



# Ultra-Flexible Test Cable

## ULC-1M-SMNM+

50Ω 1M DC to 18 GHz SMA-Male to N-Male

### THE BIG DEAL

- Ultra-flexible design for easy connections & bend radius
- Extra rugged construction with strain relief for longer life
- Triple shield cable for excellent shielding effectiveness
- Stainless steel N-Type connectors for long mating-cycle life
- 6 month guarantee\*



Generic photo used for illustration purposes only

<b>Model No.</b>	ULC-1M-SMNM+
<b>Case Style</b>	NS1993-3.28
<b>Connectors</b>	SMA-Male to N-Male

### APPLICATIONS

- Test and measurement
- Research & Development labs
- Environmental & temperature test chambers
- Field RF testing

**+RoHS Compliant**  
 The +Suffix identifies RoHS Compliance.  
 See our website for methodologies and qualifications

**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.

### PRODUCT OVERVIEW

Mini-Circuits' ULC-SMNM+ are ultra-flexible cables which provide wideband performance from DC to 18 GHz with low insertion loss and excellent VSWR. The cable is designed for stability of phase and amplitude versus flexure while offering tremendous durability and reliability. Its unique construction of a triple shielded cable with a unique molded boot allows the cable to have the greatest of flexibility and yet handle the demanding lab environments where constant bending and flexing are required. In addition, they feature SMA-Male to N-Male stainless steel connectors. Available from stock in a variety of lengths to support many different requirements.

### KEY FEATURES

Feature	Advantages
Ultra-Flexible 0.75 inch static bend radius 2.0 inch dynamic bend radius	Supports a wide range of test measurements in which tight bends are needed to be made.
Excellent stability of phase and insertion loss versus flexure	ULC-series test cables have been tested in bend radii as tight as 2.0 inches to qualify minimal change in insertion loss, insertion phase, and VSWR, providing reliable performance in a wide range of configurations.
Performance qualified to 20,000 flexures	Like all Mini-Circuits test cables, ULC-series models have been performance qualified up to 20,000 bend cycles, ensuring outstanding durability and extra long life.





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### ELECTRICAL SPECIFICATIONS AT +25°C

Parameter	Frequency (GHz)	Min.	Typ.	Max.	Units
Frequency Range		DC		18	GHz
Length <sup>1</sup>			1		MT
Insertion Loss	DC-2	—			dB
	2-6	—			
	6-12	—			
	12-18	—			
Return Loss	DC-2	17		—	dB
	2-6	17		—	
	6-12	17		—	
	12-18	17		—	

1. Custom sizes available, consult factory.

### PERFORMANCE CHANGE VS. FLEXURE (TYPICAL)<sup>2</sup>

Parameter	Frequency (GHz)	Bend Radius (inches)			Units
		10.0	3.25	2.40	
Insertion Loss <sup>3</sup>	DC - 6	0.00	0.00	0.01	dB
	2 - 6	0.00	0.01	0.01	
	6 - 12	0.01	0.02	0.03	
	12 - 18	0.01	0.02	0.03	
Insertion Phase <sup>3</sup>	DC - 6	0.06	0.05	0.21	Deg
	2 - 6	0.17	0.18	0.69	
	6 - 12	0.36	0.42	1.45	
	12 - 18	0.49	0.73	2.37	
VSWR <sup>3</sup>	DC - 6	0.00	0.00	0.00	:1
	2 - 6	0.00	0.00	0.00	
	6 - 12	0.01	0.01	0.02	
	12 - 18	0.01	0.01	0.02	

2. Performance change versus flexure with a 3 ft cable 360° around a 4" diameter mandrel.

3. Absolute values normalized to the reference position 0. See [AN-46-003](#) under Associated Application Notes

### ABSOLUTE MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	-55°C to +85°C
Storage Temperature	-55°C to +85°C
Power Handling at 25°C, Sea Level	210 W Max at 2 GHz
	120 W Max at 6 GHz
	82 W Max at 12 GHz
	67 W Max at 18 GHz

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





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Mini-Circuits

50Ω 1M DC to 18 GHz SMA-Male to N-Male

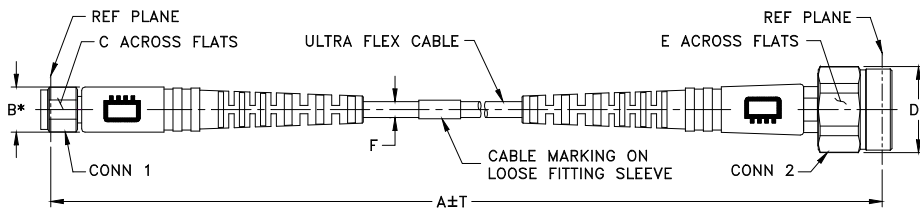
### CABLE CONSTRUCTION



- Inner Conductor: Silver Plated Copper Clad Steel
- Dielectric
- Inner Shield: Silver Plated Copper Flat Braid
- Interlayer Shield: Metalized Polyimide
- Outer Shield: Silver Plated Copper Braid
- Jacket: Polyurethane

Connectors:  
 Passivated stainless steel (Body & Hex Nut)  
 Gold plated beryllium copper center contacts  
 PTFE Dielectric

### OUTLINE DRAWING



\* OVERALL CONNECTOR/BOOT DIMENSION  
 [CONNECTOR/BOOT SHAPE MAY VARY]

### OUTLINE DIMENSIONS (Inch/mm)

A	B	C	D	E	F	T	wt
Feet	Meters	.426	.313	.812	.750	150±.004	grams
3.28	1.00	10.82	7.95	20.62	19.05	3.81±0.10	77





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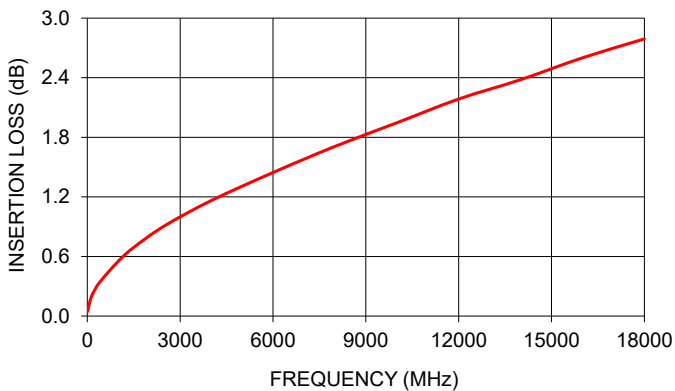
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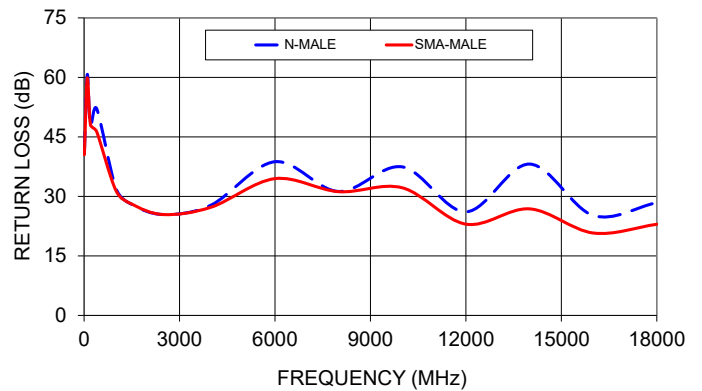
### TYPICAL PERFORMANCE DATA AND CHARTS

Frequency (MHz)	Insertion Loss (dB)	Return Loss (dB)	
		SMA-Male	N-Male
10	0.05	40.88	40.50
100	0.17	60.70	59.79
200	0.24	47.85	48.13
400	0.34	52.05	46.25
1000	0.55	32.08	31.51
1500	0.69	27.98	28.08
2500	0.91	25.44	25.42
4000	1.16	27.85	27.30
6000	1.45	38.75	34.48
8000	1.71	31.25	31.19
10000	1.95	37.44	32.18
12000	2.18	26.12	23.01
14000	2.38	38.15	26.86
16000	2.60	25.21	20.77
18000	2.79	28.43	22.98

ULC-1M-SMNM+ INSERTION LOSS



ULC-1M-SMNM+ RETURN LOSS



#### 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/terms/viewterm.html](http://www.minicircuits.com/terms/viewterm.html)

