



# Instrumentation Test Cable

## VNAX-1M-EMERF+

50Ω 1M DC to 67 GHz Low Loss

### The Big Deal

- Ultra-wideband operation, DC to 67 GHz
- 1.85mm Rugged Female connector for direct interface with 67 GHz VNA ports
- Low insertion loss and excellent return loss
- Rugged construction, crush and torque resistant



CASE STYLE: RH2934-3.28

### Product Overview

Mini-Circuits' VNAX-1M-EMERF+ is an ultra-wideband precision rugged instrumentation cable specially designed for use with 67 GHz VNA equipment in test environments. The cable provides excellent VSWR and very low insertion loss over its entire frequency range. 1.85mm rugged female to 1.85mm male connector configuration provides direct connection from the ports of a 67 GHz VNA to 1.85mm connectorized devices without the need for adapters. The cable features a rugged crush and torque resistant outer sheath that protects the cable from damage in demanding lab settings.

### Key Features

Feature	Advantages
DC-67 GHz operation designed for use with Vector Network Analyzers (VNA)	Covers a wide range of test applications; rugged 1.87mm connector interfaces directly with VNA without the need for an adapter for improved VSWR performance and lower cost.
Rugged cable-connector interface	Chrome plated metal back shell maintains integrity of the cable-connector interface improving the reliability and extending life of use.
Extra rugged yet flexible armored cable construction.	100% coverage, non-interleaved, stainless steel spiral sheath provides crush resistance and captured, opposing force steel braid provides torque resistance. PET monofilament yarn outer cover eliminates conductivity and allows easy handling.
1M length	Standard VNA cable length makes this model a high performing, cost-effective replacement for expensive OEM cables.
Anti-Torque Component	Nut component feature on connector used to fit a torque wrench to minimize stress on connectors and prevent breakage

#### Notes

- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.  
 B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.  
 C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at [www.minicircuits.com/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp)





# Instrumentation Test Cable

## VNAX-1M-EMERF+

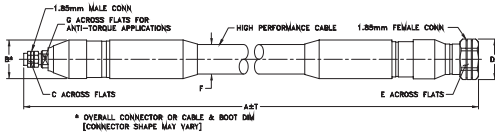
50Ω 1M DC to 67 GHz Low Loss

### Maximum Ratings

Operating Temperature	+18°C to +28°C	
Storage Temperature	-40°C to +50°C	
Power Handling at 25°C, Sea level	115W	1GHz
	59W	6GHz
	27W	26.5GHz
	17W	67GHz

Permanent damage may occur if any of these limits are exceeded.

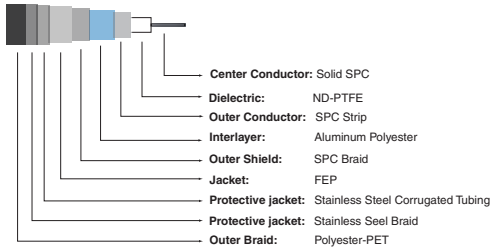
### Outline Drawing



### Outline Dimensions (inch/mm)

	A	B	C	D	E	F	G	T	wt
Feet	3.28	1.00	20.07	8.00	21.08	19.05	15.3	7.0	+79/-0
Meters	0.79	0.315	0.83	.75	.602	.275	Inch	MM	grams
									+20.0/-0

### Cable Construction



#### Product Guarantee

Mini-Circuits® will repair or replace your test cable at its option if the connector attachment fails within six months of shipment. This guarantee excludes cable or connector interface damage from misuse or abuse.

### Features

- extremely low insertion loss
- extra rugged construction includes protective shield and strain relief for longer life
- stainless steel 40 GHz connector for long mating-cycle life
- amplitude and phase stability vs flexure

### Applications

- military and defense applications
- research & development labs
- precision testing



CASE STYLE: RH2934-3.28

Conn 1	Conn 2	Model
1.85mm Male	1.85mm Rugged Female	VNAX-1M-EMERF+

#### +RoHS Compliant

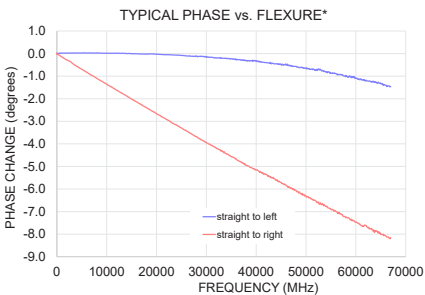
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

### Electrical Specifications at 25°C

Parameter	Condition (GHz)	Min.	Typ.	Max.	Units
Frequency Range		DC		67	GHz
Length			1		M
Insertion Loss	DC - 18	—	1.86	4.3	dB
	18 - 40	—	3.72	5.5	
	40 - 50	—	4.88	6.4	
Return Loss	50 - 67	—	5.79	6.9	dB
	DC - 18	19	33	—	
	18 - 40	17	22	—	
Return Loss	40 - 50	16	25	—	dB
	50 - 67	16	15	—	

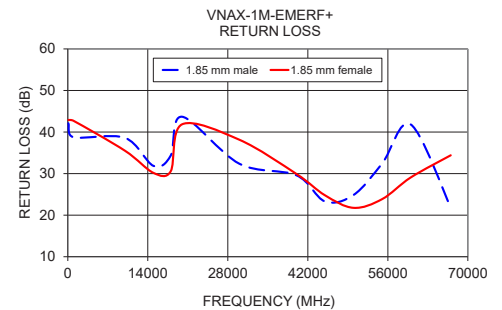
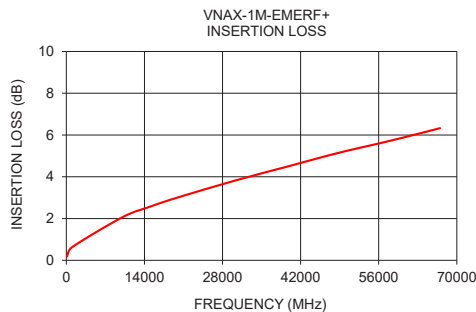
### Typical Performance Data

Frequency (MHz)	Insertion Loss (dB)	Return Loss (dB)	
		1.85 mm Male	1.85 mm Female
100	0.18	42.11	42.90
1000	0.62	38.76	42.71
10000	2.06	38.61	35.51
15000	2.57	31.86	30.16
18000	2.84	34.31	30.54
20000	3.01	43.68	41.86
30000	3.80	32.39	38.16
40000	4.52	29.60	29.93
45000	4.88	23.31	24.78
50000	5.22	24.86	21.76
55000	5.53	32.43	23.86
60000	5.85	41.83	29.07
67000	6.33	21.85	34.41



\* Typical phase change over flexure performed on VNAX-3FT-KMVRF+ by wrapping cable 360° around 4" radii mandrels referenced to normalized straight position.

\*\* Setup is flipped and measurement is repeated.



#### Notes

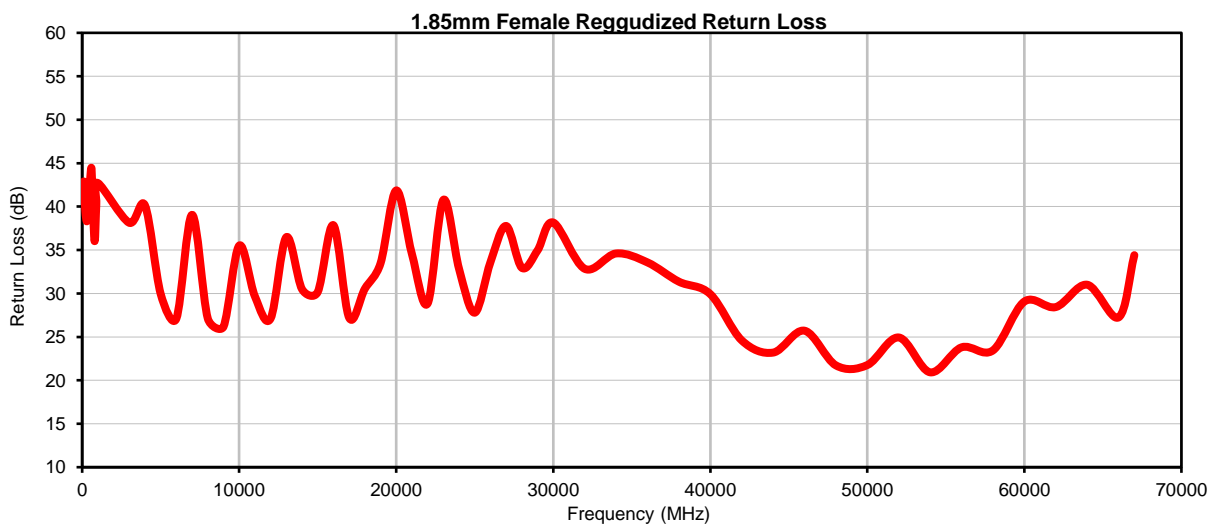
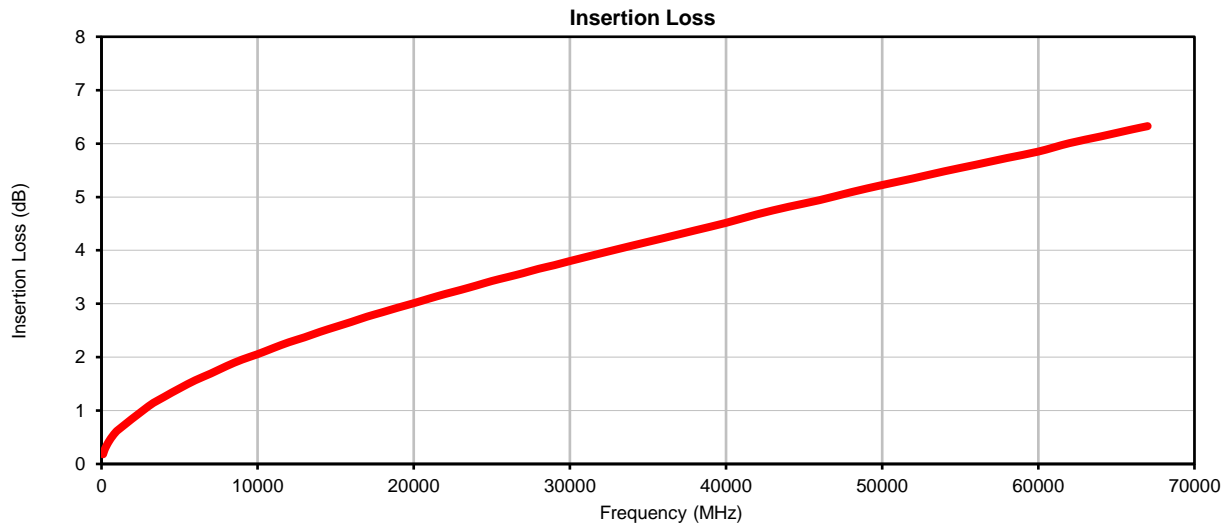
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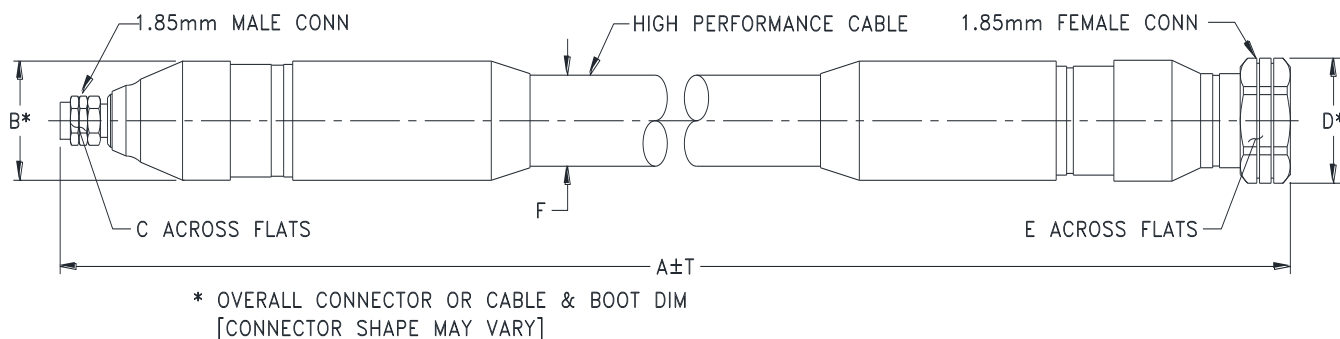
*Typical Performance Data*

FREQUENCY  (MHz)	INSERTION LOSS  (dB)	1.85mm MALE RETURN LOSS  (dB)	1.85mm FEMALE Ruggedized RETURN LOSS  (dB)
100	0.18	42.11	42.90
200	0.27	40.03	39.51
300	0.33	35.95	38.32
400	0.39	38.34	40.29
500	0.43	39.71	42.94
600	0.48	45.73	44.31
700	0.52	40.89	39.21
800	0.56	35.00	36.02
900	0.59	38.66	40.22
1000	0.62	38.76	42.71
3000	1.08	42.34	38.14
4000	1.25	42.85	40.14
5000	1.42	29.37	29.95
6000	1.57	27.09	27.12
7000	1.69	45.24	39.05
8000	1.83	28.53	27.12
9000	1.95	24.68	26.17
10000	2.06	38.61	35.51
11000	2.17	30.55	29.66
12000	2.28	26.73	27.12
13000	2.37	34.10	36.47
14000	2.47	33.18	30.49
15000	2.57	31.86	30.16
16000	2.66	38.50	37.86
17000	2.76	31.83	27.21
18000	2.84	34.31	30.54
19000	2.93	32.09	33.47
20000	3.01	43.68	41.86
21000	3.10	36.79	34.52
22000	3.18	32.37	28.85
23000	3.26	38.48	40.77
24000	3.34	35.01	32.83
25000	3.43	31.22	27.79
26000	3.50	32.86	33.61
27000	3.57	52.43	37.77
28000	3.65	37.08	32.95
29000	3.72	39.22	34.96
30000	3.80	32.39	38.16
32000	3.95	40.73	32.84
34000	4.09	35.68	34.60
36000	4.23	41.53	33.57
38000	4.37	29.73	31.36
40000	4.52	29.60	29.93
42000	4.68	25.76	24.60
44000	4.82	22.27	23.19
46000	4.94	30.98	25.71
48000	5.09	22.01	21.72
50000	5.22	24.86	21.76
52000	5.35	26.89	24.93
54000	5.48	23.32	20.92
56000	5.60	28.46	23.80
58000	5.73	27.26	23.45
60000	5.85	41.83	29.07
62000	6.01	27.26	28.43
64000	6.13	26.37	31.00
66000	6.26	20.69	27.25
67000	6.33	21.85	34.41

Typical Performance Curves



### Outline Dimensions



#### RH2934 SERIES

1.85mm MALE (CONN-1)

1.85mm FEMALE (CONN-2)

CASE STYLE #	A		B	C	D	E	F	T		WEIGHT GRAMS
	FEET	METERS						INCH	MM	
RH2934-2	2.00	.61	.79 (20.0)	.315 (8.00)	.83 (21.00)	.75 (19.00)	.602 (15.3)	+.50/-0	+12.7/-0	414
RH2934-3	3.00	.91						+.72/-0	+18.3/-0	506
RH2934-3.28	3.28	1.00						+.79/-0	+20.0/-0	531

Unless otherwise specified dimensions are in inches (mm).

Tolerances: 2Pl. ± .03; 3Pl. ± .015

#### Note:

1. High Performance rugged Cable.



P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



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RF/IF MICROWAVE COMPONENTS



All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	+18°C to 28°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-40° to 50°C Ambient Environment	Individual Model Data Sheet