

VITA RF

PRODUCT PORTFOLIO
ENABLING AN OPEN VPX WORLD



SOSA[™]
Sensor Open Systems Architecture

VITA[™]
Open Standards, Open Markets

VITA 67.3 OVERVIEW

The VITA 67.3 specification draws on the solutions provided in 67.1 and 67.2 but is unique as it doesn't define the locations of the ports like its predecessors. Additionally, floating contacts have been moved to the Backplane side (vs the Plug-In side in 67.1 and 67.2). These two changes were implemented to allow Plug-In Module designers the freedom to implement direct RF connector PCB launches on the carrier and/or any mezzanine card, eliminating the requirement for RF cable assemblies on the Plug-In Module. However cable options are available and still permitted.

Chassis and card-manufacturers work toward developing an interoperable solution satisfying their immediate density and performance related challenges. In order to assure the most robust solutions, it is advisable to use modules and contacts from the same manufacturers. However, fully populated Plug-In Modules utilizing V67.3 hardware from two different OEMs qualified to the VPX standard can plug-in to the same Backplane slot.



Figure 1
VITA Sample Chassis with 67.1/67.2 (SMPM) and 67.3 (SMPM & SMPS) Modules

VITA 67.3 Connector Modules C, D and E were developed to take advantage of the 1" pitch between adjacent Plug-In Modules. SV Microwave has created a variety of Backplane Connector modules fitting the Module C envelope. While we can customize these to accommodate any application, the most widely adopted options have been the 10 and 14 port configurations that are now available in our global distribution channel.



Figure 1.1
Module D (1/2 Width)



Figure 1.2
Module C (Full Width)



Figure 1.3
Module E (1 1/2 Width)

VITA 67.3 SMPM SERIES

SV Microwave's VITA 67.3 SMPM series electrical and mechanical performance meet and exceed the standards specified in ANSI/VITA67.3-2017, listed below for reference.

SPECIFICATIONS - VITA 67.3 SMPM (MATED PAIR)				
ELECTRICAL			MECHANICAL	
VSWR	2 MHz to 40 GHz	1.5:1 Max	Axial Travel	.079"
Insertion Loss	2 MHz to 40 GHz	.12 * $\sqrt{(f(\text{GHz}))}$	Radial Float	± .010"
Cross Talk Requirement (dB MIN)	3 MHz to 30 MHz	≥ 140 dB	Engage Force	3.5 lbs (typ)
	30 MHz to 3 GHz	≥ 120 dB	Disengage Force	3.5 lbs (typ)
	3 GHz to 27 GHz	≥ 100 dB	Min Pitch (.047")	.228"
	27 GHz to 40 GHz	≥ 90 dB	Min Pitch (.086")	.228"
Power Handling	3 MHz to 30 MHz	30 dBm	Spring Force (Full Deflection)	4.25 lbs (typ)
	30 MHz to 3 GHz	20 dBm	Mating Cycles	500 Min
	3 GHz to 40 GHz	20 dBm	Vibration	MIL-STD-810

VITA 67.3 SMPM BACKPLANE CONNECTOR MODULES



VITA 67.3 SMPM
10-Port Backplane
Connector Module
SV PN: SF9321-60059



VITA 67.3 SMPM
14-Port Backplane
Connector Module
SV PN: SF9321-60086

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VITA 67.3 SMPM
Backplane Contact
For Ø.086" Cable
SV PN: 3221-40066



VITA 67.3 SMPM
Backplane Contact
For Ø.047" Cable
SV PN: 3221-40071



VITA 67.3 SMPM
Bullet Insertion/
Removal Tool
SV PN: 500-32-007



VITA 67.3 SMPM
Contact Removal Tool
SV PN: 500-32-015

VITA 67.3 SMPM PLUG-IN CONNECTOR MODULES

Plug-In Connector Modules are manufactured by a variety of embedded systems technology companies with the common goal of interfacing to the Backplane. SV offers a variety of SMPM Plug-In Connector Modules and contact options as COTS parts.



**VITA 67.3 SMPM
10-Port Plug-In Connector
Module**
SV PN: 9311-60220



**VITA 67.3 SMPM
14-Port Plug-In
Connector Module**
SV PN: 9311-60221



**VITA 67.3 SMPM
Male to Male
Plug-In Adapter**
SV PN: 1132-6116



**VITA 67.3 SMPM
Male Edge Launch Connector
(Smooth Bore)**
SV PN: 3211-60035



**VITA 67.3 SMPM
Female to Female
Bullet (OAL .211")**
SV PN: 3290-4002

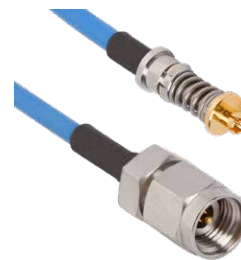


**VITA 67.3 SMPM
Plug-In Male Contact**
SV PN: 3211-60351 (Ø.047" cable)
SV PN: 3211-60350 (Ø.085" cable)

SV's VITA 67.3 product line has been extended to include SMPM fixed length cable assembly configurations. These standard items are stocking with SV's distribution partners for quick turn prototyping. Once functionality is verified, contact SV directly for customized cable solutions - whether you are looking for low loss, phase stability or phase/delay matched sets, SV can build a custom cable to meet your needs.



**SMPM Female VITA 67.3 to
SMA Male Cable Assembly
for Ø.085" Cable**
SV PN: 7032-7434-120 (12")
SV PN: 7032-7434-180 (18")



**SMPM Female VITA 67.3 to
2.92 mm Male Cable
Assembly for Ø.085" Cable**
SV PN: 7032-7435-120 (12")
SV PN: 7032-7435-180 (18")



**SMPM Male VITA 67.3 to SMA
Male Cable Assembly
for Ø.085" Cable**
SV PN: 7032-7840 (12")



**SMPM Male VITA 67.3 to SMA
Male Cable Assembly for
Ø.047" Cable**
SV PN: 7032-7841 (12")

VITA 67.3 SMPM ELECTRICAL TEST DATA

Mated pair testing of Backplane and Plug-In Connector Modules confirms specification data. Positioning of gate flags is important since the specification references mated pair performance; SV can provide a full signal path solution that includes almost any standard RF interface. The aluminum block shown in Figure 4 holds the male and female contacts in the proper alignment position during testing, replicating the geometry of the end application.

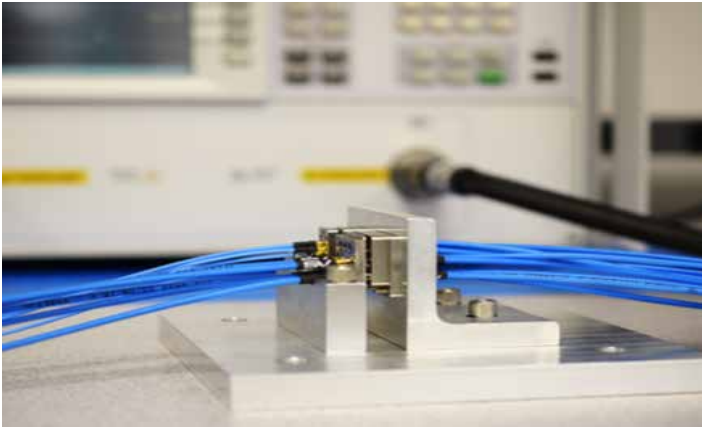


Figure 2
Test Setup for Mated Pair VITA 67.3 SMPM

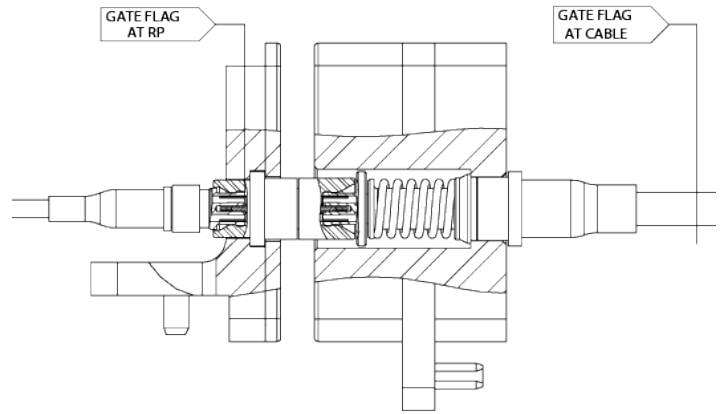


Figure 2.1
Gate Flag Position for SMPM Mated Pair Measurement

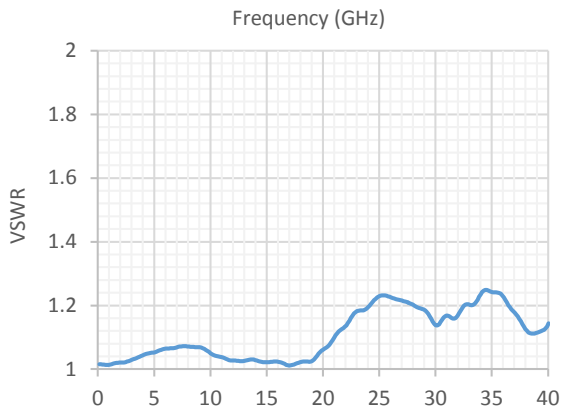


Figure 2.2
Gated VSWR Plot (typical)

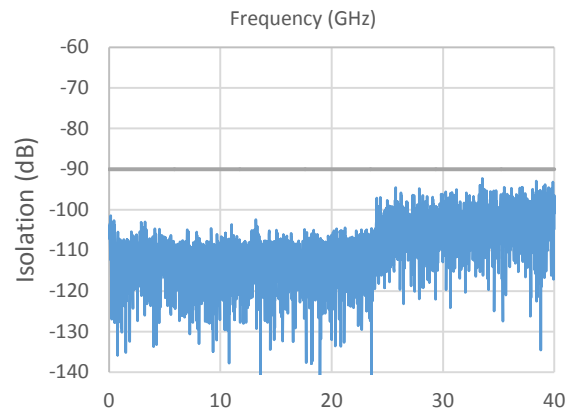


Figure 2.3
Electrical Isolation Plot (Mated Pair)

VITA 67.3 SMPS MODULES

In order to support design flexibility, increased data rates and high density requirements of VPX platforms, SV Microwave has designed VITA 67.3 modules with our smallest high performance interface - the SMPS series. The SMPS series has been an industry standard for over 10 years and is used extensively in some of the most demanding US MIL-AERO programs. The SMPS interface is currently being adopted as a DLA Standard under the name SMP3. SV's SMPS contacts are compatible with the DLA open standard.

SPECIFICATIONS - VITA 67.3 SMPS (MATED PAIR)				
ELECTRICAL			MECHANICAL	
VSWR	2 MHz to 67 GHz	1.5:1 Max (1.35:1 (typ))	Axial Travel	.079"
Insertion Loss	2 MHz to 67 GHz	.12 * $\sqrt{(f(\text{GHz}))}$	Radial Float	± .010"
Cross Talk Requirement (dB MIN)	3 MHz to 30 MHz	≥ 140 dB		
	30 MHz to 3 GHz	≥ 120 dB	Engage/Disengage Force	1.0 lbs (typ)
	3 GHz to 27 GHz	≥ 100 dB	Min Pitch (.047")	.145"
	27 GHz to 40 GHz	≥ 90 dB	Min Pitch (.086")	.155"
Power Handling	3 MHz to 30 MHz	30 dBm	Spring Force/Contact Nominal Mated Condition	2.1 lbs (typ)
	30 MHz to 3 GHz	20 dBm	Full Deflection	2.6 lbs (typ)
	3 GHz to 40 GHz	20 dBm	Mating Cycles	500 Min
			Vibration	MIL-STD-810

VITA 67.3 SMPS BACKPLANE CONNECTOR MODULES



VITA 67.3 SMPS 19-Port Backplane Connector Module
SV PN: SF9321-60093
only for Ø.047" cable
SOSA Aligned
Sensor Open Systems Architecture



VITA 67.3 SMPS 12-Port Backplane Connector Module
SV PN: SF9321-60084
only for Ø.047" cable



VITA 67.3 SMPS Backplane Contact For Ø.086" Cable
SV PN: 3821-40024



VITA 67.3 SMPS Backplane Contact For Ø.047" Cable
SV PN: 3821-40023



VITA 67.3 SMPS Bullet Insertion/Removal Tool
SV PN: 500-38-004



VITA 67.3 SMPS Contact Removal Tool
SV PN: 500-38-006

VITA 67.3 SMPS PLUG-IN CONNECTOR MODULES

VITA 67.3 SMPS Plug-In Connector Modules slightly differ from their SMPM predecessor. These contacts have either snap-in or flange mounted features which are tightly pitched and stay aligned via precision holes in the Plug-In Connector Module.



**VITA 67.3 SMPS
19-Port Plug-In
Connector Module**
SV PN: SF9311-60171
SOSA Aligned
Sensor Open Systems Architecture



**VITA 67.3 SMPS
12-Port Plug-In
Connector Module**
SV PN: SF9311-60166



**VITA 67.3 SMPS
Plug-In Adapter**
SV PN: SF1138-6020



**VITA 67.3 SMPS
Plug-In Male Contact**
SV PN: SF3811-60060
(Ø.047" cable)
SV PN: SF3811-60059
(Ø.085" cable)



**VITA 67.3 SMPS
Male Edge Launch Connector**
SV PN: 3811-40003



**VITA 67.3 SMPS
Female to Female
Bullet (OAL .098")**
SV PN: 1138-4001

SV's VITA 67.3 product line has been extended to include SMPS fixed length cable assembly configurations. These standard items are stocking with SV's distribution partners for quick turn prototyping. Once functionality is verified, contact SV directly for customized cable solutions - whether you are looking for low loss, phase stability or phase/delay matched sets, SV can build a custom cable to meet your needs.



**SMPS Male VITA 67.3 to SMA
Male 12" Cable Assembly
for Ø.085 Cable**
SV PN: 7038-0337



**SMPS Male VITA 67.3 to SMA
Male 12" Cable Assembly
for Ø.047" Cable**
SV PN: 7038-0338



**SMPS Female VITA 67.3 to SMA
Male 12" Cable Assembly
for Ø.085" Cable**
SV PN: 7038-0370



**SMPS Female VITA 67.3 to SMA
Male 12" Cable Assembly
for Ø.047" Cable**
SV PN: 7038-0371

VITA 67.3 SMPS ELECTRICAL TEST DATA

Mated pair testing of Backplane and Plug-In Connector Modules confirms specification data. Below you will see our test configuration and data.

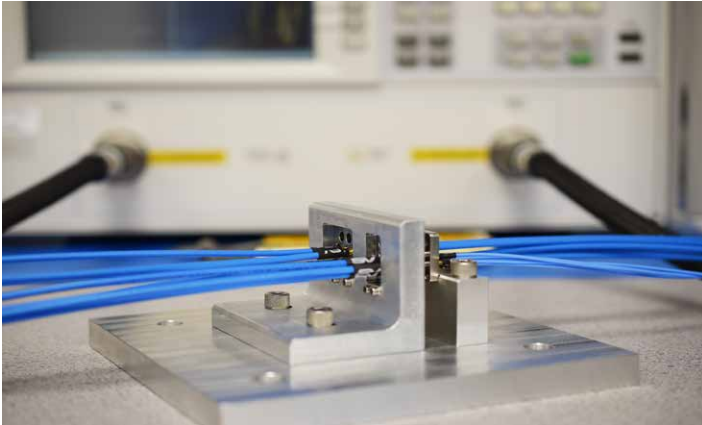


Figure 3
Test Setup for Mated Pair VITA 67.3 SMPS

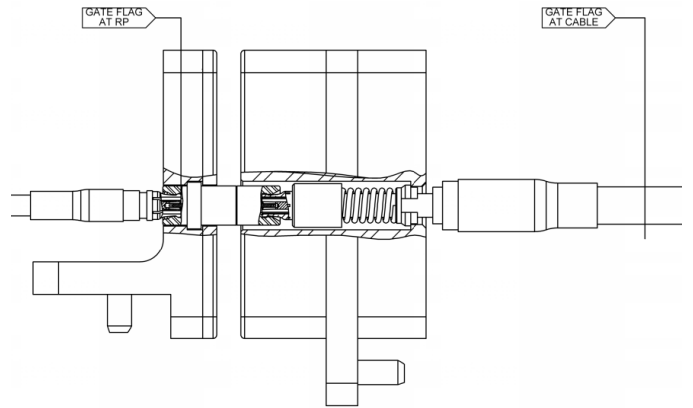


Figure 3.1
Gate flag position for SMPS Mated Pair Measurement

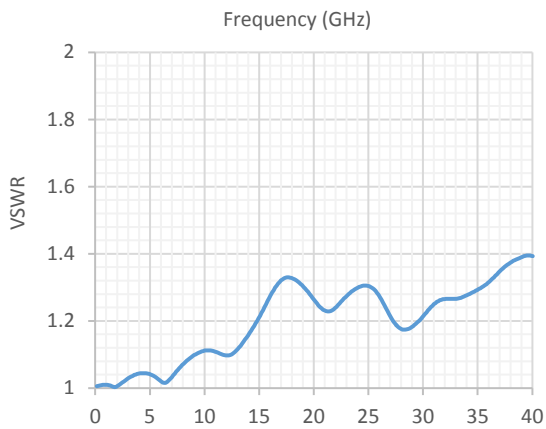


Figure 3.2
Gated VSWR Plot (typical)

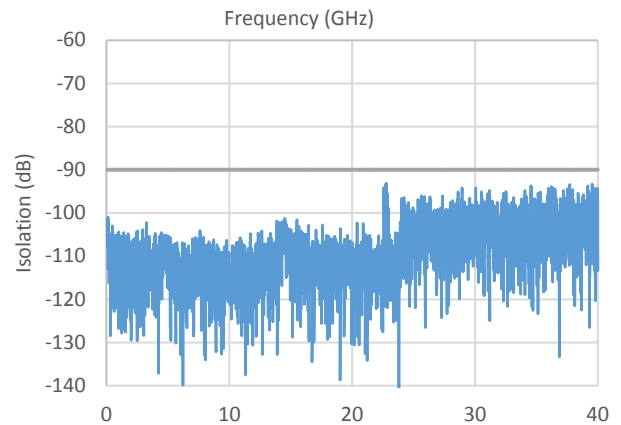


Figure 3.3
Electrical Isolation Plot (Mated Pair)

VITA 67.1 AND 67.2 OVERVIEW

The VITA 67.1 and 67.2 Open VPX standards have enjoyed growing popularity in recent years as they are adopted by an increasing number of DOD programs. SV Microwave, as a leader in the development of 67.1 and 67.2, continues to support these important products both directly and through a wide product offering in our distribution channel. Key features include:

- Populated Plug-In Connector Modules inter-mate with Backplane Connector Modules across multiple qualified manufacturers
- Plug-In Connector Modules must be populated by that manufacturer's Plug-In Contact



VITA 67.1 SMPM
4-Port (1/2 width) Backplane Connector Module
SV PN: SF1132-6037



VITA 67.2 SMPM
8-Port (full width) Backplane Connector Module
SV PN: SF1132-6036



VITA 67.1 SMPM
4-Port (1/2 width) Plug-In Connector Module
SV PN: SF9321-60015



VITA 67.2 SMPM
8-Port (full width) Plug-In Connector Module
SV PN: SF9321-60013



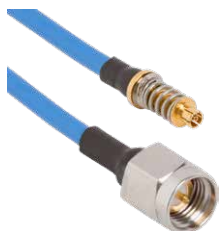
VITA 67.1/67.2 SMPM
Plug-In Contact
For Ø.047" Cable
SV PN: 3221-40019



VITA 67.1/67.2 SMPM
Plug-In Contact
For Ø.085" Cable
SV PN: 3221-40022



VITA 67.1/67.2 SMPM
Contact Removal Tool
SV PN: 500-32-022



SMPM Female VITA 67.1/67.2 to SMA Male Cable Assembly
For Ø.085" Cable
SV PN: 7032-6729-060 (6")
SV PN: 7032-6729-120 (12")



SMPM Female VITA 67.1/67.2 to SMA Male Cable Assembly
For Ø.047" Cable
SV PN: 7032-6728-060 (6")
SV PN: 7032-6728-120 (12")

VITA 67 BACKPLANE TO MULTIPOINT CONNECTOR SOLUTIONS

SV can also terminate your VITA backplane cables to a variety of multipoint I/O panel solutions. Rather than cabling to individual I/O connectors, it is often advantageous to use a multipoint I/O connector such as a D38999 circular or rectangular multipoint for increased density and ruggedization. Below are just a few examples of the many solutions that SV has for these applications.



Figure 4
VITA Sample Chassis with 67 RF Modules Terminated to D38999 Circular Connectors with Coaxial Contacts

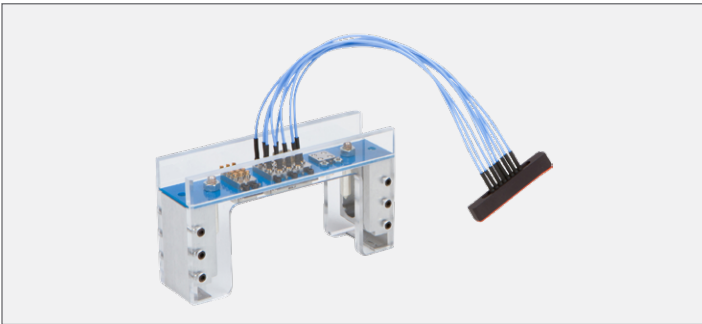


Figure 5
VITA Sample Chassis with SMPM Backplane Connector Modules terminated to Mini-D RF Bulkhead Mount IP68 8-Port SMPS Male Connector with Ø.047” Flex Cable

Figure 6
Enhanced View of Mini-D RF Bulkhead Mount IP68 8-Port SMPS Male Connector

D38999 CIRCULAR CONNECTORS COTS CONTACTS:				
SIZE	INTERFACE	CABLE	TYPE	PART NUMBER
8	BMA	Ø.086”	Socket	SF9411-6000
			Pin	SF9421-6000
12	SMPM	Ø.047”	Socket	SF3251-60004
			Pin	3241-40004
		Ø.086”	Socket	SF3211-6004
			Pin	3221-4002
16	SMPS	Ø.047”	Socket	SF9911-60001
			Pin	9921-40001
		Ø.086”	Socket	9351-40029
			Pin	9341-40043

VITA 66.5 SMPS + FIBER HYBRID MODULES

SV Microwave also manufactures a variety of hybrid VITA modules. These modules contain both VITA compliant coaxial cavities and Multi-Mode MT Ferrules in compliance with the VITA 66 standard. Our catalog of hybrid modules is highly customizable and constantly expanding. A few examples are shown below. Check our website www.svmicrowave.com for a full list of the latest VITA and SOSA-aligned module offerings.

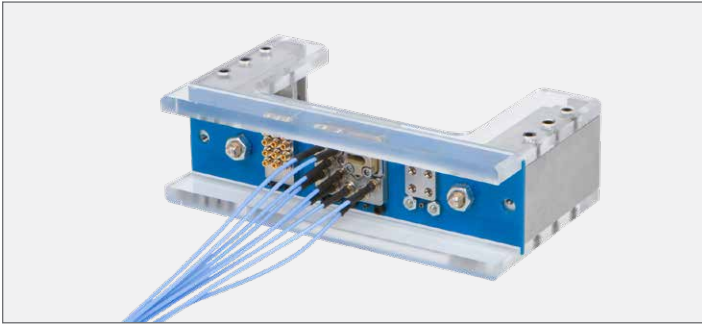


Figure 7

VITA Sample Chassis with Backplane Connector Modules
Including Hybrid Coaxial and Fiber Module.
9 SMPM 67.3 Contacts/1 MT Fiber Contact

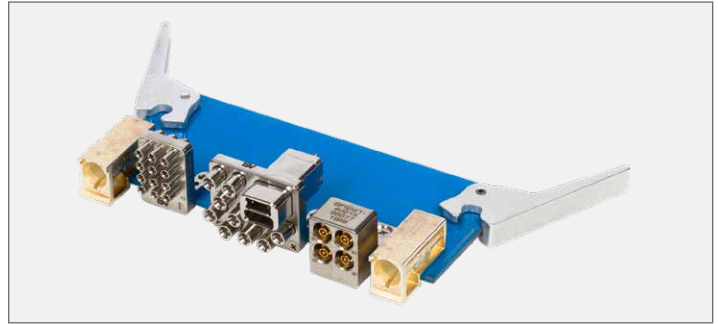


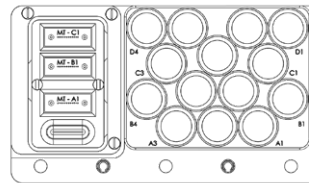
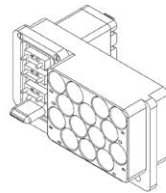
Figure 8

VITA Sample Plug-In Connector Modules with Hybrid Coaxial
and Fiber Module.

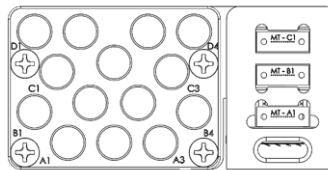
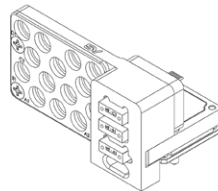
SOSA ALIGNED MODULE OFFERINGS

Sensor Open Systems Architecture

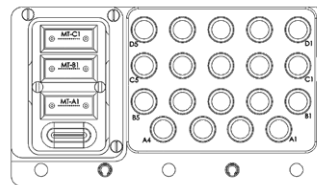
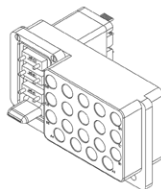
VITA 65 6.4.5.8.7
14-Port SMPM + 3 MT Fiber
Backplane Hybrid Module
SV PN: 9321-60109



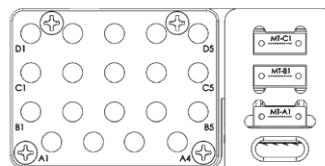
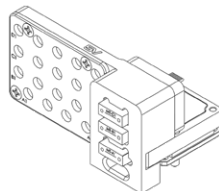
VITA 65 6.4.5.8.7
14-Port SMPM + 3MT Fiber
Plug-In Hybrid Module
SV PN: 9311-60215



VITA 65 6.4.5.8.8
19-Port SMPM + 3MT Fiber
Backplane Hybrid Module
SV PN: 9321-60108



VITA 65 6.4.5.8.8
19-Port SMPM + 3MT Fiber
Plug-In Hybrid Module
SV PN: 9311-60214



RAPID RESPONSE VITA 67 ONLINE CABLE BUILDER

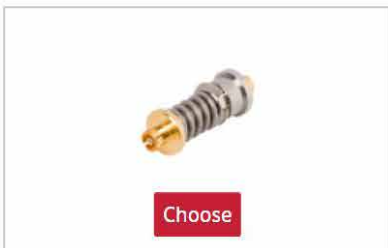
SV Microwave's Rapid Response Cable Builder offers VITA 67.1, 67.2 and 67.3 cable assemblies online. These cables are custom made and ship within 5-10 business days. For more information, please visit our website at <http://svmicrowave.com/products/rf-cable-builder>



For more information, download the [Rapid Response Application Note](#).

*Please note: Cable assemblies ship in 5 - 10 days.

Lead time is extended for orders of 25 pieces or more or when a PO is used. Contact the factory for specific lead times at RapidResponse@svmicro.com.



[copy this connector to other side](#)



[copy this connector to other side](#)

Cable length inches

Delay Match (Additional \$20 charge)

ROHS COMPLIANT

PRODUCT DATA DRAWING

12.0 ± 0.2

MATERIAL:

CONNECTORS: VITA 67.3 SMPM Backplane Contact (3221-40071)
SMA Male (SF2911-60172)

CABLE: Flexible Ø.047 Cable

SHRINK TUBING: M23053/5

PERFORMANCE:

IMPEDANCE: 50 Ohms

FREQ. RANGE: DC to 18 GHz

VSWR: 1.3:1 Max, DC to 18.0 GHz

INSERTION LOSS: 2.35 dB Max.

NOTES:

- See individual data drawings for connector specifications
- Dimensions shown are in inches

<p>Amphenol 2400 Centrepark West Drive, Suite 100 West Palm Beach, FL 33409</p>	
TITLE:	VITA 67.3 SMPM Backplane Contact to SMA Mate 12" Cable Assembly for Ø.047 Cable
DWG. NO.	FV67.35MPPM-047-MSSMA-120
DRAWN	2020-12-08 16:12:42

APPENDIX I

INSTALLATION INSTRUCTIONS: VITA 67.3 SMPM

VITA 67.3 SMPM contacts have a unique 'contact + adapter' configuration that enables them to be easily assembled and removed from the Backplane Connector Module and provide excellent radial captivation on the multiport block.

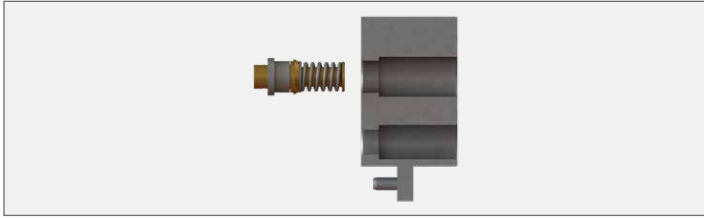


Figure 9
Contact Installation to Connector Module (by hand)

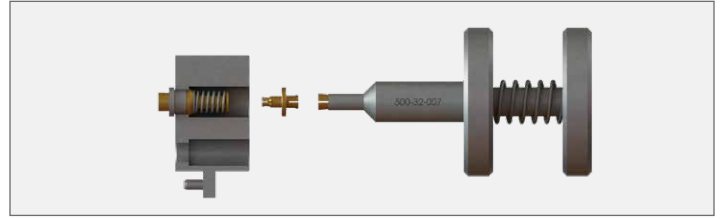


Figure 9.1
Bullet Installation to Contact. Uses Tool PN 500-32-007.

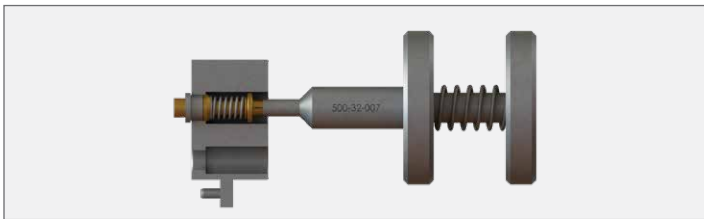


Figure 9.2
Bullet Fully Seated in Contact

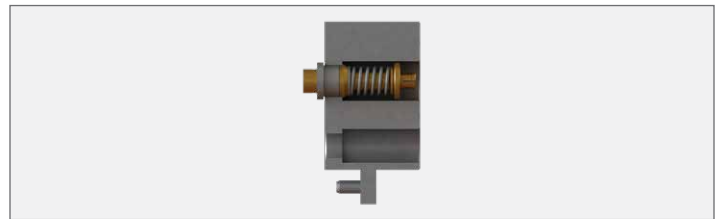


Figure 9.3
Final Assembly. Connector Module + Contact + Bullet.

REMOVAL INSTRUCTIONS: VITA 67.3 SMPM

To remove the contacts (once adapters are extracted), removal tool PN 500-32-015 is used to compress the clip and plunge the contact from the housing. SV Microwave has also developed an extended length removal tool (not shown, PN 500-32-042) for deep chassis applications.

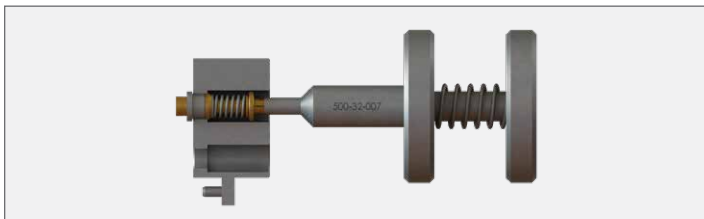


Figure 9.4
Bullet Removed From Contact. Uses Tool PN 500-32-007.

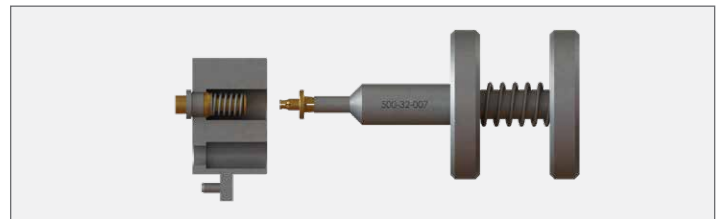


Figure 9.5
Bullet Removed From Contact



Figure 9.6
Contact Removed. Uses Tool PN 500-32-015.



Figure 9.7
Contact Removed from Block

APPENDIX II

INSTALLATION INSTRUCTIONS: VITA 67.3 SMPS

VITA 67.3 SMPS contacts have a similar 'contact + adapter' configuration to the SMPM series. However, in the SMPS series the Female-Female bullet is replaced by a Female-Male adapter. This feature enables quick installation, removal, and centering of the contact relative to the connector module.

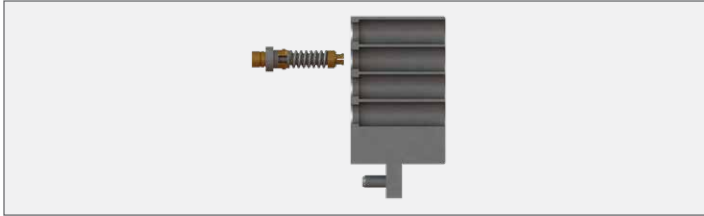


Figure 10
Contact Installation to Connector Module (by hand)

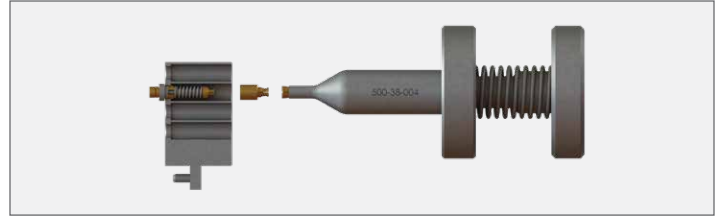


Figure 10.1
Bullet Installation to Contact. Uses Tool PN 500-38-004.



Figure 10.2
Bullet Fully Seated in Contact



Figure 10.3
Final Assembly. Connector Module + Contact + Bullet

REMOVAL INSTRUCTIONS: VITA 67.3 SMPS

To remove the contacts (once the adapters are extracted), removal tool PN 500-38-006 is used to compress the clip and plunge the contact from the housing.

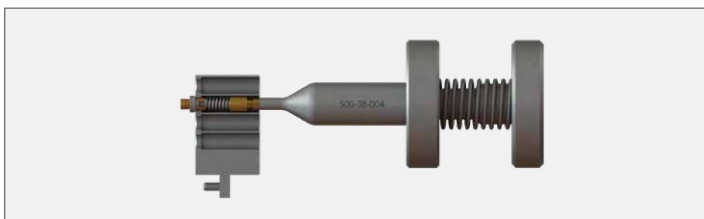


Figure 10.4
Bullet Removed From Contact. Uses Tool PN 500-38-004.

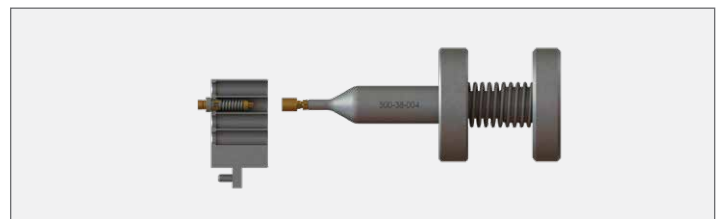


Figure 10.5
Bullet Removed From Contact

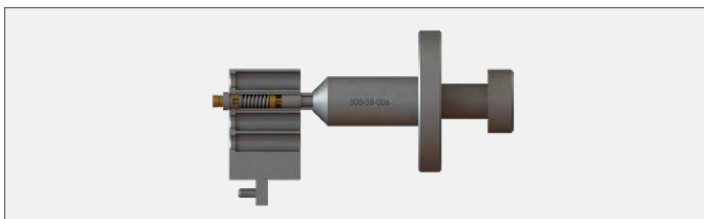


Figure 10.6
Contact Removed. Uses Tool PN 500-38-006.

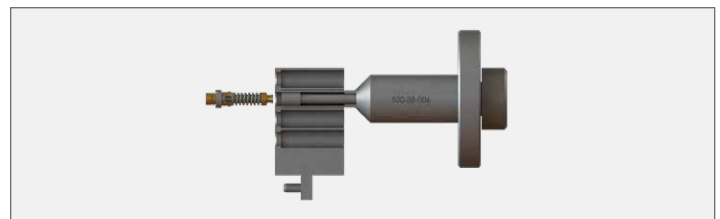


Figure 10.7
Contact Removed from Block

APPENDIX III

CABLE AND CONNECTOR ROUTING OPTIONS

This Appendix has been included to illustrate some pictorial examples showing routing options for terminating backplane and Plug-In modules.

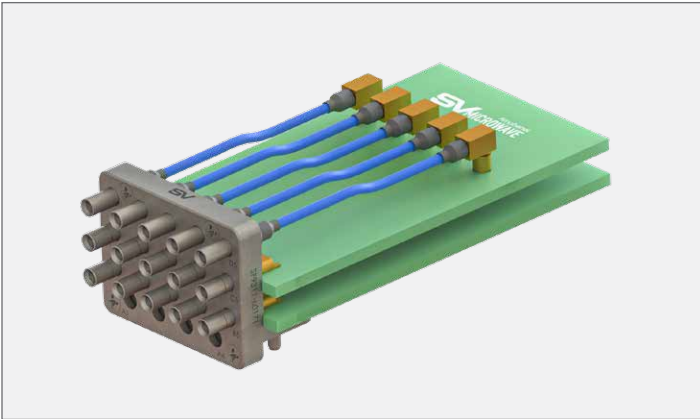


Figure 11
Stacked Circuit Boards

Stacking circuit boards can achieve the highest signal density. Cards can be stacked and aligned with the connector rows. In this example with a 14-Port VITA 67.2 SMPS Plug-In Module, there are four rows for stacked circuit boards.

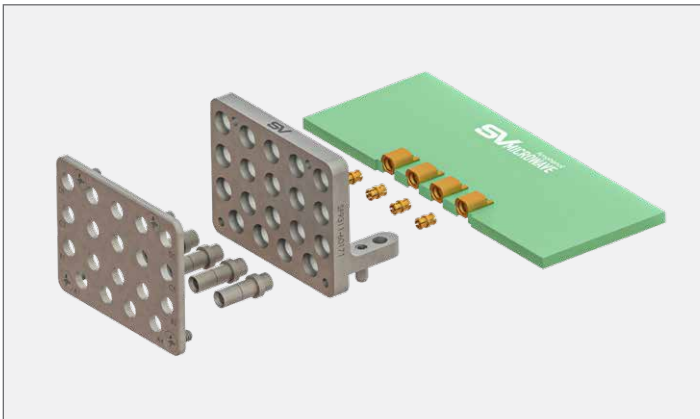


Figure 12
Direct Edge Launch

In this Plug-In Module, adapter contacts (SF1138-6020) are used with SMPS adapters (“bullets”, PN 1138-4001) and SMPS Edge Launch connectors (3285-6001) to launch the signal directly from the module to the PCB.

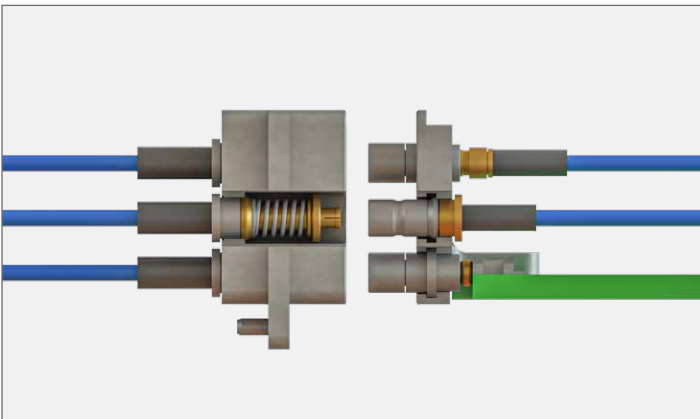


Figure 13
Cable to Cable with Adapter Mated Set

In this mated set of VITA 67.3 SMPM modules, the modules are cabled on both sides. The Backplane Module uses a standard SMPM contact (3221-40066). The top two Plug-In Modules are using snap-in SMPM cable contacts (3211-60350) terminated to Ø.086” flex cable.



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