HAND FLEX™

# Coaxial Cable

## 086-10SBSM+

50Ω 10 inch DC to 18 GHz SMA-Male to SMA-Female Bulkhead

### THE BIG DEAL

- Wideband frequency coverage, DC to 18 GHz
- Low Loss, 1.0 dB at 18 GHz
- Excellent Return Loss, 25 dB at 18 GHz
- SMA-F bulkhead connector at one end
- Hand formable to almost any custom shape without special bending tools
- 6 mm bend radius for tight installations
- Anti-torque nut prevents cable stress during installation
- Insulated outer jacket standard[1]
- Connector interface, meets MIL-STD-348
- Ideal for interconnect of assembled systems

*Generic photo used for illustration purposes only*

| | |
|---|---|
| **Model No.** | 086-10SBSM+ |
| **Case Style** | KP1567-10 |
| **Connectors** | SMA-Male to SMA-Female Bulkhead |

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

### APPLICATIONS

- Bulkhead connector mounts on front panel of equipment racks
- Replacement for custom bent 0.086" semi-rigid cables
- Communication receivers and transmitters
- Military and aerospace system
- Environmental and test chambers

### PRODUCT OVERVIEW

The 086 SBSM Series Hand-Flex™ Coaxial Cables are ideal for interconnection of coaxial components or sub-systems to equipment racks. 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. SMA-M connector has gold plated, brass center conductor and SMA-F has gold plated BeCuB center conductor.

### KEY FEATURES

| Feature | Advantages |
|---|---|
| Hand-Formable RF Cables | The 086 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. |
| SMA-F bulkhead connector at one end | Mounts directly on equipment racks eliminating need for bulkhead adapter, thereby improving reliability. |
| Tight Bend Radius | Capable of only 6 mm bend radius, the 086 Hand-Flex™ series is able to make connections in tight spaces making these cables ideal for dense system integration. |
| Excellent Return Loss | Supporting typical return loss of 26 dB to 6 GHz and 19 dB to 18 GHz, the 086 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:<br>• 211W at 0.5 GHz<br>• 35W at 18 GHz | Mini-Circuits 086 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 086 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. |

REV. C
ECO-017388
086-10SBSM+
MCL NY
240318

## ELECTRICAL SPECIFICATIONS AT +25°C

| Parameter | Frequency (GHz) | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|
| Frequency Range | | DC | | 18 | GHz |
| Length[2] | | | 10 | | inches |
| Insertion Loss | DC - 2 | — | 0.2 | 0.41 | dB |
| | 2 - 6 | — | 0.36 | 0.74 | |
| | 6 - 10 | — | 0.58 | 1.0 | |
| | 10 - 18 | — | 0.78 | 1.36 | |
| Return Loss | DC - 2 | 23 | 37 | — | dB |
| | 2 - 6 | 23 | 31 | — | |
| | 6 - 10 | 17 | 30 | — | |
| | 10 - 18 | 16 | 27 | — | |

1. Unjacketed cable also available upon request.
2. 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 | 211W at 0.5 GHz<br>150W at 1 GHz<br>104W at 2 GHz<br>59W at 6 GHz<br>45W at 10 GHz<br>35W at 18 GHz |

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

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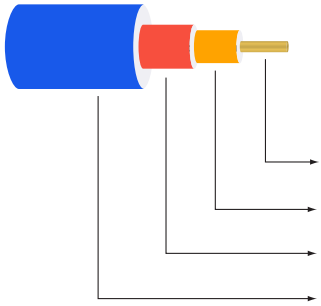
# Coaxial Cable

## 086-10SBSM+

50Ω 10 inch DC to 18 GHz SMA-Male to SMA-Female Bulkhead

### CABLE CONSTRUCTION



Center Conductor: Silver Plated Copper Clad Steel

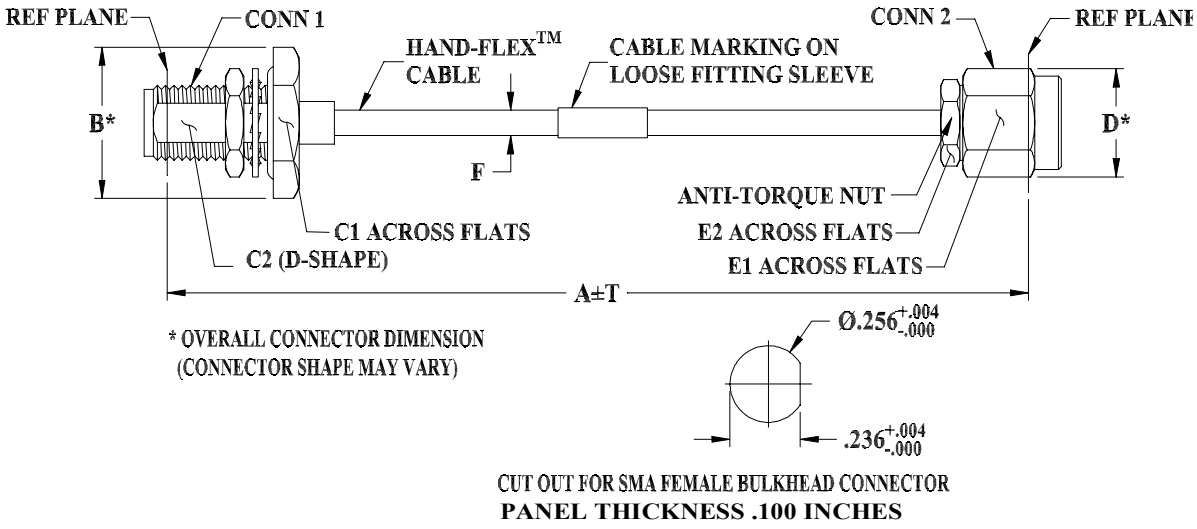
Dielectric: Solid PTFE

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: Brass, Gold Plated (SMA-M)
and BeCuB Gold Plated (SMA-F)

### OUTLINE DRAWING




### OUTLINE DIMENSIONS (Inch / mm)

| A | B | C1 | C2 | D | E1 | E2 | F | T | wt |
|---|---|---|---|---|---|---|---|---|---|
| 10.0 | .51 | .438 | .232 | .36 | .313 | .250 | .108 | 0.1 | grams |
| 254.00 | 12.95 | 11.13 | 5.89 | 9.14 | 7.95 | 6.35 | 2.75 | 2.54 | 10.57 |

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# Coaxial Cable

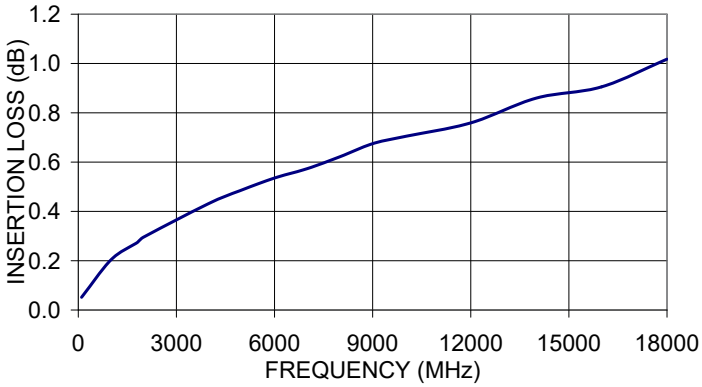
## 086-10SBSM+

50Ω 10 inch DC to 18 GHz SMA-Male to SMA-Female Bulkhead

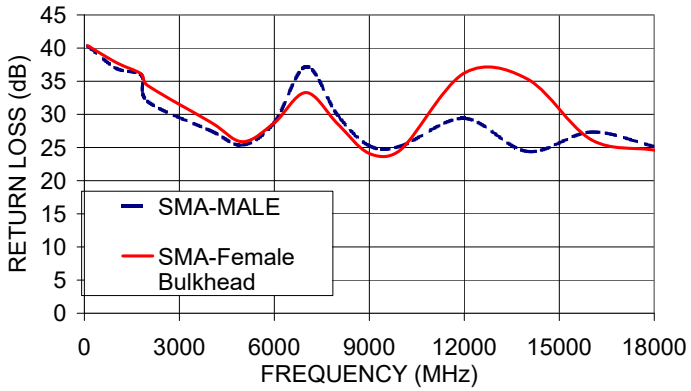
### TYPICAL PERFORMANCE DATA AND CHARTS

| Frequency (MHz) | Insertion Loss (dB) | Return Loss (dB) | |
|---|---|---|---|
| | | SMA-Male | SMA-Female Bulkhead |
| 100 | 0.05 | 40.3 | 40.4 |
| 1008 | 0.20 | 36.9 | 37.8 |
| 1800 | 0.27 | 35.9 | 36.1 |
| 2000 | 0.30 | 31.9 | 34.3 |
| 4001 | 0.43 | 27.5 | 28.8 |
| 5000 | 0.49 | 25.4 | 25.9 |
| 6000 | 0.54 | 28.8 | 28.7 |
| 7001 | 0.57 | 37.2 | 33.3 |
| 8001 | 0.62 | 29.9 | 28.6 |
| 9000 | 0.67 | 25.3 | 24.1 |
| 10000 | 0.70 | 25.2 | 24.7 |
| 12001 | 0.76 | 29.4 | 36.2 |
| 14001 | 0.86 | 24.4 | 35.3 |
| 16000 | 0.91 | 27.3 | 26.2 |
| 18000 | 1.02 | 25.2 | 24.6 |

086-10SBSM+
INSERTION LOSS




086-10SBSM+
RETURN LOSS

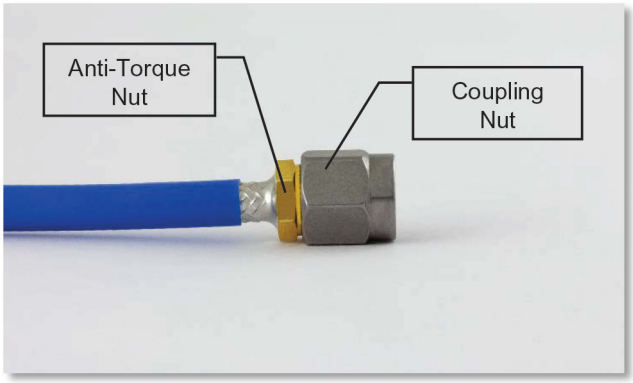


## PROPER CABLE CONNECTION USING ANTI-TORQUE NUT

Mini-Circuits 086-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 torquing and twisting when tightening the cable connector.

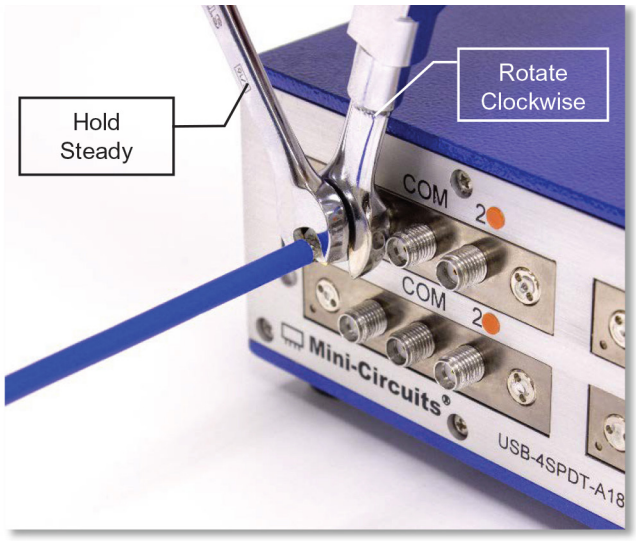
**TO PROPERLY TIGHTEN THE CABLE CONNECTOR:**

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 086-10SBSM+

*Straight SMA Female Bulkhead to Straight SMA Male*

## *Typical Performance Data*

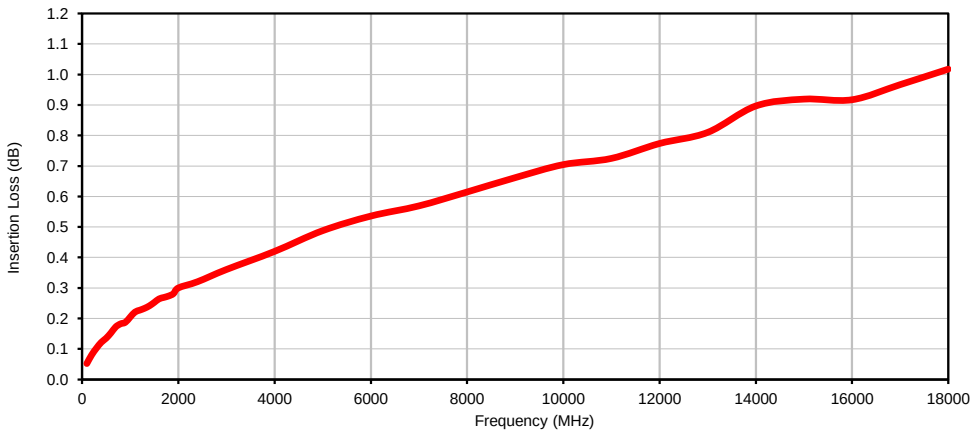
| FREQUENCY (MHz) | INSERTION LOSS (dB) | SMA-MALE RETURN LOSS (dB) | SMA-FEMALE BULKHEAD RETURN LOSS (dB) |
|---|---|---|---|
| 100.0 | 0.05 | 40.3 | 40.4 |
| 200.0 | 0.08 | 35.5 | 35.5 |
| 300.0 | 0.10 | 34.9 | 34.9 |
| 400.0 | 0.12 | 39.1 | 39.5 |
| 500.0 | 0.13 | 49.4 | 45.6 |
| 600.0 | 0.15 | 35.6 | 36.4 |
| 700.0 | 0.17 | 32.2 | 33.6 |
| 800.0 | 0.18 | 33.9 | 34.8 |
| 900.0 | 0.19 | 44.9 | 40.6 |
| 1000.0 | 0.20 | 37.8 | 38.4 |
| 1100.0 | 0.22 | 32.0 | 33.4 |
| 1200.0 | 0.23 | 31.1 | 32.3 |
| 1300.0 | 0.23 | 34.6 | 34.7 |
| 1400.0 | 0.24 | 41.3 | 40.3 |
| 1500.0 | 0.25 | 34.9 | 37.0 |
| 1600.0 | 0.26 | 31.8 | 33.3 |
| 1700.0 | 0.27 | 32.6 | 33.3 |
| 1800.0 | 0.27 | 35.9 | 36.1 |
| 1900.0 | 0.28 | 34.9 | 37.5 |
| 2000.0 | 0.30 | 32.0 | 34.3 |
| 2400.0 | 0.32 | 33.5 | 37.3 |
| 3000.0 | 0.36 | 30.4 | 31.6 |
| 4000.0 | 0.42 | 27.9 | 29.3 |
| 5000.0 | 0.49 | 25.2 | 25.6 |
| 6000.0 | 0.54 | 28.8 | 28.7 |
| 7000.0 | 0.57 | 35.5 | 32.7 |
| 8000.0 | 0.61 | 31.9 | 30.0 |
| 9000.0 | 0.66 | 25.9 | 24.6 |
| 10000.0 | 0.70 | 25.2 | 24.7 |
| 11000.0 | 0.72 | 24.1 | 27.2 |
| 12000.0 | 0.77 | 27.8 | 39.3 |
| 13000.0 | 0.81 | 29.6 | 31.8 |
| 14000.0 | 0.90 | 25.1 | 35.9 |
| 15000.0 | 0.92 | 25.5 | 28.5 |
| 16000.0 | 0.92 | 27.4 | 26.7 |
| 17000.0 | 0.97 | 35.4 | 35.2 |
| 18000.0 | 1.02 | 25.2 | 24.6 |

# Hand-Flex Coaxial Cable 086-10SBSM+

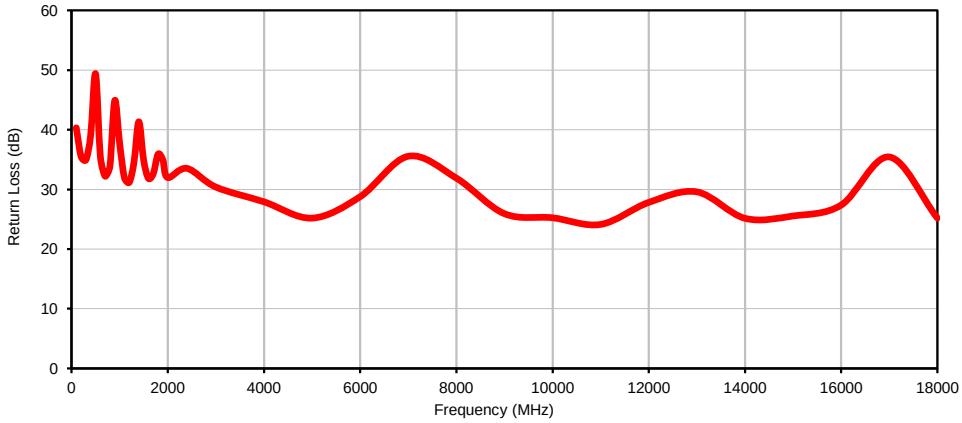
*Straight SMA Female Bulkhead to Straight SMA Male*

## *Typical Performance Curves*

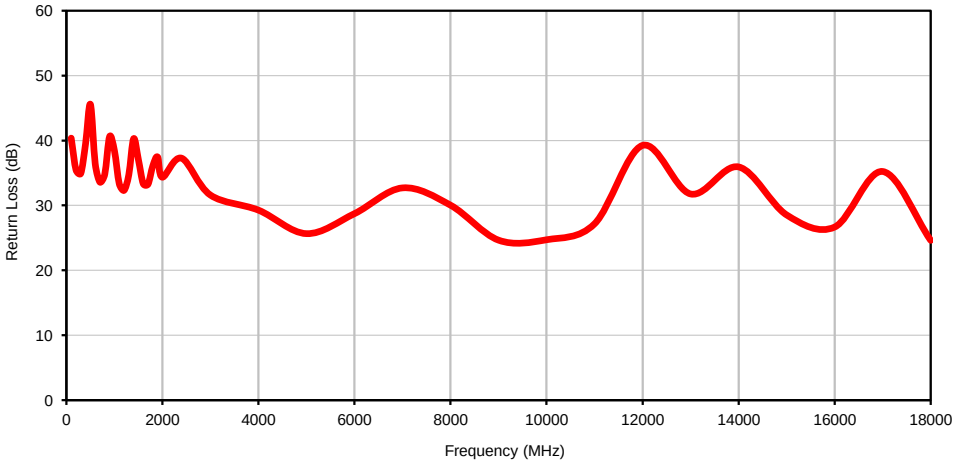
**Insertion Loss**




**SMA-Male Return Loss**



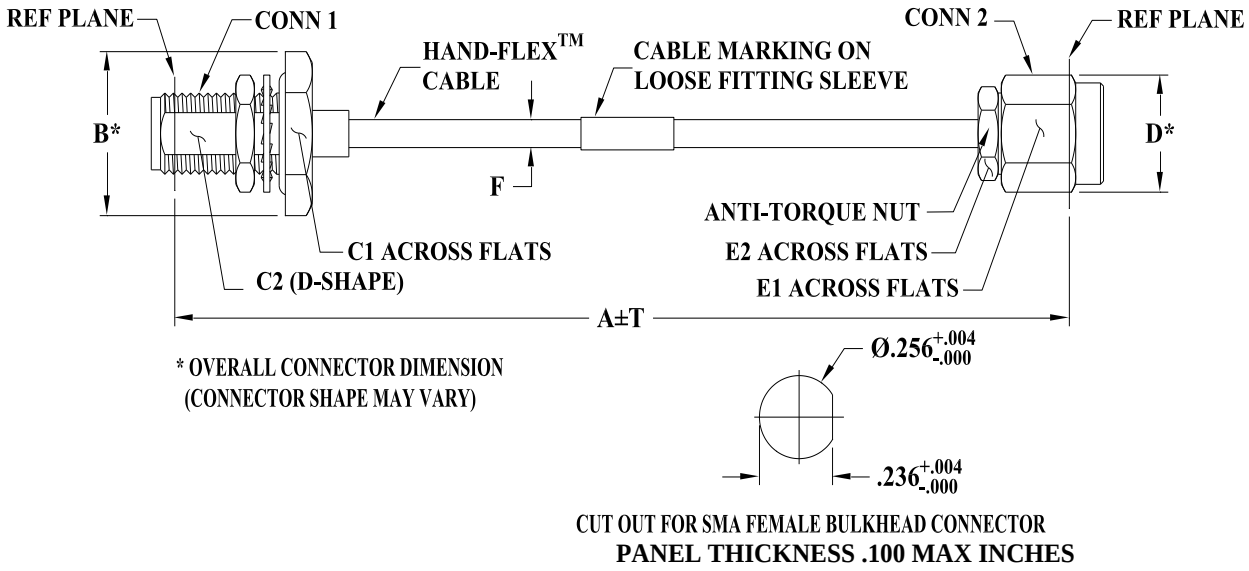

**SMA-Female Bulkhead Return Loss**



# Case Style KP

**KP1567**

## Outline Dimensions




KP1567 SERIES
SMA FEMALE BULKHEAD (CONN-1)
SMA MALE (CONN-2)

| CASE STYLE # | A | | B | C1 | C2 | D | E1 | E2 | F | | T | | WEIGHT GRAMS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | INCH | MM | | | | | | | 086U-ASM+ | 086-ASM+ | INCH | MM | |
| KP1567-3 | 3.00 | 76.20 | .51 (12.95) | .438 (11.13) | .232 (5.89) | .36 (9.14) | .313 (7.95) | .250 (6.35) | .089∀.002 (2.26∀.06) | .108 NOM (2.75 NOM) | .05 | 1.27 | 7.37 |
| KP1567-5 | 5.00 | 127.00 | | | | | | | | | .05 | 1.27 | 8.29 |
| KP1567-6 | 6.00 | 152.40 | | | | | | | | | .05 | 1.27 | 8.74 |
| KP1567-7 | 7.00 | 177.80 | | | | | | | | | .10 | 2.54 | 9.20 |
| KP1567-8 | 8.00 | 203.20 | | | | | | | | | .10 | 2.54 | 9.66 |
| KP1567-9 | 9.00 | 228.60 | | | | | | | | | .10 | 2.54 | 10.11 |
| KP1567-10 | 10.00 | 254.00 | | | | | | | | | .10 | 2.54 | 10.57 |
| KP1567-11 | 11.00 | 279.40 | | | | | | | | | .10 | 2.54 | 11.03 |
| KP1567-12 | 12.00 | 304.80 | | | | | | | | | .10 | 2.54 | 11.48 |
| KP1567-13 | 13.00 | 330.20 | | | | | | | | | .15 | 3.81 | 11.94 |
| KP1567-14 | 14.00 | 355.60 | | | | | | | | | .15 | 3.81 | 12.40 |
| KP1567-16 | 16.00 | 406.40 | | | | | | | | | .15 | 3.81 | 13.31 |

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

### Note:

1. 086 Hand-Flex™ Coaxial Cable.
2. "A" represents length of cable.


Mini-Circuits®
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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)<br>Ambient Environment | Individual Model Data sheet |
| Storage Temperature | -55° to 105° C or -55° to 85° C (see data sheet)<br>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<br>30 mm, 5 times for 086 series cables | |
| Single Bend Radius | 8 mm for 141 series cables<br>6 mm for 086 series cables | |


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