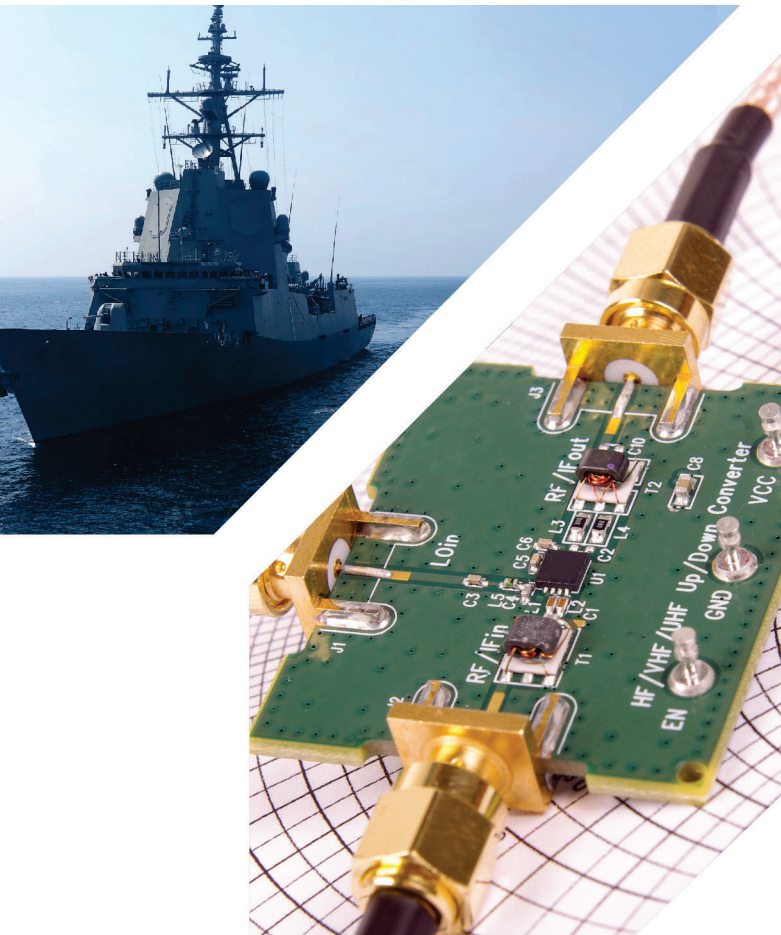


# MINIATURE MULTI-CHANNEL SOLUTIONS

Engineered to suit your needs.

 **TELEDYNE**  
STORM MICROWAVE  
Everywhereyoulook™



# MINIATURE MULTI-CHANNEL SOLUTIONS

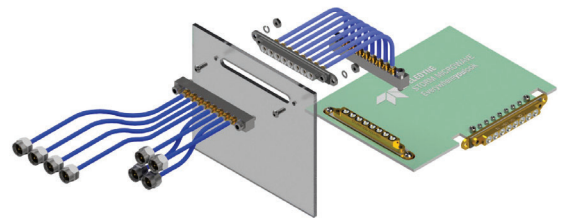
Teledyne Storm Microwave has been providing high quality interconnect products and cable assemblies to domestic and international defense and telecom markets since 1978.

Teledyne Storm Microwave's Miniature Multi-Channel Solutions offer a compact, high density interconnect system that allows for multiple high frequency connections with a single connector.

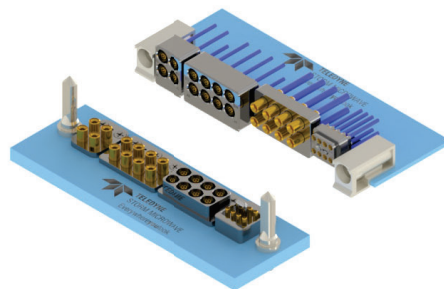
Utilization of the time tested StormFlex cable instills confidence that your miniature harness solution will meet or exceed performance expectations in the toughest environments.

The **MultiMate** family utilizes the standard SMPM interface to bring you **board to device** interconnect solutions:

- The **MINI-MULTIMATE**<sup>®</sup>, your go-to high performance multi-channel solution.
- The **SPACEMATE**<sup>™</sup>, an out of this world space qualified solution.
- The **WEATHERMATE**<sup>™</sup>, a submersible water-resistant solution.



The **VITA 67** family of products allow for high-density, low-profile connections from **backplane to daughter-card**. With a full offering of VITA 67.1, 67.2, 67.3, and the ultra-high-density Nano line Teledyne Storm Microwave's VITA 67 products allow you to make up to 18 connections in a single connector block.



# TABLE OF CONTENTS



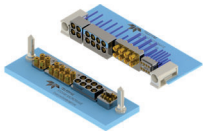
Mini-MultiMate® .....4



SpaceMate™ .....8



WeatherMate™ .....12



VITA 67.....15



StormFlex® .....18



Phase Master® .....21



Custom Harnesses.....22

# MINI-MULTIMATE<sup>®</sup>

## 4 & 8 POSITION



### HIGH FREQUENCY MULTIPLE INTERCONNECT SYSTEM



The Mini-MultiMate<sup>®</sup> is a compact, rugged, splash-resistant interconnect system that allows multiple high frequency connections (up to 50 GHz) with a single connector.

As an interconnect between a panel or PCB, the Mini-MultiMate's compact size and utilization of Storm Flex<sup>®</sup> 047 & 086 cables makes it the perfect fit for high density layouts.

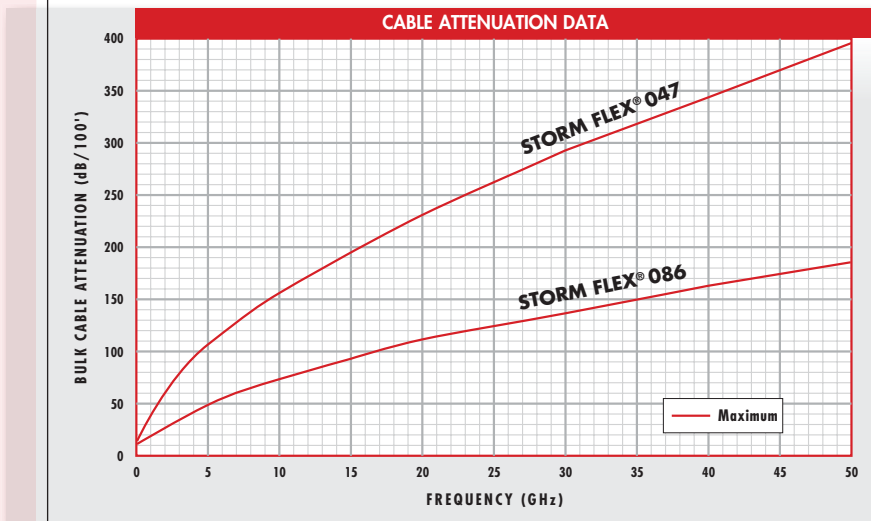
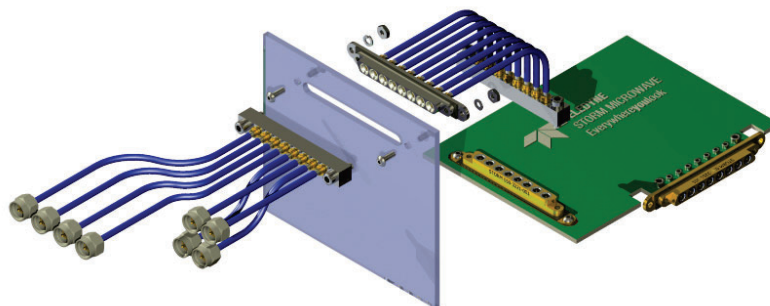
Built to be durable, Storm Flex<sup>®</sup> 047 & 086 cables have the flexibility to handle tight bends and offer superior and consistent electrical performance with flexure.

The Mini-MultiMate<sup>®</sup> also accepts 047 & 086 semi-rigid cables.

Ease-of-use features include port identification on the connector block and the ability to replace individual channel assemblies.

Applications that can benefit from use of the Mini-MultiMate<sup>®</sup> include:

- Radar
- Missile Systems
- Electronic Warfare
- Automated Test Equipment



**TELEDYNE  
STORM MICROWAVE**  
Everywhereyoulook<sup>™</sup>

High value microwave and  
electronic interconnect solutions

[www.teledynestorm.com](http://www.teledynestorm.com)

**MATERIALS**

Contacts	<b>BODY AND CONTACT:</b>	Beryllium Copper per ASTM B196, C17300, Gold plated per ASTM B488, Type 2, Class 1.27
	<b>LOCKING RING:</b>	Beryllium Copper per ASTM B196, C17300, Gold plated per ASTM B488, Type 2, Class 0.25
	<b>INSULATOR:</b>	Teflon per ASTM D1710, Type 1, Grade 1, Class A or Torlon 4203 per MIL-P-46179
	<b>O-RING:</b>	Silicone Rubber per ASTM per A-A-59588
Connector Block	<b>LOCKING NUT:</b>	Corrosion resistant steel Per ASTM 582, S30300 Alloy, Passivate per SAE-AMS-2700
	<b>HOUSING:</b>	Brass per ASTM B16, C36000 alloy, Nickel plate per SAE-AMS-QQ-N-290 or Gold plated per ASTM B488, Class 0.25
	<b>JACK SCREWS/BUSHING:</b>	Corrosion resistant steel
	<b>GASKET:</b>	Silicone Rubber per ASTM per A-A-59588

**ENVIRONMENTAL WHEN MATED WITH STORM FLEX® 086 CABLE**

Temperature	-55° C to +125° C
Vibration (High Frequency)	Meets MIL-STD-202, Method 204, Condition D
Shock (Specified Pulse)	Meets MIL-STD-202, Method 213, Test Condition I
Ingress Protection	IEC 60529 IP54 (1.0 mm probe/watersplash)

**ELECTRICAL**

Nominal Impedance	50 Ohms				
Frequency	DC – 50 GHz				
VSWR (Typical; for full data see website)	Freq. Range GHz	Mated Harness Pair	On Board:	Edge Launch	Vertical Launch
	0 - 9	1.20:1		1.40:1	1.35:1
	9 - 18	1.35:1		1.55:1	1.50:1
	18 - 26.5	1.35:1		1.55:1	1.50:1
	26.5 - 40	1.60:1		1.55:1	2.15:1
	40 - 50	1.60:1		1.70:1	-
Cable Attenuation (Nominal)	0.94 dB/ft @ 18 GHz	1.17 dB/ft @ 26.5 GHz		1.71 dB/ft @ 50 GHz	
DWV (@ sea level)	325 Vrms when tested per MIL-STD-202, Method 301				
Insulation Resistance	5000 Mega Ohms minimum when tested per MIL-STD-202, Method 302, Condition B				
RF Leakage	70 dB thru 18 GHz; 63 dB thru 26.5 GHz; 55 dB thru 40 GHz per MIL-STD-1344, Method 3008 (Mode Stirred)				
Channel to Channel Isolation (Cross Talk)	95 dB min. thru 40 GHz (Testing at other frequencies available on request.)				

**MECHANICAL**

	<b>STORM FLEX® 047</b>	<b>STORM FLEX® 086</b>
Cable Outer Diameter	0.055 inch (Nominal)	0.096 inch (Nominal)
Minimum Bend Radius	0.600 inch (Dynamic)	1.000 inch (Dynamic)
	0.040 inch (Static)	0.187 inch (Static)
Durability	500 mates (Minimum)	500 mates (Minimum)
Pull Force	10 lbs (Tensile Load)	10 lbs (Tensile Load)



# MINI-MULTIMATE®



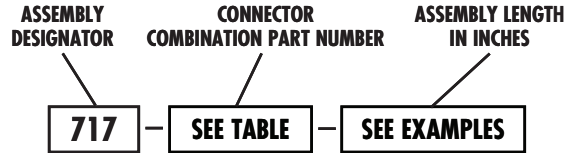
## CONNECTOR COMBINATION PART NUMBERS\*

	50 GHz		50 GHz		50 GHz		50 GHz		
	4-Position Male (Storm Flex® 047)	4-Position Female (Storm Flex® 047)	4-Position Male (Storm Flex® 086)	4-Position Female (Storm Flex® 086)	8-Position Male (Storm Flex® 047)	8-Position Female (Storm Flex® 047)	8-Position Male (Storm Flex® 086)	8-Position Female (Storm Flex® 086)	
50 GHz	2.4mm SP	4087	4086	4083	4082	4085	4084	4081	4080
	4-Position Male	8787	8687	8383	8283	-	-	-	-
	4-Position Female	8687	8686	8283	8282	-	-	-	-
40 GHz	8-Position Male	-	-	-	-	8585	8485	8181	8081
	8-Position Female	-	-	-	-	8485	8484	8081	8080
26.5 GHz	2.9mm SP	3787	3786	3783	3782	3785	3784	3781	3780
	SMPM SJ	2187	2186	2183	2182	2185	2184	2181	2180
18 GHz	SMA SP	0387	0386	0383	0382	0385	0384	0381	0380
	SSMA SP	3087	3086	3083	3082	3085	3084	3081	3080
	SMA SJ	0287	0286	0283	0282	0285	0284	0281	0280
	SMP SJ	0687	0686	0683	0682	0685	0684	0681	0680

NOTE: All non-8-position connectors will order x4 or x8.  
\* Other connector styles available; consult Storm

## ORDERING INFORMATION: Part Number Designation

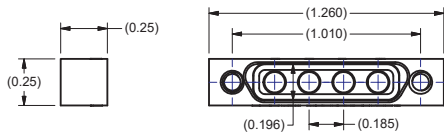
CONNECTOR CODES	
SP	Straight Plug
SJ	Straight Jack



### EXAMPLES:

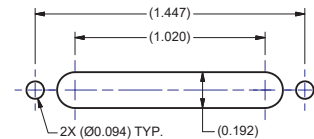
717-4080-009 = Mini-MultiMate® assembly with Storm Flex® 086 cables, [8] 2.4 mm SP connectors to 8-position female connector (assembly operates to 50 GHz), 9 inches

717-3087-018 = Mini-MultiMate® assembly with Storm Flex® 047 cables, [4] SSMA SP connectors to 4-position male connector (assembly operates to 26.5 GHz), 18 inches



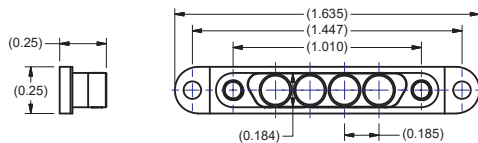
### 4-POSITION PLUG HOUSING

P/N: 050-3403-001



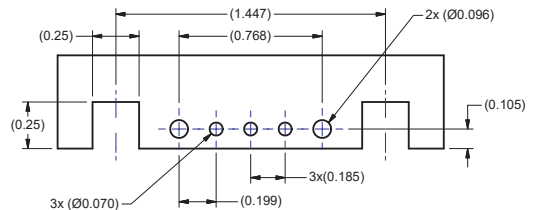
### 4-POSITION PANEL CUTOUT

Panel Thickness: 1/32" - 3/32"



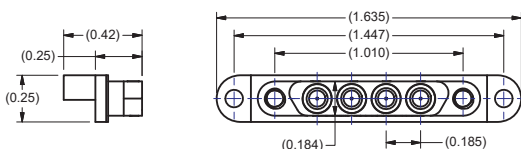
### 4-POSITION PANEL MOUNT RECEPTACLE

P/N: 050-3548-001



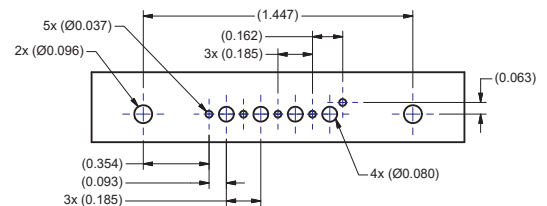
### 4-POSITION PCB BOARD LAUNCH PAD (Edge Launch)

For complete recommended board specifications, see TSM DWG 710-0702



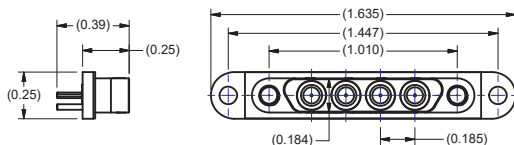
### 4-POSITION PCB MOUNT RECEPTACLE (Edge Launch)

P/N: 050-3399-001



### 4-POSITION PCB BOARD LAUNCH PAD (Vertical Launch)

For complete recommended board specifications, see TSM DWG 710-0703



### 4-POSITION PCB MOUNT RECEPTACLE (Vertical Launch)

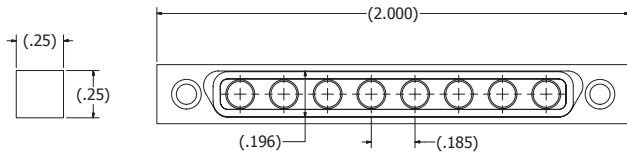
P/N: 050-3401-001

NOTE: All dimensions are in inches.

# MINI-MULTIMATE®

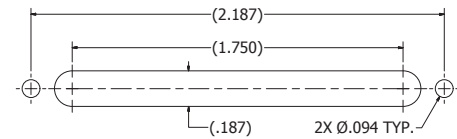
4 & 8 POSITION

## HIGH FREQUENCY MULTIPLE INTERCONNECT SYSTEM



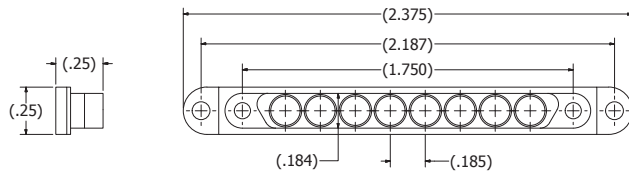
**8-POSITION PLUG HOUSING**

P/N: 050-3054-001



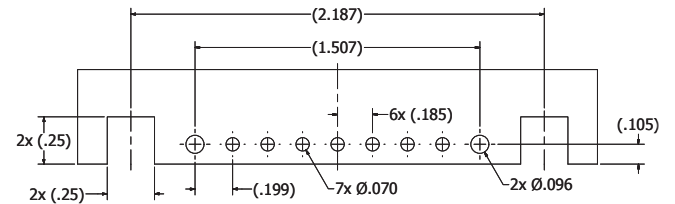
**8-POSITION PANEL CUTOUT**

Panel Thickness: 1/32" - 3/32"



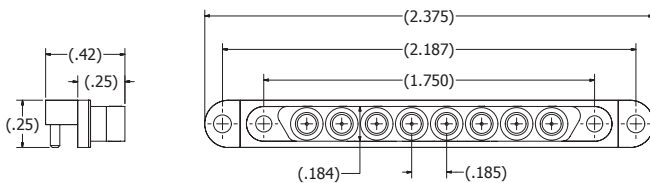
**8-POSITION PANEL MOUNT RECEPTACLE**

P/N: 050-3055-001



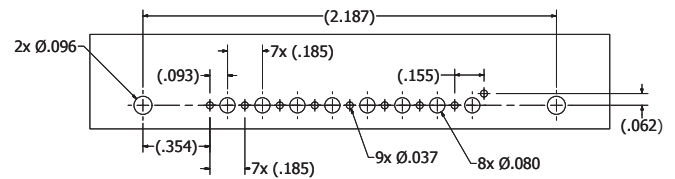
**8-POSITION PCB BOARD LAUNCH PAD (Edge Launch)**

For complete recommended board specifications, see TSM DWG 710-0605



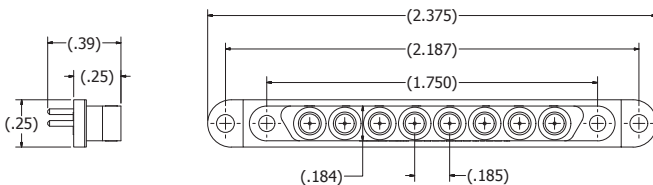
**8-POSITION PCB MOUNT RECEPTACLE (Edge Launch)**

P/N: 050-3251-001



**8-POSITION PCB BOARD LAUNCH PAD (Vertical Launch)**

For complete recommended board specifications, see TSM DWG 710-0626



**8-POSITION PCB MOUNT RECEPTACLE (Vertical Launch)**

P/N: 050-3290-001

### Supplemental Materials



**Spare Cable Assemblies**

Storm Flex® 047 and  
Storm Flex® 086 cables



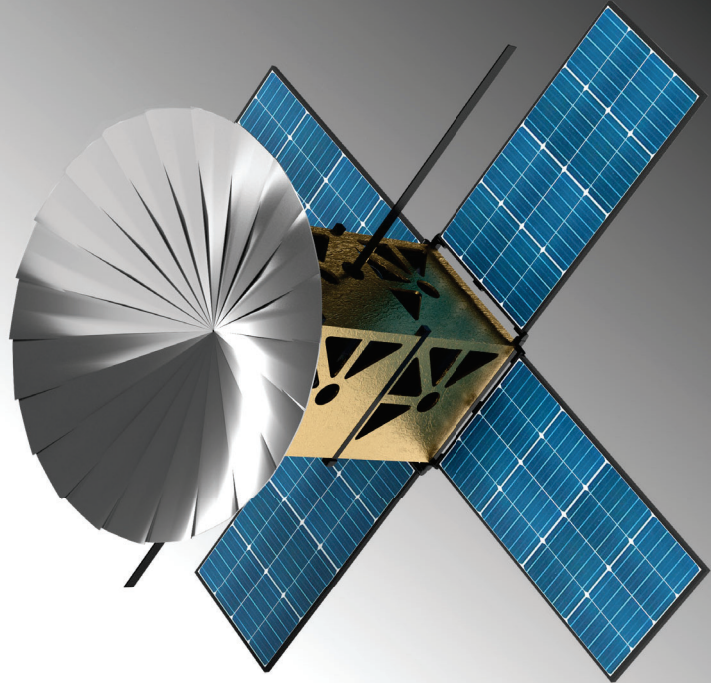
**Contact release tool for use  
with Mini-MultiMate® Female**

P/N: 520-3303-003

NOTE: All dimensions are in inches.

# SPACEMATE™

SM



## SPACE QUALIFIED HIGH FREQUENCY MULTIPLE INTERCONNECT SYSTEM



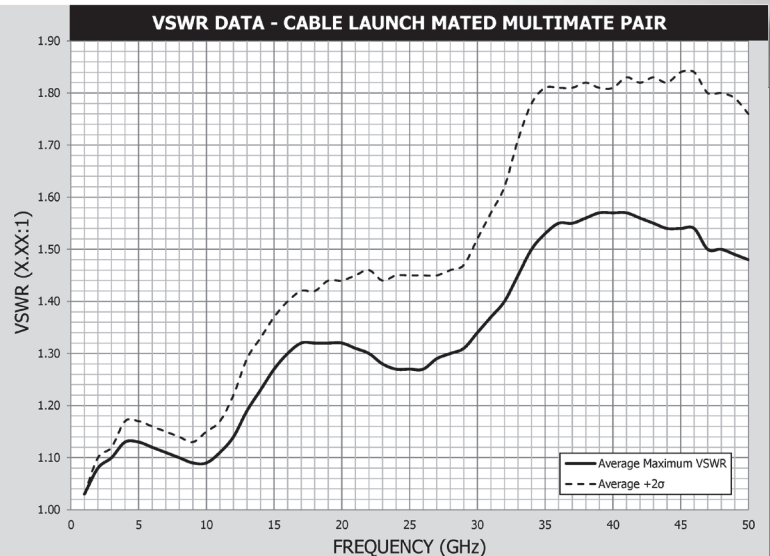
**The SpaceMate™ is a compact, rugged, SPACE qualified interconnect system that allows multiple high frequency connections (up to 50 GHz) with a single connector.**

Building on the Mini-MultiMate® platform the SpaceMate™ provides a high density interconnect between a panel or PCB utilizing the time tested StormFlex® 047 & 086 cables.

Materials were selected to meet outgassing requirements and operate in a LEO satellite environment.

Built to be durable, StormFlex® 047 & 086 cables have the flexibility to handle tight bends and offer superior and consistent electrical performance with flexure.

Qualified for use in low earth orbit the SpaceMate™ is a turnkey RF interconnect solution for LEO and Cube satellites.



**TELEDYNE  
STORM MICROWAVE**  
Everywhereyoulook™

*High value microwave and  
electronic interconnect solutions*

[www.teledynestorm.com](http://www.teledynestorm.com)



## MATERIALS

Contacts	BODY AND CONTACT:	Beryllium Copper per ASTM B196, C17300, Gold plated per ASTM B488, Type 2, Class 1.27
	LOCKING RING:	Beryllium Copper per ASTM B196, C17300, Gold plated per ASTM B488, Type 2, Class 0.25
	INSULATOR:	Teflon per ASTM D1710, Type 1, Grade 1, Class A or Torlon 4203 per MIL-P-46179
	O-RING:	Silicone Rubber per ASTM per A-A-59588
	LOCKING NUT:	Corrosion resistant steel Per ASTM 582, S30300 Alloy, Passivate per SAE-AMS-2700
Connector Block	HOUSING:	Brass per ASTM B16, C36000 alloy, Nickel plate per SAE-AMS-QQ-N-290 or Gold plated per ASTM B488, Class 0.25
	JACK SCREWS/BUSHING:	Corrosion resistant steel



## ENVIRONMENTAL WHEN MATED WITH STORM FLEX® 086 CABLE

Temperature	-55° C to +85° C
Vibration (High Frequency)	Meets MIL-STD-202, Method 204, Condition D
Shock (Specified Pulse)	Meets MIL-STD-202, Method 213, Test Condition I
Thermal Shock	Meets MIL-STD-202, Method 107, -55° C to +85° C
Outgassing	Meets ASTM E595, 1.00% TML max, 0.10% CVCM max

## ELECTRICAL

Nominal Impedance	50 Ohms				
Frequency	DC – 50 GHz				
VSWR (Typical; for full data see website)	Freq. Range GHz	Mated Harness Pair	On Board:	Edge Launch	Vertical Launch
	0 - 9	1.20:1		1.40:1	1.35:1
	9 - 18	1.35:1		1.55:1	1.50:1
	18 - 26.5	1.35:1		1.55:1	1.50:1
	26.5 - 40	1.60:1		1.55:1	2.15:1
	40 - 50	1.60:1		1.70:1	-
Cable Attenuation (Nominal)	0.94 dB/ft @ 18 GHz	1.17 dB/ft @ 26.5 GHz		1.71 dB/ft @ 50 GHz	
DWV (@ sea level)	325 Vrms when tested per MIL-STD-202, Method 301				
Insulation Resistance	5000 Mega Ohms minimum when tested per MIL-STD-202, Method 302, Condition B				
RF Leakage	70 dB thru 18 GHz; 63 dB thru 26.5 GHz; 55 dB thru 40 GHz per MIL-STD-1344, Method 3008 (Mode Stirred)				
Channel to Channel Isolation (Cross Talk)	95 dB min. thru 40 GHz (Testing at other frequencies available on request.)				

## MECHANICAL

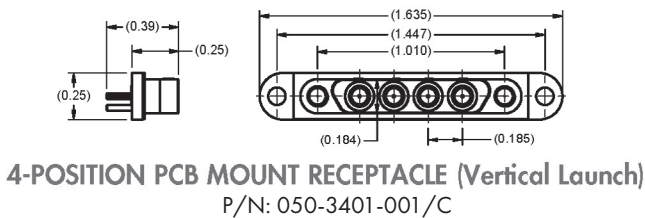
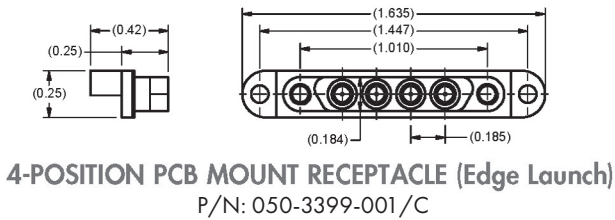
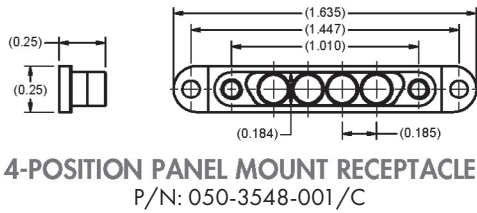
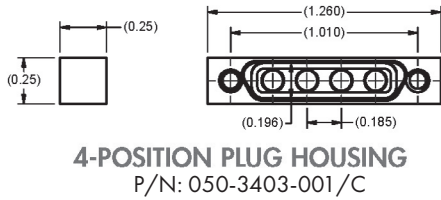
	STORM FLEX® 047	STORM FLEX® 086
Cable Outer Diameter	0.055 inch (Nominal)	0.096 inch (Nominal)
Minimum Bend Radius	0.600 inch (Dynamic) 0.040 inch (Static)	1.000 inch (Dynamic) 0.187 inch (Static)
Durability	500 mates (Minimum)	500 mates (Minimum)
Pull Force	10 lbs (Tensile Load)	10 lbs (Tensile Load)



**CONNECTOR COMBINATION PART NUMBERS\***

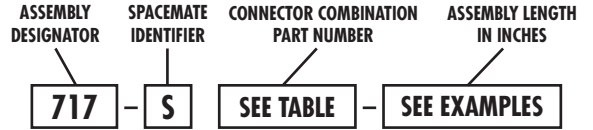
	50 GHz		50 GHz		50 GHz		50 GHz		
	4-Position Male (Storm Flex® 047)	4-Position Female (Storm Flex® 086)	4-Position Male (Storm Flex® 047)	4-Position Female (Storm Flex® 086)	8-Position Male (Storm Flex® 047)	8-Position Female (Storm Flex® 086)	8-Position Male (Storm Flex® 047)	8-Position Female (Storm Flex® 086)	
50 GHz	2.4mm SP	4087	4086	4083	4082	4085	4084	4081	4080
	4-Position Male	8787	8687	8383	8283	-	-	-	-
40 GHz	4-Position Female	8687	8686	8283	8282	-	-	-	-
	8-Position Male	-	-	-	-	8585	8485	8181	8081
26.5 GHz	8-Position Female	-	-	-	-	8485	8484	8081	8080
	2.9mm SP	3787	3786	3783	3782	3785	3784	3781	3780
18 GHz	SMPM SJ	2187	2186	2183	2182	2185	2184	2181	2180
	SMA SP	0387	0386	0383	0382	0385	0384	0381	0380
18 GHz	SSMA SP	3087	3086	3083	3082	3085	3084	3081	3080
	SMA SP	0287	0286	0283	0282	0285	0284	0281	0280
18 GHz	SMA SJ	0487	0486	0483	0482	0485	0484	0481	0480
	SMP SJ	0687	0686	0683	0682	0685	0684	0681	0680

NOTE: All non-8-position connectors will order x4 or x8.  
\* Other connector styles available; consult Storm



**ORDERING INFORMATION: Part Number Designation**

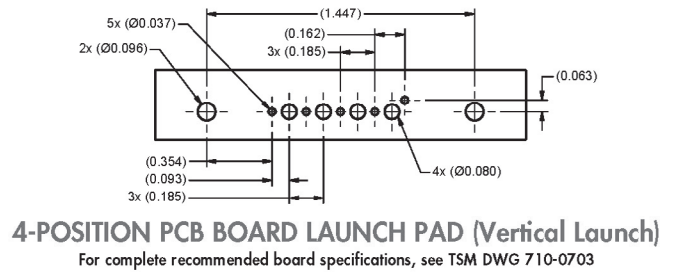
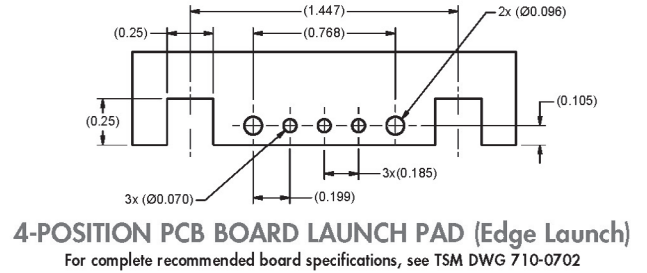
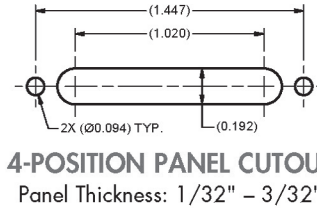
CONNECTOR CODES	
SP	Straight Plug
SJ	Straight Jack



**EXAMPLES:**

717-54080-009 = Spacemate™ assembly with Storm Flex® 086 cables, [8] 2.4 mm SP connectors to 8-position female connector (assembly operates to 50 GHz), **9 inches**

717-S3087-018 = Spacemate™ assembly with Storm Flex® 047 cables, [4] SSMA SP connectors to 4-position male connector (assembly operates to 26.5 GHz), **18 inches**



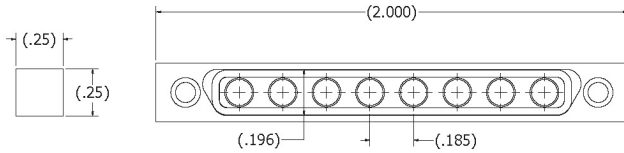
NOTE: All dimensions are in inches.

# SPACEMATE™

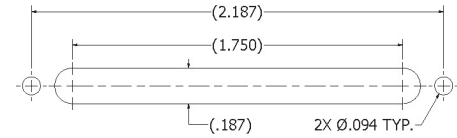
## 4 & 8 POSITION

## SPACE QUALIFIED HIGH FREQUENCY MULTIPLE INTERCONNECT SYSTEM

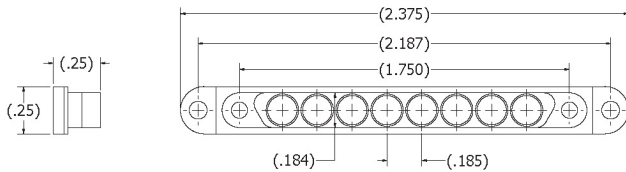
SM



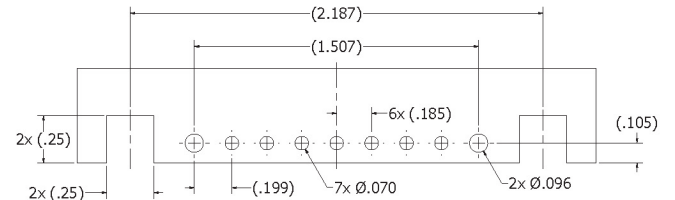
**8-POSITION PLUG HOUSING**  
P/N: 050-3054-001/C



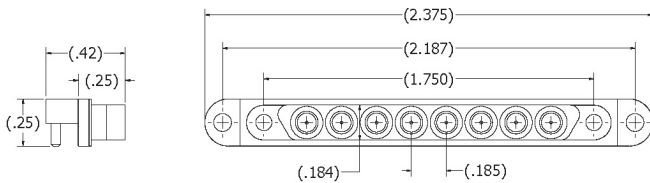
**8-POSITION PANEL CUTOUT**  
Panel Thickness: 1/32" – 3/32"



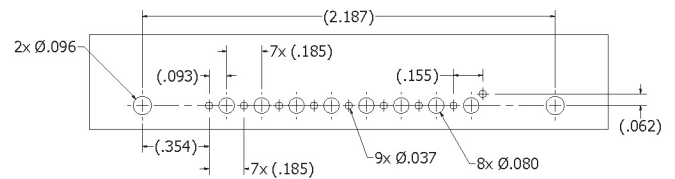
**8-POSITION PANEL MOUNT RECEPTACLE**  
P/N: 050-3055-001/C



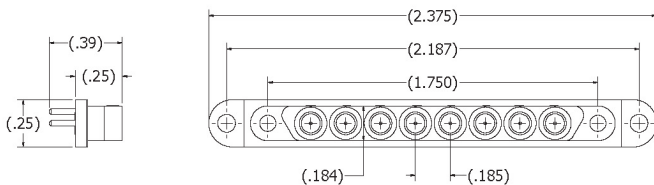
**8-POSITION PCB BOARD LAUNCH PAD (Edge Launch)**  
For complete recommended board specifications, see TSM DWG 710-0605



**8-POSITION PCB MOUNT RECEPTACLE (Edge Launch)**  
P/N: 050-3251-001/C



**8-POSITION PCB BOARD LAUNCH PAD (Vertical Launch)**  
For complete recommended board specifications, see TSM DWG 710-0626



**8-POSITION PCB MOUNT RECEPTACLE (Vertical Launch)**  
P/N: 050-3290-001/C

**NOTE: All dimensions are in inches.**

### Supplemental Materials



**Spare Cable Assemblies**  
Storm Flex® 047 and  
Storm Flex® 086 cables



**Contact release tool for use  
with SpaceMate™ Female**  
P/N: 520-3303-003

# WEATHERMATE™



WM

## WEATHER RESISTANT HIGH FREQUENCY MULTI-CHANNEL INTERCONNECT SYSTEM



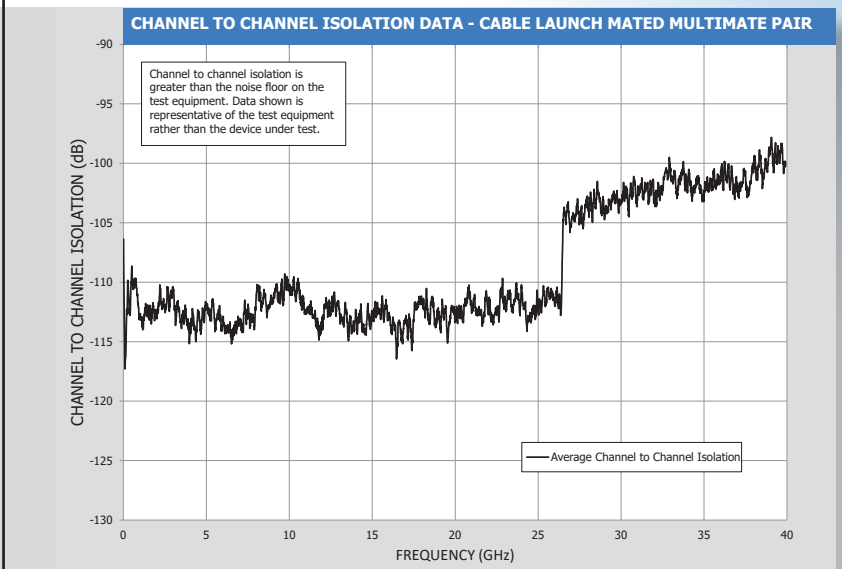
The WeatherMate™ is a compact, rugged, submersion resistant interconnect system that allows multiple high frequency connections (up to 50 GHz) with a single connector.

Building on the Mini-MultiMate® platform the WeatherMate™ provides a high density interconnect through a panel utilizing the rugged StormFlex® 047 & 086 cables.

IP67 ingress protection ensures product survival when submerged for 30 minutes up to a depth of 1 m.

Siltem™ cable jacket provides improved cable bend memory over standard FEP and is also low smoke zero halogen.

The WeatherMate™ is perfect for applications where a weather and splash resistant multi-channel high frequency harness are critical for system success.



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*High value microwave and  
electronic interconnect solutions*

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**MATERIALS**

Contacts	<b>BODY AND CONTACT:</b>	Beryllium Copper per ASTM B196, C17300, Gold plated per ASTM B488, Type 2, Class 1.27
	<b>LOCKING RING:</b>	Beryllium Copper per ASTM B196, C17300, Gold plated per ASTM B488, Type 2, Class 0.25
	<b>INSULATOR:</b>	Teflon per ASTM D1710, Type 1, Grade 1, Class A or Torlon 4203 per MIL-P-46179
	<b>O-RING:</b>	Silicone Rubber per ASTM per A-A-59588
	<b>LOCKING NUT:</b>	Corrosion resistant steel Per ASTM 582, S30300 Alloy, Passivate per SAE-AMS-2700
Connector Block	<b>HOUSING:</b>	Brass per ASTM B16, C36000 alloy, Nickel plate per SAE-AMS-QQ-N-290 or Gold plated per ASTM B488, Class 0.25
	<b>JACK SCREWS/BUSHING:</b>	Corrosion resistant steel
	<b>GASKET:</b>	Fluorosilicone Adhesive Backed
	<b>POTTING COMPOUND:</b>	Polyurethane



**ENVIRONMENTAL WHEN MATED WITH STORM FLEX® 086 CABLE**

Temperature	-55° C to + 85°C
Vibration (High Frequency)	Meets MIL-STD-202, Method 204, Condition D
Shock (Specified Pulse)	Meets MIL-STD-202, Method 213, Test Condition I
Ingress Protection	IEC 60529 IP67 (1.0 meter Immersion/Tested for 30min)

**ELECTRICAL**

Nominal Impedance	50 Ohms		
Frequency	DC – 50 GHz		
VSWR (Typical; for full data see website)	Freq. Range GHz	Mated Harness Pair	
	0 - 9	1.20:1	
	9 - 18	1.35:1	
	18 - 26.5	1.35:1	
	26.5 - 40	1.60:1	
Cable Attenuation (Nominal)	0.94 dB/ft @ 18 GHz	1.17 dB/ft @ 26.5 GHz	1.71 dB/ft @ 50 GHz
	DWV (@ sea level) 325 Vrms when tested per MIL-STD-202, Method 301		
	Insulation Resistance 5000 Mega Ohms minimum when tested per MIL-STD-202, Method 302, Condition B		
RF Leakage	70 dB thru 18 GHz; 63 dB thru 26.5 GHz; 55 dB thru 40 GHz per MIL-STD-1344, Method 3008 (Mode Stirred)		
Channel to Channel Isolation (Cross Talk)	95 dB min. thru 40 GHz (Testing at other frequencies available on request.)		

**MECHANICAL**

	<b>STORM FLEX® 047</b>	<b>STORM FLEX® 086</b>
Cable Outer Diameter	0.055 inch (Nominal)	0.096 inch (Nominal)
Minimum Bend Radius	0.600 inch (Dynamic)	1.000 inch (Dynamic)
	0.040 inch (Static)	0.187 inch (Static)
Durability	500 mates (Minimum)	500 mates (Minimum)
Pull Force	10 lbs (Tensile Load)	10 lbs (Tensile Load)



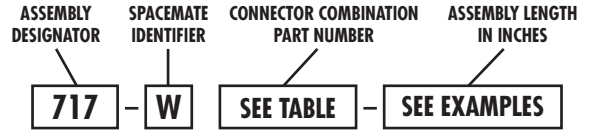
**CONNECTOR COMBINATION PART NUMBERS\***

	50 GHz				50 GHz			
	4-Position Male (Storm Flex® 047)	4-Position Female (Storm Flex® 047)	4-Position Male (Storm Flex® 086)	4-Position Female (Storm Flex® 086)	8-Position Male (Storm Flex® 047)	8-Position Female (Storm Flex® 047)	8-Position Male (Storm Flex® 086)	8-Position Female (Storm Flex® 086)
50 GHz	2.4mm SP	4087	4086	4083	4082	4085	4084	4080
	4-Position Male	8787	8687	8383	8283	-	-	-
	4-Position Female	8687	8686	8283	8282	-	-	-
	8-Position Male	-	-	-	-	8585	8485	8181
40 GHz	8-Position Female	-	-	-	-	8485	8484	8081
	8-Position Female	-	-	-	-	8485	8484	8081
	2.9mm SP	3787	3786	3783	3782	3785	3784	3781
26.5 GHz	SMP SJ	2187	2186	2183	2182	2185	2184	2181
	SMA SP	0387	0386	0383	0382	0385	0384	0381
18 GHz	SSMA SP	3087	3086	3083	3082	3085	3084	3081
	SMA SP	0287	0286	0283	0282	0285	0284	0281
18 GHz	SMA SJ	0487	0486	0483	0482	0485	0484	0481
	SMP SJ	0687	0686	0683	0682	0685	0684	0681

NOTE: All non-8-position connectors will order x4 or x8.  
\* Other connector styles available; consult Storm

**ORDERING INFORMATION: Part Number Designation**

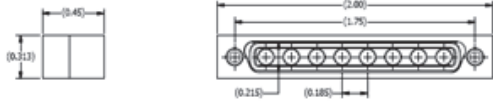
CONNECTOR CODES	
SP	Straight Plug
SJ	Straight Jack



**EXAMPLES:**

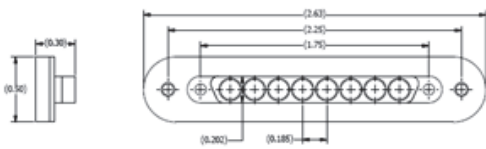
717-W4080-009 = Weathermate™ assembly with Storm Flex® 086 cables, [8] 2.4 mm SP connectors to 8-position female connector (assembly operates to 50 GHz), **9 inches**

717-W3087-018 = Weathermate™ assembly with Storm Flex® 047 cables, [4] SSMA SP connectors to 4-position male connector (assembly operates to 26.5 GHz), **18 inches**



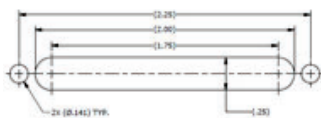
**8 POSITION PLUG HOUSING**

P/N: 050-3550-001



**8 POSITION PANEL MOUNT RECEPTACLE**

P/N: 050-3551-001



**8 POSITION PANEL CUTOUT**

Panel Thickness: 1/32" - 3/32"

**CASE STUDY**

**THE CHALLENGE**

A customer is working to develop a common electronics module to use across a family of radar systems they have been tasked with upgrading. Confronted with the need to fit more electronics into the existing space and having been impressed with the performance and compact footprint of the Mini-MultiMate®, the customer reached out to Teledyne Storm. The added feature of weatherproof construction was required.

This was the genesis of the WeatherMate™.

**THE SOLUTION**

Teledyne Storm's team responds by designing new connector blocks, building on the framework of the Mini-MultiMate® product, incorporating features that will provide a water tight seal between mating assemblies. This new design has the potential to provide the compact footprint and electrical performance of the Mini-MultiMate® while also being capable of withstanding submersion for 30 minutes at a depth up to 1 meter.

The team quickly builds prototypes and experiments with various potting and gasketing materials until a solution is found that will meet the customer performance requirements. Once the design has been qualified, Teledyne Storm's attention to process control and quality inspections ensure correct execution and delivery of the harnesses.

**THE RESULT**

The WeatherMate™, a compact high performance multi-channel connector system that is suitable for use in weather exposed environments.



# VITA 67



## RF COAXIAL INTERCONNECT SYSTEM VPX COMPATIBLE



VITA 67 is a VPX standard for blindmate coax connectors that allows **high density, high performance RF connections** to be made **between a backplane and plug-in modules.**

VITA 67 components are connector blocks that utilize SMPM RF interfaces and cables to make the electrical connection between circuit boards.

Designed to accommodate 0.086" or 0.047" diameter cables, the rugged VITA 67 blocks are perfectly complemented by their pairing with Teledyne Storm's Storm Flex® 086 and 047 cables.

These Storm Flex® cables have the **flexibility to handle tight bends**, and are known for their **durability** and **superior electrical performance.**

The VITA 67–Storm Flex® combination is ideally suited for not only commercial applications, but also the often harsh requirements of military and aerospace applications.

### FEATURES

- ~ Available in 4 position and 8 position formats
- ~ Mother card and daughter card versions
- ~ Standard MIL-STD-348 SMPM interface
- ~ Works beyond the VITA 67 minimum operation frequency of 26.5 GHz
- ~ Utilizes Storm Flex® 086 and 047 cable

### BENEFITS

- ~ Layout flexibility
- ~ Works with standard VPX parts
- ~ Saves time by enabling quick connect/disconnect
- ~ No special adapters required
- ~ Broader use across multiple applications
- ~ Offers the flexibility needed to handle high density configurations
- ~ Withstands multiple flexures immediately behind the connectors without breaking or degrading
- ~ High compression resistance

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## SPECIFICATIONS

Operating Frequency	DC to 40 GHz* (performance based on connector selection)
VSWR (max)	1.45:1 DC to 40 GHz* (performance based on connector selection)
Insertion Loss	See calculator on Storm website (TYP. 12" Storm Flex® 086 max IL: 2.13 dB)
Dielectric Withstanding Voltage	325 Vrms (min) tested per MIL-STD-202, Method 301
Mating Characteristics	Force to engage and disengage: 3.5 lbs (typical) Spring force at full deflection: 4.25 lbs (typical)
Insulation Resistance	5000 Mohms (min) tested per MIL-STD-202, Method 302, Condition B
Corrosion	Tested per MIL-STD-202, Method 101
Contact Resistance – Initial (milliohms, max)	Center contact 6.0 and outer contact 5.0, tested per MIL-PRF-39012, para. 4.6.13
Temperature	-55° C to +85° C TYP.
Vibration	Tested per MIL-STD-202, Method 214, Test Condition I, Curve D
Shock	Sawtooth pulse of 100 g 6ms per Mil-STD-202, Method 213, Condition I
Thermal Shock	Tested per MIL-STD-202, Method 107, Test Condition A
Moisture Resistance – Humidity	1,000 megohms within 5 minutes after removal from humidity, tested per MIL-STD-202, Method 106
Power Handling	RF power CW average: 20 dBm min. from 30 MHz to 27 GHz and 30 dBm min. from 3 MHz to 30 MHz
Channel to Channel Isolation	100 dB 3–26.5 GHz >120 dB 30 MHz–3 GHz >140 dB 3–30 MHz
Intermateability	Connector blocks and SMPM contacts can not always be mixed between manufacturers.

\*The VITA specification lists electrical requirements through 26.5 GHz. In practice, cables will operate above this frequency.

## CONFIGURATION

Direct Attach Connector Block	DC to 40 GHz* (performance based on connector selection)
Connector Block	1.45:1 DC to 40 GHz* (performance based on connector selection)
Cable Type	See calculator on Storm website (TYP. 12" Storm Flex® 086 max IL: 2.13 dB)
Connectors	325 Vrms (min) tested per MIL-STD-202, Method 301

## MATERIALS

### CONNECTOR BLOCKS

SMPM Block	<b>OPTION 1:</b> Aluminum 6061-T6 with chemical conversion coat, Type 1, Class 3 per MIL-DTL-5541
	<b>OPTION 2:</b> Corrosion resistant steel per ASTM A 582, S30300, Cond. A with passivate per SAE-AMS-2700, Method 2, Class 4
Direct Attach Block	<b>Mounting &amp; connector block:</b> Aluminum 6061-T651 or -T6 per SAE-AMS-4027 with chemical conversion coat, Type 1, Class 3 per MIL-DTL-5541. <b>Screws &amp; pins:</b> 18-8 stainless steel, spring steel, with passivate per SAE-AMS-2700, Method 2, Class 4

### SMPM CONNECTORS

**Body, locking ring, contact:** Beryllium copper per ASTM B196, C17300, Temper TD04 with gold plate per ASTM B488, Type 2, Class 1.27 on body & contact, and nickel plate per SAE-AMS-QQ-N-290 on locking ring. **Insulator:** Teflon per ASTM D1710, Type 1, Grade 1, Class A. **Spring:** Corrosion resistant steel per SAE-AMS-5678, UNS alloy S17700 with passivate per SAE-AMS-2700

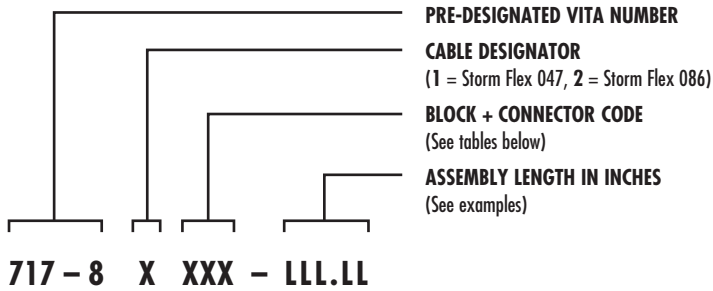
## APPLICATIONS

- Robust and rugged high speed cabled solution
- High-reliability, high-density for aerospace & defense applications
- SIGINT, EWR, ground base station & communication systems, avionics, radar systems
- Air Transport Racks (ATRs) without Rear Transition Modules (RTMs) or limited speed through RTM



# VITA 67

## ORDERING INFORMATION: Part Number Designation



### EXAMPLES:

717-82A37-012 = VITA 67 assembly with Storm Flex® 086 cables, 4-Position SMPM Block (stainless) to [4] 2.9 mm SP connectors (assembly operates to 40 GHz), **12 inches**

717-81D06-009.5 = VITA 67 assembly with Storm Flex® 047 cables, 8-Position SMPM Block (aluminum) to [8] GPO SJ connectors (assembly operates to 18 GHz), **9.5 inches**

## STORM FLEX® 086 - CABLE OPTION 2

### CONNECTOR COMBINATION PART NUMBERS\*

		40 GHz					
		4-Position Direct Attach Block	4-Position SMPM Block (aluminum)	4-Position SMPM Block (stainless steel)	8-Position SMPM Attach Block	8-Position SMPM Block (aluminum)	8-Position SMPM Block (stainless steel)
50 GHz	2.4 mm SP	E40	B40	A40	F40	D40	C40
	SMPM female	E70	B70	A70	F70	D70	C70
	SMPM male	E71	B71	A71	F71	D71	C71
40 GHz	2.9 mm SP	E37	B37	A37	F37	D37	C37
	SMPM SJ Float Mount	E72	B72	A72	F72	D72	C72
	SMPM SP Bulkhead Mount	E73	B73	A73	F73	D73	C73
26.5 GHz	8-position female	E80	B80	A80	F80	D80	C80
	8-position male	E81	B81	A81	F81	D81	C81
	SMA SP	E03	B03	A03	F03	D03	C03
18 GHz	SSMA SP	E30	B30	A30	F30	D30	C30
	GPO RAJ	E07	B07	A07	F07	D07	C07
	GPPO SJ	E21	B21	A21	F21	D21	C21
4 GHz	SMA SP	E02	B02	A02	F02	D02	C02
	SMA SJ	E04	B04	A04	F04	D04	C04
	SMP SJ	E06	B06	A06	F06	D06	C06
	BNC SP	E42	B42	A42	F42	D42	C42

NOTE: All non-4 and 8-position connectors will order x4 or x8  
 \* Other connector styles available; consult Storm

## STORM FLEX® 047 - CABLE OPTION 1

### CONNECTOR COMBINATION PART NUMBERS\*

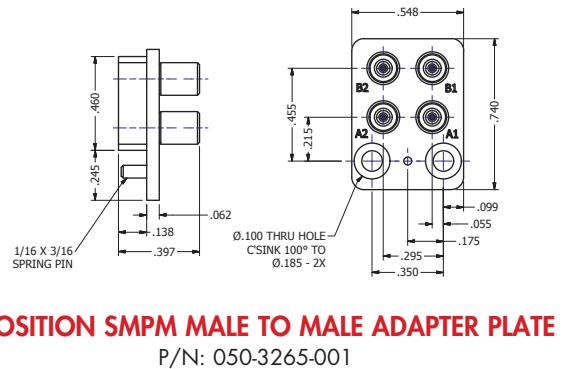
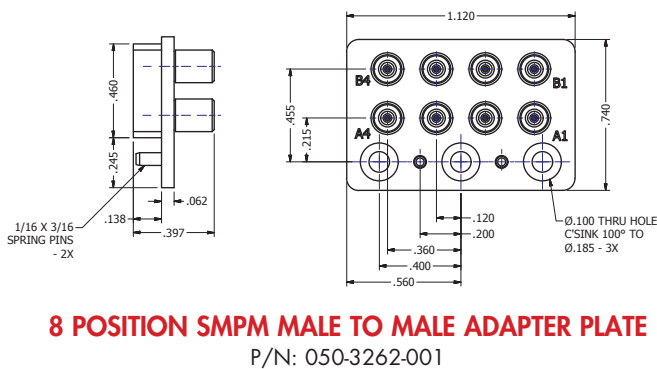
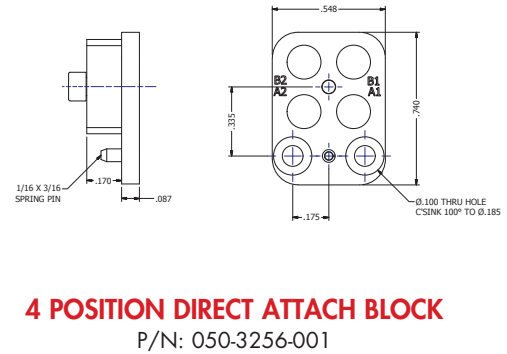
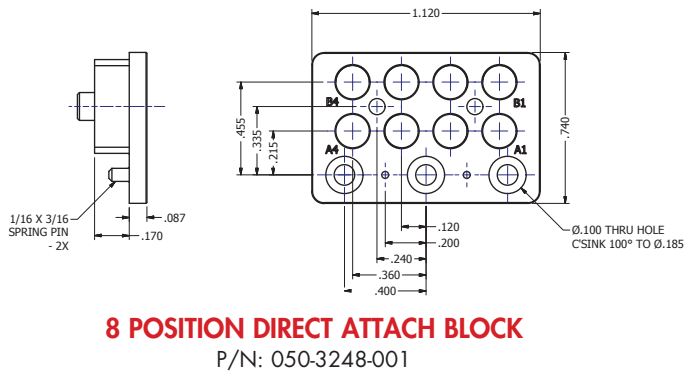
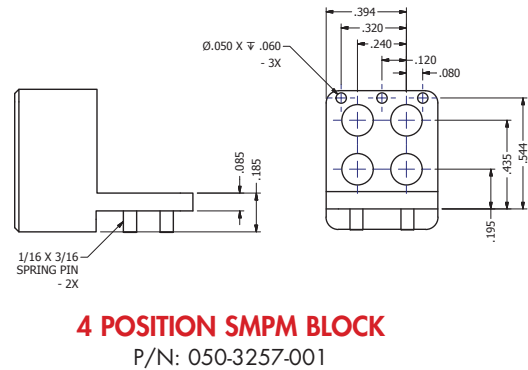
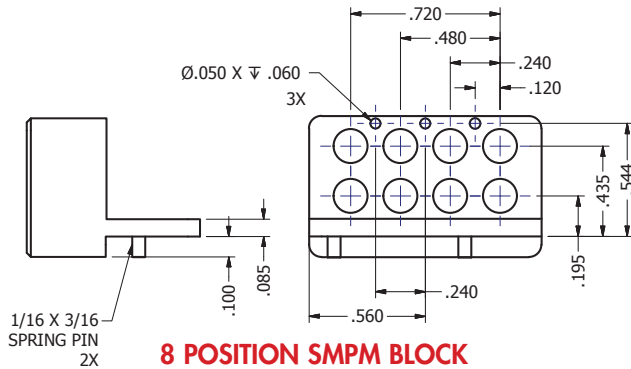
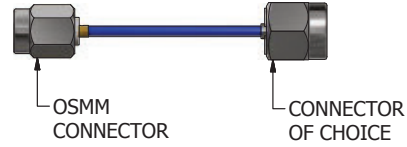
		40 GHz					
		4-Position Direct Attach Block	4-Position SMPM Block (aluminum)	4-Position SMPM Block (stainless steel)	8-Position SMPM Attach Block	8-Position SMPM Block (aluminum)	8-Position SMPM Block (stainless steel)
50 GHz	2.4 mm SP	E40	B40	A40	F40	D40	C40
	GPPO SJ	E21	B21	A21	F21	D21	C21
40 GHz	SMPM SJ Float Mount	E70	B70	A70	F70	D70	C70
	SMPM SP Bulkhead Mount	E71	B71	A71	F71	D71	C71
26.5 GHz	SMA SP	E03	B03	A03	F03	D03	C03
	GPO RAJ	E09	B09	A09	F09	D09	C09
18 GHz	GPO SJ	E06	B06	A06	F06	D06	C06
	GPPO RAJ	E22	B22	A22	F22	D22	C22
14 GHz	SMA SP	E02	B02	A02	F02	D02	C02
	SSMA SP	E30	B30	A30	F30	D30	C30

NOTE: All non-4 and 8-position connectors will order x4 or x8  
 \* Other connector styles available; consult Storm

CONNECTOR CODES	
SP	Straight Plug
SJ	Straight Jack
RAJ	Right-Angle Jack

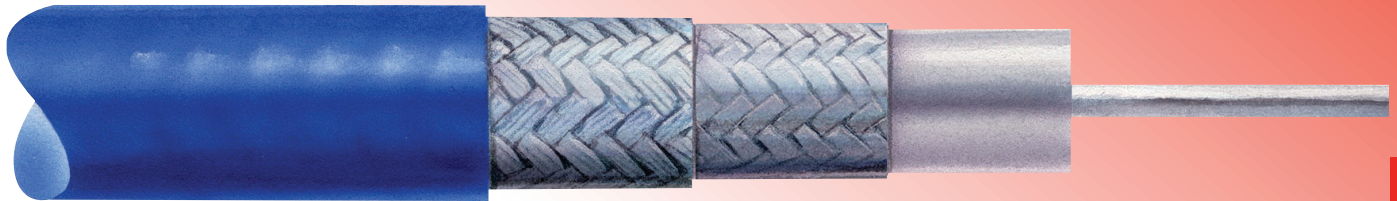
### TELEDYNE STORM MICROWAVE CABLE ASSEMBLIES

Pair With Connector Blocks Below For Complete Assembly



# STORM FLEX®

## 047 & 086 SERIES



SF



### STORM FLEX® 047 & 086

With 0.055" and 0.096" (1.40mm and 2.4mm) diameters, durable construction, and low profile connector configurations, miniature multi-channel harness solutions utilizing StormFlex® cable offer **superior electrical performance in a trouble-free, compact assembly.**

#### IDEAL WHEN:

*Development of complicated semi-rigid cable drawings is prohibitive from a standpoint of time or cost*

*Expensive SMA right-angle connectors may be prohibitive from a standpoint of cost.*

*Installation of other miniature cable assemblies has caused expensive or hard-to-find failures.*

*High density devices require stable, miniature cable assemblies for connection during test.*

#### FEATURES

- ~ Solid PTFE dielectric
- ~ Ultra-high strength, multilayer outer braid
- ~ 0.055", 0.096", & 0.160" (1.40 mm, 2.44 mm, & 4.06 mm) diameters
- ~ Wide range of low profile SMA, GPO®, and GPPO® connectors

#### BENEFITS

- ~ High compression resistance and greater durability
- ~ Eliminates cable breakage associated with repeated bending and handling
- ~ Provides alternatives to 0.047", 0.086", & 0.141" (1.19 mm, 2.18 mm, & 3.58 mm) semi-rigid cable - eliminating costs associated with time-consuming cable layout
- ~ Storm Flex® cables can be configured to solve tough packaging challenges



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**STORM MICROWAVE**  
Everywhereyoulook™

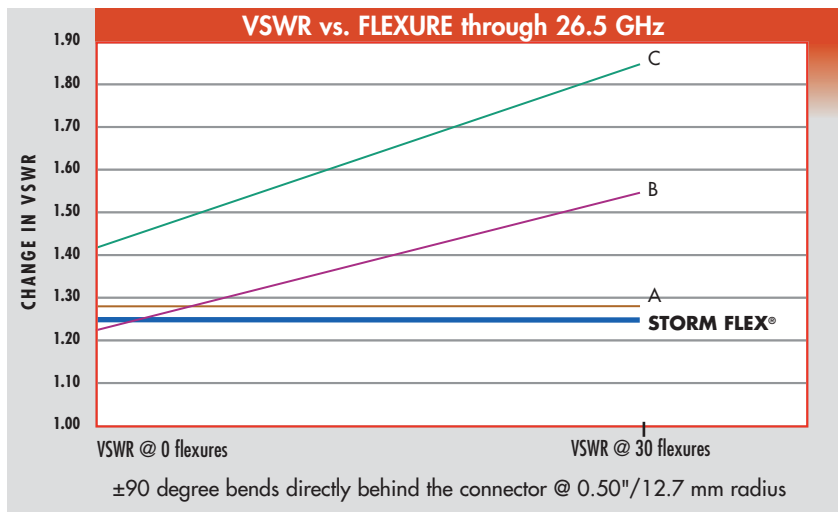
High value microwave and  
electronic interconnect solutions

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**BUILT FOR USE . . . BUILT TO LAST**

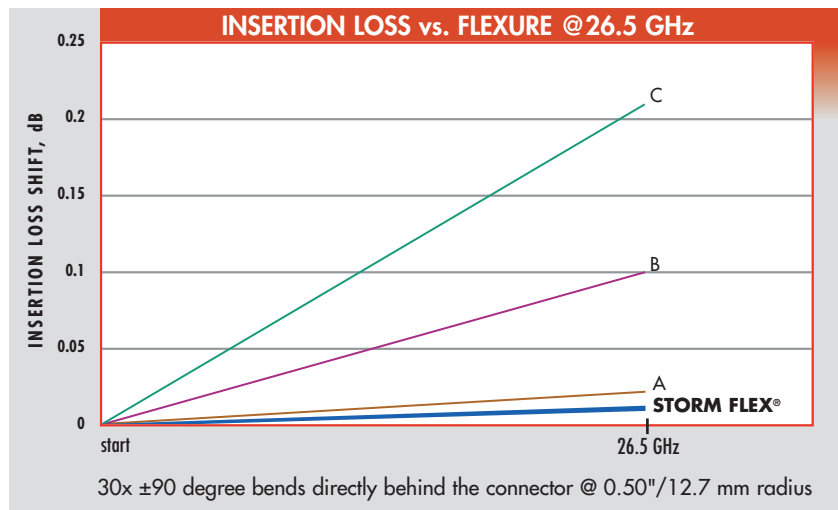
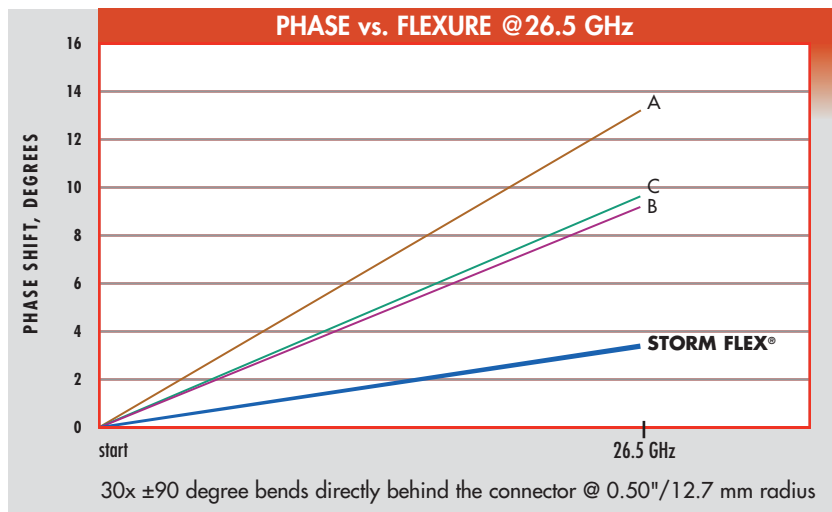
**THE FLEXIBILITY TO HANDLE TIGHT BENDS.  
DURABILITY YOU CAN RELY ON.  
PERFORMANCE TESTED.**

Built to be durable, Storm Flex® products provide consistent performance with flexure...**out-performing leading competitors when put to the test.**



- **STORM FLEX®**
- Competitor A
- Competitor B
- Competitor C

**SF**



**TELEDYNE**  
**STORM MICROWAVE**  
Everywhere you look™

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Woodridge, Illinois 60517

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Fax 630.754.3500  
Toll Free 888.347.8676  
storm\_microwave@teledyne.com

[www.teledynestorm.com](http://www.teledynestorm.com)

AS9100/ISO 9001 REGISTERED

09/14

Test data based on Storm Flex® 086 cable.

FOR AN OPTION WITH PHASE STABILITY OVER TEMPERATURE

# PHASE MASTER®

## 096 SERIES



PM

### PHASE STABLE CABLE ASSEMBLIES



**If your Miniature Multi-Channel Harness requires an unmatched combination of phase stability, low loss, and value...**

Then take a look at our **Phase Master®** cables, **now available in 096 size.**

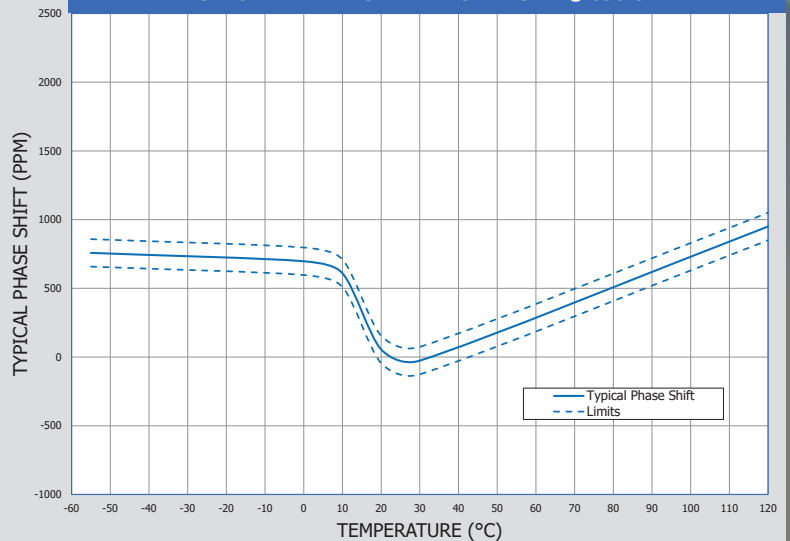
**Superior phase stability vs. temperature** makes this cable the ideal choice for phase-sensitive applications - particularly those **with wide operating temperature ratings.**

Phase Master's enhanced phase stability - a result of a proprietary combination of high performance, tape wrapped PTFE dielectric and helically wrapped SPC shield - offers:

- Improved system performance
- Less frequent calibration
- More precise measurements

From environmental stress screening to electronically scanned radar systems, count on Phase Master assemblies to provide **unparalleled value and performance.**

PHASE vs. TEMPERATURE - PHASE MASTER® 096 CABLE



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*High value microwave and  
electronic interconnect solutions*

[www.teledynestorm.com](http://www.teledynestorm.com)

# CUSTOM HARNESSSES

Teledyne Storm Microwave maintains a dedicated engineering staff for the design and manufacture of multi-channel microwave harness assemblies for a range of military and commercial applications.



Teledyne Storm Microwave can provide custom harnesses in a wide variety of configurations engineered to suit your specific application. We handle all cable assembly processes - from design through manufacture - in-house, carefully assessing application requirements in order to maximize both performance and durability.



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Toll Free 888.347.8676  
storm\_microwave@teledyne.com

