



Mini-Circuits

HAND  
FLEX™

# Coaxial Cable

047-6SMPR+

50Ω 6 inch DC to 18 GHz Right Angle SMP-Female

## THE BIG DEAL

- Wideband frequency coverage, DC to 18 GHz
- Low Loss, 0.77 dB at 18 GHz
- Excellent Return Loss, 26 dB at 18 GHz
- Hand formable to almost any custom shape without special bending tools
- 3.2mm bend radius for tight installations
- Connector interface, meets MIL-STD-348
- Ideal for interconnect of assembled systems



Generic photo used for illustration purposes only

|            |                        |
|------------|------------------------|
| Model No.  | 047-6SMPR+             |
| Case Style | BZ2421H6               |
| Connectors | Right Angle SMP-Female |

## +RoHS Compliant

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

## APPLICATIONS

- Replacement for custom bent 0.047" semi-rigid cables
- Communication receivers and transmitters
- Military and aerospace system
- Environmental and test chambers

## PRODUCT OVERVIEW

The 047 Series Hand-Flex™ Coaxial Cables are ideal for interconnection of coaxial components or sub-systems in tight spaces. The outer shield is tin plated copper braid and tin soaked, which minimizes signal leakage and at the same time flexible for easy bend. Right-angle SMP-F blind mate push-on / snap-on connectors make these cables ideal for connections between adjacent modules in crowded system layouts. The 047 Series Hand-Flex™ Cables features gold plated beryllium copper construction. The 047 Series Cables are available in variety of length to meet your requirements.

## KEY FEATURES

| Feature                                                                                                                       | Advantages                                                                                                                                                                                                                                                                                    |
|-------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hand-Formable RF Cables                                                                                                       | The 047 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, 3.2mm                                                                                                      | Capable of only 3.2mm bend radius, the 047 Hand-Flex™ series is able to make connections in tight spaces making these cables ideal for dense system integration.                                                                                                                              |
| Right-angle SMP-F blind mate push-on / snap-on connectors                                                                     | Ideal for interconnect of adjacent modules with tight space constraints without sacrificing high- frequency performance due to severe bend near the connector interface.                                                                                                                      |
| Excellent Return Loss, <ul style="list-style-type: none"><li>• 30 dB at 6 GHz</li><li>• 26 dB at 18 GHz</li></ul>             | The 047 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: <ul style="list-style-type: none"><li>• 22.5 W at 0.5 GHz</li><li>• 4.5 W at 18 GHz</li></ul> | Mini-Circuits' 047 Cable series can support medium to high RF power levels enabling these cables to be used in the transmit path.                                                                                                                                                             |





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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> |                 | 6    |      |      | inches |
| Insertion Loss      | DC - 2          | —    | 0.21 | 0.52 | dB     |
|                     | 2 - 6           | —    | 0.37 | 0.97 |        |
|                     | 6 - 10          | —    | 0.55 | 1.22 |        |
|                     | 10 - 18         | —    | 0.75 | 1.66 |        |
| Return Loss         | DC - 2          | 20   | 30   | —    | dB     |
|                     | 2 - 6           | 20   | 33   | —    |        |
|                     | 6 - 10          | 17   | 31   | —    |        |
|                     | 10 - 18         | 17   | 25   | —    |        |

1. Custom sizes available, consult factory.

## ABSOLUTE MAXIMUM RATINGS

| Parameter                          | Ratings                                                                                                  |
|------------------------------------|----------------------------------------------------------------------------------------------------------|
| Operating Temperature              | -45°C to 85°C                                                                                            |
| Storage Temperature                | -45°C to 85°C                                                                                            |
| Power Handling at +25°C, Sea Level | 22.5W at 0.5 GHz<br>15.5W at 1 GHz<br>11W at 2 GHz<br>5.5W at 6 GHz<br>4.6W at 10 GHz<br>4.5 W at 18 GHz |

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





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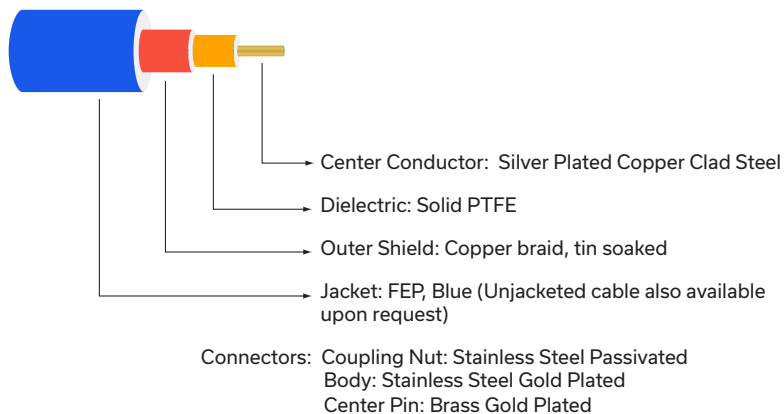
**HAND  
FLEX™**

# Coaxial Cable

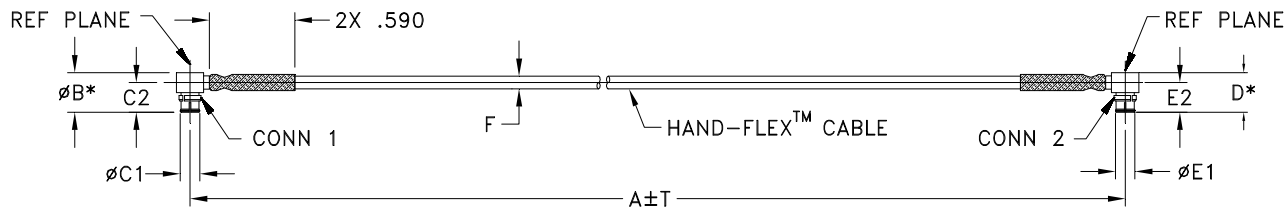
**047-6SMPR+**

50Ω 6 inch DC to 18 GHz Right Angle SMP-Female

## CABLE CONSTRUCTION



## OUTLINE DRAWING



\* OVERALL CONNECTOR DIMENSION [CONNECTOR SHAPE MAY VARY]

## OUTLINE DIMENSIONS (Inch mm)

| A      | B    | C1   | C2    | D    | E1   |
|--------|------|------|-------|------|------|
| 6.0    | .14  | .135 | .287  | .14  | .135 |
| 152.40 | 3.56 | 3.43 | 7.29  | 3.56 | 3.43 |
| E2     | F    | T    | wt    |      |      |
| .289   | .069 | 0.05 | grams |      |      |
| 7.34   | 1.75 | 1.27 | 2.20  |      |      |





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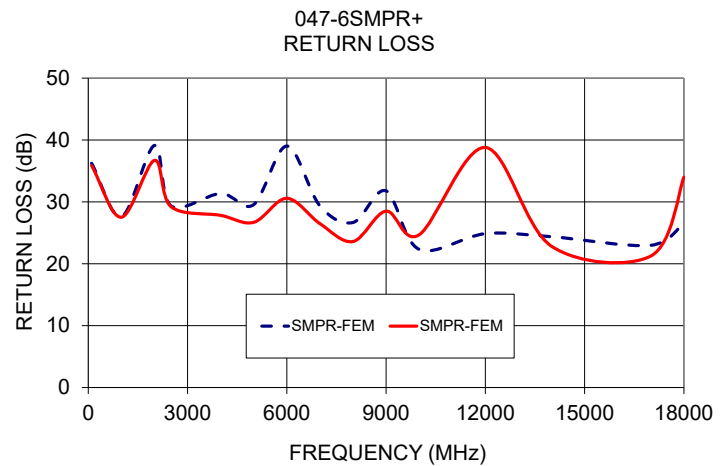
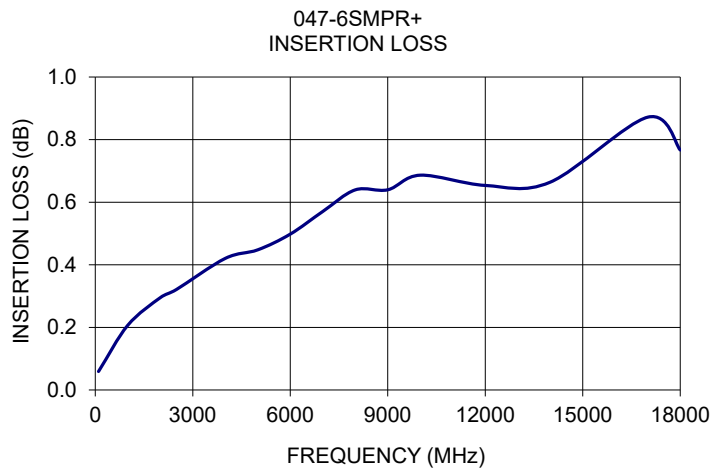
# Coaxial Cable

047-6SMPR+

50Ω 6 inch DC to 18 GHz Right Angle SMP-Female

## TYPICAL PERFORMANCE DATA AND CHARTS

| Frequency<br>(MHz) | Insertion Loss<br>(dB) | Return Loss<br>(dB)    |                        |
|--------------------|------------------------|------------------------|------------------------|
|                    |                        | Right Angle SMP-Female | Right Angle SMP-Female |
| 100                | 0.06                   | 36.2                   | 35.9                   |
| 1000               | 0.21                   | 27.6                   | 27.5                   |
| 2000               | 0.29                   | 39.1                   | 36.7                   |
| 2500               | 0.32                   | 29.4                   | 29.2                   |
| 4000               | 0.42                   | 31.3                   | 27.8                   |
| 5000               | 0.45                   | 29.6                   | 26.7                   |
| 6000               | 0.50                   | 39.0                   | 30.6                   |
| 7000               | 0.57                   | 29.4                   | 26.5                   |
| 8000               | 0.64                   | 26.7                   | 23.6                   |
| 9000               | 0.64                   | 31.8                   | 28.5                   |
| 10000              | 0.69                   | 22.3                   | 24.7                   |
| 12000              | 0.65                   | 24.9                   | 38.8                   |
| 14000              | 0.66                   | 24.4                   | 22.8                   |
| 17000              | 0.87                   | 23.0                   | 21.3                   |
| 18000              | 0.77                   | 26.7                   | 34.0                   |



### NOTES

- 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.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- 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)



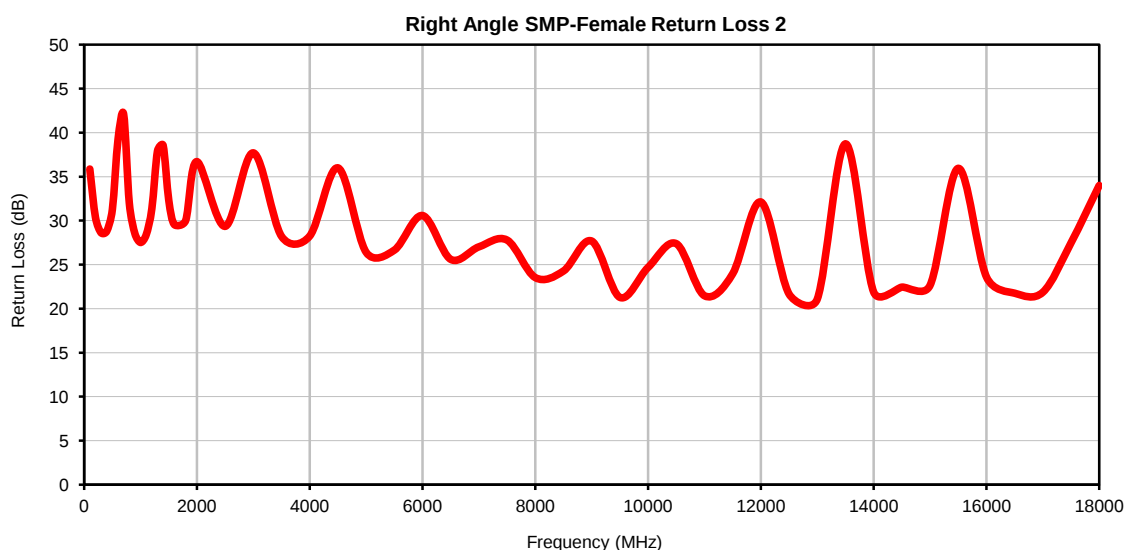
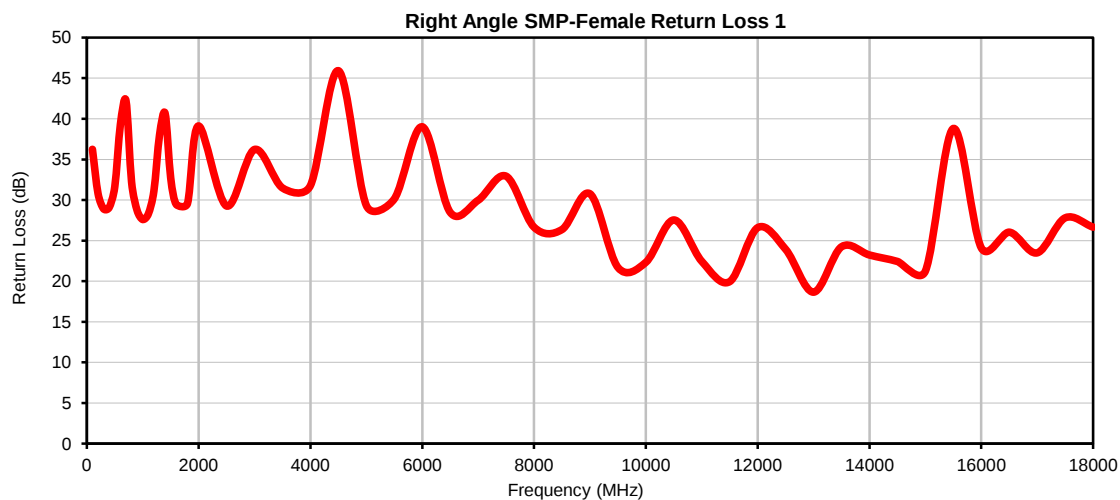
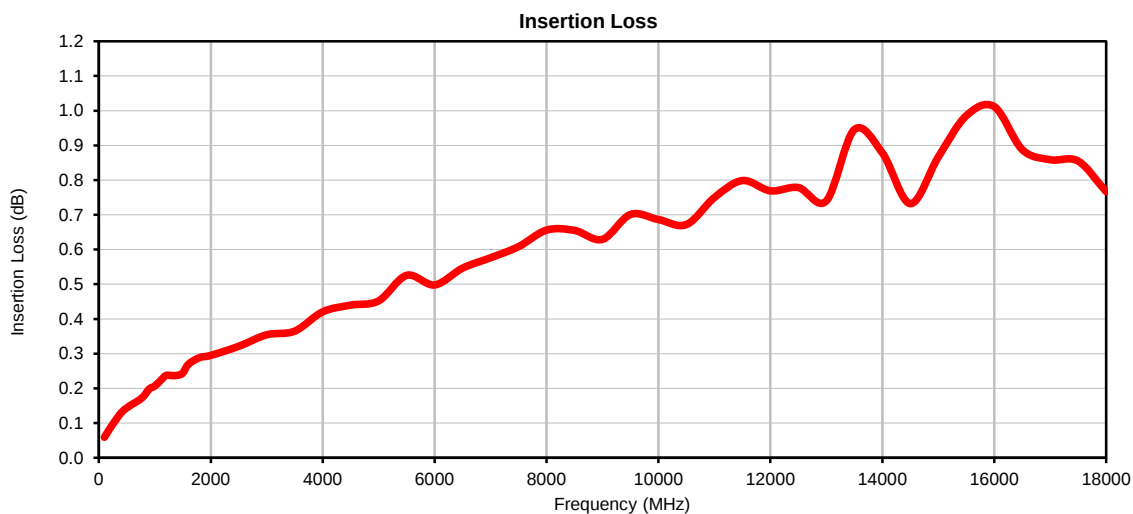
## Typical Performance Data

| FREQUENCY<br>(MHz) | INSERTION<br>LOSS<br>(dB) | RIGHT ANGLE<br>SMP-FEMALE 1<br>RETURN LOSS<br>(dB) | RIGHT ANGLE<br>SMP-FEMALE 2<br>RETURN LOSS<br>(dB) |
|--------------------|---------------------------|----------------------------------------------------|----------------------------------------------------|
| 100                | 0.06                      | 36.2                                               | 35.9                                               |
| 200                | 0.08                      | 30.8                                               | 30.4                                               |
| 300                | 0.11                      | 28.9                                               | 28.6                                               |
| 400                | 0.13                      | 29.1                                               | 28.8                                               |
| 500                | 0.14                      | 31.6                                               | 31.3                                               |
| 600                | 0.15                      | 39.3                                               | 39.2                                               |
| 700                | 0.16                      | 42.2                                               | 42.1                                               |
| 800                | 0.18                      | 32.2                                               | 32.0                                               |
| 900                | 0.20                      | 28.7                                               | 28.5                                               |
| 1000               | 0.21                      | 27.6                                               | 27.5                                               |
| 1100               | 0.22                      | 28.3                                               | 28.4                                               |
| 1200               | 0.24                      | 31.1                                               | 31.4                                               |
| 1300               | 0.24                      | 38.0                                               | 37.9                                               |
| 1400               | 0.24                      | 40.7                                               | 38.6                                               |
| 1500               | 0.24                      | 32.7                                               | 32.3                                               |
| 1600               | 0.27                      | 29.4                                               | 29.5                                               |
| 1800               | 0.29                      | 29.6                                               | 30.0                                               |
| 2000               | 0.29                      | 39.1                                               | 36.7                                               |
| 2500               | 0.32                      | 29.3                                               | 29.4                                               |
| 3000               | 0.35                      | 36.2                                               | 37.7                                               |
| 3500               | 0.36                      | 31.5                                               | 28.2                                               |
| 4000               | 0.42                      | 31.8                                               | 28.3                                               |
| 4500               | 0.44                      | 45.9                                               | 36.0                                               |
| 5000               | 0.45                      | 29.3                                               | 26.4                                               |
| 5500               | 0.53                      | 30.1                                               | 26.7                                               |
| 6000               | 0.50                      | 39.0                                               | 30.6                                               |
| 6500               | 0.55                      | 28.5                                               | 25.6                                               |
| 7000               | 0.58                      | 30.0                                               | 27.0                                               |
| 7500               | 0.61                      | 32.9                                               | 27.8                                               |
| 8000               | 0.66                      | 26.7                                               | 23.5                                               |
| 8500               | 0.66                      | 26.4                                               | 24.3                                               |
| 9000               | 0.63                      | 30.8                                               | 27.7                                               |
| 9500               | 0.70                      | 21.7                                               | 21.3                                               |
| 10000              | 0.69                      | 22.3                                               | 24.7                                               |
| 10500              | 0.67                      | 27.5                                               | 27.4                                               |
| 11000              | 0.75                      | 22.4                                               | 21.5                                               |
| 11500              | 0.80                      | 19.9                                               | 24.0                                               |
| 12000              | 0.77                      | 26.6                                               | 32.1                                               |
| 12500              | 0.78                      | 23.9                                               | 21.7                                               |
| 13000              | 0.74                      | 18.7                                               | 21.1                                               |
| 13500              | 0.95                      | 24.2                                               | 38.7                                               |
| 14000              | 0.88                      | 23.2                                               | 21.9                                               |
| 14500              | 0.73                      | 22.4                                               | 22.4                                               |
| 15000              | 0.87                      | 21.2                                               | 22.6                                               |
| 15500              | 0.99                      | 38.8                                               | 35.9                                               |
| 16000              | 1.01                      | 24.1                                               | 23.6                                               |
| 16500              | 0.89                      | 26.0                                               | 21.8                                               |
| 17000              | 0.86                      | 23.5                                               | 21.9                                               |
| 17500              | 0.85                      | 27.8                                               | 27.5                                               |
| 18000              | 0.77                      | 26.7                                               | 34.0                                               |

# Hand-Flex Coaxial Cable

047-6SMPR+

Right Angle SMP-Female to Right Angle SMP-Female



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

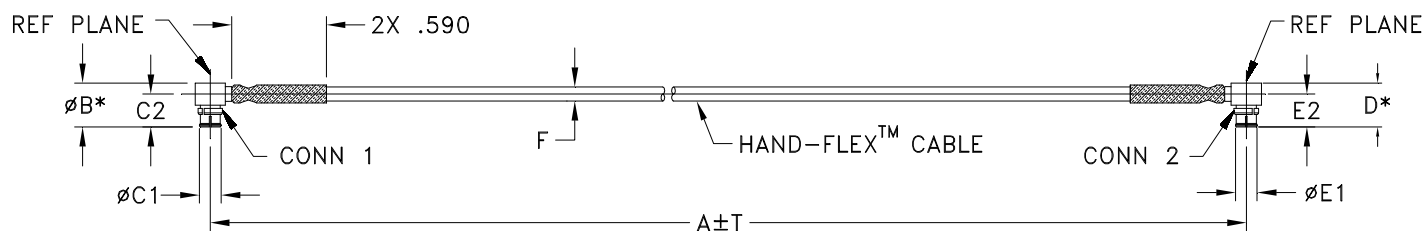


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IF/RF MICROWAVE COMPONENTS

REV. OR  
047-6SMPR+  
3/20/2018  
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### Outline Dimensions



\* OVERALL CONNECTOR DIMENSION [CONNECTOR SHAPE MAY VARY]

BZ2421H SERIES  
SMPR FEMALE (CONN-1)  
SMPR FEMALE (CONN-2)

| CASE<br>STYLE # | A     |        | B             | C1             | C2             | D             | E1             | E2             | F                      |                        | G  | H  | T    |      | WEIGHT<br>GRAMS |
|-----------------|-------|--------|---------------|----------------|----------------|---------------|----------------|----------------|------------------------|------------------------|----|----|------|------|-----------------|
|                 | INCH  | MM     |               |                |                |               |                |                | 047U-ASMPR+            | 047-ASMPR+             |    |    | INCH | MM   |                 |
| BZ2421H3        | 3.00  | 76.20  | .14<br>(3.50) | .135<br>(3.43) | .287<br>(7.35) | .14<br>(3.50) | .135<br>(3.43) | .289<br>(7.35) | .048 MAX<br>(1.22 MAX) | .069 MAX<br>(1.75 MAX) | -- | -- | .05  | 1.27 | 1.4             |
| BZ2421H6        | 6.00  | 152.40 |               |                |                |               |                |                |                        |                        | -- | -- | .05  | 1.27 | 2.2             |
| BZ2421H12       | 12.00 | 304.80 |               |                |                |               |                |                |                        |                        | -- | -- | .10  | 2.54 | 4.0             |
|                 |       |        |               |                |                |               |                |                |                        |                        |    |    |      |      |                 |
|                 |       |        |               |                |                |               |                |                |                        |                        |    |    |      |      |                 |
|                 |       |        |               |                |                |               |                |                |                        |                        |    |    |      |      |                 |

Unless otherwise specified dimensions are in inches (mm).

Tolerances: 2Pl. ± .03; 3Pl. ± .015

#### Note:

- 047 Hand-Flex™ Coaxial Cable.
- "A" represents length of cable.



INTERNET <http://www.minicircuits.com>

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Mini-Circuits ISO 9001 & ISO 14001 Certified



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 | -45° to 85°C<br>Ambient Environment | Individual Model Data Sheet |
| Storage Temperature   | -45° to 85°C<br>Ambient Environment | Individual Model Data Sheet |
| Thermal Shock         | -45° to 125°C, 3 Cycles             | MIL-STD-202F; Method 107G   |
| Single Bend Radius    | 3.2 mm for 047 series cables        |                             |