HAND FLEX™

Coaxial Cable

141-3SMRSM+

50Ω 3 inch DC to 18 GHz Right Angle SMA-Male to SMA-Male

THE BIG DEAL

- Right-Angle connection capable of DC to 18 GHz
- Low Loss, 0.28 dB at 18 GHz
- Excellent Return Loss, 21 dB typ. at 18 GHz
- Hand formable to almost any custom shape without special bending tools
- 8 mm bend radius for tight installations
- Anti-torque nut prevents cable stress during installation
- Insulated outer jacket standard
- Ideal for interconnect of assembled systems

Generic photo used for illustration purposes only

Model No.	141-3SMRSM+
Case Style	KQ1612-3
Connectors	Right Angle SMA-Male to SMA-Male

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

APPLICATIONS

- Replacement for custom bent 0.141" semi-rigid cables
- Communication receivers and transmitters
- Military and aerospace system
- Environmental and test chambers

PRODUCT OVERVIEW

The 141 SMRSM Series Hand-Flex™ Coaxial Cables are ideal for interconnection of coaxial components or sub-systems equipment. The construction includes a silver-plated copper-clad steel center conductor which maintains the shape after bending. The outer shield is copper braid, tin soaked, which minimizes signal leakage and at the same time flexible for easy bend. Dielectric is low loss PTFE. Connectors have passivated stainless-steel coupling nut over a gold plated connector body and Silver Plated Copper Steel center conductor.

KEY FEATURES

Feature	Advantages
Hand-Formable RF Cables	The 141 Series Hand-Flex™cables are hand formable making them ideal for use integrating coaxial components and sub-assemblies without the need for special cable-bending tools and alleviating the risk of damage during the bending process typical of semi-rigid coaxial cable assemblies.
Tight Bend Radius 8 mm	Capable of only 8 mm bend radius, the 141 Hand Flex™ series is able to make connections in tight spaces making these cables ideal for dense system integration.
18 GHz Right-Angle Connector	Using a custom right-angle connector, the 141 SMRSM Series is able to meet system requirements of 90° connections without bending and sacrificing high frequency performance up to 18 GHz.
Excellent Return Loss	Supporting typical return loss of 26 dB to 6 GHz and 19 dB to 18 GHz, the 141 Series Hand-Flex Cables are ideally suited for interconnecting a wide variety of RF components while minimizing VSWR ripple contribution due to mating cables & connectors.
Good Power Handling Capability: • 546 W at 0.5 GHz • 90 W at 18 GHz	Mini-Circuits' 141 Cable series can support medium to high RF power levels enabling these cables to be used in the transmit path. (power rating is at sea-level altitudes)
Built-in Anti-torque nut	Mini-Circuits' 141 Series Hand Flex™ cables include an anti-torque feature to support the straight SMA connector body during installation alleviating risk of stress to the connector/cable interface
Jacketed and Unjacketed options	Standard 141 Series cables include a blue FEP insulator jacket reducing the risk of accidental shorting of DC power lines or active pins during installation and operation. Unjacketed versions are available upon request.

ELECTRICAL SPECIFICATIONS AT +25°C

Parameter	Condition (GHz)	Min.	Typ.	Max.	Units
Frequency Range		DC		18	GHz
Length[1]			3		inches
Insertion Loss	DC - 2	—	0.09	0.3	dB
	2 - 6	—	0.15	0.6	
	6 - 10	—	0.19	0.7	
	10 - 18	—	0.28	1.0	
Return Loss	DC - 2	20	33	—	dB
	2 - 6	20	25	—	
	6 - 10	16	30	—	
	10 - 18	16	21	—	

1. Custom sizes available, consult factory.

ABSOLUTE MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	-55°C to +105°C
Storage Temperature	-55°C to +105°C
Power Handling at +25°C, Sea Level	546 W at 0.5 GHz 387 W at 1 GHz 273 W at 2 GHz 156 W at 6 GHz 121 W at 10 GHz 90 W at 18 GHz

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

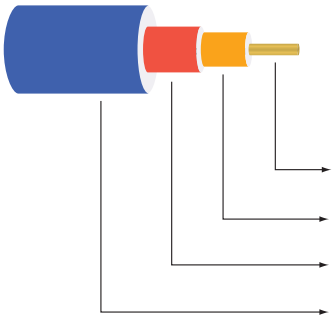
HAND FLEX™

Coaxial Cable

141-3SMRSM+

50Ω 3 inch DC to 18 GHz Right Angle SMA-Male to SMA-Male

CABLE CONSTRUCTION



Center Conductor: Silver Plated Copper Clad Steel

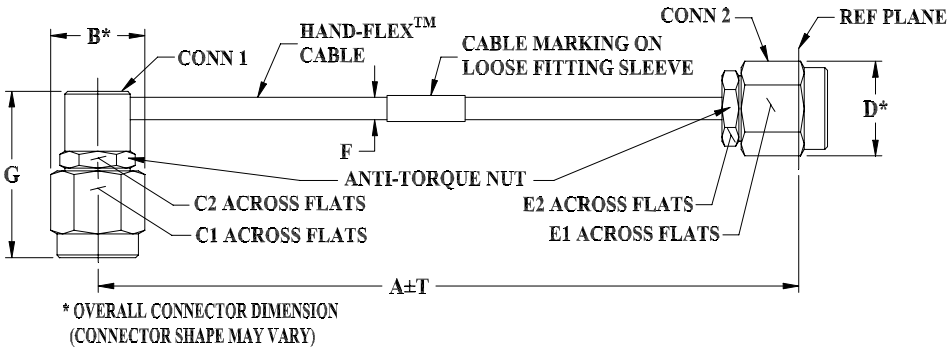
Dielectric: Solid PTFE

Outer Shield: Copper Braid, Tin Soaked

Jacket: FEP, Blue (Unjacketed cable also available upon request)

Connectors:
Coupling Nut: Stainless Steel Passivated
Body: Stainless Steel Gold Plated
Center Pin: Silver Plated Copper Clad Steel

OUTLINE DRAWING



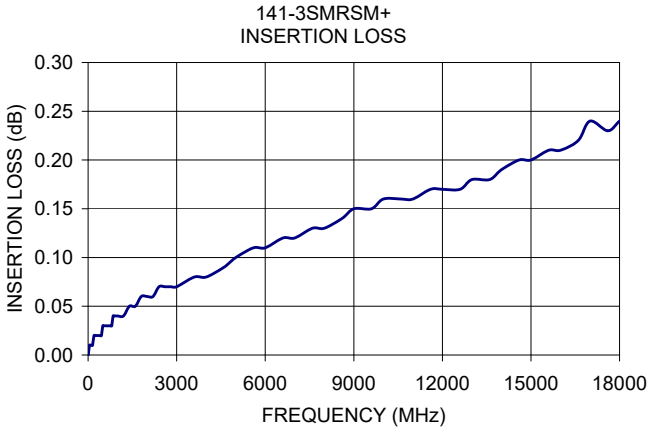
OUTLINE DIMENSIONS (Inch / mm)

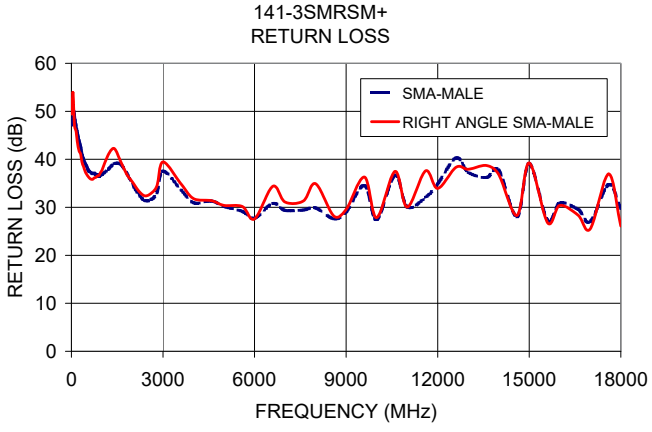
A	B	C1	C2	D	E1
3.0	.36	.313	.250	.36	.313
76.20	9.14	7.95	6.35	9.14	7.95

E2	F		G	T	wt
.250	.141±.003	.163±.004	.728±.02	.05	grams
6.35	(3.58±0.07)	(4.14±0.10)	18.50±0.5	1.27	8.83

TYPICAL PERFORMANCE DATA AND CHARTS

Frequency (MHz)	Insertion Loss (dB)	Return Loss (dB)	
		SMA-Male	Right Angle SMA-Male
10.0	0.00	47.1	49.4
1000.0	0.04	36.8	37.7
1800.0	0.06	37.3	37.0
2400.0	0.07	31.4	32.4
4000.0	0.08	31.0	31.8
5000.0	0.10	30.2	30.4
6000.0	0.11	27.7	27.6
7000.0	0.12	29.4	31.1
8000.0	0.13	29.9	34.9
9000.0	0.15	29.0	29.6
10000.0	0.16	27.4	27.8
12000.0	0.17	34.9	33.9
14000.0	0.19	37.8	36.8
16000.0	0.21	30.9	30.4
18000.0	0.24	29.7	26.1



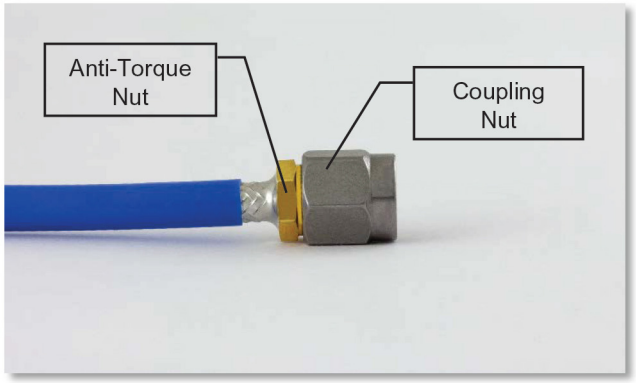


PROPER CABLE CONNECTION USING ANTI-TORQUE NUT

Mini-Circuits 141-series HandFlex™ interconnect cables are constructed with an anti-torque nut adjacent to the connector coupling nut. When used properly, this feature prevents possible damage to the cable due to torqueing and twisting when tightening the cable connector.

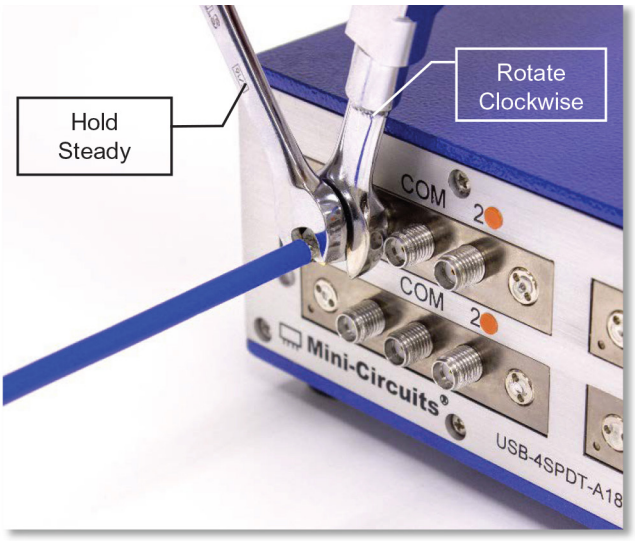
TO PROPERLY TIGHTEN THE CABLE CONNECTOR:

1) The cable connector includes a coupling nut which rotates to fasten the connector, and an anti-torque nut, which is fixed to prevent the cable from twisting during connection.



2) To properly tighten the cable, use a standard 1/4-inch open end wrench to brace the anti-torque nut.

3) Using a 5/16-inch open end wrench, rotate the coupling nut clockwise to tighten the cable connector.



*NOTE: Mini-Circuits recommends using a 5/16-inch open end wrench calibrated to 8 inch-pounds maximum torque to prevent damage due to over-torqueing the connector.

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

Hand-Flex Coaxial Cable

141-3SMRSM+

SMA-Male to Right Angle SMA-Male

Typical Performance Data

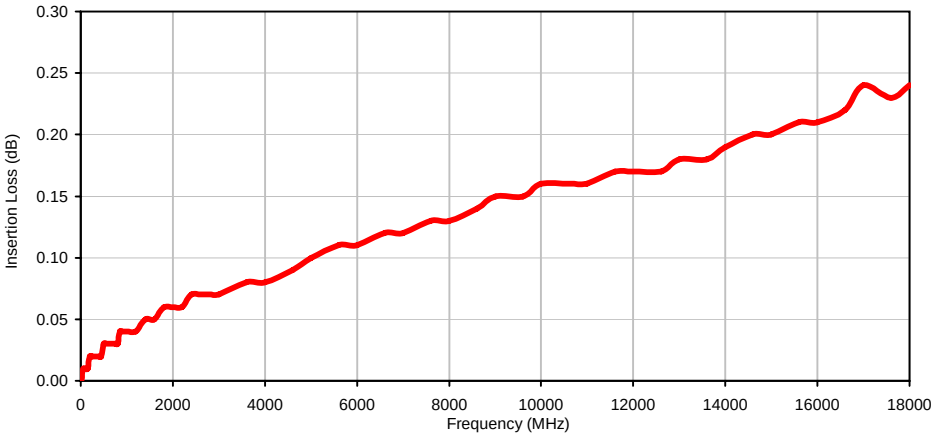
FREQUENCY (MHz)	INSERTION LOSS (dB)	SMA-MALE RETURN LOSS (dB)	RIGHT ANGLE SMA-MALE RETURN LOSS (dB)
10.0	0.00	47.1	49.4
50.0	0.01	51.1	53.9
100.0	0.01	49.1	47.1
150.0	0.01	47.2	45.9
200.0	0.02	45.4	43.4
250.0	0.02	43.9	41.8
300.0	0.02	42.7	41.1
350.0	0.02	40.9	39.3
400.0	0.02	40.0	38.5
450.0	0.02	39.1	37.5
500.0	0.03	38.5	36.9
550.0	0.03	37.7	36.4
600.0	0.03	37.4	36.1
650.0	0.03	37.2	35.8
700.0	0.03	37.0	35.9
750.0	0.03	37.1	36.2
800.0	0.03	36.8	36.2
850.0	0.04	36.8	36.5
900.0	0.04	36.5	36.6
950.0	0.04	36.7	37.2
1000.0	0.04	36.8	37.7
1200.0	0.04	37.9	40.9
1400.0	0.05	39.1	42.3
1600.0	0.05	39.0	39.8
1800.0	0.06	37.3	37.0
2000.0	0.06	34.7	35.3
2200.0	0.06	32.7	33.4
2400.0	0.07	31.4	32.4
2600.0	0.07	31.6	32.9
2800.0	0.07	33.0	34.5
3000.0	0.07	37.5	39.5
3600.0	0.08	33.6	34.8
4000.0	0.08	31.0	31.8
4600.0	0.09	31.3	31.4
5000.0	0.10	30.2	30.4
5600.0	0.11	29.2	30.2
6000.0	0.11	27.7	27.6
6600.0	0.12	30.8	34.4
7000.0	0.12	29.4	31.1
7600.0	0.13	29.4	31.3
8000.0	0.13	29.9	34.9
8600.0	0.14	27.6	28.2
9000.0	0.15	29.0	29.6
9600.0	0.15	34.5	36.3
10000.0	0.16	27.4	27.8
10600.0	0.16	36.7	37.5
11000.0	0.16	30.1	30.1
11600.0	0.17	32.1	37.6
12000.0	0.17	34.9	33.9
12600.0	0.17	40.3	38.4
13000.0	0.18	37.3	37.9
13600.0	0.18	36.2	38.7
14000.0	0.19	37.8	36.8
14600.0	0.20	28.0	28.3
15000.0	0.20	39.1	39.3
15600.0	0.21	27.3	26.8
16000.0	0.21	30.9	30.4
16600.0	0.22	29.6	28.4
17000.0	0.24	27.0	25.5
17600.0	0.23	34.7	37.0
18000.0	0.24	29.7	26.1

Hand-Flex Coaxial Cable 141-3SMRSM+

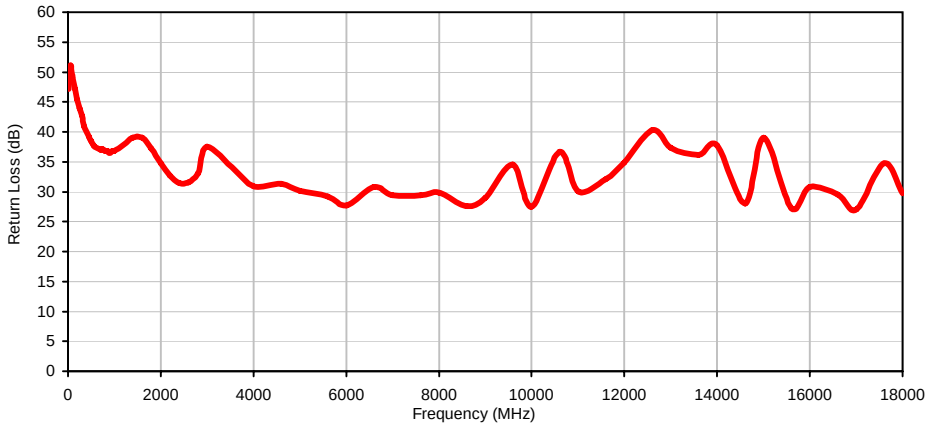
SMA-Male to Right Angle SMA-Male

Typical Performance Curves

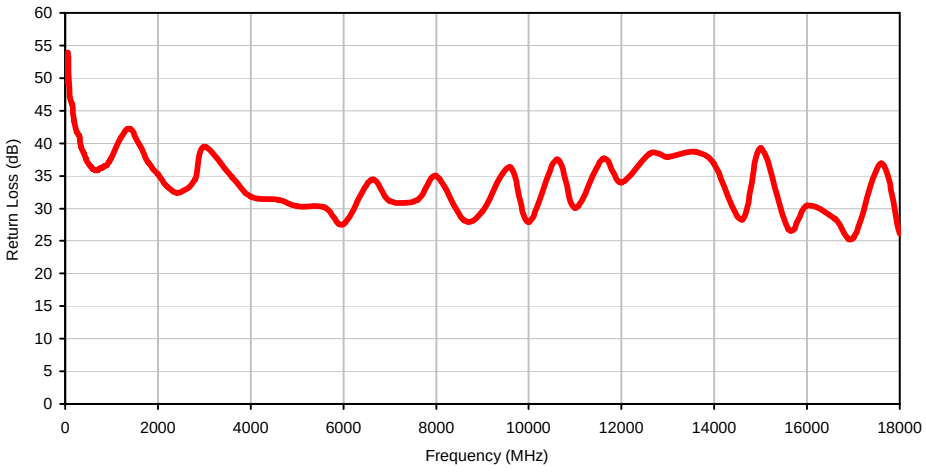
Insertion Loss



SMA-Male Return Loss



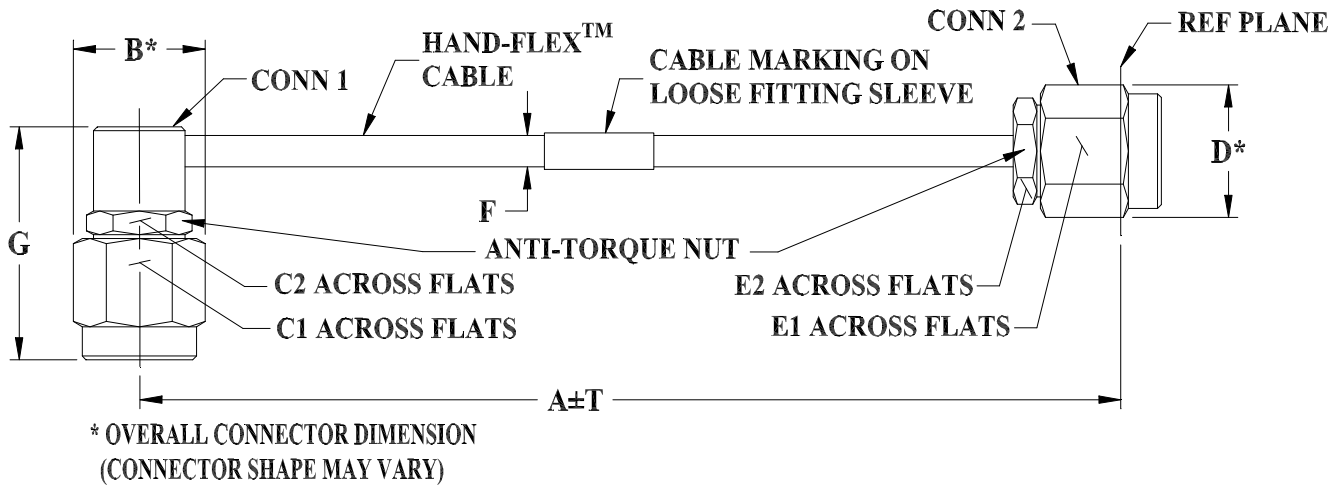
Right Angle SMA-Male Return Loss



Case Style KQ

KQ1612

Outline Dimensions



KQ1612 SERIES
RIGHT ANGLE SMA MALE (CONN-1)
SMA MALE (CONN-2)

CASE STYLE #	A		B	C1	C2	D	E1	E2	F		G	H	T		WEIGHT GRAMS +/- 2gms
	INCH	MM							141U-ASMRSM+	141-ASMRSM+			INCH	MM	
KQ1612-3	3.00	76.20											.05	1.27	10.13
KQ1612-4	4.00	101.60											.05	1.27	11.27
KQ1612-5	5.00	127.00											.05	1.27	12.42
KQ1612-.5.5	5.50	139.70											.05	1.27	12.99
KQ1612-6	6.00	152.40											.05	1.27	13.56
KQ1612-7	7.00	177.80											.10	2.54	14.70
KQ1612-8	8.00	203.20	.36 (9.14)	.313 (7.95)	.250 (6.35)	.36 (9.14)	.313 (7.95)	.250 (6.35)	.141±.003 (3.58±0.07)	.163±.004 (4.14±0.10)	.728±.020 (18.50±0.50)	-- --	.10	2.54	15.84
KQ1612-9	9.00	228.60											.10	2.54	16.99
KQ1612-10	10.00	254.00											.10	2.54	18.13
KQ1612-11	11.00	279.40											.10	2.54	19.27
KQ1612-12	12.00	304.80											.10	2.54	20.42
KQ1612-13	13.00	330.20											.15	3.81	21.56
KQ1612-14	14.00	355.60											.15	3.81	22.70

Unless otherwise specified dimensions are in inches (mm).
Tolerances: 2Pl. ± .03; 3Pl. ± .015

Note:

1. 141 Hand-Flex™ Coaxial Cable.
2. "A" represents length of cable.

Mini-Circuits®
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KQ1612

Outline Dimensions

KQ1612 SERIES
RIGHT ANGLE SMA MALE (CONN-1)
SMA MALE (CONN-2)

CASE STYLE #	A		B	C1	C2	D	E1	E2	F		G	H	T		WEIGHT GRAMS +/- 2gms
	INCH	MM							141U-ASMRSM+	141-ASMRSM+			INCH	MM	
KQ1612-15	15.00	381.00	.36 (9.14)	.313 (7.95)	.250 (6.35)	.36 (9.14)	.313 (7.95)	.250 (6.35)	.141∀.003 (3.58∀0.07)	.163∀.004 (4.14∀0.10)	.728∀.020 (18.50∀0.50)	-- --	.15	3.81	23.85
KQ1612-16	16.00	406.40											.15	3.81	24.99
KQ1612-17	17.00	431.80											.15	3.81	26.13
KQ1612-18	18.00	457.20											.15	3.81	27.27
KQ1612-20	20.00	508.00											.15	3.81	29.56
KQ1612-24	24.00	609.60											.15	3.81	34.13
KQ1612-32	32.00	812.80											.20	5.08	43.28
KQ1612-36	36.00	914.40											.20	5.08	47.85

Unless otherwise specified dimensions are in inches (mm).
Tolerances: 2Pl. ± .03; 3Pl. ± .015

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Mini-Circuits

Environmental Specifications **ENV52**

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	-55° to 105° C or -55° to 85° C (see datasheet) Ambient Environment	Individual Model Data sheet
Storage Temperature	-55° to 105° C or -55° to 85° C (see data sheet) Ambient Environment	Individual Model Data Sheet
Thermal Shock	-55° to 100°C, 100 Cycles	MIL-STD-202F; Method 107G
Multiple Bend Radius	40 mm, 5 times for 141 series cables 30 mm, 5 times for 086 series cables	
Single Bend Radius	8 mm for 141 series cables 6 mm for 086 series cables	

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