



Mini-Circuits

**HAND  
FLEX™**

# Coaxial Cable

**141-16SMNB+**

50Ω 16 inch DC to 12.5 GHz

## THE BIG DEAL

- Bulkhead Female Type-N connector at one end
- Low Loss, 0.6 dB at 12.5 GHz
- Excellent Return Loss, 23 dB at 12.5 GHz
- Hand formable to almost any custom shape without special bending tools
- 8mm bend radius for tight installations
- Anti-torque nut prevents cable stress during installation
- Insulated outer jacket standard<sup>1</sup>
- Ideal for interconnect of assembled systems



*Generic photo used for illustration purposes only*

|            |                               |
|------------|-------------------------------|
| Model No.  | 141-16SMNB+                   |
| Case Style | KQ1669-16                     |
| Connectors | SMA-Male to N-Female Bulkhead |

## +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

141 SMNB+ series Hand-Flex™ coaxial cables are ideal for integrating rack-mounted coaxial components and sub-assemblies in tight spaces and dense system configurations. N-Type female bulkhead connector at one end is equipped with a nickel-plated brass flange for secure connections to rack mounted equipment. SMA-connector has a passivated stainless steel coupling nut over a gold-plated connector body. The outer shield is tin-soaked copper braid, which minimizes signal leakage with high flexibility for easy bending, and dielectric is low loss PTFE. 141-SMNB+ series Hand-Flex™ coaxial cables are available in various lengths for different system requirements.

## KEY FEATURES

| Features                                                                                                                     | Advantages                                                                                                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Single N-Type female bulkhead connector                                                                                      | Eliminates need for a bulkhead adapter and connects directly to the front panel of rack-mounted equipment, improving reliability and reducing system cost                                                         |
| Hand-Formable                                                                                                                | 141 SMNB+ series Hand-Flex™ cables avoid the need for cable-bending tools, alleviating the risk of damage during bending processes typical of semi-rigid cable assemblies.                                        |
| 8mm Bend Radius                                                                                                              | Ideal for making connections in tight spaces and dense system assemblies.                                                                                                                                         |
| Excellent Return Loss                                                                                                        | Typical return loss of 21 dB to 12.5 GHz or better makes 141-SMNB series cables ideal for connecting a wide variety of RF components while minimizing VSWR ripple contribution due to mating cables & connectors. |
| High Power Handling Capability: <ul style="list-style-type: none"><li>• 546W at 0.5 GHz</li><li>• 110W at 12.5 GHz</li></ul> | 141-SMNB coaxial cables can support medium to high RF power levels and can be used in the transmit path. (Power rating at sea-level).                                                                             |
| Built-in Anti-torque Nut                                                                                                     | Anti-torque feature supports the SMA connector body during installation, preventing stress to the connector/cable interface. Connector interface meets MIL-STD-348.                                               |

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**ELECTRICAL SPECIFICATIONS AT +25°C**

| Parameter           | Frequency (GHz) | Min. | Typ. | Max. | Units  |
|---------------------|-----------------|------|------|------|--------|
| Frequency Range     |                 | DC   |      | 12.5 | GHz    |
| Length <sup>1</sup> |                 | 16   |      |      | inches |
| Insertion Loss      | DC - 2          | —    | 0.25 | 0.45 | dB     |
|                     | 2 - 6           | —    | 0.47 | 0.80 |        |
|                     | 6 - 10          | —    | 0.63 | 1.10 |        |
|                     | 10 - 12.5       | —    | 0.76 | 1.45 |        |
| Return Loss         | DC - 2          | 22.0 | 32.0 | —    | dB     |
|                     | 2 - 6           | 17.0 | 23.0 | —    |        |
|                     | 6 - 10          | 17.0 | 22.0 | —    |        |
|                     | 10 - 12.5       | 17.0 | 18.0 | —    |        |

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 | 546W at 0.5 GHz<br>387W at 1 GHz<br>273W at 2 GHz   |
| Sea Level              | 156W at 6 GHz<br>121W at 10 GHz<br>110W at 12.5 GHz |

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





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## 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)

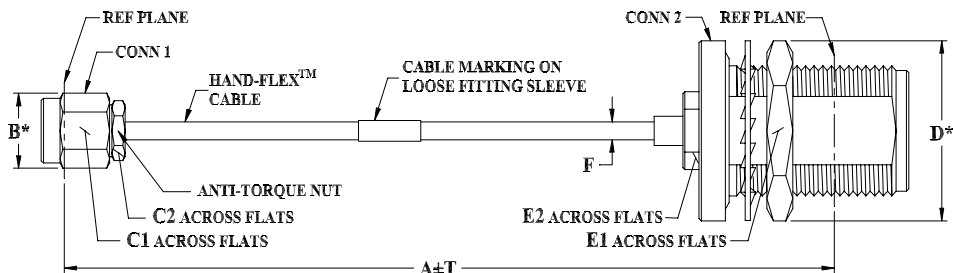
SMA-Male Connector:

- Washer Nut: Stainless Steel
- Passivated Body: Stainless Steel
- Gold Plated Center Pin: Silver Plated Copper Clad Steel

N-Female Connector:

- Washer, Nut & Body: Brass Nickel Plated.
- Center Pin: BecuB, Gold Plated

## OUTLINE DRAWING



\* OVERALL CONNECTOR DIMENSION  
(CONNECTOR SHAPE MAY VARY)

## OUTLINE DIMENSIONS (Inch/mm)

| A      | B    | C1   | C2   | D     | E1    | E2    | F         | T    | wt    |
|--------|------|------|------|-------|-------|-------|-----------|------|-------|
| 16.0   | .36  | .313 | .250 | .87   | .750  | .531  | .163±.004 | .15  | grams |
| 406.40 | 9.14 | 7.95 | 6.35 | 22.10 | 19.05 | 13.49 | 4.14±0.10 | 3.81 | 59.59 |

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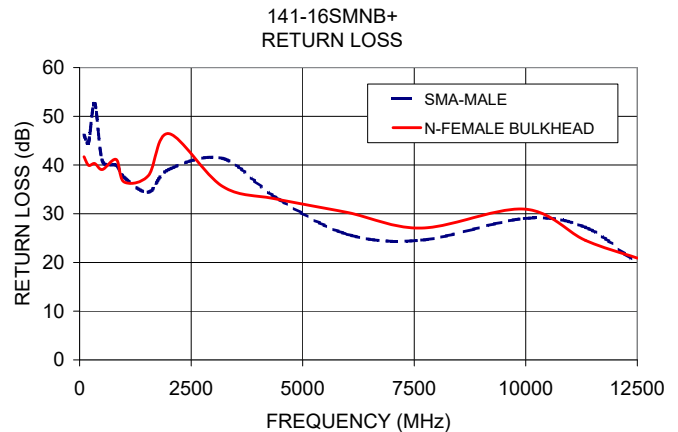
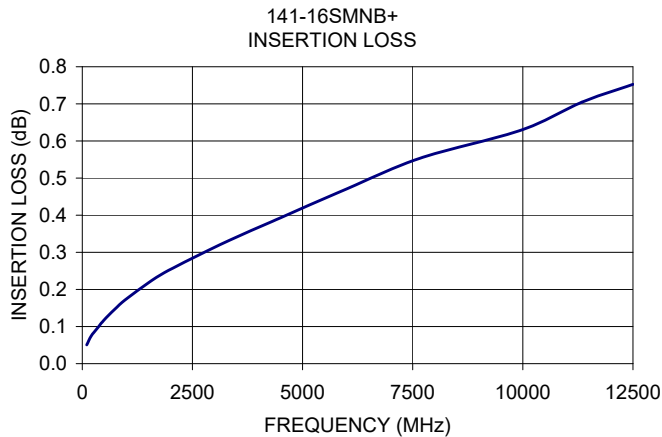
# Coaxial Cable

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## TYPICAL PERFORMANCE DATA AND CHARTS

| Frequency<br>(MHz) | Insertion Loss<br>(dB) | Return Loss<br>(dB) |                      |
|--------------------|------------------------|---------------------|----------------------|
|                    |                        | SMA-Male            | N-Female<br>Bulkhead |
| 100                | 0.05                   | 46.1                | 41.7                 |
| 200                | 0.07                   | 44.7                | 39.9                 |
| 340                | 0.10                   | 52.6                | 40.3                 |
| 510                | 0.12                   | 40.8                | 39.1                 |
| 820                | 0.16                   | 39.9                | 41.1                 |
| 1000               | 0.17                   | 37.5                | 36.5                 |
| 1540               | 0.22                   | 34.4                | 37.8                 |
| 2000               | 0.25                   | 39.1                | 46.4                 |
| 3200               | 0.32                   | 41.4                | 35.6                 |
| 4400               | 0.39                   | 33.3                | 33.0                 |
| 6000               | 0.47                   | 25.8                | 30.3                 |
| 7670               | 0.55                   | 24.6                | 27.1                 |
| 9970               | 0.63                   | 29.0                | 30.9                 |
| 11340              | 0.70                   | 27.2                | 24.5                 |
| 12500              | 0.75                   | 19.8                | 20.9                 |



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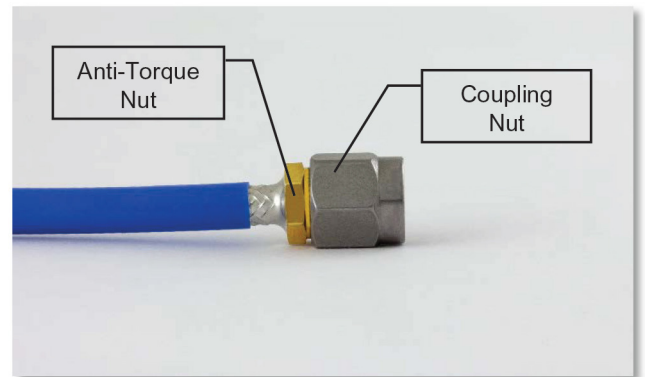
50Ω 16 inch DC to 12.5 GHz

## 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.

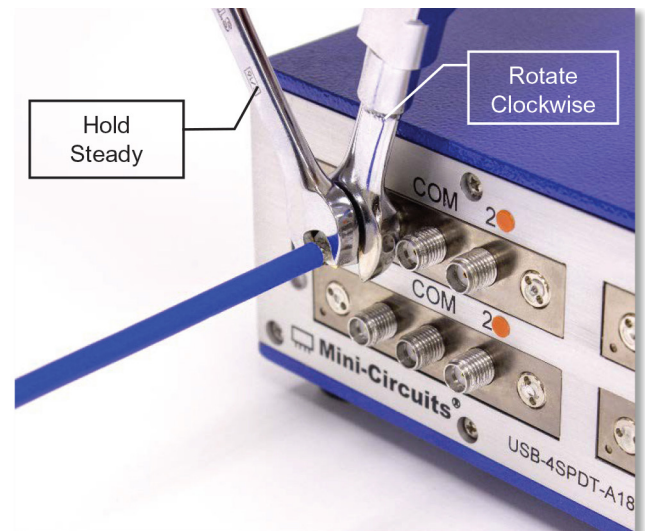
### TO PROPERLY TIGHTEN THE CABLE CONNECTOR:

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

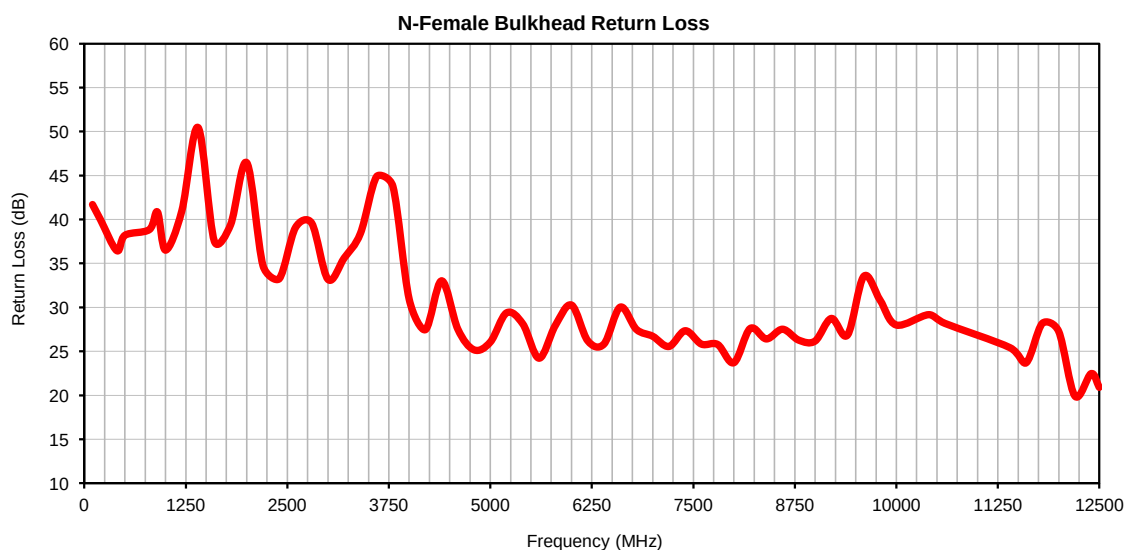
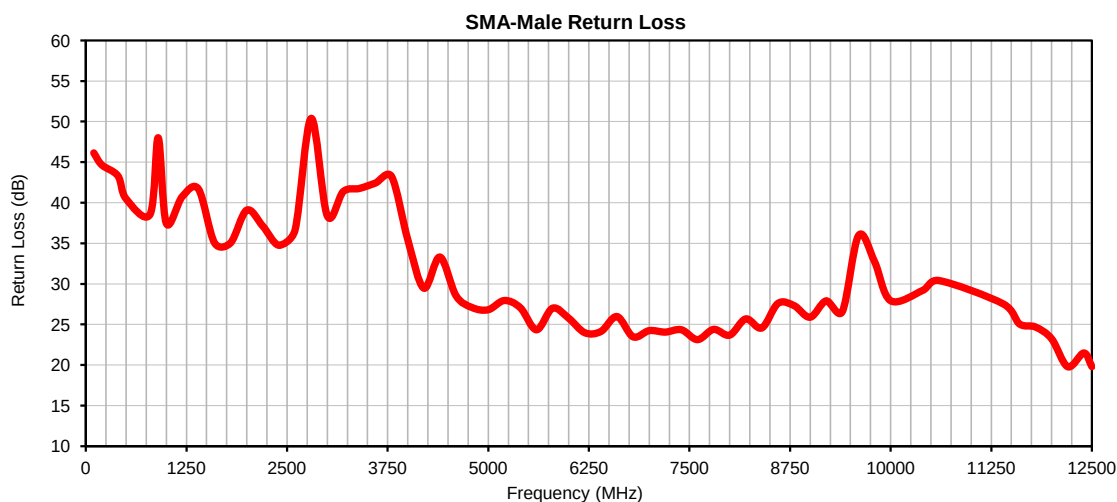
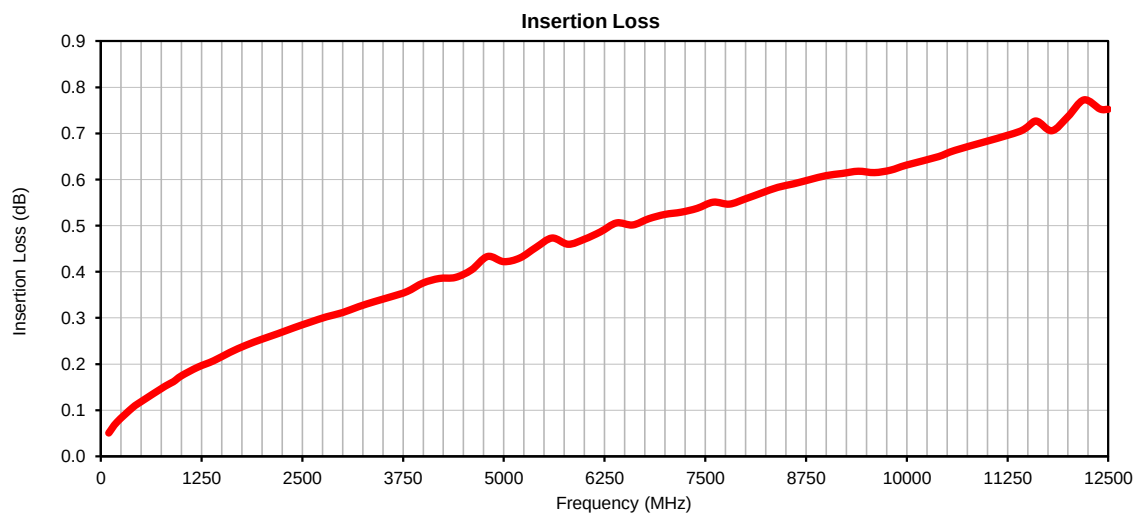
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- B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- C. The parts covered by this specification document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



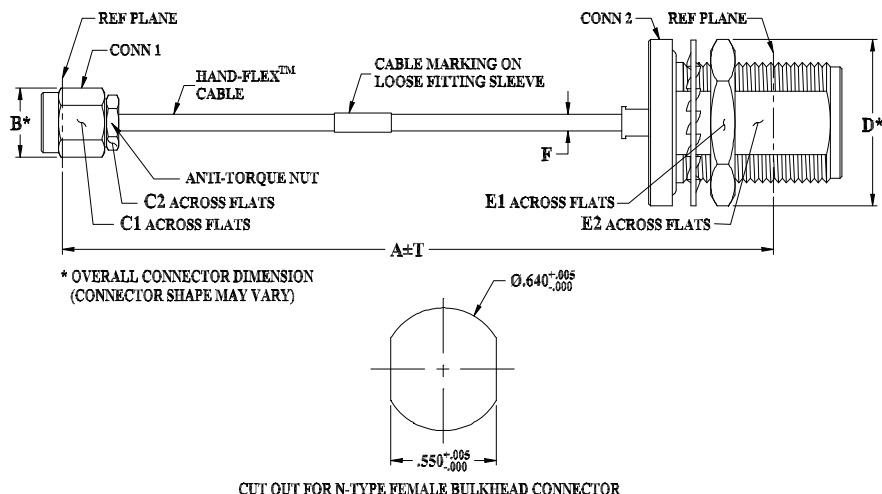
## Typical Performance Data

| FREQUENCY<br>(MHz) | INSERTION<br>LOSS<br>(dB) | SMA-MALE<br>RETURN LOSS<br>(dB) | N-FEMALE<br>BULKHEAD<br>RETURN LOSS<br>(dB) |
|--------------------|---------------------------|---------------------------------|---------------------------------------------|
| 100.0              | 0.05                      | 46.1                            | 41.7                                        |
| 200.0              | 0.07                      | 44.7                            | 39.9                                        |
| 400.0              | 0.11                      | 43.3                            | 36.5                                        |
| 500.0              | 0.12                      | 40.5                            | 38.2                                        |
| 800.0              | 0.15                      | 38.6                            | 38.8                                        |
| 900.0              | 0.16                      | 48.0                            | 40.8                                        |
| 1000.0             | 0.17                      | 37.5                            | 36.5                                        |
| 1200.0             | 0.19                      | 40.8                            | 41.0                                        |
| 1400.0             | 0.21                      | 41.7                            | 50.5                                        |
| 1600.0             | 0.23                      | 35.1                            | 37.5                                        |
| 1800.0             | 0.24                      | 35.1                            | 39.4                                        |
| 2000.0             | 0.25                      | 39.1                            | 46.4                                        |
| 2200.0             | 0.27                      | 37.1                            | 34.7                                        |
| 2400.0             | 0.28                      | 34.8                            | 33.3                                        |
| 2600.0             | 0.29                      | 36.6                            | 39.1                                        |
| 2800.0             | 0.30                      | 50.4                            | 39.6                                        |
| 3000.0             | 0.31                      | 38.4                            | 33.2                                        |
| 3200.0             | 0.32                      | 41.4                            | 35.6                                        |
| 3400.0             | 0.34                      | 41.8                            | 38.4                                        |
| 3600.0             | 0.35                      | 42.4                            | 44.9                                        |
| 3800.0             | 0.36                      | 43.2                            | 43.8                                        |
| 4000.0             | 0.38                      | 35.5                            | 30.9                                        |
| 4200.0             | 0.39                      | 29.5                            | 27.5                                        |
| 4400.0             | 0.39                      | 33.3                            | 33.0                                        |
| 4600.0             | 0.40                      | 28.6                            | 27.5                                        |
| 4800.0             | 0.43                      | 27.1                            | 25.2                                        |
| 5000.0             | 0.42                      | 26.8                            | 26.1                                        |
| 5200.0             | 0.43                      | 28.0                            | 29.4                                        |
| 5400.0             | 0.45                      | 27.1                            | 28.1                                        |
| 5600.0             | 0.47                      | 24.4                            | 24.2                                        |
| 5800.0             | 0.46                      | 27.0                            | 27.9                                        |
| 6000.0             | 0.47                      | 25.8                            | 30.3                                        |
| 6200.0             | 0.49                      | 24.0                            | 26.2                                        |
| 6400.0             | 0.51                      | 24.1                            | 25.8                                        |
| 6600.0             | 0.50                      | 26.0                            | 30.0                                        |
| 6800.0             | 0.52                      | 23.5                            | 27.5                                        |
| 7000.0             | 0.52                      | 24.3                            | 26.7                                        |
| 7200.0             | 0.53                      | 24.1                            | 25.6                                        |
| 7400.0             | 0.54                      | 24.4                            | 27.3                                        |
| 7600.0             | 0.55                      | 23.1                            | 25.8                                        |
| 7800.0             | 0.55                      | 24.4                            | 25.8                                        |
| 8000.0             | 0.56                      | 23.7                            | 23.7                                        |
| 8200.0             | 0.57                      | 25.7                            | 27.6                                        |
| 8400.0             | 0.58                      | 24.6                            | 26.4                                        |
| 8600.0             | 0.59                      | 27.6                            | 27.5                                        |
| 8800.0             | 0.60                      | 27.3                            | 26.3                                        |
| 9000.0             | 0.61                      | 25.9                            | 26.2                                        |
| 9200.0             | 0.61                      | 27.9                            | 28.7                                        |
| 9400.0             | 0.62                      | 26.6                            | 26.9                                        |
| 9600.0             | 0.62                      | 35.9                            | 33.5                                        |
| 9800.0             | 0.62                      | 32.7                            | 30.8                                        |
| 10000.0            | 0.63                      | 27.9                            | 28.0                                        |
| 10400.0            | 0.65                      | 29.2                            | 29.2                                        |
| 10600.0            | 0.66                      | 30.4                            | 28.2                                        |
| 11400.0            | 0.70                      | 27.5                            | 25.4                                        |
| 11600.0            | 0.73                      | 25.1                            | 23.7                                        |
| 11800.0            | 0.71                      | 24.7                            | 28.2                                        |
| 12000.0            | 0.74                      | 23.2                            | 27.3                                        |
| 12200.0            | 0.77                      | 19.8                            | 19.9                                        |
| 12400.0            | 0.75                      | 21.5                            | 22.5                                        |
| 12500.0            | 0.75                      | 19.8                            | 20.9                                        |

### Typical Performance Curves



### Outline Dimensions



KQ1669 SERIES  
SMA MALE (CONN-1)  
N FEMALE BULKHEAD (CONN-2)

| CASE<br>STYLE # | A     |        | B             | C1             | C2             | D              | E1              | E2              | F                        |                          | T    |      | WEIGHT<br>GRAMS |
|-----------------|-------|--------|---------------|----------------|----------------|----------------|-----------------|-----------------|--------------------------|--------------------------|------|------|-----------------|
|                 | INCH  | MM     |               |                |                |                |                 |                 | 141U-ASMNB+              | 141-ASMNB+               | INCH | MM   |                 |
| KQ1669-3        | 3.00  | 76.20  | .36<br>(9.14) | .313<br>(7.95) | .250<br>(6.35) | .87<br>(22.10) | .750<br>(19.05) | .531<br>(13.49) | .141±.003<br>(3.58±0.07) | .163±.004<br>(4.14±0.10) | .05  | 1.27 | 44.73           |
| KQ1669-4        | 4.00  | 101.60 |               |                |                |                |                 |                 |                          |                          | .05  | 1.27 | 45.87           |
| KQ1669-5        | 5.00  | 127.00 |               |                |                |                |                 |                 |                          |                          | .05  | 1.27 | 47.02           |
| KQ1669-6        | 6.00  | 152.40 |               |                |                |                |                 |                 |                          |                          | .05  | 1.27 | 48.16           |
| KQ1669-7        | 7.00  | 177.80 |               |                |                |                |                 |                 |                          |                          | .10  | 2.54 | 49.30           |
| KQ1669-8        | 8.00  | 203.20 |               |                |                |                |                 |                 |                          |                          | .10  | 2.54 | 50.44           |
| KQ1669-9        | 9.00  | 228.60 |               |                |                |                |                 |                 |                          |                          | .10  | 2.54 | 51.59           |
| KQ1669-10       | 10.00 | 254.00 |               |                |                |                |                 |                 |                          |                          | .10  | 2.54 | 52.73           |
| KQ1669-11       | 11.00 | 279.40 |               |                |                |                |                 |                 |                          |                          | .10  | 2.54 | 53.87           |
| KQ1669-12       | 12.00 | 304.80 |               |                |                |                |                 |                 |                          |                          | .10  | 2.54 | 55.02           |
| KQ1669-14       | 14.00 | 355.60 |               |                |                |                |                 |                 |                          |                          | .15  | 3.81 | 57.30           |
| KQ1669-16       | 16.00 | 406.40 |               |                |                |                |                 |                 |                          |                          | .15  | 3.81 | 59.59           |
| KQ1669-18       | 18.00 | 457.20 |               |                |                |                |                 |                 |                          |                          | .15  | 3.81 | 61.87           |
| KQ1669-20       | 20.00 | 508.00 |               |                |                |                |                 |                 |                          |                          | .15  | 3.81 | 64.16           |
| KQ1669-24       | 24.00 | 609.60 |               |                |                |                |                 |                 |                          |                          | .15  | 3.81 | 68.73           |
| KQ1669-30       | 30.00 | 762.00 |               |                |                |                |                 |                 |                          |                          | .20  | 5.08 | 75.59           |
| KQ1669-36       | 36.00 | 914.40 |               |                |                |                |                 |                 |                          |                          | .20  | 5.08 | 82.45           |

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.



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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 | -55° to 105°C<br>Ambient Environment                                         | Individual Model Data Sheet |
| Storage Temperature   | -55° to 105°C<br>Ambient Environment                                         | Individual Model Data Sheet |
| Thermal Shock         | -55° to 100°C, 50 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                     |                             |