Quick Start Guide

VectorStar™ ME7838A/AX 2-Port Broadband/Banded mmWave System

High Performance Modular Broadband/Banded mmWave Vector Network Analyzer (VNA) Measurement System, 70 kHz to 125 GHz

Anritsu

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High Performance Modular Broadband/Banded mmWave Vector Network Analyzer (VNA) Measurement System, 70 kHz to 125 GHz

This guide provides quick setup instructions for theVectorStar™ ME7838A/AX Broadband/Banded mmWave VNA System assembly. For additional safety and compliance information, and for more details about the assembly, configuration, setup, and initial testing of the equipment, refer to the *VectorStar ME7838A/AX Series Broadband Vector Network Analyzers Installation Guide – 10410-00293.*

This and all other documentation that supports the ME7838A/AX is available on the ME7838x web page:

http://www.anritsu.com/test-measurement/products/me7838

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

ME7838A/AX Broadband System Main Components

The ME7838A/AX Multiport Broadband system consists of the following components:

- MS4647A or MS4647B VNA with Option 007 (Receiver Offset) and Option 08x (Modular Broadband Connection Capability)
- 3739B/C Broadband Test Set
- Two 3743A/AX mmWave Modules
- Front and rear panel cables

ME7838A/AX Banded System Main Components

The ME7838A/AX Multiport Banded system consists of the following components:

- MS464xA/B VNA with Option 08x
- 3739B/C Broadband Test Set
- Two 3744A-EE, 3744A-EW, or two OML/VDI mmWave Modules
- Front and rear panel cables

Caution

A MS464xA/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 3739B/C 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.

Installing Rear Panel Cables (MS464xA VNA)

This section focuses on installing cables when using a MS464xA VNA. Start the ME7838A assembly by placing the 3739B/C Broadband Test Set so you can access the rear panel for cable connection.

Warning	To avoid injury, use two or more people to lift the MS464xA VNA to the top of the 3739B/C Test Set.

Caution	To avoid connector damage or inaccurate measurements, before making any connections, ensure the connectors are clean, undamaged, and meet pin depth specification. Observe connector torque requirements where indicated in this guide.

At the rear panels connect the cables as shown in Figure 1 and Table 1.

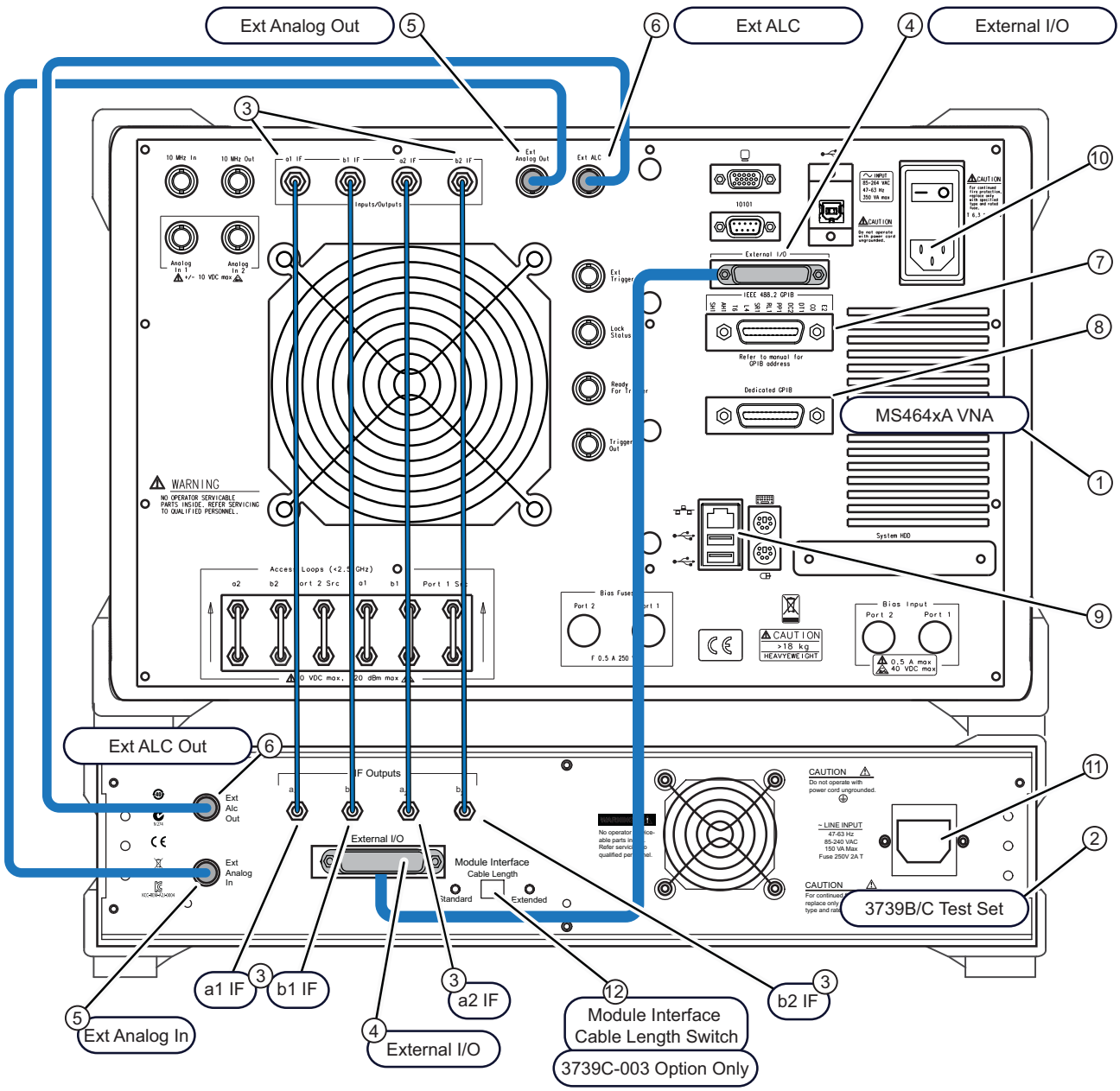


Figure 1 Install Rear Panel Cables between 3739B/C Test Set and MS464xA VNA

Table 1. ME7838A Cable Rear Panel Connections (MS464xA VNA)

Part Number	Index	Description	From VNA Location	To 3739B/C Test Set Location
MS464xA VNA	1	MS464xA VNAs only work with ME7838A systems.		
3739B/C Test Set	2			
3-73598-1 [a] (5 cable bundle)	3	IF Interface Cables	a1 IF b1 IF a2 IF b2 IF	a1 IF b1 IF a2 IF b2 IF
	4	External I/O Cable	External I/O	External I/O
3-806-225	5	BNC (M-M) Cable	VNA Ext Analog Out	Test Set EXT ANALOG IN
3-806-225	6	BNC (M-M) Cable	VNA Ext ALC	Test Set EXT ALC OUT
GPIB Cable (Not supplied)	7	Cable for programmatic control	IEEE 488.2 GPIB (For remote controlling ME7838)	NA
GPIB Cable (Not supplied)	8	Cable for programmatic control	Dedicated GPIB (For controlling peripherals such as Power Meter)	NA
Ethernet Cable (Not supplied)	9	Cable for programmatic control	Ethernet Port	NA
USB Type B Cable (Not supplied)		Cable for programmatic control	USB Port (2)	NA
–	10	AC Power Cord	AC Power Input	NA
–	11	AC Power Cord	NA	AC Power Input
–	12	Module Interface Cable Length Switch (Included with 3739C-003 Option)		

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).

Installing Rear Panel Cables (MS464xB VNA)

This section focuses on installing cables when using a MS464xB VNA. Start the ME7838A/AX assembly by placing the 3739B/C Broadband Test Set so you can access the rear panel for cable connection. Start the ME7838A/AX assembly by placing the 3739B/C Broadband Test Set so you can access the rear panel for cable connection.

Warning	To avoid injury, use two or more people to lift the MS464xB VNA to the top of the 3739B/C Test Set.

Caution	To avoid connector damage or inaccurate measurements, before making any connections, ensure the connectors are clean, undamaged, and meet pin depth specification. Observe connector torque requirements where indicated in this guide.

At the rear panels connect the cables as shown in Figure 2 and Table 2.

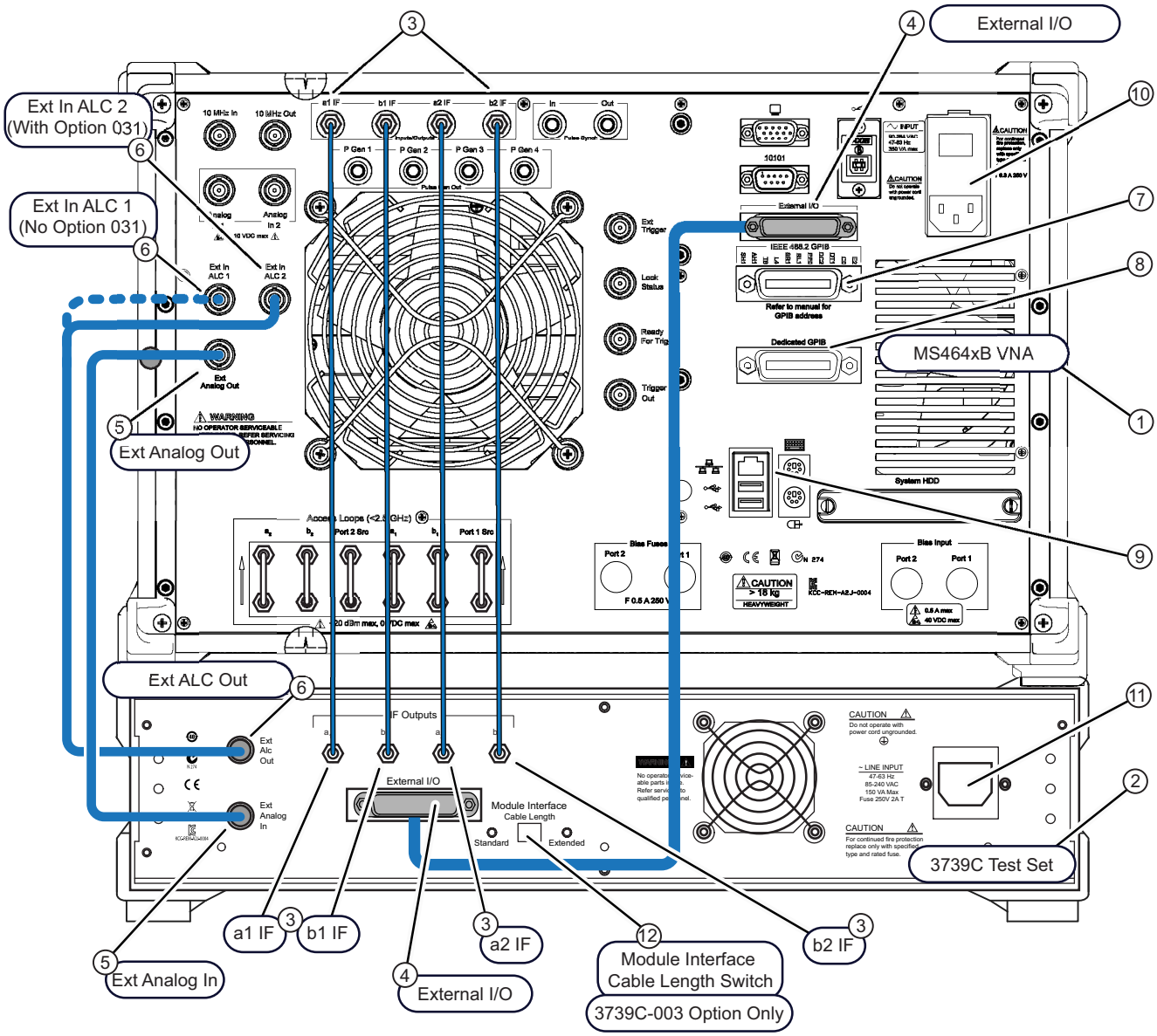


Figure 2 Install Rear Panel Cables between 3739B/C Test Set and MS464xB VNA

Table 2. ME7838A/AX Cable Rear Panel Connections (MS464xB VNA)

Part Number	Index	Description	From VNA Location	To 3739B/C Test Set Location
MS464xB VNA	1			
3739B/C Test Set	2			
3-73598-1 [a] (5 cable bundle)	3	IF Interface Cables	a1 IF b1 IF a2 IF b2 IF	a1 IF b1 IF a2 IF b2 IF
	4	External I/O Cable[b]	External I/O	External I/O
3-806-225	5	BNC (M-M) Cable	Ext Analog Out	Test Set EXT ANALOG IN
3-806-225	6	BNC (M-M) Cable	Ext In ALC 1 (without Option 031) Ext In ALC 2 (with Option 031)	Test Set EXT ALC OUT
GPIB Cable (Not supplied)	7	Cable for programmatic control	IEEE 488.2 GPIB (for remote controlling ME7838)	NA
GPIB Cable (Not supplied)	8	Cable for programmatic control	Dedicated GPIB (For controlling peripherals such as Power Meter)	NA
Ethernet Cable (Not supplied)	9	Cable for programmatic control	Ethernet Port	NA
USB Type B Cable (Not supplied)		Cable for programmatic control	USB Port (2)	NA
–	10	AC Power Cord[c]	AC Power Input	NA
–	11	AC Power Cord[c]	NA	AC Power Input
–	12	Module Interface Cable Length Switch (Included with 3739C-003 Option)		

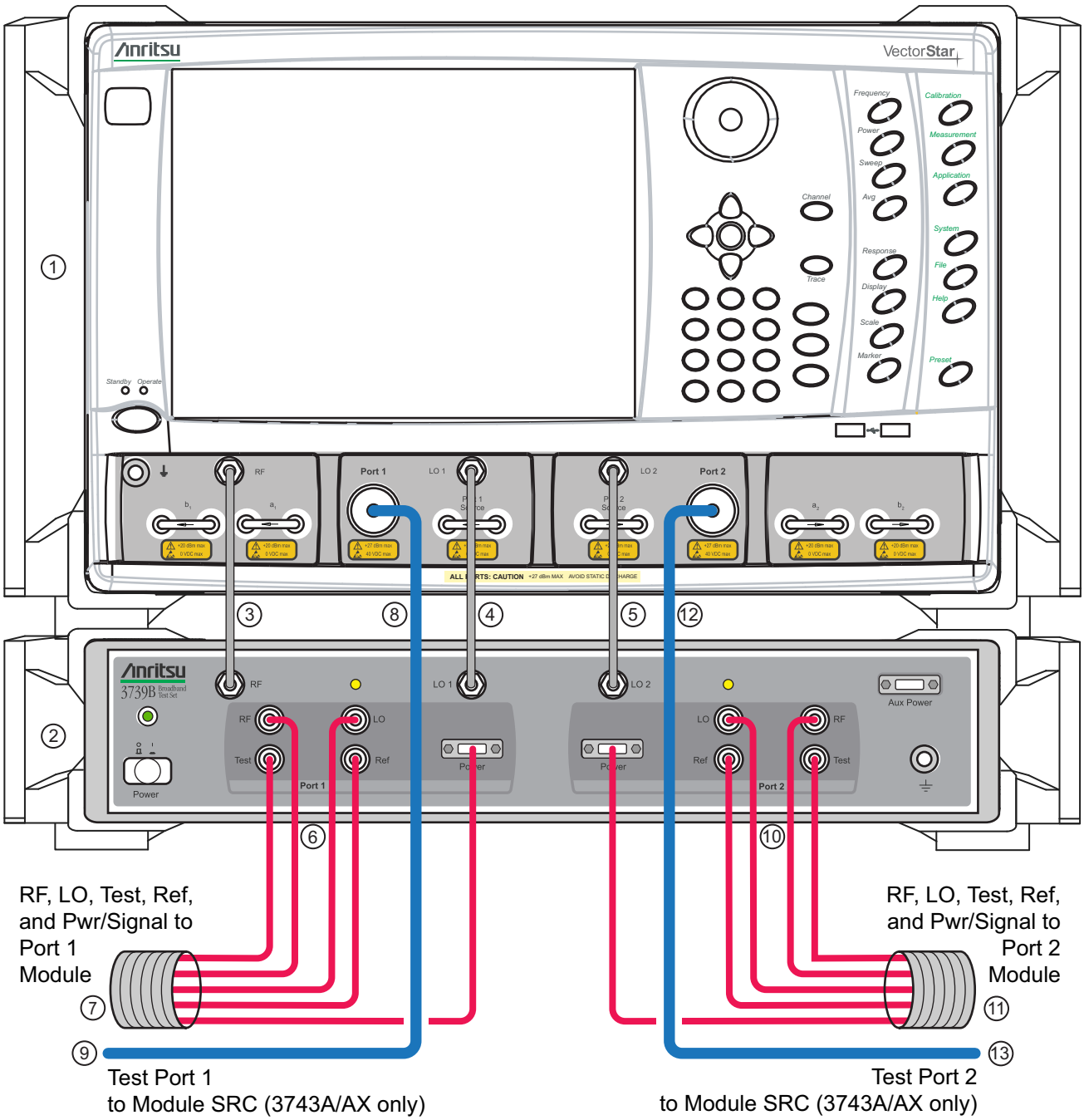
a. Tighten each cable in this group using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).

b. Tighten the connector screws with a flat blade screwdriver.

c. Do not connect the AC power cords to the AC source yet.

Installing Front Panel Cables

Connect the front panel cables between the VNA and the 3739B/C Test Set, and between the Test Set and the mmWave modules as shown below and as described in Table 3.



Example MS464xA/B VNA equipped with Option 051, 061, or 062 with included Front Panel Loops

Note: The cables for Test Port 1 to Module SRC (key 8 to 9) and Test Port 2 to Module SRC (key12 to13) are not used with mmWave modules 3744A-EE, 3744A-EW, or 3744A-Rx.

Figure 3 Front Panel Cables between 3739B/C Test Set, MS464xA/B VNA, and Modules

Table 3. ME7838A/AX Cable Interconnect Part Numbers and Locations

Part Number	Index	Description	Connection From	Connection To
MS464xA/B VNA	1			
3739B/C Test Set	2			
3-67357-xx (See Note 1)	3	Semi-Rigid (KM-KM) Cable • Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).	VNA RF	Test Set RF
3-67357-xx (See Note 1)	4	Semi-Rigid (KM-KM) Cable • Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).	VNA LO1	Test Set LO1
3-67357-xx (See Note 1)	5	Semi-Rigid (KM-KM) Cable • Tighten using an 8 mm (5/16 in) torque end wrench set to 0.9 N·m (8 lbf·in).	VNA LO2	Test Set LO2
3-75685-1	6-7, 10-11	mmWave Module Interface Cables ***(for 3743A/AX, 3744A-EE, 3744A-EW modules)*** Group of 5 cables for each port	Test Set (Port 1, Port 2) RF, LO, Test, Ref, Power/Signal	Module (Port 1, Port 2) RF, LO, Test, Ref, Power/Signal
3-75685-2		OML Module Interface Cables Group of 4 cables for each port	Test Set (Port 1, Port 2) RF, LO, Test, Ref	Module (Port 1, Port 2) RF, LO, Test IF, Ref IF
		VDI Module Interface Cables Group of 4 cables for each port	Test Set (Port 1, Port 2) RF, LO, Test, Ref	Module (Port 1, Port 2) RF Input, LO Input, Meas. IF, Ref IF
3-75685-3		mmWave Module Interface Cables ***(for 3744A-Rx modules)*** Group of 3 cables	Test Set (Port 1, Port 2) LO, Test, Power/Signal	Module (Port 1, Port 2) LO, Test, Power/Signal
806-2xx-R [a] (See Note 2)	8-9, 12-13	Coaxial Cable	VNA (Port 1, Port 2)	mmWave module (Port 1, Port 2)

Cable Selection Notes

	Cable Selection	Description
Note 1	3-67357-13	Standard (Non-Rack Mount)
	3-67357-67	3739B-001 or 3739C-001 Rack Mount Option
	Cable Selection	**Description**
Note 2	806-206-R	24 in, 1.85 mm M-F coaxial cable
	806-209-R	36 in, 1.85 mm M-F coaxial cable

a. The 806-2xx-R Coaxial Cable is not included or required when using the 3744A-EE, 3744A-EW mmWave modules, or the 3744A-Rx Receiver Module.

mmWave Module Connections

Connect the 3739B/C Broadband Test Set Port-1 and Port-2 cables to the 3743A/AX, 3744A-EE, 3744A-EW, or 3744A-Rx Modules as shown below, observing the correct torque limits for each connector. See Figure 4 and Table 4. Route the cable assemblies through the cable restraint.

Note	For ease of connection, the module can be removed from the bracket, then reinstalled after cables are secured. Observe torque instructions where indicated. Each module (except the 3744A-Rx) is characterized for absolute power 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. If an alternative 3743A/AX mmWave module is used there will be approximately 1 dB of absolute power inaccuracy which can be corrected by performing a power calibration. For more detailed information on the modules including DUT Waveguide (WG) connection alignment and custom bracket mounting, refer to the *VectorStar Broadband/Banded mmWave Modules Reference Manual – 10410-00311.*

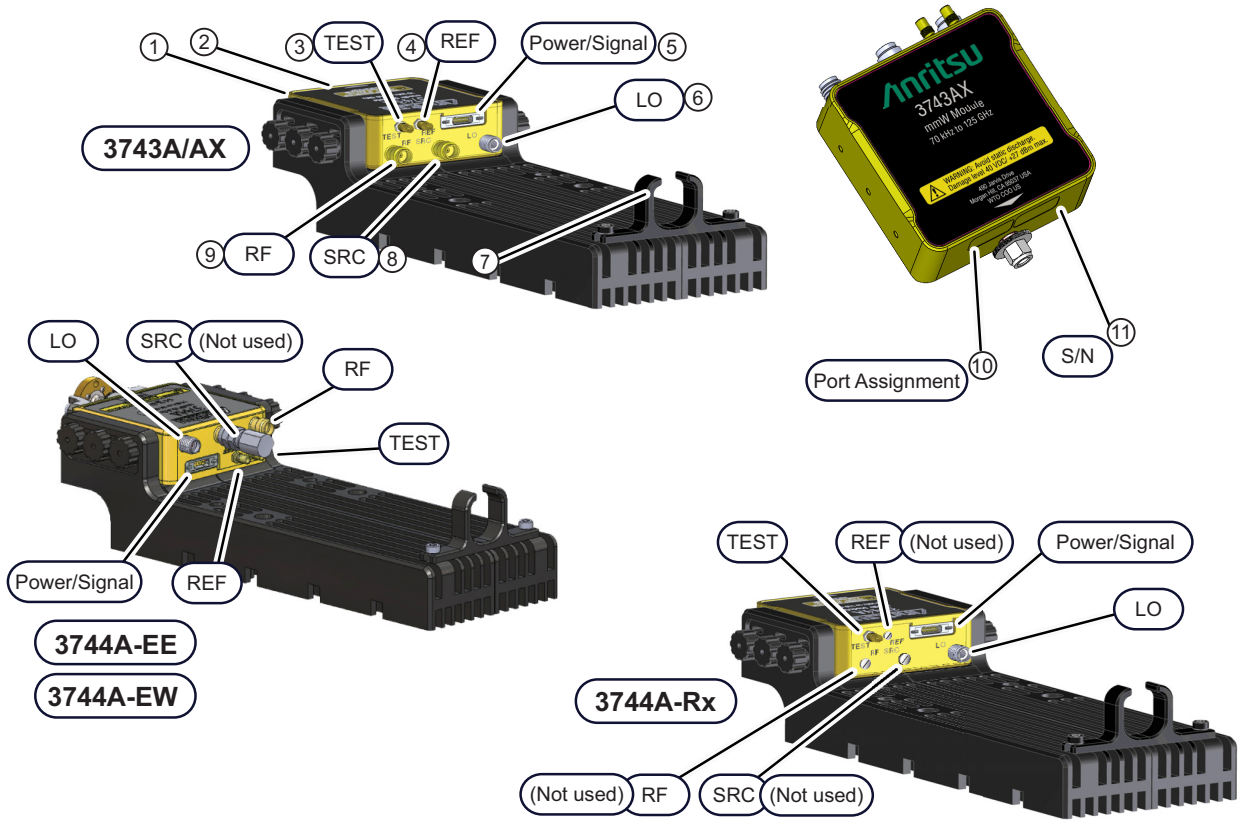


Figure 4 mmWave Module Connections

Inverting a Module

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

1. Remove the six Knurled Head M2 × 8 mm Thumbscrews from the module.
2. Turn the module over.
3. Install the cable assembly.
4. Install the module into the bracket and then install the thumbscrews.

Table 4. mmWave Module Connections

Cable P/N	Index	Description
N/A	1	mmWave Module in bracket
N/A	2	**W1** – 1 mm Connector ***(3743A/AX, 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 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.
3-75685-1 [a] or 3-75685-3 [b]	3	**TEST** – SSMC Connector ***(3743A/AX, 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, 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** Latching Bi-Lobe™ Connector ***(3743A/AX, 3744A-EE, 3744A-EW, 3744A-Rx)*** (Bi-Lobe is a registered trademark of Omnetics Corporation.)
	6	**LO** – K Connector ***(3743A/AX, 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.
N/A	7	Module Power and I/O Cable Restraint
806-206-R [c] or 806-209-R [c]	8	**SRC** – V Connector ***(3743A/AX 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.
3-75685-1 [a]	9	**RF –** V Connector ***(3743A/AX, 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.
N/A	10	Factory Calibrated Port Assignment Label
N/A	11	Module Serial Number Label

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

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

c. The 806-2xx-R Coaxial Cable is used only with the 3743A/AX module.

mmWave Module Operating Environment

The following notes should be observed when operating the 3743A/AX and 3744A-xx mmWave Modules:

- The modules require use of heatsink with adequate air circulation. Thermal heat sinking similar to the supplied mounting brackets of the modules should be considered in custom mounting applications.
- Each 3743A/AX 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 sinking path for the module is on the two external side surfaces used to mount to the support brackets.
- With the attached cable mounting brackets, the case temperature rise is approximately 15 °C to 20 °C above ambient.

OML/VDI Module Connections

Connect the front panel cables between the 3739B/C Test Set, and the OML or VDI modules as shown in Figure 5, Figure 6, and Figure 7, and as described in Table 5, Table 6, and Table 7.

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

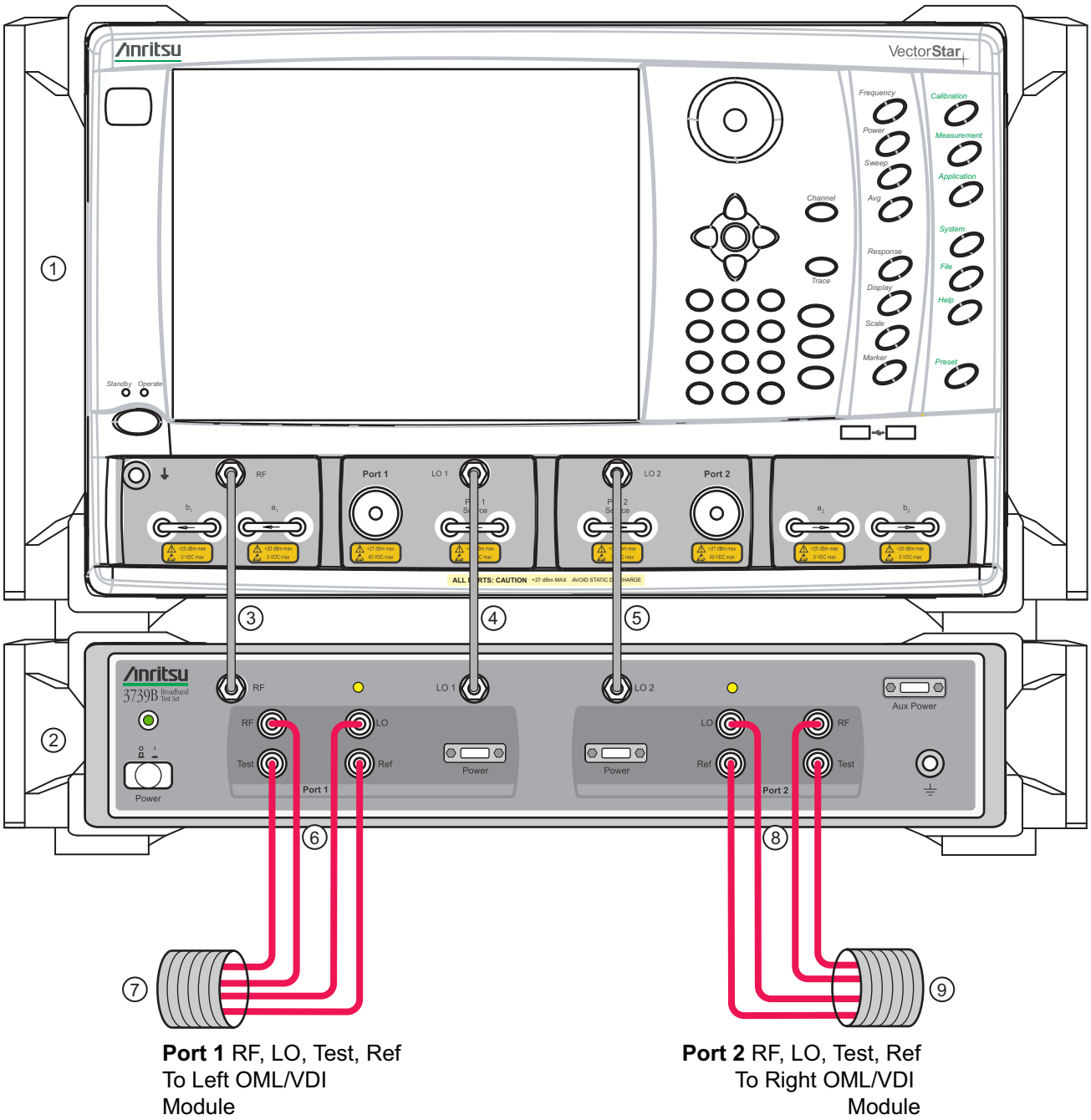


Figure 5 Cable Connections between VNA, 3739B/C Test Set, and OML or VDI Frequency Extension Modules

Table 5 ME7838A/AX Cable Interconnect Part Numbers and Locations

Part Number	Index	Description	Connection From	Connection To
MS464xA	1	VectorStar VNA		
3739B/C	2	3Broadband Test Set		
3-67357-xx (See Note 1)	3	Semi-Rigid (KM-KM) Cable • 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.	VNA RF	Test Set RF
3-67357-xx (See Note 1)	4	Semi-Rigid (KM-KM) Cable • 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.	VNA LO1	Test Set LO1
3-67357-xx (See Note 1)	5	Semi-Rigid (KM-KM) Cable • 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.	VNA LO2	Test Set LO2
3-75685-2	6-7, 8-9	OML Module Interface Cables Group of 4 cables for each port	Test Set (Port 1, Port 2) Ref RF LO Test	OML Module (Port 1, Port 2) Ref IF RF Input LO Input Test IF
3-75685-2		VDI Module Interface Cables Group of 4 cables for each port	Test Set (Port 1, Port 2) RF Ref Test LO	VDI Module (Port 1, Port 2) RF Input Ref. IF Meas. IF LO Input
	Cable Selection Notes			
Note 1	**Cable Selection**		**Description**	
	3-67357-13		Standard (Non-Rack Mount)	
	3-67357-67		3739B-001 or 3739C-001 Rack Mount Option	

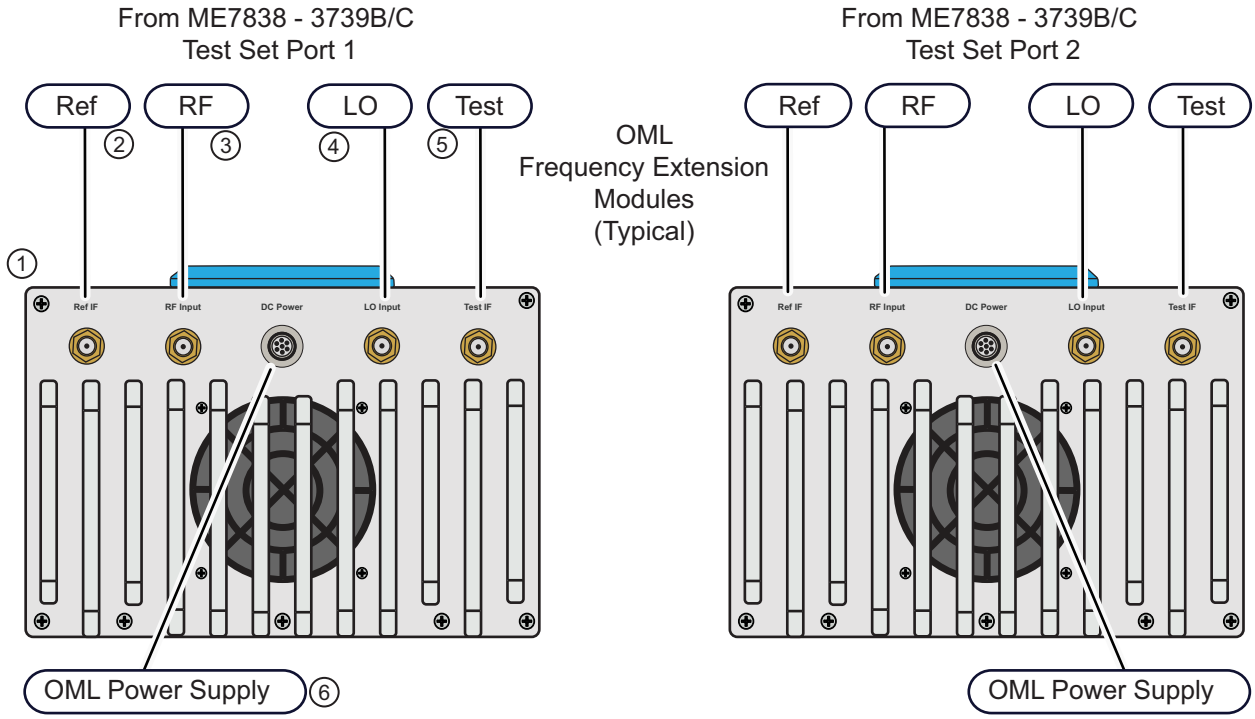


Figure 6 VNA/Test Set Cable Connections to OML Modules

Table 6. OML Module Connections

Cable P/N	Index	Description
N/A	1	OML Module
3-75685-2	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.
N/A	6	OML Module Power Supply

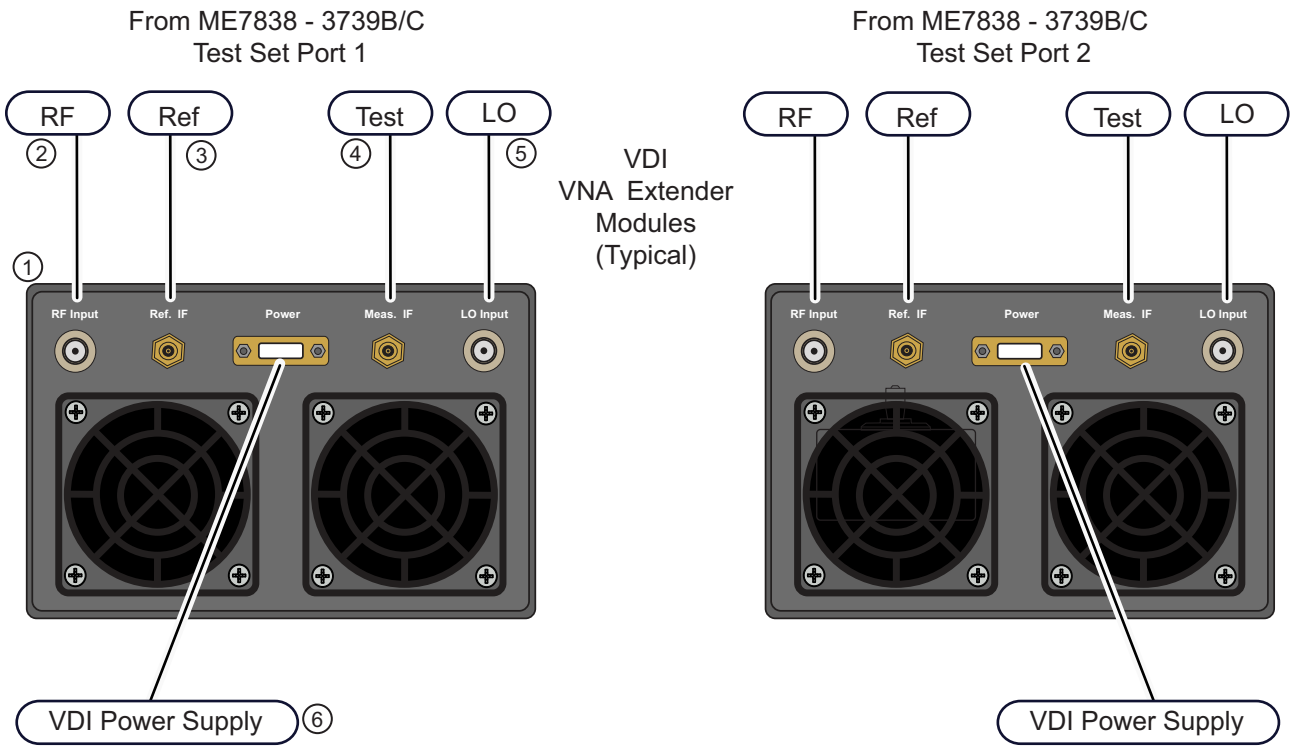


Figure 7 VNA/Test Set Cable Connections to VDI Modules

Table 7. VDI Module Connections

Cable P/N	Index	Description
N/A	1	VDI Module
3-75685-2	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.
N/A	6[a]	VDI Module Power Supply

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

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