MS464xA port labeled: P1 source loop out	MN469xC port labeled: TO VNA Port 1 Src OUTPUT

Table 2-1. ME7838x4/x4X Multiport Rear Panel Cable Connections (MS464xA) (2 of 2)

Index	Part Number	Cable Description	Connection From	Connection To
18	3-62112-80 ^a	SMA male-male semi-rigid	MS464xA port labeled: P1 source loop in	MN469xC port labeled: TO VNA Port 1 Src INPUT
19	MS464xA VNA			
20	MN469xC Test Set			
21	3736B Test Set			
22	3739C Test Set			

a. Tighten each cable in this group using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).

2-7 Rear Panel Connections Between System Components (MS464xB-031 VNA)

In this section, connect the cables between the VNA and the Test Sets as shown in [Figure 2-3](#) or [Figure 2-4](#), and [Table 2-2](#).

Cable Connections (Systems with Option 031 Dual Source Architecture)

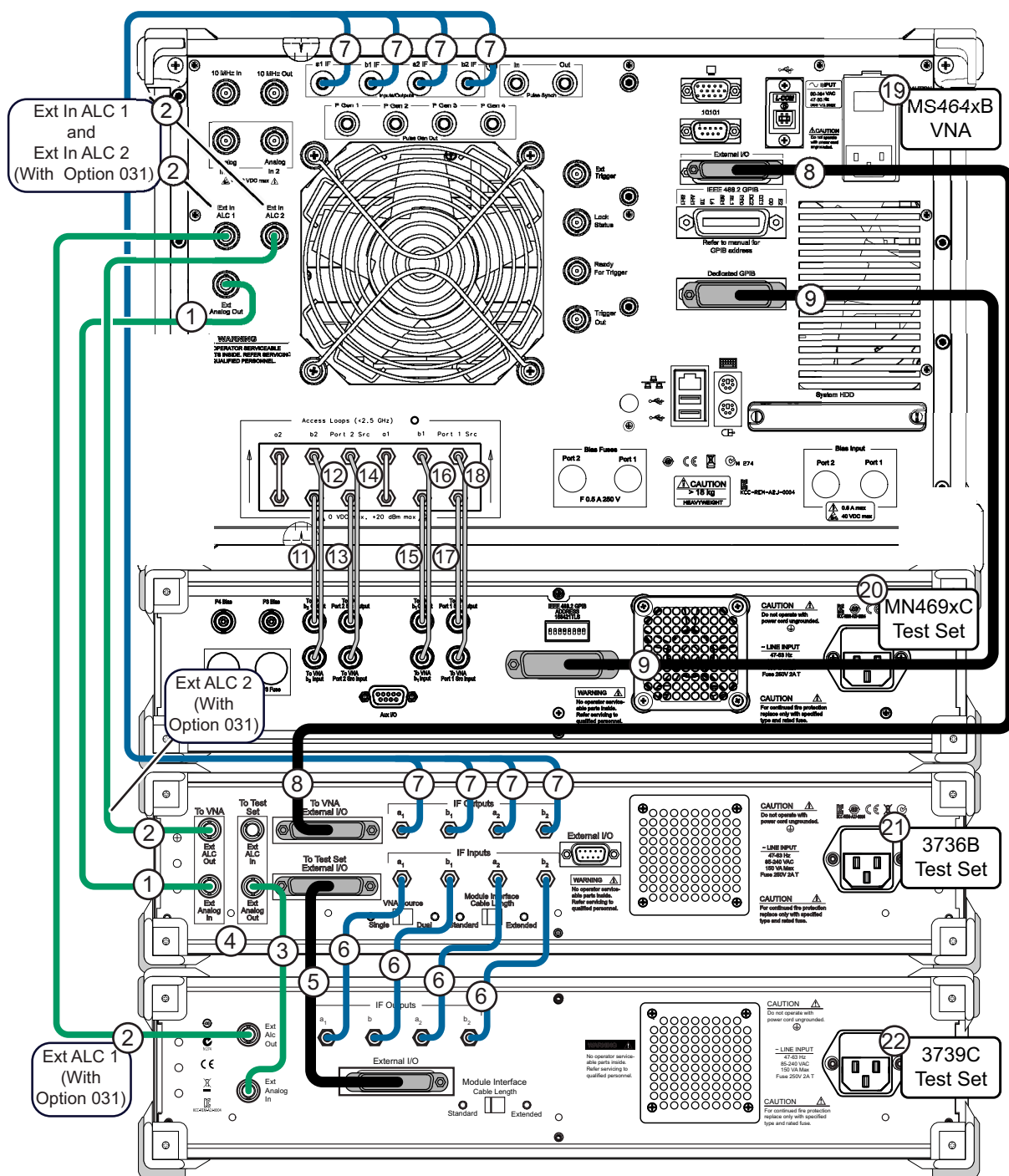


Figure 2-3. ME7838x4/x4X Multiport BB/mmW VNA System – Rear Panel Cables (With Option 031)

Cable Connections (Systems without Option 031)

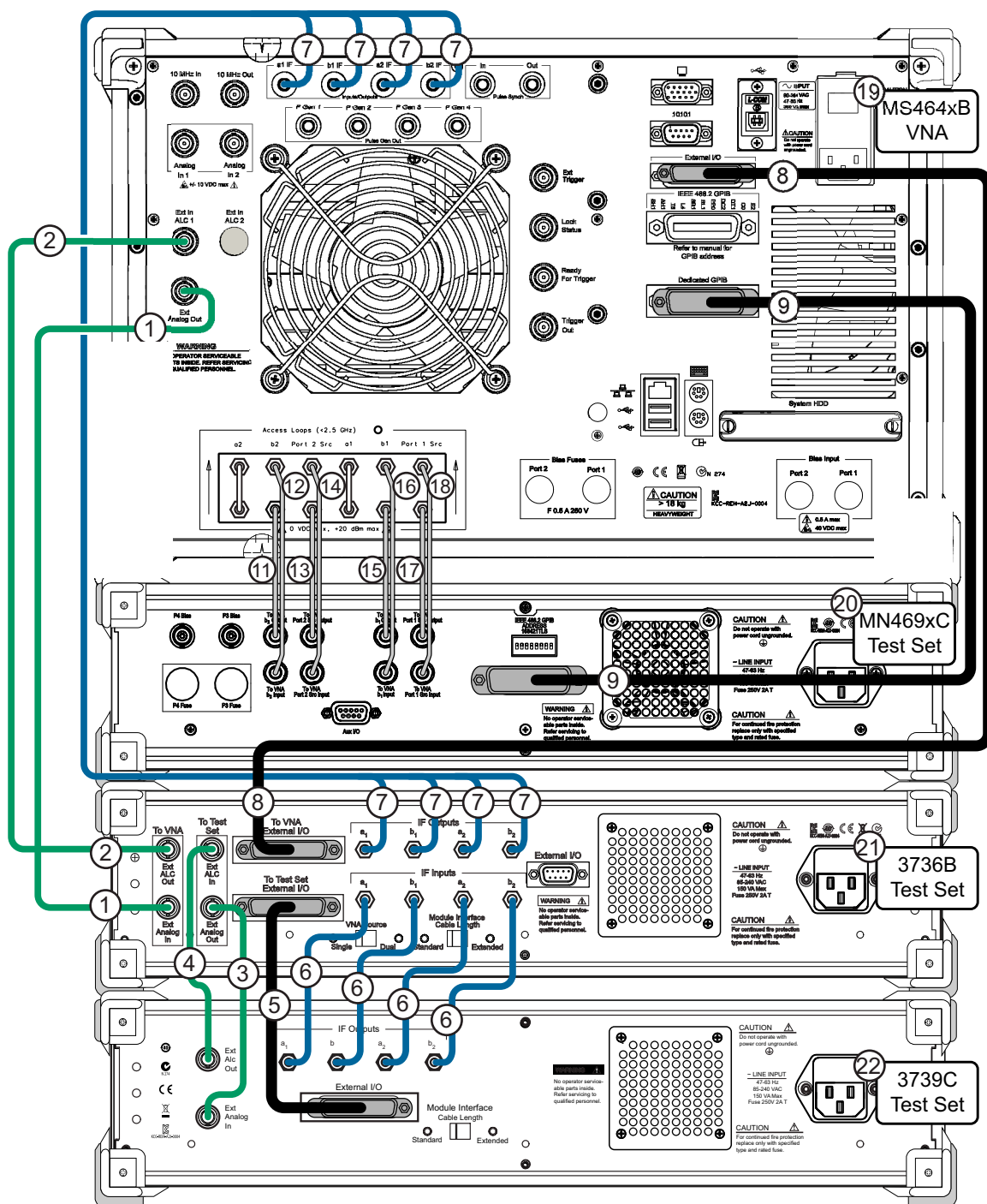


Figure 2-4. ME7838x4/x4X Multiport BB/mmW VNA System – Rear Panel Cables (No Option 031)

Table 2-2. ME7838x4/x4X Multiport Rear Panel Cable Connections (MS464xB) (1 of 2)

Index	Part Number	Cable Description	Connection From	Connection To
1	3-806-225	BNC (male-male), 24 in	MS464xB port labeled: Ext Analog Out	3736B port labeled: EXT ANALOG IN
2	3-806-225	BNC (male-male), 24 in	VNA port labeled: Ext In ALC 1 <i>(No Option 031)</i> (Figure 2-4)	3736B port labeled: EXT ALC OUT
		BNC (male-male), 24 in	VNA port labeled: Ext In ALC 1 <i>(With Option 031)</i> (Figure 2-3)	3739C port labeled: EXT ALC OUT
		BNC (male-male), 24 in	VNA port labeled: Ext In ALC 2 <i>(With Option 031)</i> (Figure 2-3)	3736B port labeled: EXT ALC OUT
3	3-806-225	BNC (male-male), 24 in	3736B port labeled: (To Test Set) EXT ANALOG OUT	3739C port labeled: EXT ANALOG IN
4	3-806-225	BNC (male-male), 24 in	3736B port labeled: (To Test Set) EXT ALC IN (Figure 2-4) <i>(Not used with Option 031)</i>	3739C port labeled: EXT ALC OUT
5	3-73598-1 ^a (5 cable bundle)	DB-25	3736B port labeled: TO TEST SET EXTERNAL I/O	3739C port labeled: EXTERNAL I/O
6		SMA male-male flexible: 3-72243-1 3-72243-2 3-72243-3 3-72243-4	3736B ports labeled: (IF INPUTS) a1 b1 a2 b2	3739C ports labeled: (IF OUTPUTS) a1 b1 a2 b2
7	3-80734 ^a (5 cable bundle)	SMA male-male flexible: 3-72243-21 3-72243-22 3-72243-23 3-72243-24	MS464xB ports labeled: (Inputs/Outputs) a1 IF b1 IF a2 IF b2 IF	3736B ports labeled: (IF OUTPUTS) a1 IF b1 IF a2 IF b2 IF
8		DB-25	MS464xB port labeled: External I/O	3736B port labeled: TO VNA EXTERNAL I/O
9	2100-1-R	GPIOB, 1 m	MS464xB port labeled: Dedicated GPIOB	MN469xC port labeled: IEEE 488.2 GPIOB
11	3-62112-81 ^a	SMA male-male semi-rigid	MS464xB port labeled: b2 loop out	MN469xC port labeled: TO VNA b2 OUTPUT
12	3-62112-80 ^a	SMA male-male semi-rigid	MS464xB port labeled: b2 loop in	MN469xC port labeled: TO VNA b2 INPUT
13	3-62112-81 ^a	SMA male-male semi-rigid	MS464xB port labeled: P2 source loop out	MN469xC port labeled: TO VNA Port 2 Src OUTPUT

Table 2-2. ME7838x4/x4X Multiport Rear Panel Cable Connections (MS464xB) (2 of 2)

Index	Part Number	Cable Description	Connection From	Connection To
14	3-62112-80 ^a	SMA male-male semi-rigid	MS464xB port labeled: P2 source loop in	MN469xC port labeled: TO VNA Port 2 Src INPUT
15	3-62112-81 ^a	SMA male-male semi-rigid	MS464xB port labeled: b1 loop out	MN469xC port labeled: TO VNA b1 OUTPUT
16	3-62112-80 ^a	SMA male-male semi-rigid	MS464xB port labeled: b1 loop in	MN469xC port labeled: TO VNA b1 INPUT
17	3-62112-81 ^a	SMA male-male semi-rigid	MS464xB port labeled: P1 source loop out	MN469xC port labeled: TO VNA Port 1 Src OUTPUT
18	3-62112-80 ^a	SMA male-male semi-rigid	MS464xB port labeled: P1 source loop in	MN469xC port labeled: TO VNA Port 1 Src INPUT
19	MS464xB VNA			
20	MN469xC Test Set			
21	3736B Test Set			
22	3739C Test Set			

a. Tighten each cable in this group using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).

2-8 Semi-rigid Cable Connections Between System Components

Make the semi-rigid cable connections as shown in [Figure 2-5](#) or [Figure 2-6](#), and in [Table 2-3](#).

If your system has Option 031 Dual Source Architecture (MS464xB only), use [Figure 2-5](#). If your system does not have Option 031, use [Figure 2-6](#).

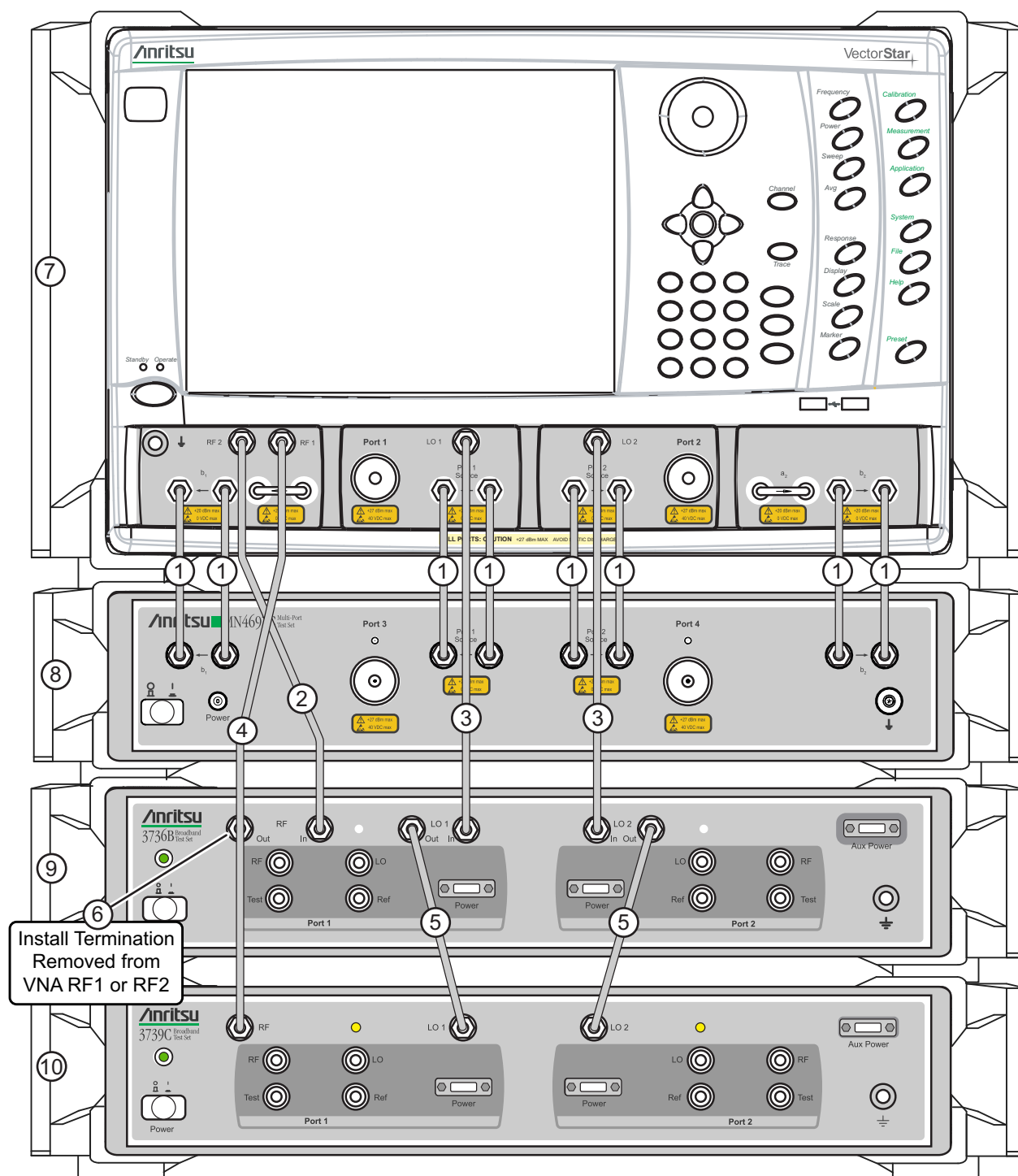


Figure 2-5. ME7838x4/x4X Multiport Semi-rigid Cable Connections (with Option 031 Dual Source Architecture)

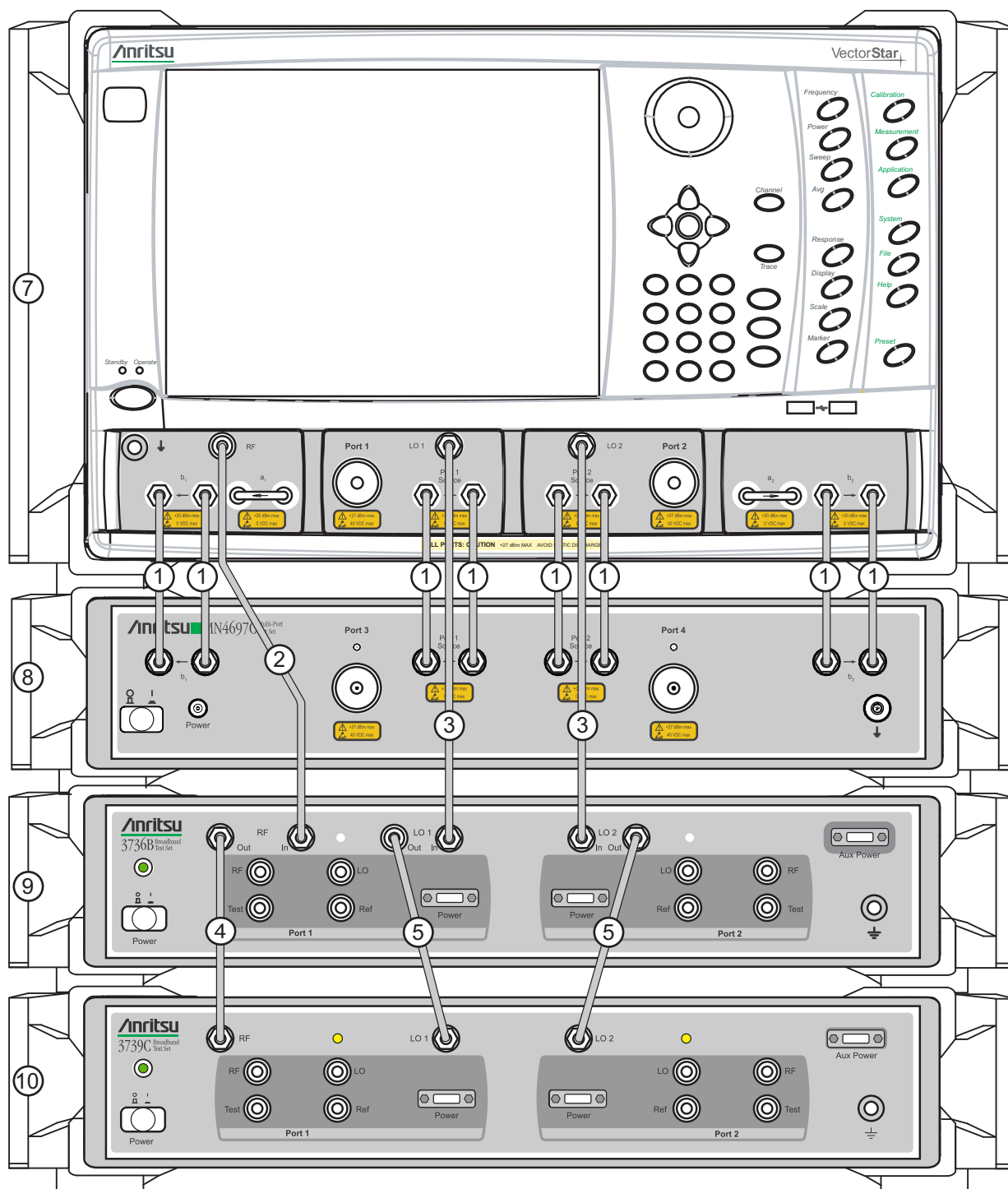


Figure 2-6. ME7838x4/x4X Multiport Semi-rigid Cable Connections (without Option 031 Dual Source Architecture)

Table 2-3. ME7838x4/x4X Multiport semi-rigid Cable Interconnect Part Numbers and Locations (1 of 2)

Index	Part Numbers	Description/Torque	Connection From	Connection To
1	3-62109-42 V (m-m) (MN4697C) 3-67357-38 K (m-m) (MN4694C)	Front Panel RF Cable (4 each) V or K male-male semi-rigid Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).	VNA port labeled: b1 (In)	MN469xC port labeled: b1 (In)
			VNA port labeled: b1 (Out)	MN469xC port labeled: b1 (Out)
			VNA port labeled: Port 1 Source (In)	MN469xC port labeled: Port 1 Source (In)
			VNA port labeled: Port 1 Source (Out)	MN469xC port labeled: Port 1 Source (Out)
			VNA port labeled: Port 2 Source (In)	MN469xC port labeled: Port 2 Source (In)
			VNA port labeled: Port 2 Source (Out)	MN469xC port labeled: Port 2 Source (Out)
			VNA port labeled: b2 (In)	MN469xC port labeled: b2 (In)
			VNA port labeled: b2 (Out)	MN469xC port labeled: b2 (Out)
2	3-67357-230	Front Panel RF Cable K male-male semi-rigid Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).	VNA port labeled: RF 2 (Figure 2-5) (With Option 031)	3736B Test Set port labeled: RF In
			VNA port labeled: RF (Figure 2-6) (No Option 031)	3736B Test Set port labeled: RF In
3	3-67357-231	Front Panel LO Cable (2 each) K male-male semi-rigid Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).	VNA port labeled: LO 1	3736B Test Set port labeled: LO 1 In
			VNA port labeled: LO 2	3736B Test Set port labeled: LO 2 In
4	3-67357-232 (With Option 031)	Front Panel RF Cable K male-male semi-rigid	VNA port labeled: RF 1 (Figure 2-5) (With Option 031)	3739C Test Set port labeled: RF
	3-67357-18 (No Option 031)	Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).	3736B Test Set port labeled: RF Out (Figure 2-6) (No Option 031)	3739C Test Set port labeled: RF
5	3-67357-19	Front Panel LO Cable (2 each) K male-male semi-rigid Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).	3736B Test Set port labeled: LO 1 Out	3739C Test Set port labeled: LO 1
			3736B Test Set port labeled: LO 2 Out	3739C Test Set port labeled: LO 2
6	V210	Termination (With Option 031) Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).	Remove from VNA port labeled: RF 1 or RF 2	Add to 3736B Test Set port labeled: RF Out

Table 2-3. ME7838x4/x4X Multiport semi-rigid Cable Interconnect Part Numbers and Locations (2 of 2)

Index	Part Numbers	Description/Torque	Connection From	Connection To
7	MS464xA VNA	Option 051, 061, or 062, and 08x (Banded)		
	MS464xB VNA	Option 051, 061, or 062, and 08x (Banded)		
	MS4647A VNA	Option 051, 061, or 062, and 08x (Broadband)		
	MS4647B VNA	Option 051, 061, or 062, and 08x (Broadband)		
8	MN4694C Test Set	(Banded)		
	MN4697C Test Set	(Broadband)		
9	3736B Test Set			
10	3739C Test Set			

2-9 Front Panel Cable Connections

Make the cable connections as shown in [Figure 2-7](#) and in [Table 2-4](#).

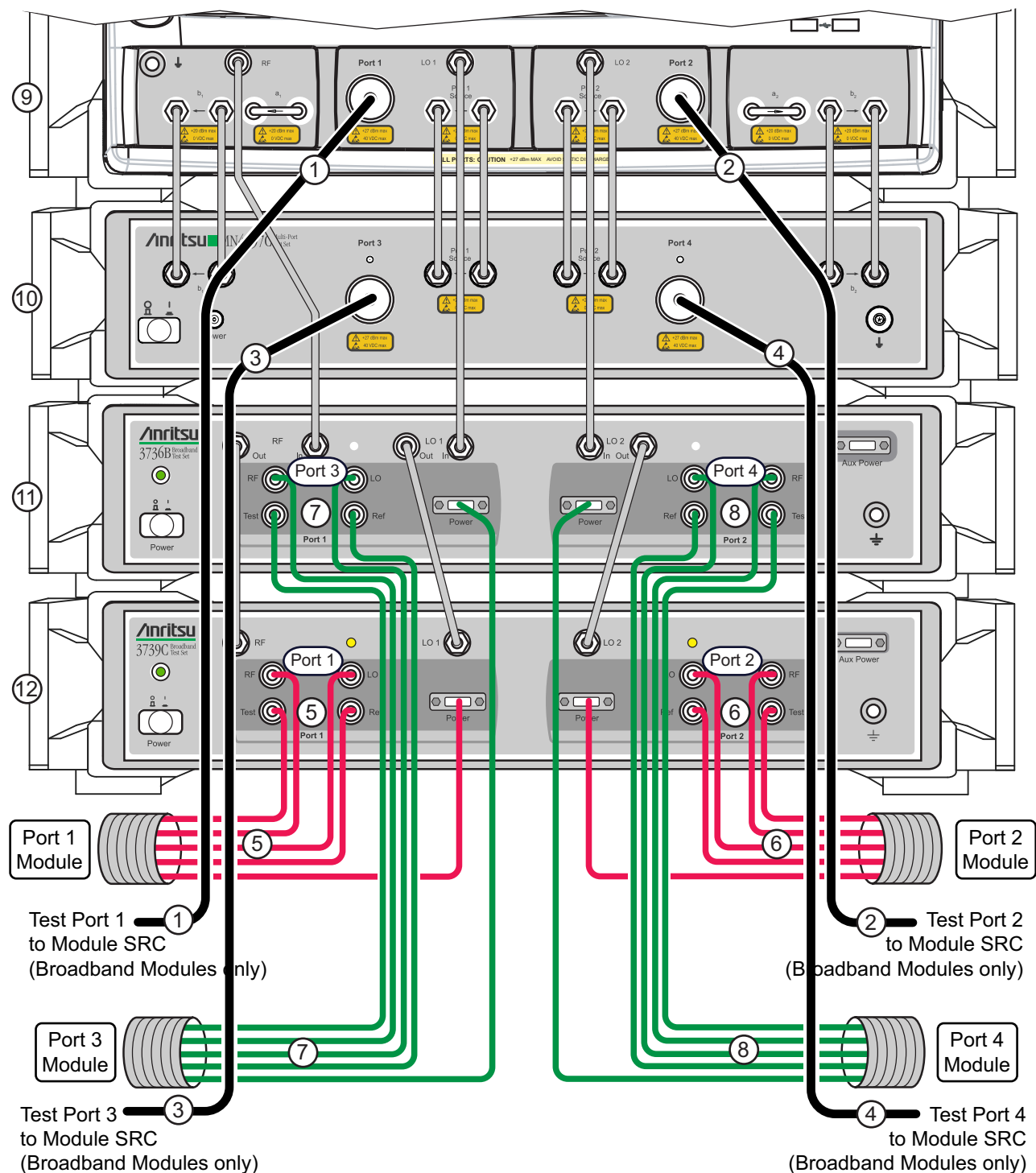


Figure 2-7. Front Panel to mmWave Module Connections

Note

The cables for Test Port 1 through Test Port 4 to Module SRC are not used with modules 3744A-EE, 3744A-EW, or 3744A-Rx.

Table 2-4. ME7838x4/x4X Cable Interconnect Part Numbers and Locations (1 of 2)

Index	Part Number	Description	Connection From	Connection To
1 2 3 4	806-209-R ^{a,b}	Coaxial Cable (4 each) V male-female flexible, 36 in (Used with Broadband Modules only) Tighten at VNA and Test Set using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).	VNA ports labeled: Port 1 Port 2 MN469xC ports: Port 3 Port 4	Broadband Module port labeled: (Port 1 Module) SRC (Port 2 Module) SRC (Port 3 Module) SRC (Port 4 Module) SRC
5 6 7 8	3-75685-1 ^a	mmWave Module Interface Cables (for 3743A/AX, 3743E/EX, MA25300A, MA25400A, 3744A-EE, 3744A-EW modules) Group of 5 cables for each port Tighten at Test Set using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).	3739C Test Set: Port 1, Port 2 RF, LO, Test, Ref, Power/Signal 3736B Test Set Port1, Port 2 (Port 3, Port 4) RF, LO, Test, Ref, Power/Signal	mmWave Modules: Port 1, Port 2 Modules RF, LO, Test, Ref, Power/Signal mmWave Modules Port 3, Port 4 Modules RF, LO, Test, Ref, Power/Signal
5 6 7 8	3-75685-2 ^a	OML Module Interface Cables Group of 4 cables for each port Tighten at Test Set using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).	3739C Test Set Port 1, Port 2 RF, LO, Test, Ref 3736B Test Set Port1, Port 2 (Port 3, Port 4) RF, LO, Test, Ref	OML Modules Port 1, Port 2 Modules RF, LO, Test IF, Ref IF OML Modules Port 3, Port 4 Modules RF, LO, Test IF, Ref IF
5 6 7 8	3-75685-3 ^a	VDI Module Interface Cables Group of 4 cables for each port Tighten at Test Set using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).	3739C Test Set Port 1, Port 2 RF, LO, Test, Ref 3736B Test Set Port1, Port 2 (Port 3, Port 4) RF, LO, Test, Ref	VDI Modules Port 1, Port 2 Modules RF Input, LO Input, Meas. IF, Ref IF VDI Modules Port 3, Port 4 Modules RF Input, LO Input, Meas. IF, Ref IF
5 6 7 8	3-75685-3 ^a	mmWave Module Interface Cables (for 3744A-Rx modules) Group of 3 cables for each port Tighten at Test Set using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).	3739C Test Set Port 1, Port 2 LO, Test, Power/Signal 3736B Test Set Port1, Port 2 (Port 3, Port 4) LO, Test, Power/Signal	Rx Modules Port 1, Port 2 Modules LO, Test, Power/Signal Rx Modules Port 3, Port 4 Modules LO, Test, Power/Signal
9	MS464xA VNA – Option 051, 061, or 062, and 08x (Banded)			
	MS464xB VNA – Option 051, 061, or 062, and 08x (Banded)			
	MS4647A VNA – Option 051, 061, or 062, and 08x (Broadband)			
	MS4647B VNA – Option 051, 061, or 062, and 08x (Broadband)			

Table 2-4. ME7838x4/x4X Cable Interconnect Part Numbers and Locations (2 of 2)

Index	Part Number	Description	Connection From	Connection To
10	MN4694C Test Set (Banded)			
	MN4697C Test Set (Broadband)			
11	3736B Test Set			
12	3739C Test Set			

a. Do not yet connect the cable ends to the mmWave modules. Module connection instructions follow this section.

b. The 806-209-R Coaxial Cable is not included or required when using the 3744A-EE, 3744A-EW mmWave modules, or the 3744A-Rx Receiver Module.

2-10 Front Panel to mmWave Module Connections

Connect the 3736B and 3739C Broadband Test Set test port cables to the 3743A/AX, 3743E/EX, MA25300A, MA25400A, 3744A-EE, 3744A-EW, or 3744A-Rx Modules as shown below, observing the correct torque limits for each connector. See [Figure 2-8](#) and [Table 2-5](#). Route the cable assemblies through the module cable restraint.

Note

It is easier to first connect the cables to the module and then mount the module in its bracket.

Observe torque instructions where indicated. Each module (except the 3744A-Rx) is characterized for a specific VNA Serial Number and VNA Test Port as designated on the module port assignment label. Ensure the module matches the correct VNA and Test Set port.

For more detailed information on the modules including DUT Waveguide (WG) connection alignment and custom bracket mounting, refer to **10410-00311-VectorStar™ Broadband/Banded mmWave Modules Reference Manual**.

Inverting a Module

If necessary, a module can be turned over in the bracket to change the elevation of the port connector. To turn the module over:

1. Remove the six knurled head thumbscrews from the module.
2. Turn the module over.
3. Install the six thumbscrews.

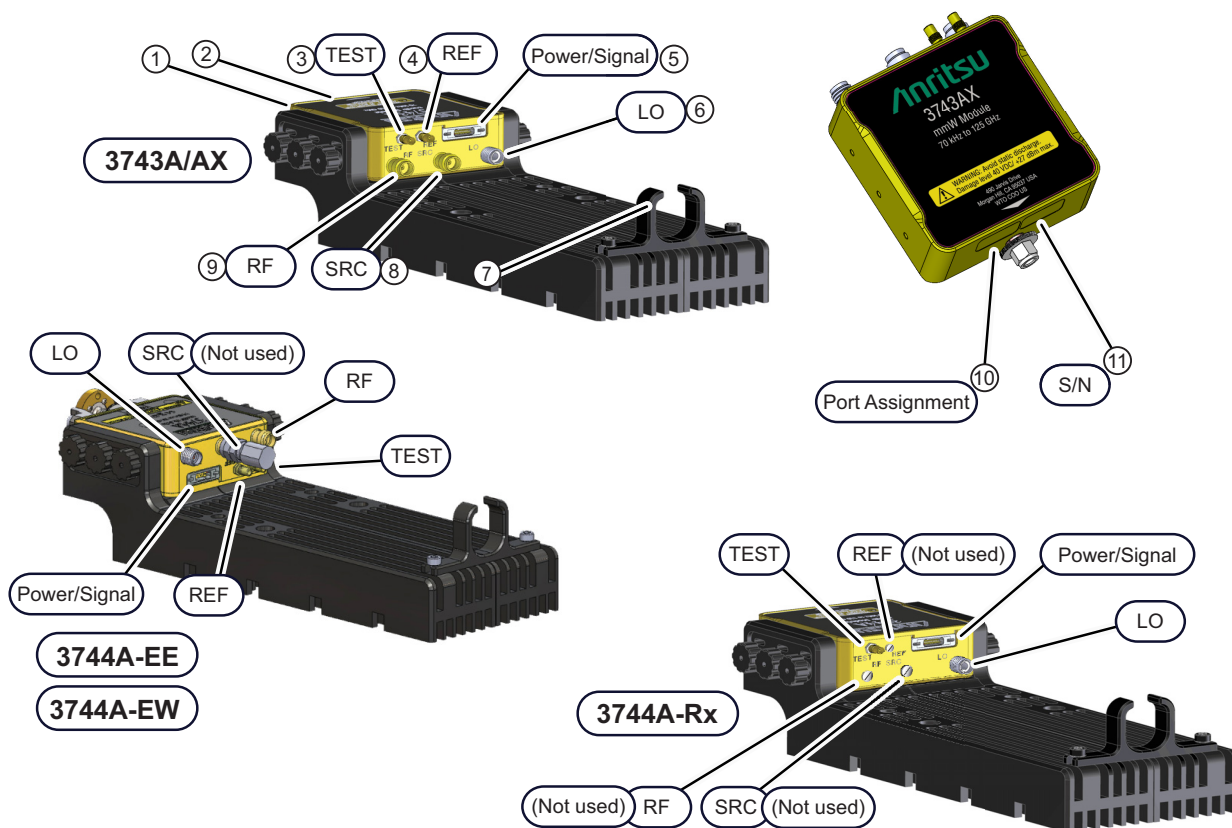


Figure 2-8. mmWave Module Connections (1 of 2)

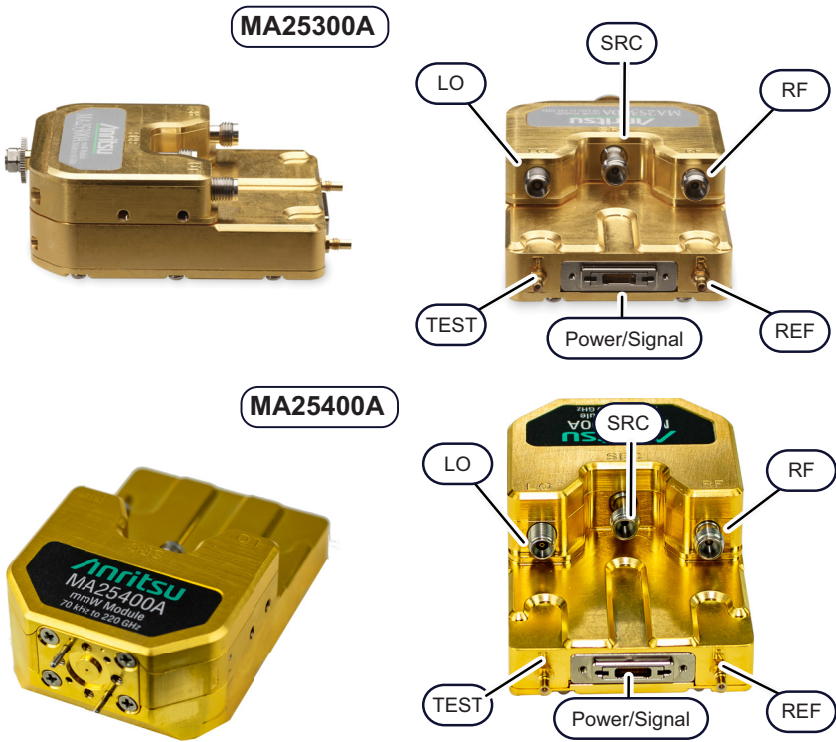


Figure 2-8. mmWave Module Connections (2 of 2)

Table 2-5. mmWave Module Connections (1 of 2)

Index	Cable P/N	Description
1	N/A	mmWave Module in bracket
2	N/A	W1 (1 mm) or 0.8 mm Connector (3743A/AX, 3743E/EX, MA25300A, 3744A-Rx modules) • Tighten using a torque end wrench and a plain end wrench • 6 mm Torque End Wrench set to 0.45 N·m (4 lbf-in). Recommended is Anritsu 01-504. • 6 mm / 7 mm Open End Wrench. Recommended is Anritsu 01-505. WR-10 or WR-12 Adapter - 1 mm connector (3744A-EE, 3744A-EW modules) • Use Waveguide Adapter Toolkits (3-74394-2, 3-74394-3, or 3-74394-4). • Tighten using a torque end wrench and a plain end wrench. • 6 mm Torque End Wrench set to 0.45 N·m (4 lbf-in). Recommended is Anritsu 01-504. • 6 mm / 7 mm Open End Wrench. Recommended is Anritsu 01-505. 0.6mm Coaxial Flange Connector (MA25400A modules) • Flange screws should be tightened using a hex torque wrench set to 6 cN·m (0.5 lbf-in). • Recommended is Anritsu 01-530-R.

Table 2-5. mmWave Module Connections (2 of 2)

Index	Cable P/N	Description
3	3-75685-1 ^a or 3-75685-3 ^{b,c}	TEST – SSMC Connector (3743A/AX/E/EX, 3744A-EE, 3744A-EW, and 3744A-Rx modules) • Tighten using a 4 mm (5/32 in) torque end wrench set to less than 0.17 N·m (1.5 lbf·in). • Recommended is Anritsu 01-529-R torque wrench.
4		REF – SSMC Connector (3743A/AX/E/EX, 3744A-EE, and 3744A-EW modules) • Tighten using a 4 mm (5/32 in) torque end wrench set to less than 0.17 N·m (1.5 lbf·in). • Recommended is Anritsu 01-529-R torque wrench.
5		Power/Signal Bi-Lobe™ Connector (3743A/AX/AX/E/EX, 3744A-EE, 3744A-EW, 3744A-Rx)
6		LO – K Connector (3743A/AX/E/EX, 3744A-EE, 3744A-EW, and 3744A-Rx modules) • Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in). • Recommended is Anritsu 01-201.
7		Module Power and I/O Cable Restraint
8	806-209-R ^d	SRC – V Connector (3743A/AX/E/EX module only) • Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in). • Recommended is Anritsu 01-201.
9	3-75685-1 ^a	RF – V Connector (3743A/AX/E/EX, 3744A-EE, and 3744A-EW modules) • Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in). • Recommended is Anritsu 01-201.
10	N/A	Factory Calibrated Port Assignment Label
11	N/A	Module Serial Number Label

a. 3743A/AX, 3743E/EX, MA25300A, MA25400A, 3744A-EE, and 3744A-EW modules use cable assembly 3-75685-1.

b. The REF cable is not used in the 3-75685-3 cable assembly.

c. 3744A-Rx module uses cable assembly 3-75685-3.

d. The 806-209-R Coaxial Cable is used only with the Broadband Millimeter Wave modules.

mmWave Module Operating Environment

The following notes should be observed when operating the mmWave modules:

- Thermal heat sinking similar to the supplied mounting brackets of the mmWave module should be considered in custom mounting applications.
- Each 3743A/AX, 3743E/EX, MA25300A, or MA25400A module consumes a maximum of 12 watts.
- Each 3744A-EE and 3744A-EW module consumes a maximum of 12 watts.
- Each 3744A-Rx Module consumes a maximum of 7 watts.
- The primary heat sink paths for the module is the two side mounting surfaces of the mounting bracket.
- With the attached cable mounting brackets, the case temperature rise is approximately 15 °C to 20 °C above ambient.
- A three (3) year warranty is valid for all versions of 3744A and 3743A/AX/E/EX modules, with or without mounting brackets attached.

2-11 Front Panel to OML/VDI Module Connections

Connect the front panel cables between the 3736B and 3739C Test Sets, and the OML or VDI frequency extension modules as shown in [Figure 2-9](#), [Figure 2-10](#), and [Figure 2-11](#), and as described in [Table 2-6](#), [Table 2-7](#), and [Table 2-8](#).

Caution To avoid connector damage, observe torque requirements where indicated.

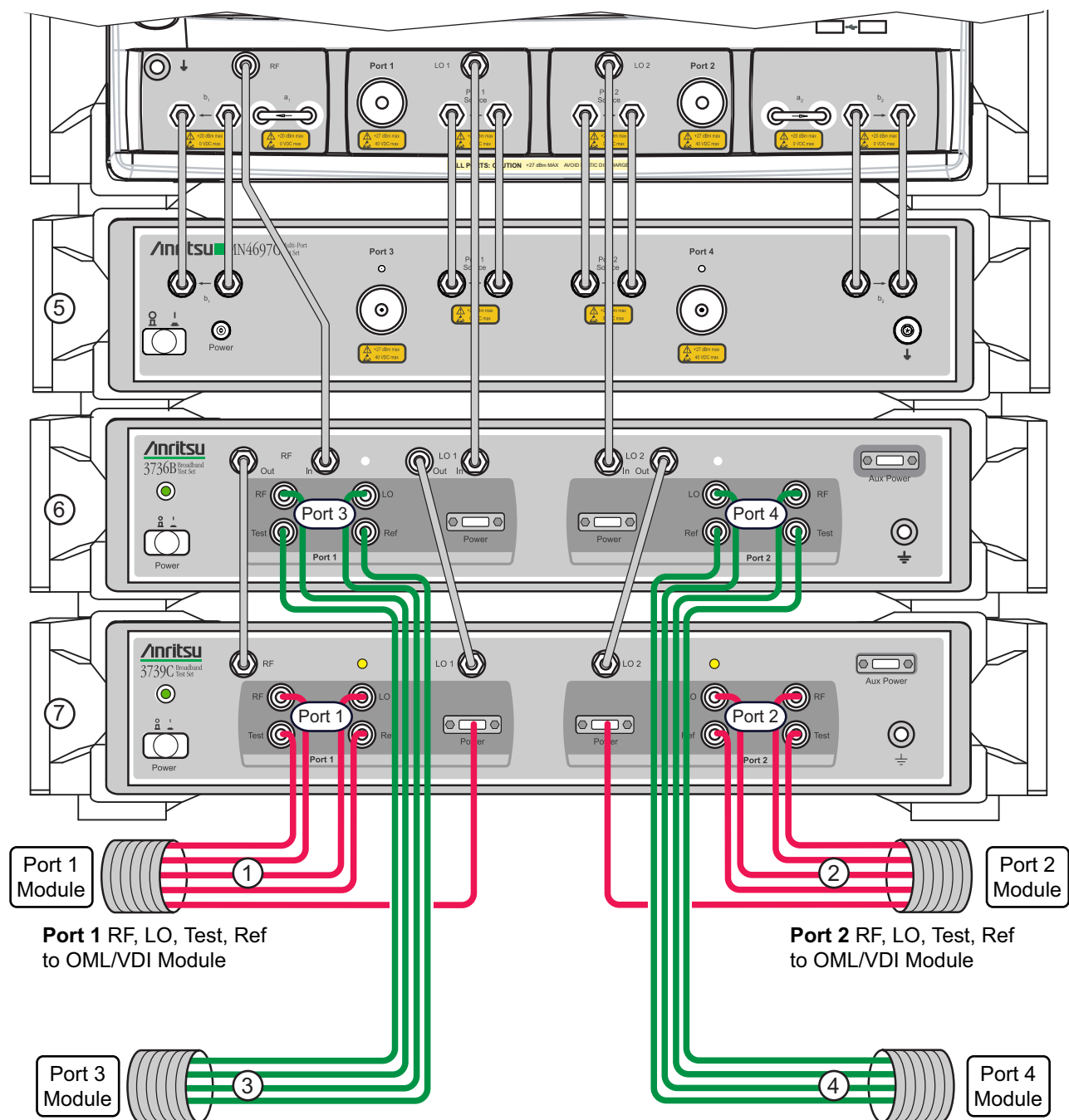


Figure 2-9. Cable Connections between 3736B, 3739C Test Sets, and OML or VDI Frequency Extension Modules

Table 2-6. ME7838x4/x4X OML/VDI Cable Interconnect Part Numbers and Locations

Index	Part Number	Description	Connection From	Connection To
1	3-75685-2 (2 each)	OML Module Interface Cable Assembly Group of 4 cables for each port	3739C Test Set Port 1, Port 2 Ref RF LO Test	OML Modules: Port 1, Port 2 Modules Ref IF RF Input LO Input Test IF
2		OML Module Interface Cable Assembly Group of 4 cables for each port	3736B Test Set Port 1, Port 2 (Port 3, Port 4) Ref RF LO Test	OML Modules: Port 3, Port 4 Modules Ref IF RF Input LO Input Test IF
3	3-75685-2 (2 each)	VDI Module Interface Cables Assembly Group of 4 cables for each port	3739C Test Set Port 1, Port 2 RF Ref Test LO	VDI Modules: Port 1, Port 2 Modules RF Input Ref. IF Meas. IF LO Input
4		VDI Module Interface Cables Assembly Group of 4 cables for each port	3736B Test Set Port 1, Port 2 (Port 3, Port 4) RF Ref Test LO	VDI Modules: Port 3, Port 4 Modules RF Input Ref. IF Meas. IF LO Input
5	MN469xC Test Set			
6	3736B Test Set			
7	3739C Test Set			

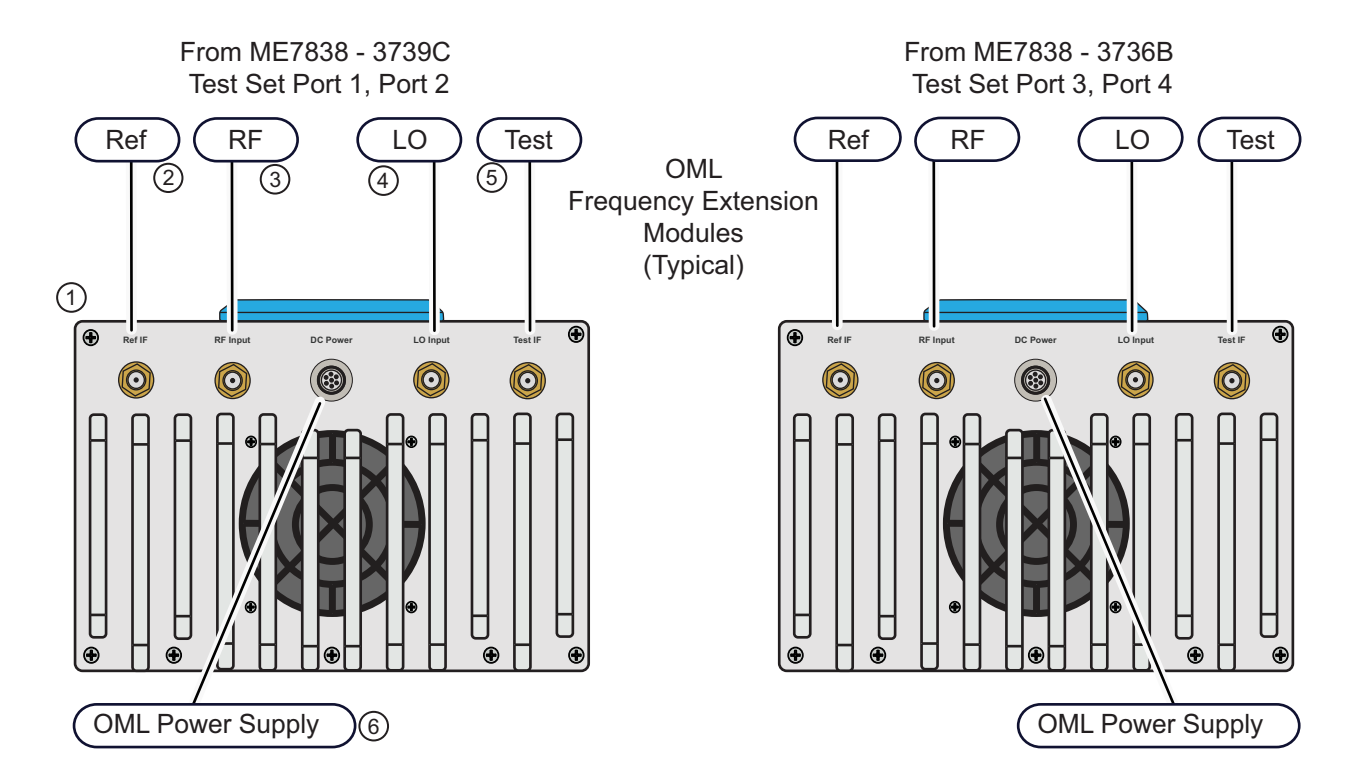


Figure 2-10. VNA Test Set Cable Connections to OML Modules

Table 2-7. OML Module Connections

Index	Cable P/N	Description
1	N/A	OML Module
2	3-75685-2	Ref IF – SMA Connector • Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in). • Recommended is Anritsu 01-201.
3		RF Input – SMA Connector • Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in). • Recommended is Anritsu 01-201.
4		LO Input – SMA Connector • Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in). • Recommended is Anritsu 01-201.
5		Test IF – SMA Connector • Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in). • Recommended is Anritsu 01-201.
6	N/A	OML Module Power Supply Connector

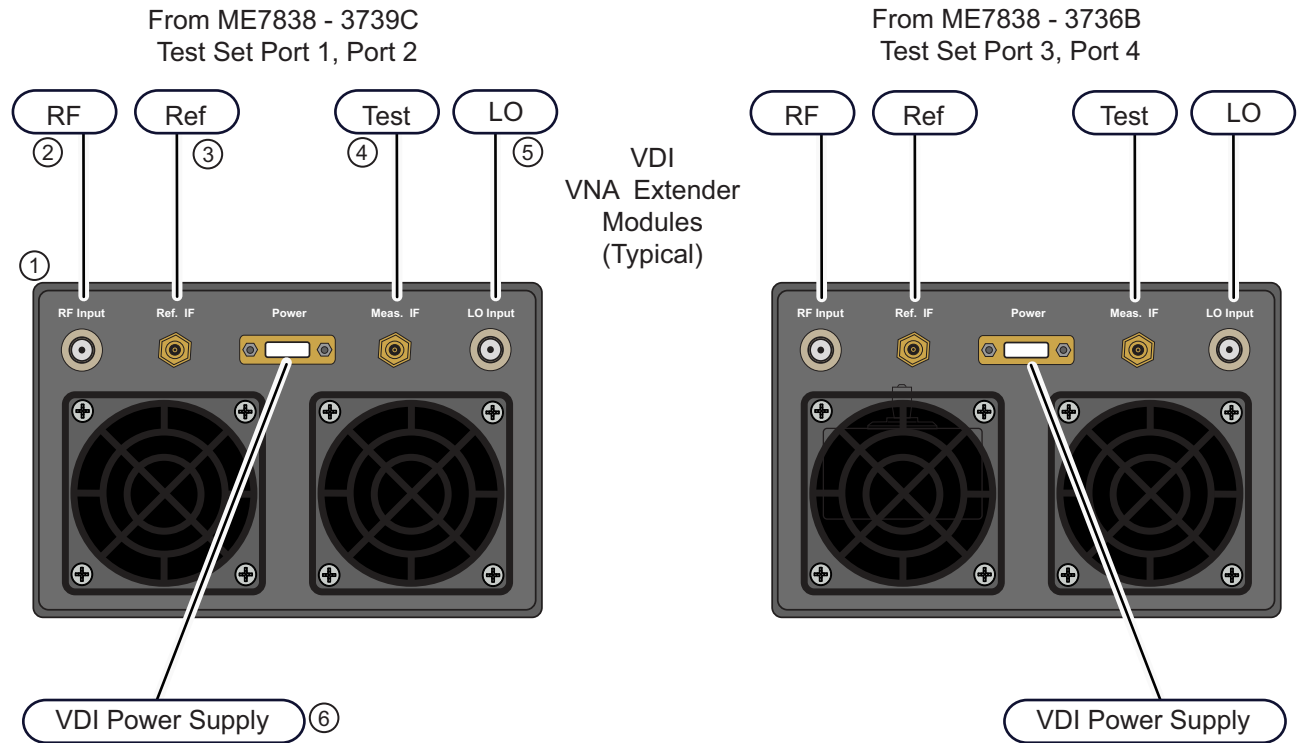


Figure 2-11. VNA Test Set Cable Connections to VDI Modules

Table 2-8. VDI Module Connections

Index	Cable P/N	Description
1	N/A	VDI Module
2	3-75685-2	RF Input – K (2.92 mm) Connector • Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in). • Recommended is Anritsu 01-201.
3		Ref. IF – SMA Connector • Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in). • Recommended is Anritsu 01-201.
4		Meas. IF – SMA Connector • Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in). • Recommended is Anritsu 01-201.
5		LO Input – K (2.92 mm) Connector • Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in). • Recommended is Anritsu 01-201.
6 ^a		VDI Module Power Supply Connector

a. The VDI module connectors may differ slightly than on the illustration shown above. For example, depending on the model and date built, the power supply connector may be round instead of rectangular.

Chapter 3 — ME7838x4/x4X Initial System Checkout

3-1 Introduction

This chapter provides the general initial system checkout for a completely assembled ME7838x4/x4X Broadband/Banded mmWave System. Since the ME7838x4/x4X supports both the MS464xA and MS464xB Series VNAs, this chapter has an initial system checkout section for each VNA series:

- [Section 3-4 “MS464xA VNA Broadband/Banded Configuration” on page 3-3](#)
- [Section 3-5 “MS464xB VNA Broadband/Banded Configuration” on page 3-11](#)
- [Section 3-6 “ME7838x4/x4X Configuration Verification – BB/mmWave Modules” on page 3-21](#)

Once this procedure is complete, the system is ready for full calibration and system performance verification.

3-2 Power Up Procedure

Use this procedure to power up the MS464xA/B VNA and the 3739C Broadband Test Set. There are no AC power connections for the mmWave Modules.

1. Connect the **AC Line Cord** to AC main power at the rear panel of each test set.
2. At the VNA Rear Panel, connect the **AC Line Cord** to the AC main power.
 - Power requirements are 90 to 264 VAC, 47 to 63 Hz, power factor controlled.
3. Make sure a USB or PS2 **mouse** is connected to the VNA.

Power Up Sequence

Power up each unit in the following sequence:

4. At the MN469xC Multiport Test Set front panel press the left side **AC Power Button**.
The yellow **Power LED** should light.
5. At the 3736B Master Test Set front panel press the left side **AC Power Button**.
The green **Power LED** should light.
6. At the 3739C Broadband Test Set front panel press the left side **AC Power Button**.
The green **Power LED** should light.
7. At the MS464xA/B VNA Rear Panel, turn the **AC Power Rocker Switch** to “I” or **ON**.
 - The front panel **Standby/Operate** key illuminates with an orange Standby LED.
 - The VNA is in Standby mode.
8. At the MS464xA/B VNA Front Panel, Press and hold the **Standby/Operate** key for at least one (1) second.
 - The **Standby/Operate** key illuminates with a green Operate LED.
 - The VNA is in Operate mode.

3-3 VNA Preset Procedure

1. Depending on the instrument preset configuration, do either [Step 2](#) or [Step 3](#) below.
2. If the VNA is configured to preset to the factory as-shipped default configuration:
 - a. Press the VNA front panel **Preset** button.
The VNA resets to the factory-default configuration,
 - b. Continue with the next applicable section.
3. If the VNA has been configured to a user-defined preset:
 - a. Use the right side menus to navigate to the **PRESET SETUP** menu.
Utilities | System | Setup | Preset Setup
 - b. Select the **Default** button, and then click the **Preset** icon on the icon toolbar.
The VNA resets to the factory-default configuration.
 - c. Continue with the next applicable section.

Note

The default power levels (< 54 GHz) will vary depending on if the system has a full 4-port factory ALC calibration (-10 dBm with an older mapped calibration, -20 dBm with the full 4-port calibration and with better accuracy). Generally, systems will be calibrated the same way as shipped unless the customer requests otherwise. Note the power accuracy with these calibration methods is different.

3-4 MS464xA VNA Broadband/Banded Configuration

Receiver Configuration for Broadband

Configure the VNA for Modular Broadband Operation by performing the following steps:

- 1. Make sure the MS4647A VNA and the 3739C Broadband Test Set are both on and warmed up.
- 2. If not already done, perform [Section 3-3 “VNA Preset Procedure” on page 3-2](#).
- 3. At the MAIN menu, select Application. The APPLICATION menu appears.
- 4. MAIN | Application | APPLICATION
- 5. Select the BB/mmWave (3739 Test Set) button in the Receiver Configuration area.
The Standard, Multiple Source, and BB/mmWave (3738 Test Set) buttons are deselected.

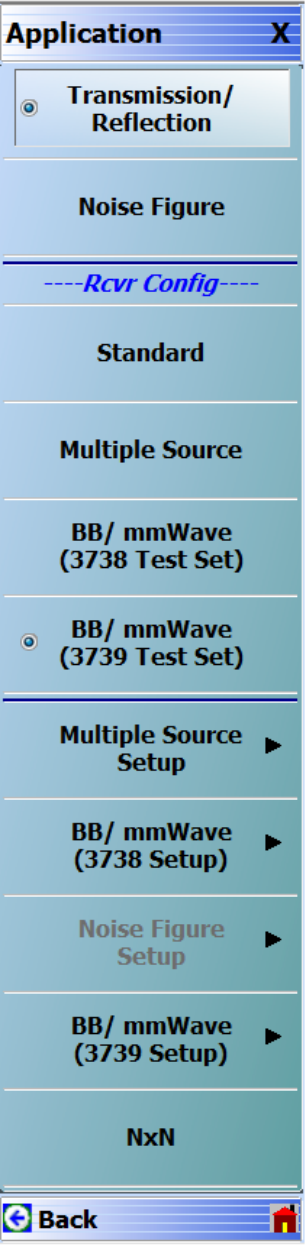


Figure 3-1. Broadband Configuration Selection (MS464xA Menu)

3739 Setup for Broadband

Configure the VectorStar VNA for Broadband Operation by performing the following steps:

- 1. Make sure the VNA and the broadband test set are both on and warmed up.
- 2. If not already done, perform [Section 3-3 “VNA Preset Procedure” on page 3-2](#).
- 3. Navigate to the Application menu and select:
Application | BB/mmWave (3739 Setup) | Broadband to 125 GHz

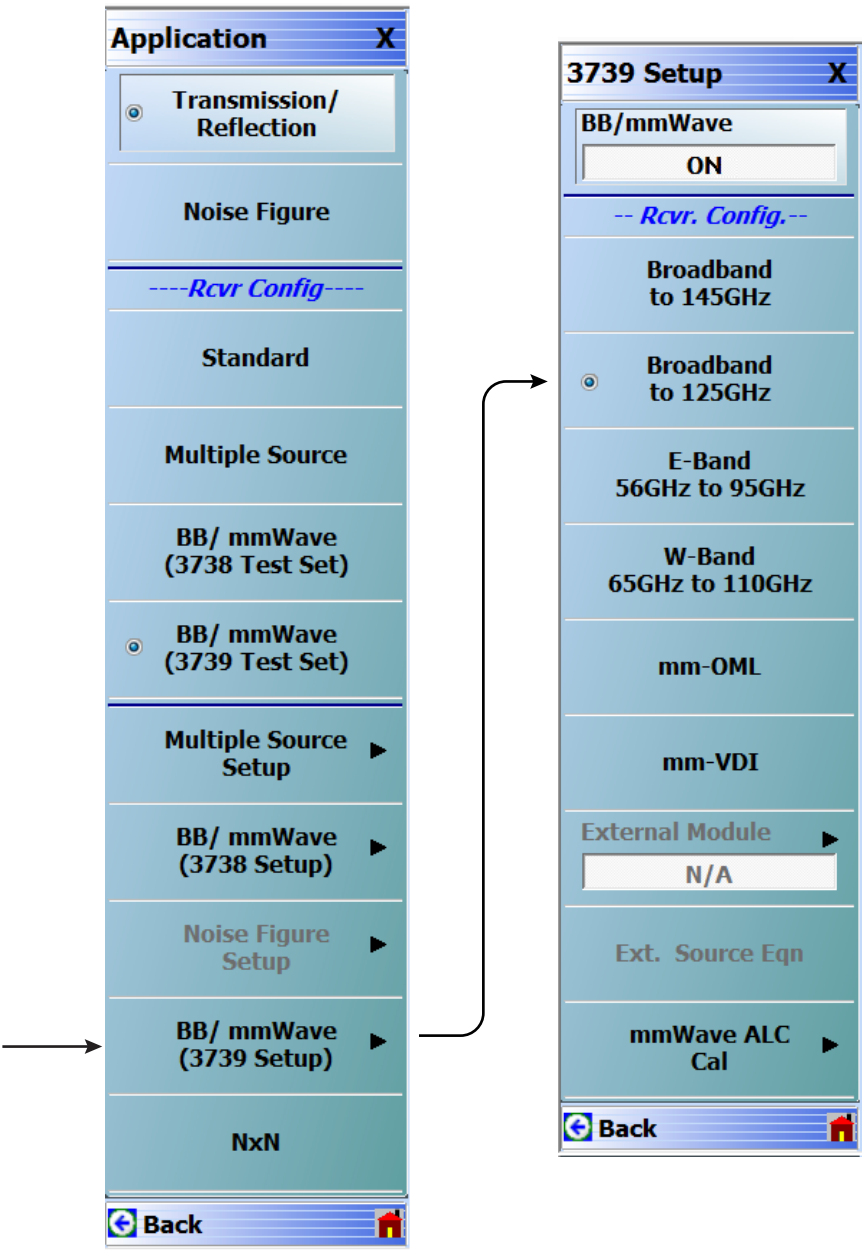
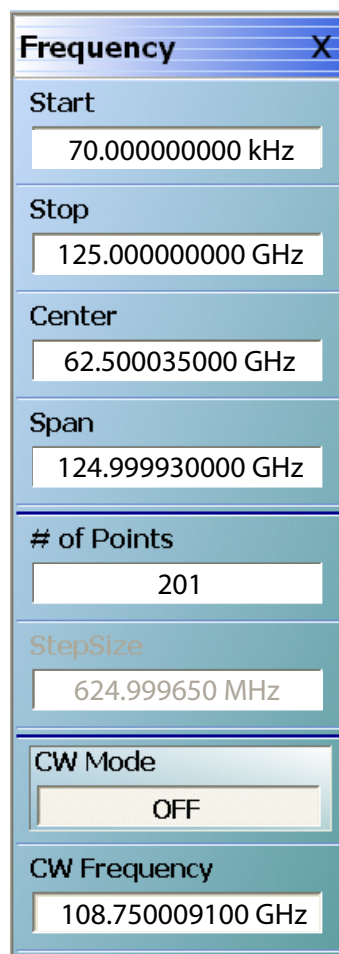


Figure 3-2. 3739 Setup for Broadband Module (MS464xA Menu)

Frequency Setup

1. Navigate to the FREQUENCY menu.
 - MAIN | Frequency | FREQUENCY
2. At the FREQUENCY menu, set the following frequency parameters:
 - Start Frequency = **70.000000000 kHz**
 - Stop Frequency = **125.000000000 GHz**
 - # of Points = **201**
3. The following frequency parameters are automatically set:
 - Center Frequency = **62.500035000 GHz**
 - Span Frequency = **124.999930000 GHz**
 - Step Size = **624.999650 MHz**
4. The system should now be sweeping fully from 70 kHz to 125 GHz.

A screenshot of the 'Frequency' menu in a software interface. The menu is titled 'Frequency' with a close button 'X' in the top right corner. It contains several input fields for frequency parameters: 'Start' (70.000000000 kHz), 'Stop' (125.000000000 GHz), 'Center' (62.500035000 GHz), 'Span' (124.999930000 GHz), '# of Points' (201), 'StepSize' (624.999650 MHz), 'CW Mode' (OFF), and 'CW Frequency' (108.750009100 GHz). The 'StepSize' field is highlighted in orange.

Parameter	Value
Start	70.000000000 kHz
Stop	125.000000000 GHz
Center	62.500035000 GHz
Span	124.999930000 GHz
# of Points	201
StepSize	624.999650 MHz
CW Mode	OFF
CW Frequency	108.750009100 GHz

Figure 3-3. FREQUENCY Menu – Settings for 70 kHz to 125 GHz Sweep

Receiver Configuration for Multiple Source

Configure the VectorStar VNA for Multiple Source Broadband Operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform [Section 3-3 “VNA Preset Procedure”](#) on page 3-2.
3. From the APPLICATION menu select Multiple Source Setup.
4. If not already done, from the MULTIPLE SOURCE menu, toggle Multiple Source to ON.
5. Select Ext. Mod. Ctrl.
6. On the EXTERNAL MODULE CTRL dialog, select 125 GHz.

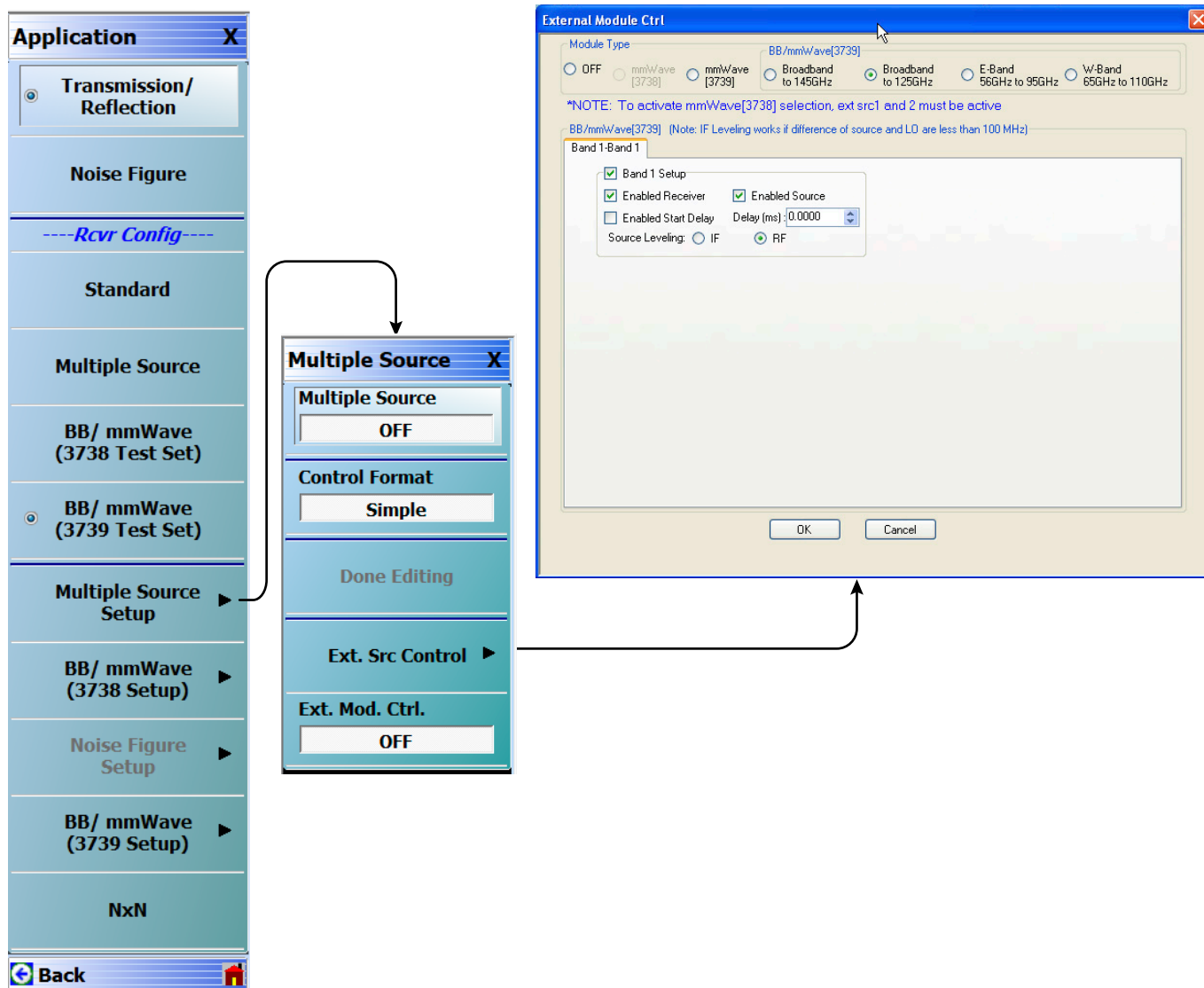


Figure 3-4. Receiver Configuration for Multiple Source (MS464xA Menu)

3739 Setup for Banded Modules

Configure the VectorStar VNA for BB/mmWave Operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform [Section 3-3 “VNA Preset Procedure” on page 3-2](#).
3. From the Application menu select BB/mmWave (3739 Setup).
4. Select E-Band or W-Band depending on your 3744A module.

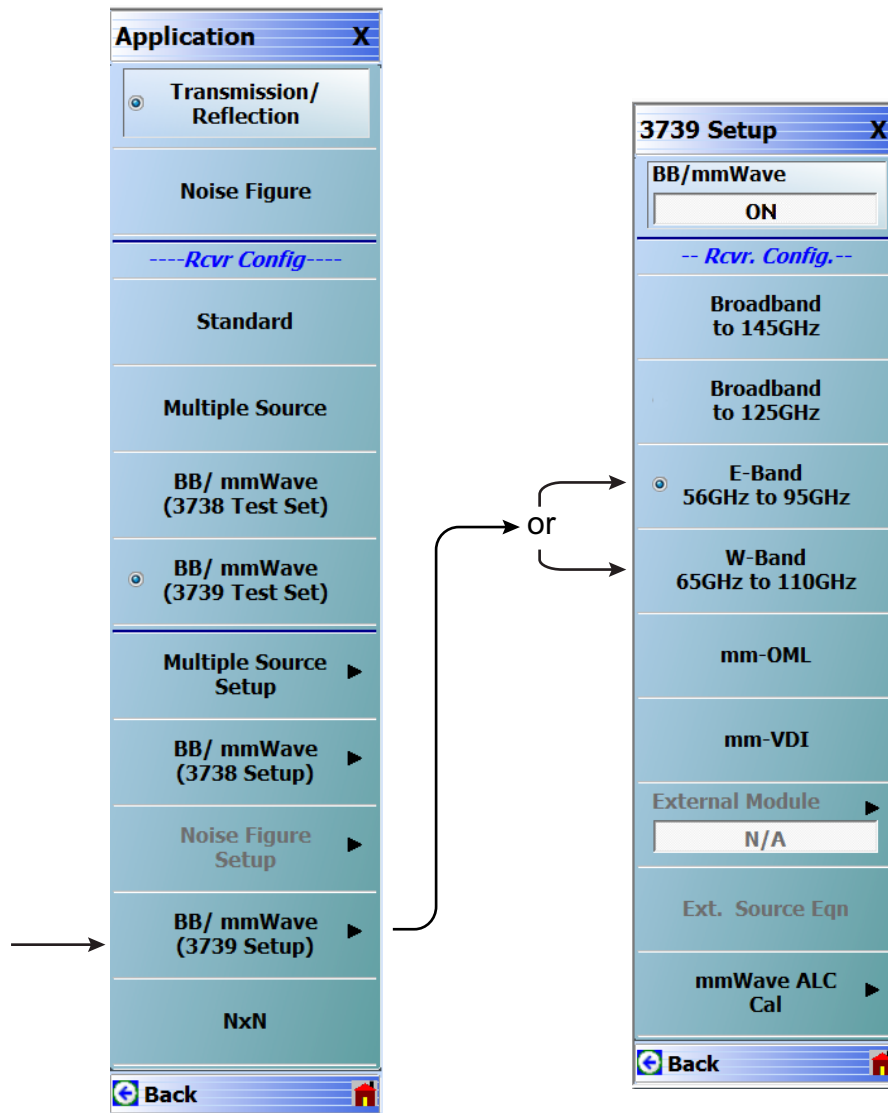


Figure 3-5. 3739 Setup for Banded Modules (MS464xA Menu)

3739 Setup for OML/VDI Selection

Configure the VectorStar VNA for OML or VDI operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform [Section 3-3 “VNA Preset Procedure” on page 3-2](#).
3. Navigate to the APPLICATION menu and select:

Rcvr Setup | BB/mmWave (3739 Setup) | mm-OML (or mm-VDI)

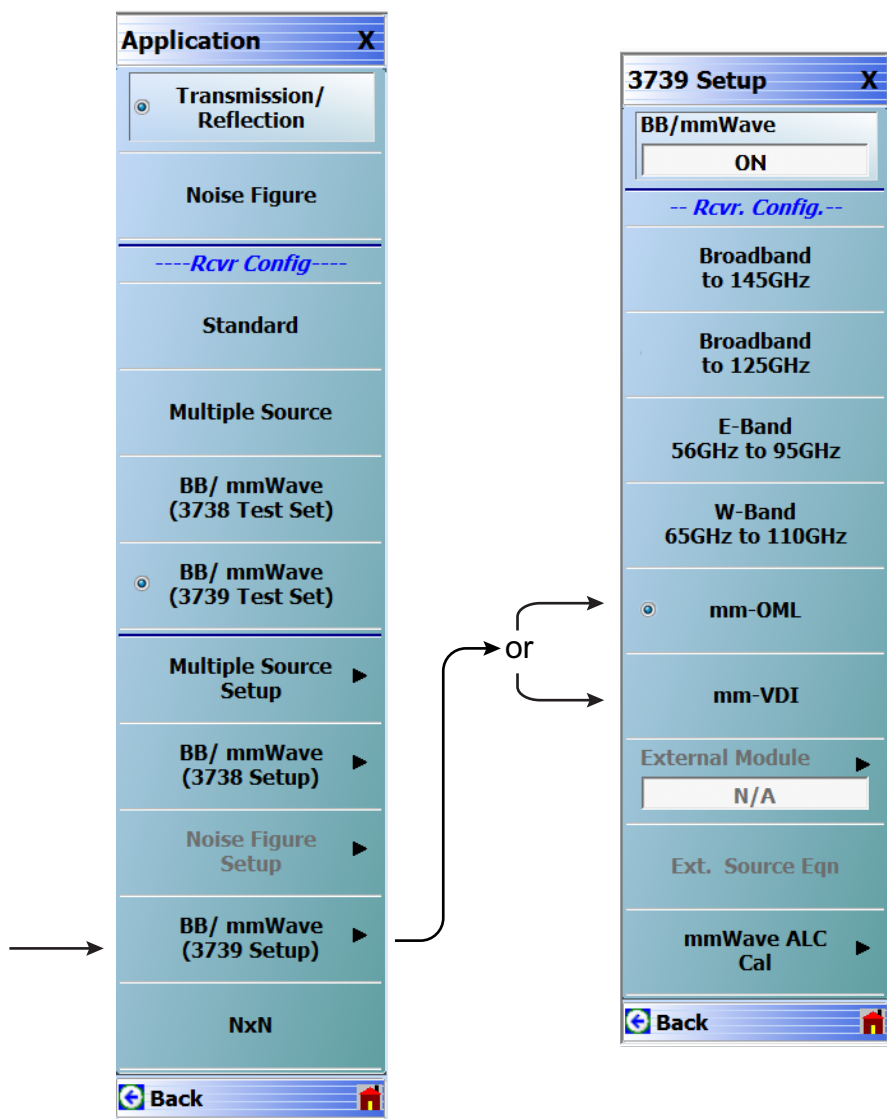


Figure 3-6. 3739 Setup for OML/VDI Selection

OML Band Selection

Configure the VectorStar VNA for OML operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform [Section 3-3 “VNA Preset Procedure” on page 3-2](#).
3. Navigate to the APPLICATION | Rcvr Config menu and select BB/mmWave (3739 Setup).

The 3739 SETUP menu opens ([Figure 3-15](#)).

4. Select External Module.
5. Select the applicable OML module band and click Apply.

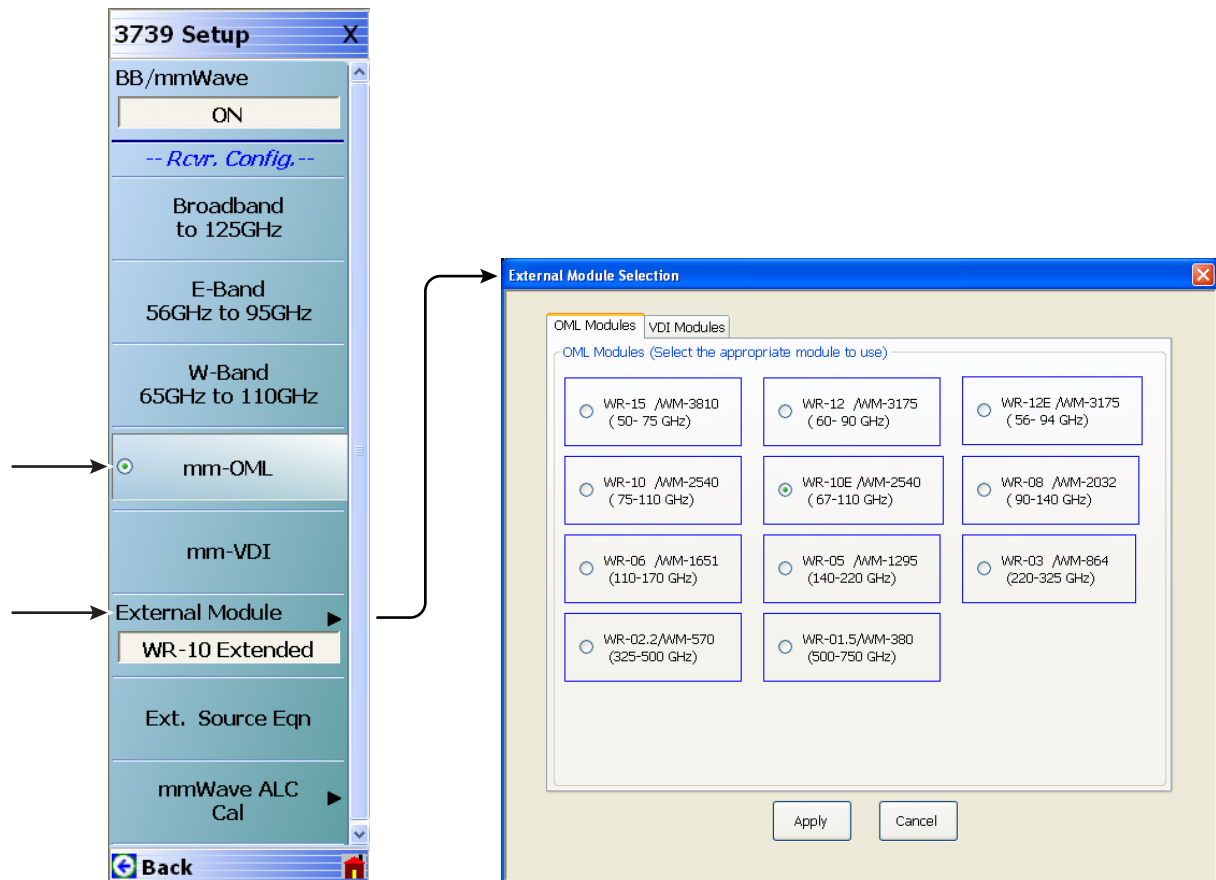


Figure 3-7. 3739 Setup Menu – OML Selection

VDI Band Selection

Configure the VectorStar VNA for VDI operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform [Section 3-3 “VNA Preset Procedure” on page 3-2](#).
3. Navigate to the APPLICATION menu and select BB/mmWave (3739 Setup).

The 3739 SETUP menu opens ([Figure 3-8](#)).

4. Select External Module.
5. Select the applicable VDI module band and Module Type and click Apply.

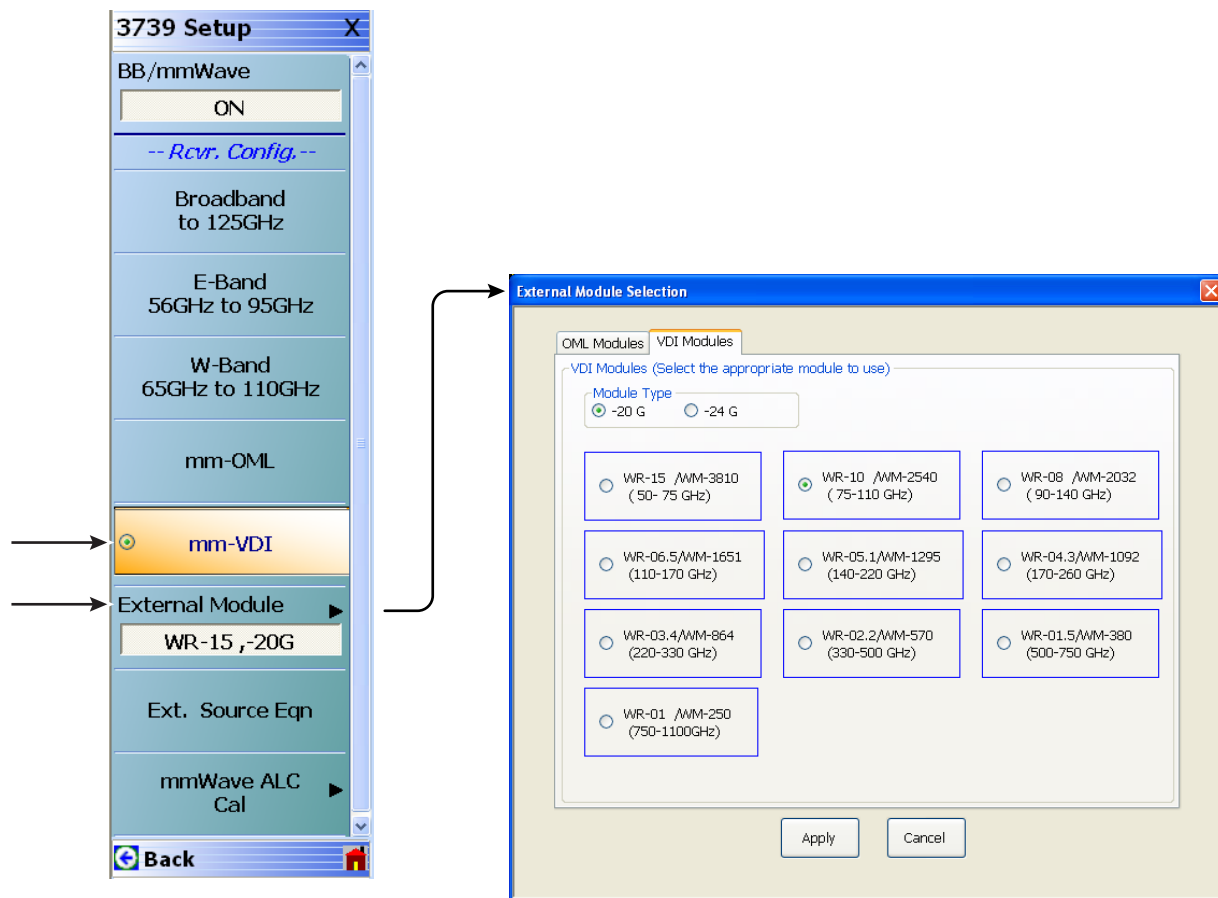


Figure 3-8. 3739 Setup Menu – VDI Band Selection

3-5 MS464xB VNA Broadband/Banded Configuration

Configure the VNA for Modular Broadband Operation by performing the following steps:

- 1. Make sure the VNA and the broadband test set are both on and warmed up.
- 2. If not already done, perform [Section 3-3 “VNA Preset Procedure” on page 3-2](#).

Receiver Configuration for Broadband

Configure the VNA for Modular Broadband Operation by performing the following steps:

- 1. Make sure the MS4647B VNA and the 3739C Broadband Test Set are both on and warmed up.
- 2. If not already done, perform [Section 3-3 “VNA Preset Procedure” on page 3-2](#).
- 3. At the MAIN menu, select Application. The APPLICATION menu appears as shown in [Figure 3-9](#).
MAIN | Application | APPLICATION
- 4. In the APPLICATION menu, select the Rcvr Config menu item. The RCVR CNFG menu appears.
MAIN | Application | APPLICATION | Rcvr Config | RCVR CNFG
- 5. In the RCVR CNFG menu, select the BB/mmWave (3739 Test Set) button.
The Standard, Multiple Source, and BB/mmWave (3738 Test Set) buttons are deselected.

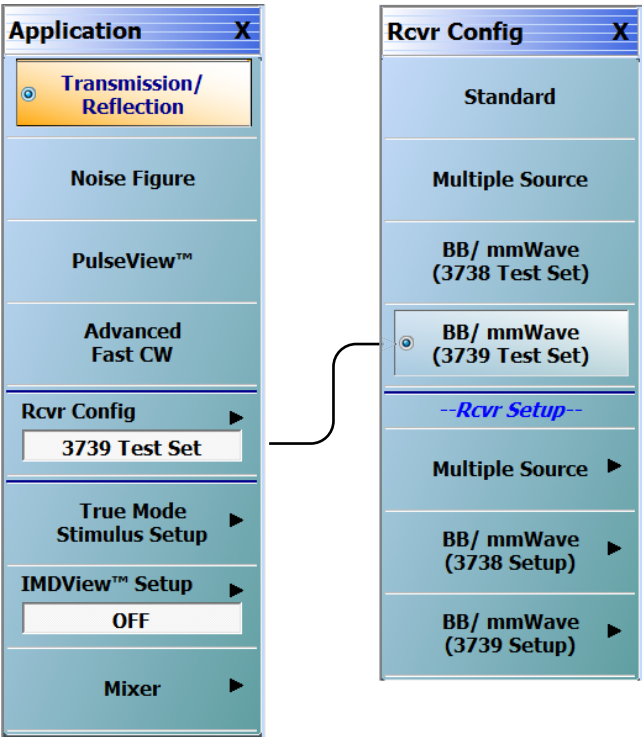


Figure 3-9. Broadband Configuration Selection

3739 Setup for Broadband

Configure the VectorStar VNA for Broadband Operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform [Section 3-3 “VNA Preset Procedure” on page 3-2](#).
3. If not already done, from the RCVR CONFIG menu, select BB/mmWave (3739 Test Set).
4. Navigate to the 3739 SETUP menu and select:
 - Broadband to 125 GHz (for the ME7838A4/A4X system, shown in [Figure 3-10](#))
 - Broadband to 145 GHz (for the ME7838D4 system)
 - Broadband to 110 GHz (for the ME7838E4/E4X system)
 - Broadband to 220 GHz (for the ME7838G4 system)

Note

While the D4 and G4 systems have operational frequency ranges greater than those shown here, the 145 and 220 GHz stop frequencies are used for simplicity.

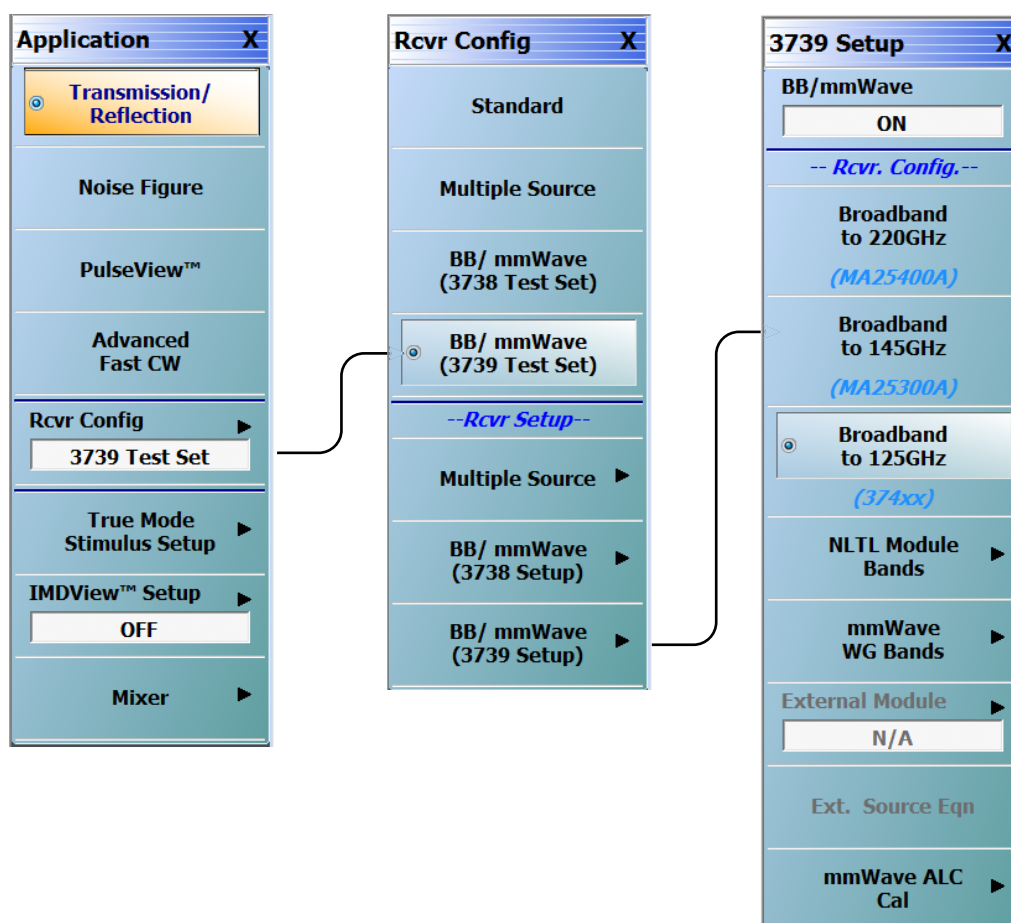


Figure 3-10. 3739 Setup for Broadband Module (MS464xB Menu) – ME7838A4/A4X Example

Menus will be slightly different in ME7838E4/E4X systems.

Frequency Setup

1. Navigate to the FREQUENCY menu.
 - MAIN | Frequency | FREQUENCY
2. At the FREQUENCY menu, set the frequency parameters, as shown in [Table 3-1](#) and [Figure 3-11](#).

Table 3-1. Frequency Parameters to Set

	A4	E4	D4	G4
Start Frequency	70.000000000 kHz	70.000000000 kHz	70.000000000 kHz	70.000000000 kHz
Stop Frequency	125.000000000 GHz	110.000000000 GHz	145.000000000 GHz	220.000000000 GHz
# of Points	201	201	201	201

3. The following frequency parameters are automatically set, as shown in [Table 3-2](#).

Table 3-2. Automatically Set Frequency Parameters

	A4	E4	D4	G4
Center Frequency	62.500035000 GHz	55.000035000 GHz	72.500035000 GHz	110.000035 GHz
Span Frequency	124.999930000 GHz	109.999930000 GHz	144.999930000 GHz	219.99993 GHz
Step Size	624.999650 MHz	549.999650 MHz	724.999650 MHz	1.09999965 GHz

4. The system should now be sweeping fully from the set Start Frequency and Stop Frequency.

Frequency

X

Start

70.000 kHz

Stop

125.000000000 GHz

Center

62.500035000 GHz

Span

124.999930000 GHz

of Points

201

StepSize

624.999650 MHz

CW Mode

OFF

CW Frequency

70.000 kHz

Src1-Src2 Phase

0 °

Figure 3-11. FREQUENCY Menu – Example for Settings for 70 kHz to 125 GHz Sweep

Receiver Configuration for Multiple Source

Configure the VectorStar VNA for Multiple Source Broadband Operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform [Section 3-3 “VNA Preset Procedure”](#) on page 3-2.
3. From the APPLICATION menu, select Rcvr Cnfig.
4. If not already done, from the RCVR CONFIG menu, select BB/mmWave (3739 Test Set).
5. If not already done, from the MULTIPLE SOURCE menu, toggle Multiple Source to ON as shown in [Figure 3-12](#) (sheet 1).
6. Select Ext. Mod. Ctrl.
7. In the EXTERNAL MODULE CTRL dialog, select 110, 125, 145, or 220 GHz as appropriate (for E4, A4, D4, and G4 systems, respectively) as shown in [Figure 3-12](#) (sheet 2)

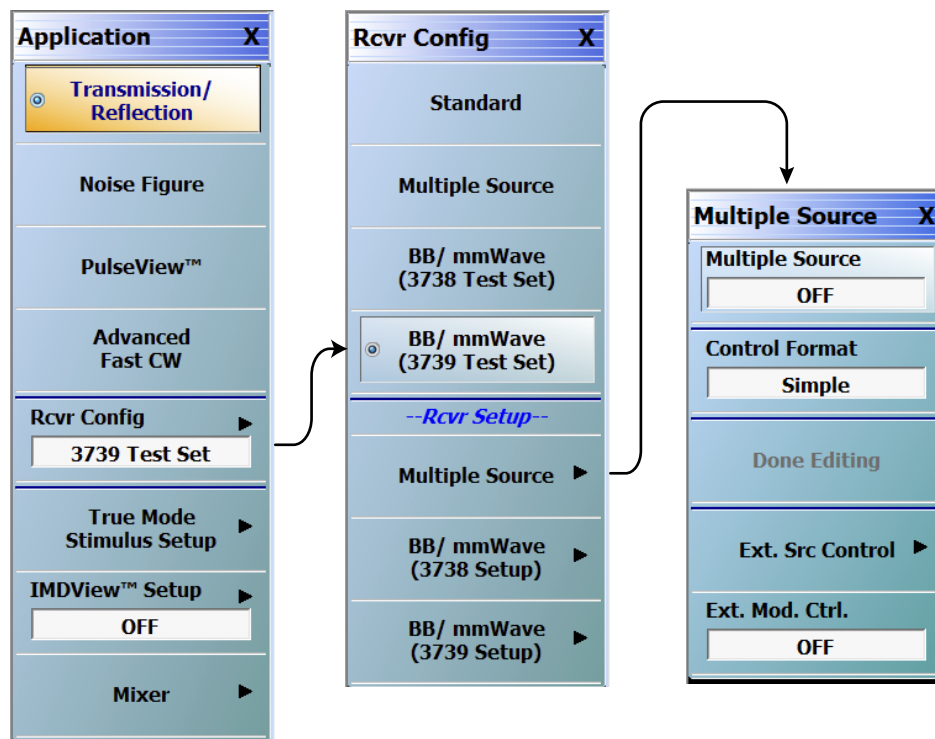


Figure 3-12. Receiver Configuration for Multiple Source (MS464xB Menu) (1 of 2)

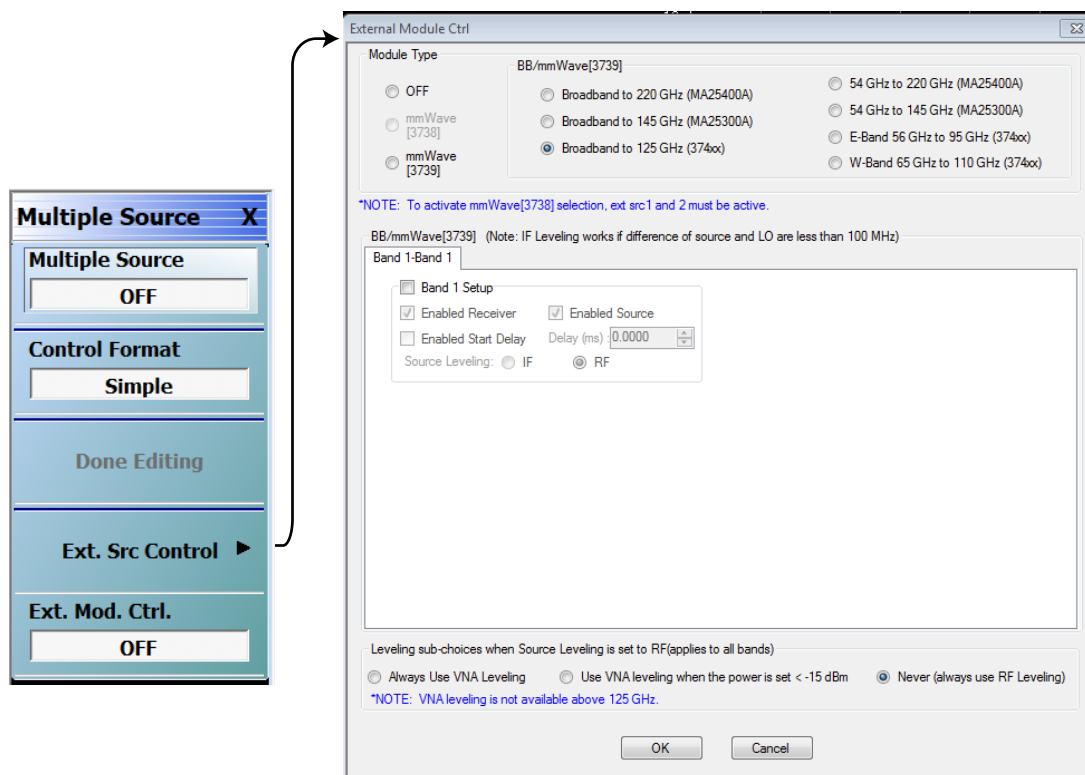


Figure 3-12. Receiver Configuration for Multiple Source (MS464xB Menu) (2 of 2)

3739 Setup for Banded Modules

Configure the VectorStar VNA for BB/mmWave Operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform [Section 3-3 “VNA Preset Procedure” on page 3-2](#).
3. From the APPLICATION menu, select Rcvr Config.
4. If not already done, from the RCVR CONFIG menu and select BB/mmWave (3739 Test Set).
5. From the RCVR CONFIG menu, select BB/mmWave (3739 Setup).
6. From the 3739 SETUP menu, select NLTL Module Bands.
7. From the NLTL MODULE menu, select E-Band or W-Band depending on your 3744A module. For the ME7838D4 system (which uses MA25300A modules), the 54 to 145 GHz selection is also a possibility. The 54 to 145 GHz selection will not be available on ME7838E4/E4X systems. The 54 to 145 GHz selection will be available on ME7838A4/A4X systems, but will only perform correctly if MA25300A modules are in use. For the ME7838G4 system (which uses MA25400A modules), the 54 to 220 GHz selection is a possibility.

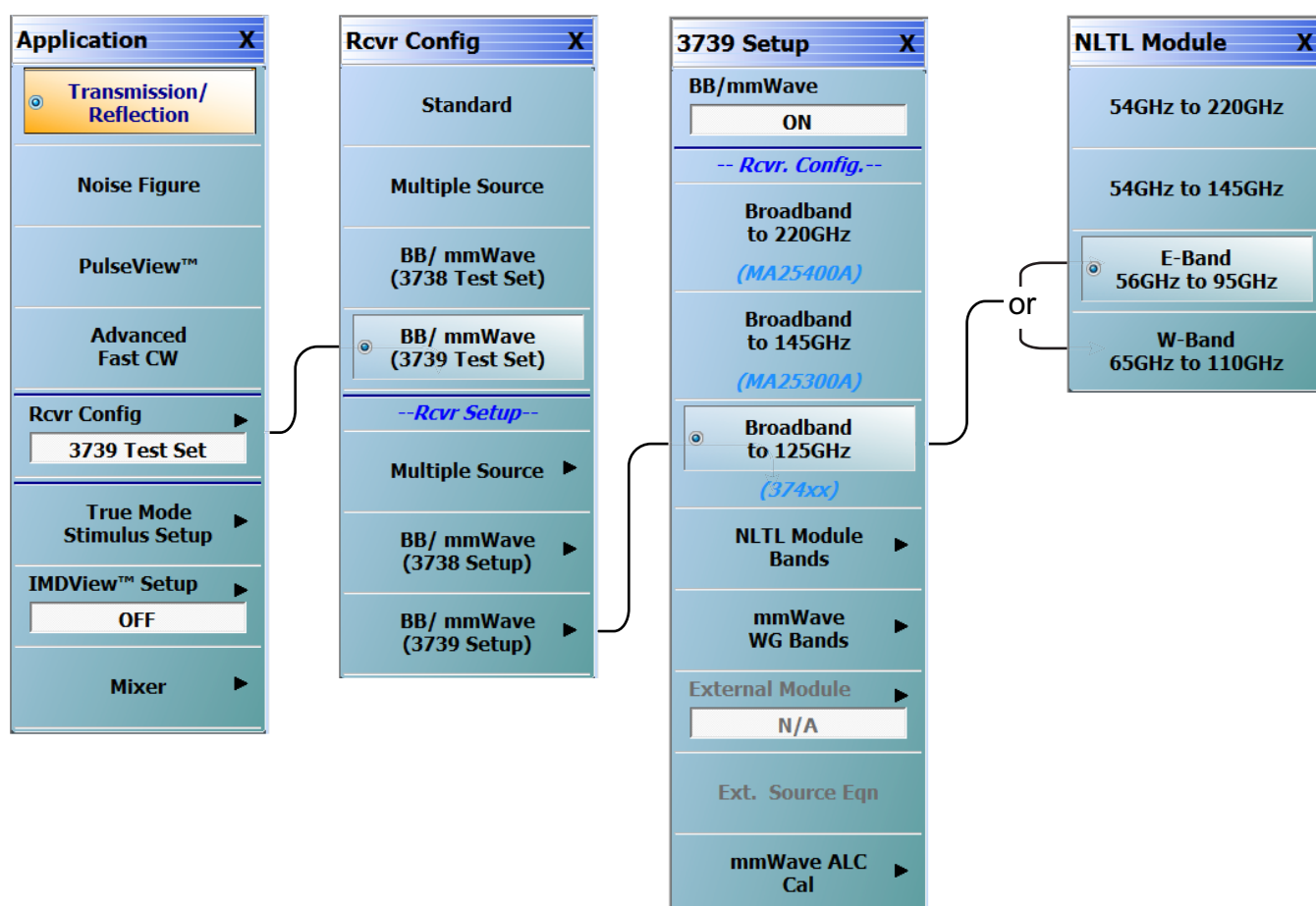


Figure 3-13. 3739 Setup for Banded Modules (ME7838A4/A4X Menu)
Menus will be slightly different in ME7838E4/E4X systems.

3739 Setup for OML/VDI Selection

Configure the VectorStar VNA for OML or VDI operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform [Section 3-3 “VNA Preset Procedure”](#) on page 3-2.
3. From the APPLICATION menu, select Rcvr Config.
4. If not already done, from the RCVR CONFIG menu and select BB/mmWave (3739 Test Set).
5. From the RCVR CONFIG menu, select BB/mmWave (3739 Setup).
6. From the 3739 SETUP menu, select mmWave WG Bands.
7. From the mmWAVE WG menu, select mm-OML (or mm-VDI)

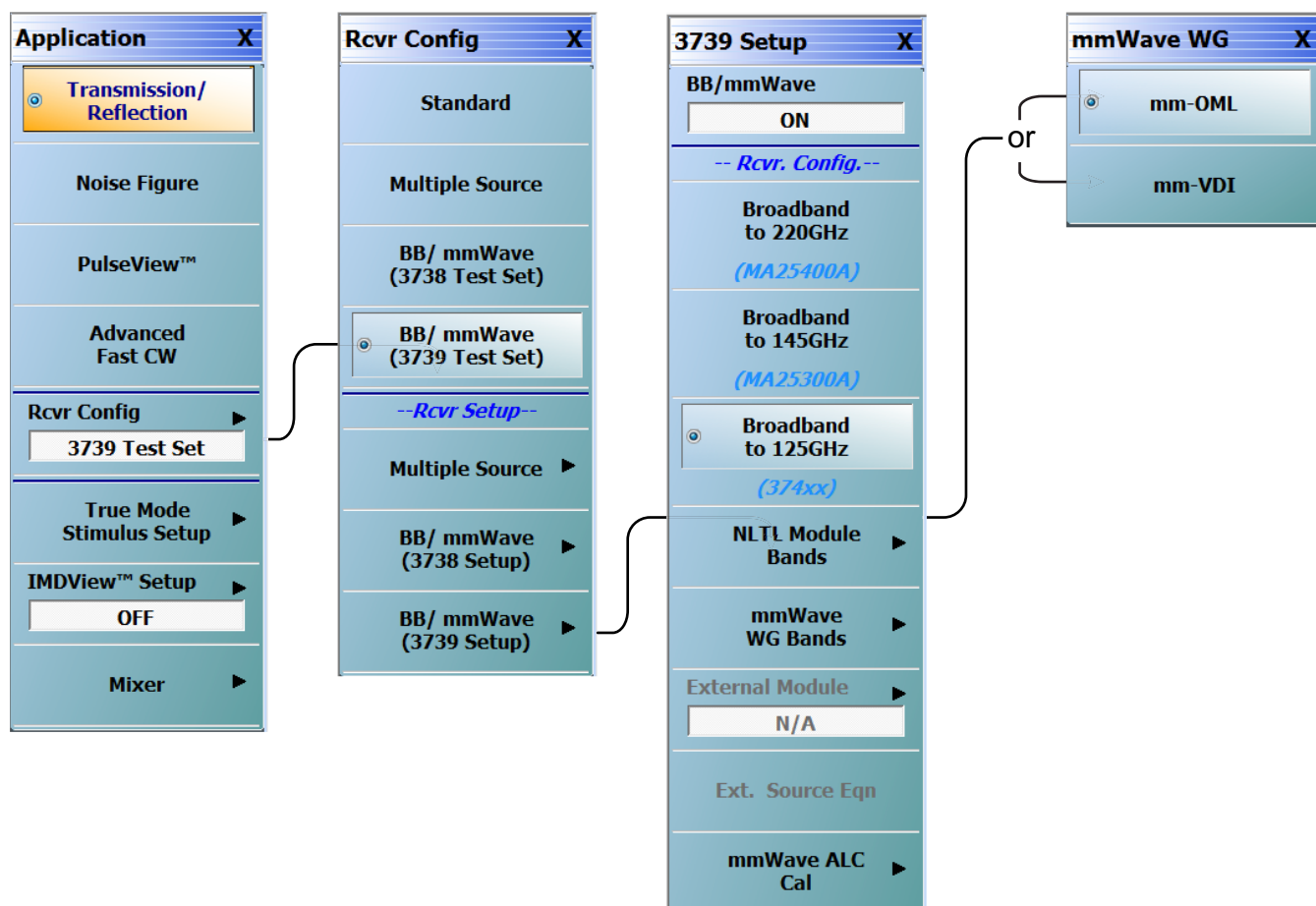


Figure 3-14. 3739 Setup for OML/VDI Selection

Menus will be slightly different in ME7838E4 systems.

OML Band Selection

Configure the VectorStar VNA for OML operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform [Section 3-3 “VNA Preset Procedure”](#) on page 3-2.
3. From the APPLICATION menu, select Rcvr Config.
4. If not already done, from the RCVR CONFIG menu and select BB/mmWave (3739 Test Set).
5. From the RCVR CONFIG menu, select BB/mmWave (3739 Setup).
6. From the 3739 SETUP menu, select mmWave WG Bands.
7. From the mmWAVE WG menu, select mm-OML ([Figure 3-15](#)).
8. From the 3739 SETUP menu, select External Module.
9. Select the applicable OML module band in the OML Modules tab and click Apply.

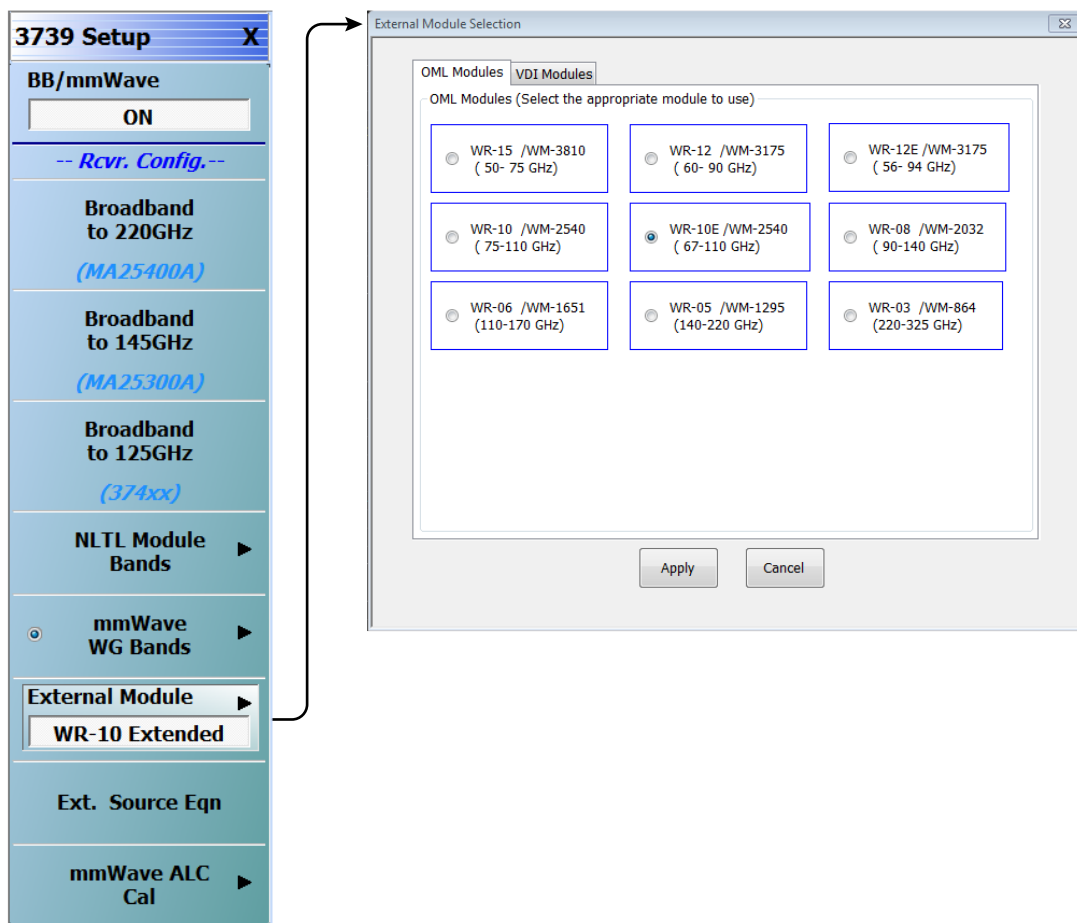


Figure 3-15. 3739 Setup Menu – OML Selection

VDI Band Selection

Configure the VectorStar VNA for VDI operation by performing the following steps:

1. Make sure the VNA and the broadband test set are both on and warmed up.
2. If not already done, perform [Section 3-3 “VNA Preset Procedure” on page 3-2](#).
3. From the APPLICATION menu, select Rcvr Config.
4. If not already done, from the RCVR CONFIG menu and select BB/mmWave (3739 Test Set).
5. From the RCVR CONFIG menu, select BB/mmWave (3739 Setup).
6. From the 3739 SETUP menu, select mmWave WG Bands.
7. From the mmWAVE WG menu, select mm-VDI ([Figure 3-15](#)).
8. From the 3739 SETUP menu, select External Module.
9. Select the applicable Module Type and VDI module band in the VDI Modules tab and click Apply.

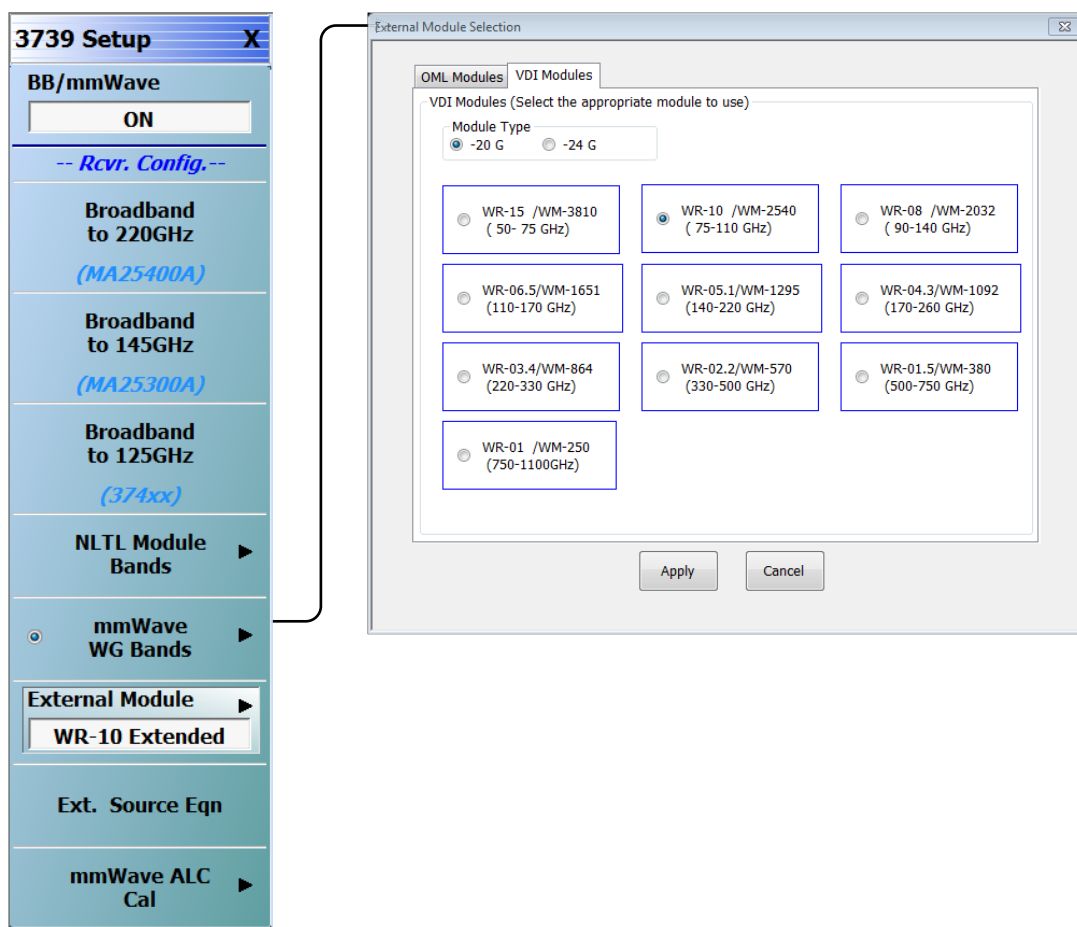


Figure 3-16. 3739 Setup Menu – VDI Selection

3-6 ME7838x4/x4X Configuration Verification – BB/mmWave Modules

Note This verification procedure applies when using 3743A/AX, 3743E/EX, MA25300A, or MA25400A broadband modules.

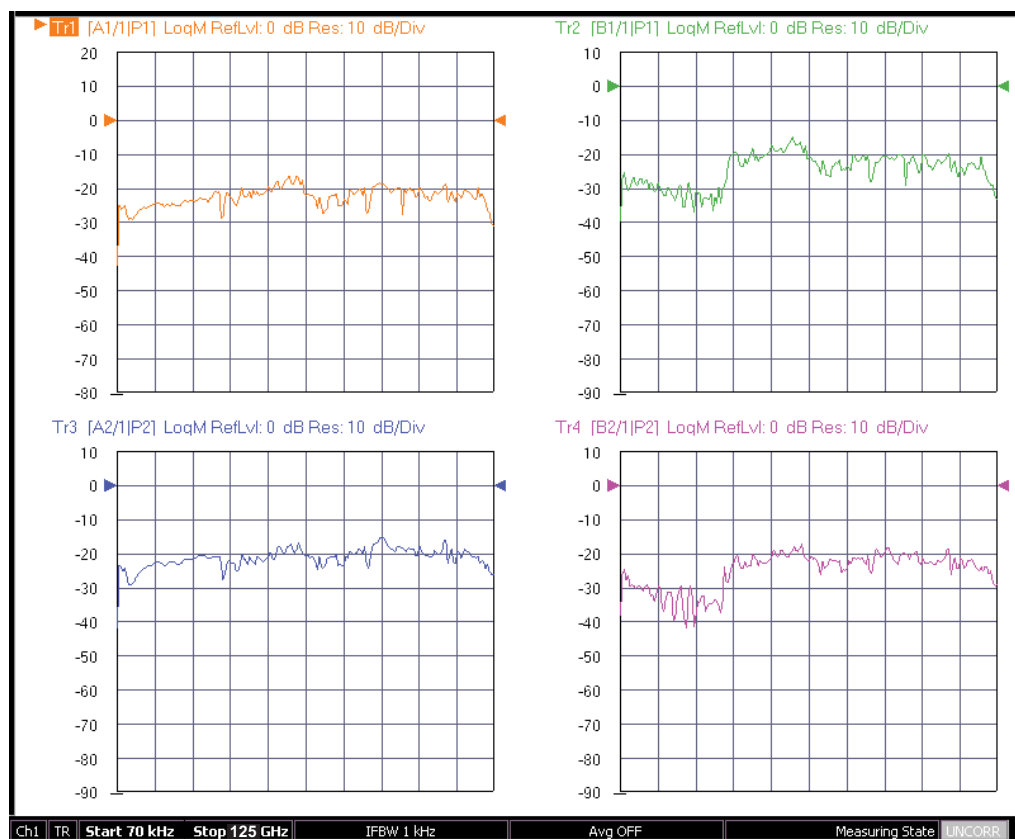
1. Ensure the system is sweeping from:
 - 70 kHz to 125 GHz for the ME7838A4/A4X system
 - 70 kHz to 145 GHz for the ME7838D4 system
 - 70 kHz to 110 GHz for the ME7838E4/E4X system
 - 70 kHz to 220 GHz for the ME7838G4 system
2. Ensure that Trace 1 is set to S11, Trace 2 set to S12, Trace 3 set to S21, and Trace 4 set to S22.
3. Select Trace 1 and then select Display | DISPLAY | Trace Format, and set to **Log Mag**.
4. Select Response | RESPONSE | User-defined. The USER-DEFINED menu appears.
 - a. Set USER-DEFINED | Numerator to **A1**.
 - b. Set USER-DEFINED | Denominator to **1**.
 - c. On the USER-DEFINED menu, select **Port 1** as the Driver Port.
 - d. Using a mouse, move the Reference Line as shown below ([Figure 3-17](#)) to Reference Position = **0**.

Note The Reference Line position can also be set from the SCALE menu in the Reference Position field.

5. For Trace 2, repeat Step 4, setting Numerator = **B1**, Denominator = **1**, Driver Port = **1**.
6. For Trace 3, repeat Step 4, setting Numerator = **A2**, Denominator = **1**, Driver Port = **2**.
7. For Trace 4, repeat Step 4, setting Numerator = **B2**, Denominator = **1**, Driver Port = **2**.
8. Connect **shorts** to module ports 1 and 2 (in the case of the ME7838G4, just leave the coaxial flange ports open), and ensure the resultant display looks similar to:
 - [Figure 3-17](#) (125 GHz shown) for ME7838A4/A4X
 - [Figure 3-18](#) (145 GHz shown) for ME7838D4
 - [Figure 3-19](#) (110 GHz shown) for ME7838E4/E4X
 - [Figure 3-20](#) (220 GHz shown) for ME7838G4

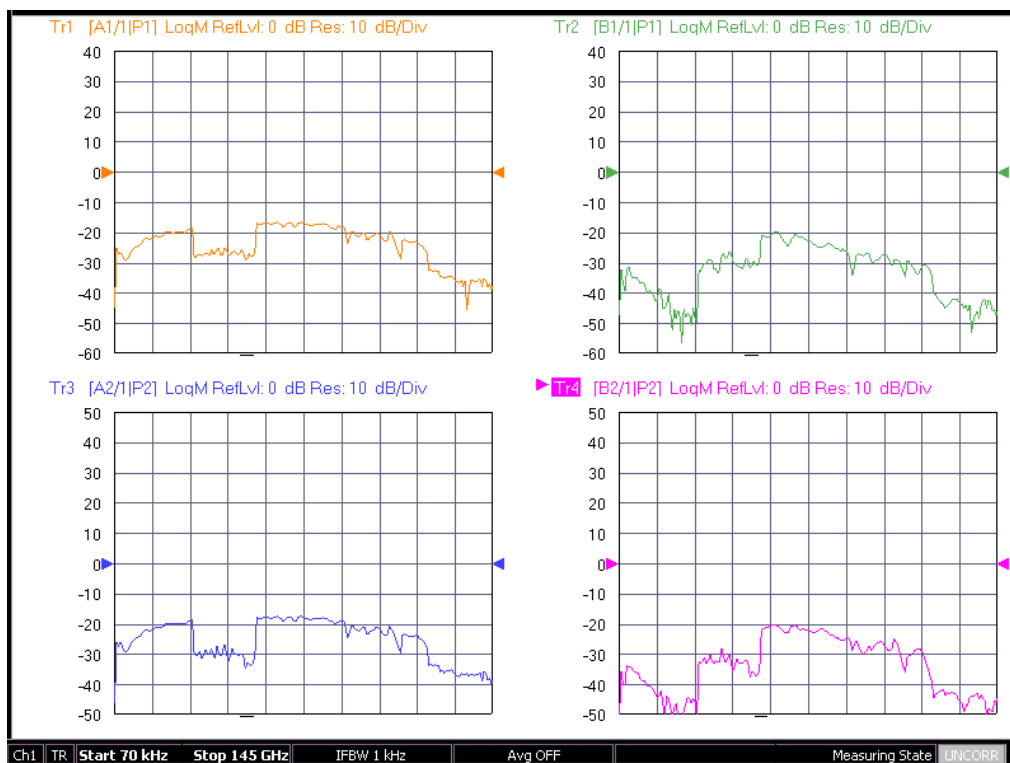
Note While the D4 and G4 systems have operational frequency ranges greater than those shown here, the 145 and 220 GHz stop frequencies are used for simplicity.

Note Certain systems will have full 4-port factory ALC calibrations (as opposed to mapped calibrations) and, as a result, have different default power settings < 54 GHz. As a result, the unratioed levels may deviate from those shown here by 5 dB or more. This generally applies to those systems shipped in 2021 and beyond.



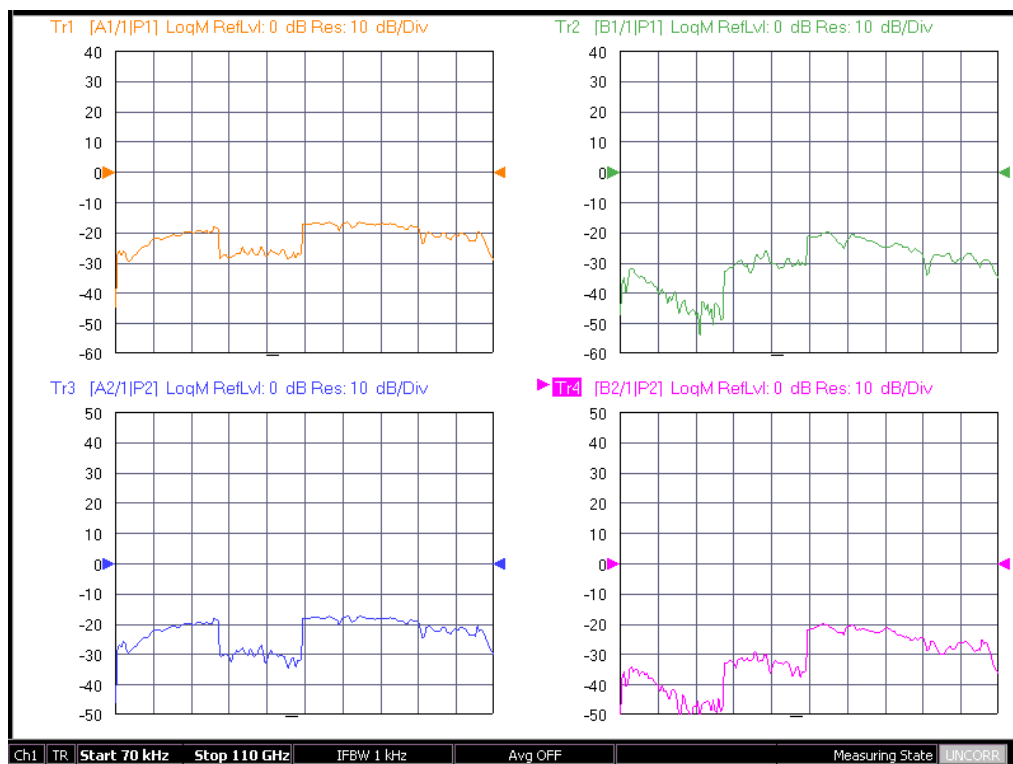
Non-Ratioed Parameters for Initial Checkout

Figure 3-17. Typical Four-Trace Display – Shorts on Port 1 and Port 2 – ME7838A4/A4X



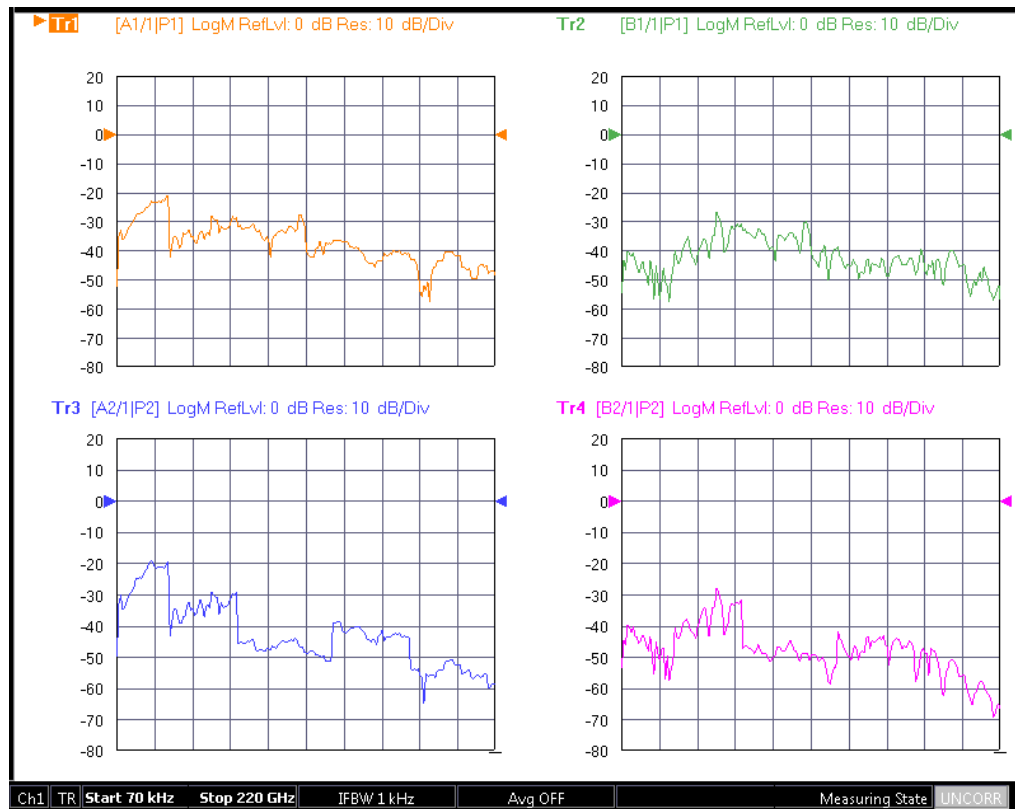
Non-Ratioed Parameters for Initial Checkout

Figure 3-18. Typical Four-Trace Display – Shorts on Port 1 and Port 2 – ME7838D4



Non-Ratioed Parameters for Initial Checkout

Figure 3-19. Typical Four-Trace Display – Shorts on Port 1 and Port 2 – ME7838E4/E4X



Non-Ratioed Parameters for Initial Checkout

Figure 3-20. Typical Four-Trace Display – Shorts on Port 1 and Port 2 – ME7838G4

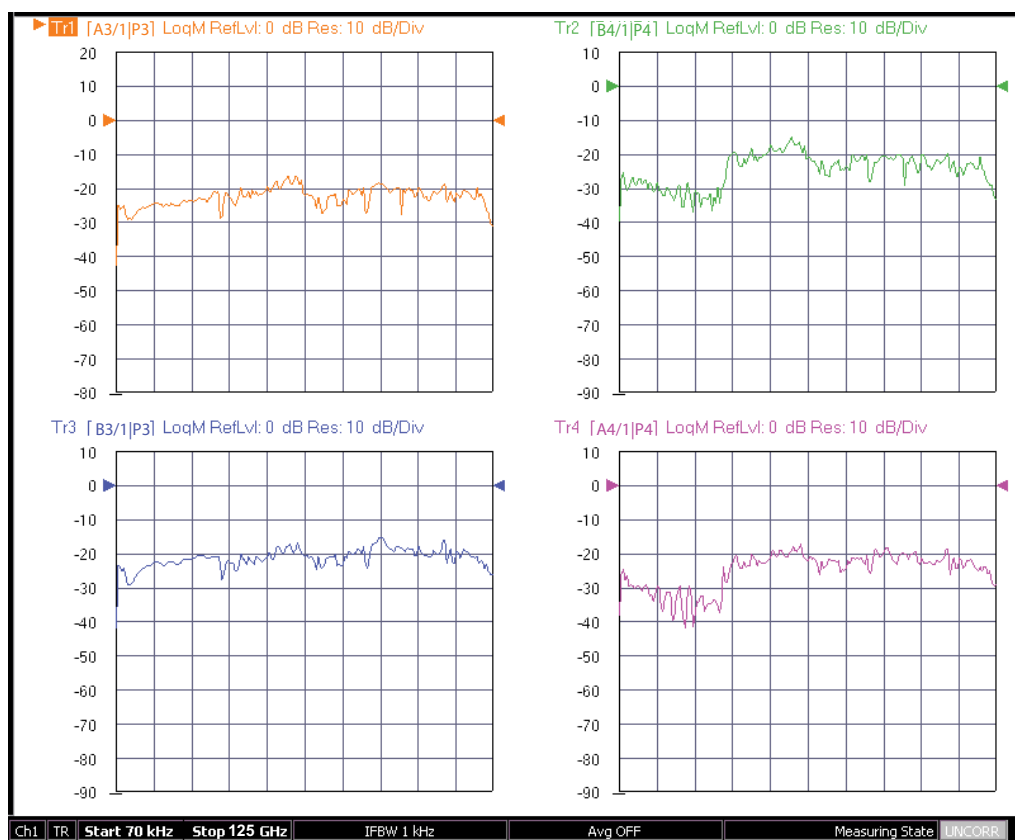
9. Select Trace 1 and then select Response | RESPONSE | User-defined. The USER-DEFINED menu appears.
 - a. Set USER-DEFINED | Numerator to **A3**.
 - b. Set USER-DEFINED | Denominator to **1**.
 - c. On the USER-DEFINED menu, select **Port 3** as the Driver Port.
 - d. Using a mouse, move the Reference Line as shown below (Figure 3-21) below to Reference Position = **0**.
10. For Trace 2, repeat Step 9, setting Numerator = **B4**, Denominator = **1**, Driver Port = **4**, Reference Position = **9**.
11. For Trace 3, repeat Step 9, setting Numerator = **B3**, Denominator = **1**, Driver Port = **3**, Reference Position = **9**.
12. For Trace 4, repeat Step 9, setting Numerator = **A4**, Denominator = **1**, Driver Port = **4**, Reference Position = **8**.

13. Connect **shorts** to module ports 3 and 4 (for the ME7838G4, just leave the coaxial flange ports open), and ensure the resultant display looks similar to:

- [Figure 3-21](#) (125 GHz shown) for ME7838A4
- [Figure 3-22](#) (145 GHz shown) for ME7838D4
- [Figure 3-23](#) (110 GHz shown) for ME7838E4
- [Figure 3-24](#) (220 GHz shown) for ME7838G4

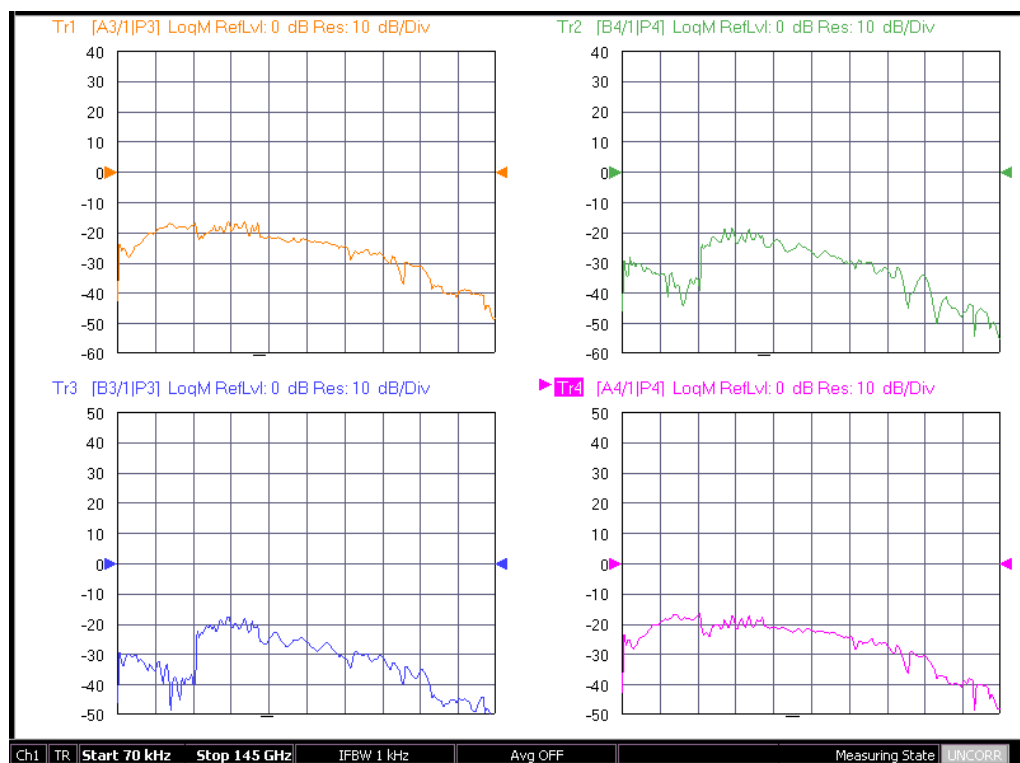
Note

Some software versions have different default power levels for < 54 GHz, so the unratioed values may be higher or lower than those shown by 5 dB or more.



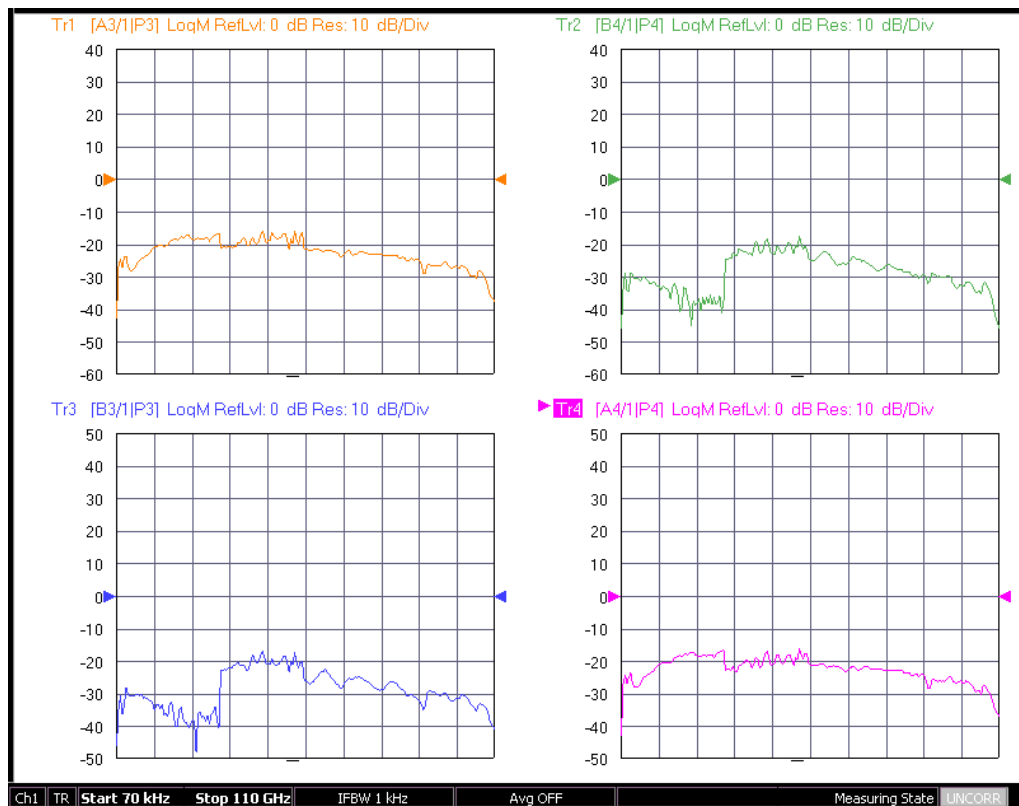
Non-Ratioed Parameters for Initial Checkout

Figure 3-21. Typical Four-Trace Display – Shorts on Port 3 and Port 4 – ME7838A4



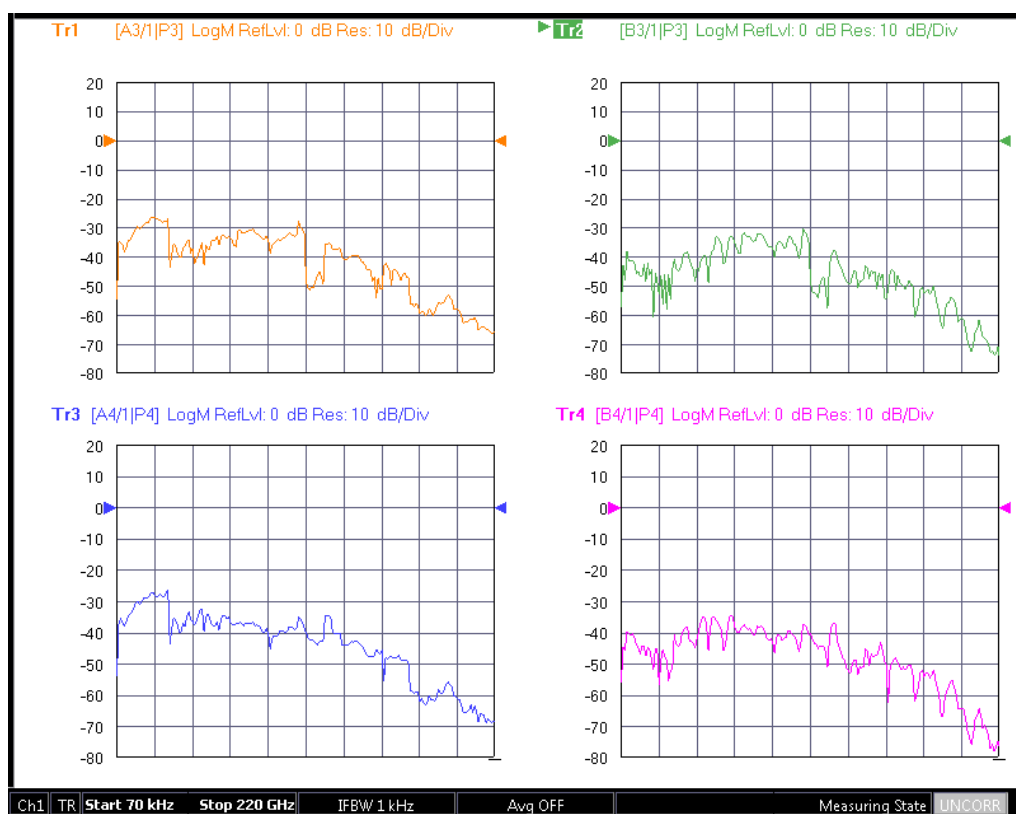
Non-Ratioed Parameters for Initial Checkout

Figure 3-22. Typical Four-Trace Display – Shorts on Port 3 and Port 4 – ME7838D4



Non-Ratioed Parameters for Initial Checkout

Figure 3-23. Typical Four-Trace Display – Shorts on Port 3 and Port 4 – ME7838E4/E4X



Non-Ratioed Parameters for Initial Checkout

Figure 3-24. Typical Four-Trace Display – Shorts on Port 3 and Port 4 – ME7838G4

VNA Power Down

1. With the VNA in operate mode, the front panel **Standby/Operate** button is illuminated with a green LED.
2. Press and hold the **Standby/Operate** button for at least one (1) second. The orange **Standby LED** is illuminated with an orange LED. The VNA is in Standby mode.
3. To completely shut down the VNA, at the rear panel, set the **AC Power Rocker Switch** in the AC Power Input Module to “O” or OFF.
4. If required, disconnect the VNA Power Cord from the AC Mains.

Test Set Power Down

5. At the Test Set front panel, press the **AC Power Button**. The green **Power LED** goes out.
6. If required, disconnect the Test Set rear panel AC Power Cord from the AC main power source.

Appendix A — ME7838x4/x4X Series Multiport Specifications

A-1 ME7838x4/x4X VNA System Specifications

The latest technical data sheets and other reference materials for the ME7838x4/x4X, MS464xA/B, and other VectorStar™ VNA systems can be downloaded from <http://www.anritsu.com>. The recommended documents are:

- VectorStar ME7838A4 Broadband/Banded mmWave VNA Technical Data Sheet – 11410-00704
- VectorStar ME7838AX/A4X Broadband/Banded mmWave VNA Technical Data Sheet – 11410-02825
- VectorStar ME7838D4 Broadband/Banded mmWave VNA Technical Data Sheet – 11410-01099
- VectorStar ME7838E4 Broadband/Banded mmWave VNA Technical Data Sheet – 11410-01100
- VectorStar ME7838E4/E4X Broadband/Banded mmWave VNA Technical Data Sheet – 11410-02827
- VectorStar ME7838G4 Broadband/Banded mmWave VNA Technical Data Sheet – 11410-01196
- VectorStar S464xA Series VNA Technical Data Sheet – 11410-00432
- VectorStar™ MS464xB Series VNA Technical Data Sheet – 11410-00611
- VectorStar MN469xC Series VNA Technical Data Sheet – 11410-00777

Enter the document part number in the home page search frame and a link to the latest version of that document will be displayed for download.

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E



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