



COAXIAL

# Non-Magnetic Flex Cables

**141N SERIES**

50Ω DC to 18 GHz SMA-Male to SMA-Male

## KEY FEATURES

- Nickel-Free Construction, Non-Magnetic
- Broadband
- Reliable Performance

## APPLICATIONS

- Cryogenic Environment Applications
- Test & Measurement
- High-Speed Data Systems
- Instrumentation
- Precision Measurements
- Quantum Computing Applications
- High-Volume Production Test
- R&D Labs & Device Characterization
- Circuit-Level Breadboarding



*Generic photo used for illustration purposes only*

## PRODUCT OVERVIEW

The 141N Series Hand-Flex™ Coaxial Cables are ideal for interconnecting coaxial components or sub-systems. The construction includes an unjacketed silver-plated copper-clad center conductor which maintains its shape after bending. The outer shield is a tin-soaked, silver-plated copper braid which minimizes signal leakage while remaining flexible for easy bending. Connectors have passivated stainless-steel coupling nuts over a gold-plated connector bodies and gold plated, brass center conductors.



### ELECTRICAL SPECIFICATIONS<sup>1</sup>

|                                     |                   |
|-------------------------------------|-------------------|
| Operating Frequency (GHz)           | 18                |
| Impedance (Ω)                       | 50                |
| Velocity of Propagation (%)         | 70                |
| Shielding Effectiveness Min. (dB/m) | 100               |
| Voltage Withstand Max. (VDC)        | 2000              |
| Return Loss Typ. [VSWR]             | 30.65 dB [1.06:1] |
| Return Loss Max. [VSWR]             | 20.08 dB [1.22:1] |

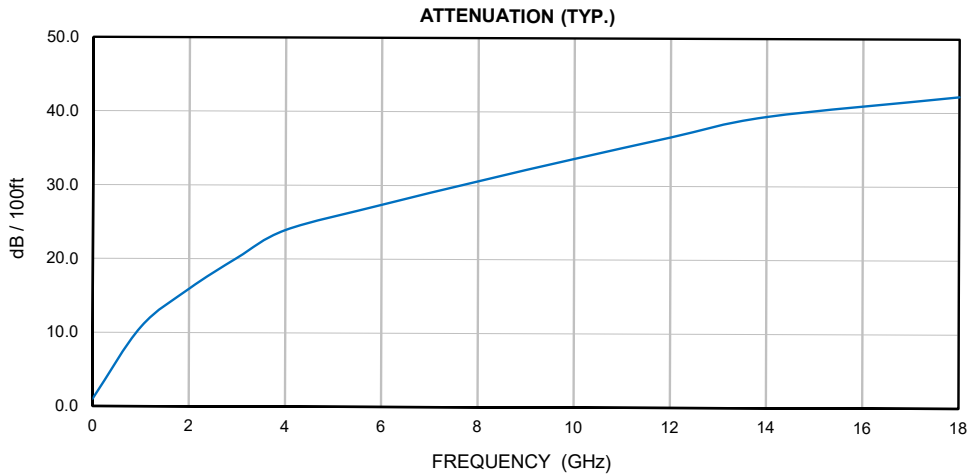
1. Permanent damage may occur if any of these limits are exceeded.

### MECHANICAL & ENVIRONMENTAL SPECIFICATIONS<sup>1</sup>

|   |                   |
|---|-------------------|
| Operating Case Temperature <sup>2</sup>       | -45 °C to +125 °C |
| Storage Temperature                           | -45 °C to +125 °C |
| Bend Radius: Installation mm [in]             | 10 [0.39]         |
| Bend Radius: Repeated mm [in]                 | 40 [1.57]         |
| Cable Weight <sup>3</sup> (g/m) [lbs/1000 ft] | 39 [26.2]         |

2. Temperature extremes are not intended for continuous normal operation.

3. Total connector weight is 5.6 g per cable.



Attenuation (Typical @ +25 °C & VSWR = 1.0) dB

| Frequency (MHz) | 1000  | 2000  | 3000  | 4000  | 6000   | 8000   | 10000  | 12000  | 14000  | 18000 |
|-----------------|-------|-------|-------|-------|--------|--------|--------|--------|--------|-------|
| dB / 100 m      | 35.27 | 25.19 | 66.09 | 78.42 | 100.39 | 120.14 | 138.48 | 155.82 | 172.39 | 52.53 |
| dB / 100 ft     | 10.75 | 15.91 | 20.14 | 23.90 | 30.59  | 36.61  | 42.20  | 47.48  | 52.53  | 62.12 |

Calculate Max Attenuation<sup>4</sup> =  $[K1 * \sqrt{FMHz} + K2 * FMHz] * 1.1 \text{ dB}$

|             |      |         |      |         |
|-------------|------|---------|------|---------|
| dB / 100 m  | K1 = | 0.99081 | K2 = | 0.00394 |
| dB / 100 ft | K1 = | 0.30200 | K2 = | 0.00120 |

4. For cable only, include 0.5 dB loss for connectors.

Max Power (VSWR = 1.0; +25 °C; Sea Level) W

| Frequency (MHz) | 1000  | 2000  | 3000  | 4000  | 6000  | 8000  | 10000 | 12000 | 14000 | 18000 |
|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Avg. Power (kW) | 0.560 | 0.395 | 0.320 | 0.280 | 0.225 | 0.195 | 0.175 | 0.165 | 0.150 | 0.130 |



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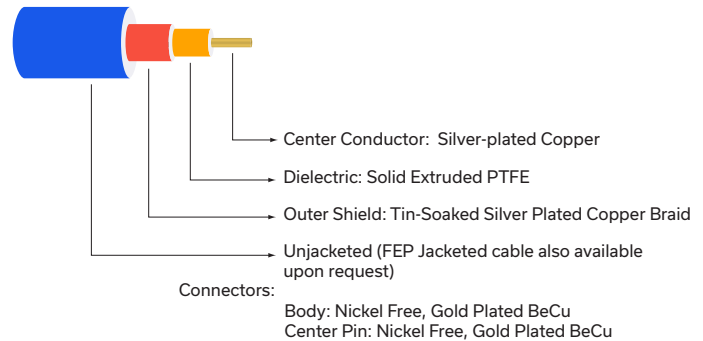
## 141N SERIES

50Ω DC to 18 GHz SMA-Male to SMA-Male

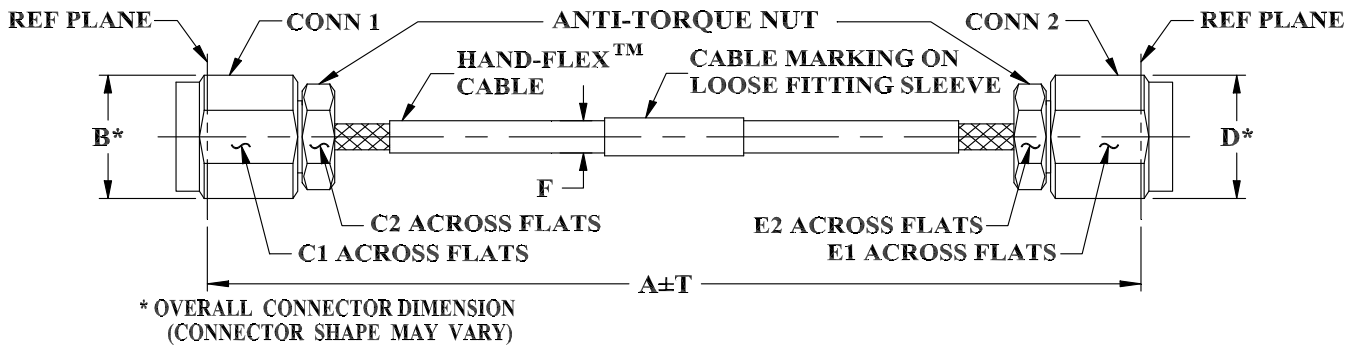
### COAXIAL CONNECTIONS

| Description    | Connector 1 | Connector 2 |
|----------------|-------------|-------------|
| Connector Type | SMA-Male    | SMA-Male    |
| Orientation    | Straight    | Straight    |

### CABLE CONSTRUCTION



### CASE STYLE DRAWING



| A     |     | B             | C1             | C2             | D              | E1             | E2              | F              | T     |       | Wt. (grams) |
|-------|-----|---------------|----------------|----------------|----------------|----------------|-----------------|----------------|-------|-------|-------------|
| Inch  | mm  |               |                |                |                |                |                 |                | Inch  | mm    |             |
| 3.94  | 100 | .36<br>(9.14) | .315<br>(8.00) | .250<br>(6.35) | 0.36<br>(9.14) | .315<br>(8.00) | 0.250<br>(6.35) | .141<br>(2.31) | ±0.05 | ±1.27 | 9.50        |
| 7.87  | 200 |               |                |                |                |                |                 |                | ±0.10 | ±2.54 | 13.40       |
| 11.81 | 300 |               |                |                |                |                |                 |                | ±0.10 | ±2.54 | 17.30       |
| 19.69 | 500 |               |                |                |                |                |                 |                | ±0.15 | ±3.81 | 25.10       |

### PRODUCT MARKING\*: 141N-XXCSM

\*Marking may contain other features or characters for internal lot control.



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**141N SERIES**

50Ω DC to 18 GHz SMA-Male to SMA-Male

ADDITIONAL INFORMATION IS AVAILABLE ON OUR DASHBOARD

[CLICK HERE](#)

|                                      |  |
|--------------------------------------|--|
| <b>Performance Data &amp; Graphs</b> | Data<br>Graphs<br>S-Parameter (S2P Files) Data Set (.zip file) |
| <b>Case Style</b>                    | KQ1506   |
| <b>RoHS Status</b>                   | Compliant  |
| <b>Environmental Ratings</b>         | ENV157   |

#### 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)

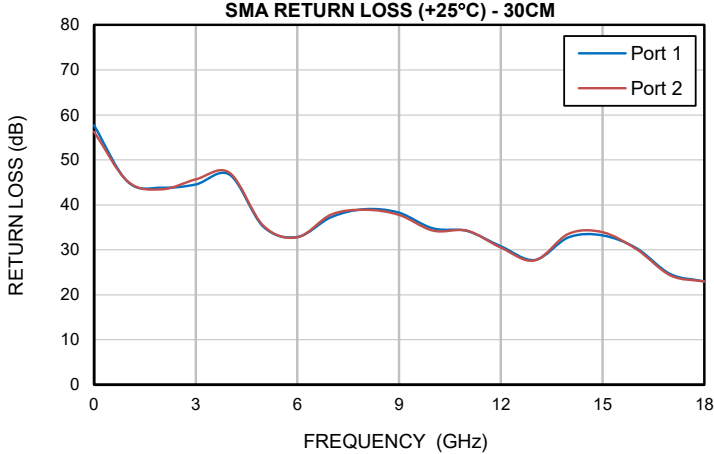
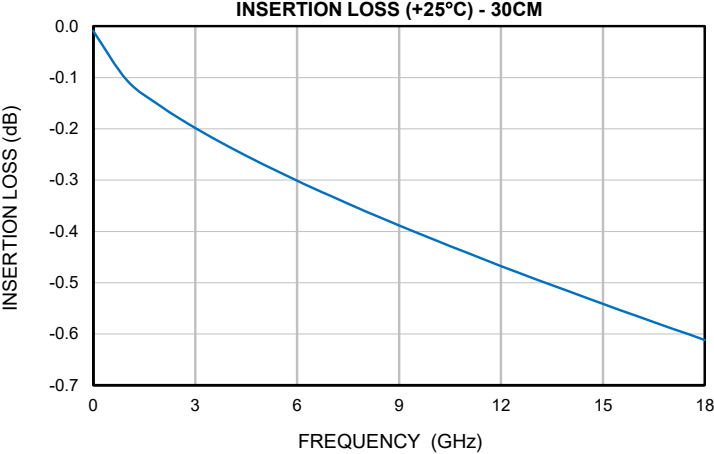


*Typical Performance Data*

| FREQ. | INSERTION LOSS | SMA MALE<br>RETURN LOSS IN | SMA MALE<br>RETURN LOSS OUT |
|-------|----------------|----------------------------|-----------------------------|
| (GHz) | (dB)           | (dB)                       | (dB)                        |
| 0     | 0.01           | 57.65                      | 56.24                       |
| 1     | 0.11           | 45.07                      | 45.17                       |
| 2     | 0.16           | 43.81                      | 43.45                       |
| 3     | 0.20           | 44.51                      | 45.62                       |
| 4     | 0.24           | 46.73                      | 47.13                       |
| 5     | 0.27           | 35.12                      | 35.30                       |
| 6     | 0.30           | 32.87                      | 32.80                       |
| 7     | 0.33           | 37.27                      | 37.84                       |
| 8     | 0.36           | 39.05                      | 38.89                       |
| 9     | 0.39           | 38.22                      | 37.73                       |
| 10    | 0.42           | 34.73                      | 34.24                       |
| 11    | 0.44           | 34.17                      | 34.24                       |
| 12    | 0.47           | 30.75                      | 30.48                       |
| 13    | 0.49           | 27.74                      | 27.63                       |
| 14    | 0.52           | 32.76                      | 33.58                       |
| 15    | 0.54           | 33.19                      | 33.91                       |
| 16    | 0.57           | 30.34                      | 30.14                       |
| 17    | 0.59           | 24.59                      | 24.33                       |
| 18    | 0.61           | 22.95                      | 22.93                       |



Typical Performance Curves

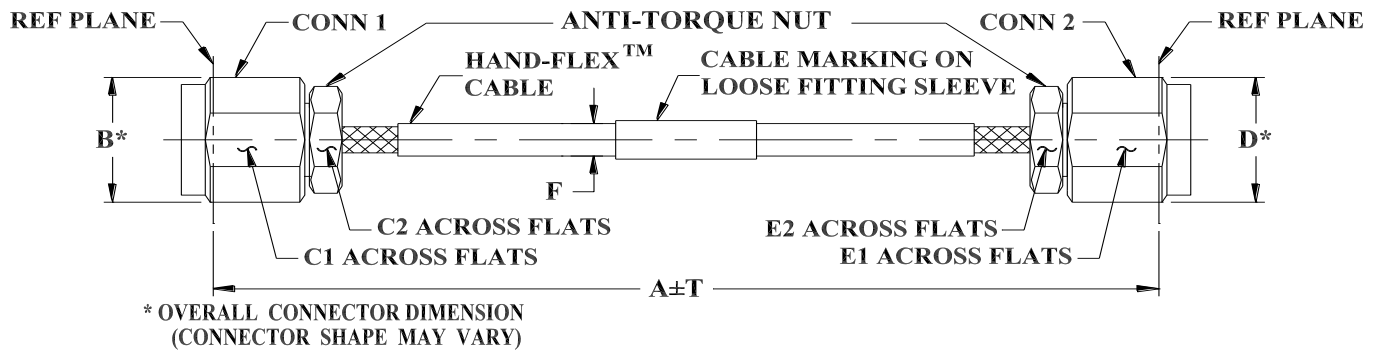


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IF/RF MICROWAVE COMPONENTS

### Outline Dimensions



KQ1506 SERIES  
SMA MALE (CONN-1)  
SMA MALE (CONN-2)

| CASE STYLE # | A     |        | B             | C1             | C2             | D             | E1             | E2             | F                        |                          | T     |      | WEIGHT GRAMS |
|--------------|-------|--------|---------------|----------------|----------------|---------------|----------------|----------------|--------------------------|--------------------------|-------|------|--------------|
|              | INCH  | MM     |               |                |                |               |                |                | 141U-ASM+                | 141-ASM+                 | INCH  | MM   |              |
| KQ1506-2     | 2.00  | 50.80  | .36<br>(9.14) | .315<br>(8.00) | .250<br>(6.35) | .36<br>(9.14) | .315<br>(8.00) | .250<br>(6.35) | .141±.003<br>(3.58±0.07) | .163±.004<br>(4.14±0.10) | .05   | 1.27 | 6.89         |
| KQ1506-3     | 3.00  | 76.20  |               |                |                |               |                |                |                          |                          | .05   | 1.27 | 8.03         |
| KQ1506-3.94  | 3.94  | 100.00 |               |                |                |               |                |                |                          |                          | .05   | 1.27 | 9.10         |
| KQ1506-4     | 4.00  | 101.60 |               |                |                |               |                |                |                          |                          | .05   | 1.27 | 9.17         |
| KQ1506-5     | 5.00  | 127.00 |               |                |                |               |                |                |                          |                          | .05   | 1.27 | 10.32        |
| KQ1506-6     | 6.00  | 152.40 |               |                |                |               |                |                |                          |                          | .05   | 1.27 | 11.46        |
| KQ1506-7     | 7.00  | 177.80 |               |                |                |               |                |                |                          |                          | .10   | 2.54 | 12.60        |
| KQ1506-7.87  | 7.87  | 200.00 |               |                |                |               |                |                |                          |                          | .10   | 2.54 | 13.60        |
| KQ1506-8     | 8.00  | 203.20 |               |                |                |               |                |                |                          |                          | .10   | 2.54 | 13.74        |
| KQ1506-9     | 9.00  | 228.60 |               |                |                |               |                |                |                          |                          | .10   | 2.54 | 14.89        |
| KQ1506-10    | 10.00 | 254.00 |               |                |                |               |                |                | .10                      | 2.54                     | 16.03 |      |              |
| KQ1506-11    | 11.00 | 279.40 |               |                |                |               |                |                | .10                      | 2.54                     | 17.17 |      |              |
| KQ1506-11.81 | 11.81 | 300.00 |               |                |                |               |                |                | .10                      | 2.54                     | 18.09 |      |              |
| KQ1506-12    | 12.00 | 304.80 |               |                |                |               |                |                | .10                      | 2.54                     | 18.32 |      |              |
| KQ1506-13    | 13.00 | 330.20 |               |                |                |               |                |                | .15                      | 3.81                     | 19.46 |      |              |
| KQ1506-14    | 14.00 | 355.60 |               |                |                |               |                |                | .15                      | 3.81                     | 20.60 |      |              |
| KQ1506-15    | 15.00 | 381.00 |               |                |                |               |                |                | .15                      | 3.81                     | 21.75 |      |              |
| KQ1506-16    | 16.00 | 406.40 |               |                |                |               |                |                | .15                      | 3.81                     | 22.89 |      |              |
| KQ1506-17    | 17.00 | 431.80 |               |                |                |               |                |                | .15                      | 3.81                     | 24.03 |      |              |
| KQ1506-18    | 18.00 | 457.20 |               |                |                |               |                |                | .15                      | 3.81                     | 25.17 |      |              |
| KQ1506-19    | 19.00 | 482.60 | .15           | 3.81           | 26.32          |               |                |                |                          |                          |       |      |              |
| KQ1506-19.7  | 19.69 | 500.00 | .15           | 3.81           | 27.12          |               |                |                |                          |                          |       |      |              |
| KQ1506-20    | 20.00 | 508.00 | .15           | 3.81           | 27.45          |               |                |                |                          |                          |       |      |              |

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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### Outline Dimensions

KQ1506 SERIES  
SMA MALE (CONN-1)  
SMA MALE (CONN-2)

| CASE STYLE # | A     |         | B             | C1             | C2             | D             | E1             | E2             | F                        |                          | T    |       | WEIGHT GRAMS |  |  |  |  |  |  |  |  |
|--------------|-------|---------|---------------|----------------|----------------|---------------|----------------|----------------|--------------------------|--------------------------|------|-------|--------------|--|--|--|--|--|--|--|--|
|              | INCH  | MM      |               |                |                |               |                |                | 141U-ASM+                | 141-ASM+                 | INCH | MM    |              |  |  |  |  |  |  |  |  |
| KQ1506-22    | 22.00 | 558.80  | .36<br>(9.14) | .315<br>(8.00) | .250<br>(6.35) | .36<br>(9.14) | .315<br>(8.00) | .250<br>(6.35) | .141±.003<br>(3.58±0.07) | .163±.004<br>(4.14±0.10) | .15  | 3.81  | 29.75        |  |  |  |  |  |  |  |  |
| KQ1506-24    | 24.00 | 609.60  |               |                |                |               |                |                |                          |                          | .15  | 3.81  | 32.03        |  |  |  |  |  |  |  |  |
| KQ1506-26    | 26.00 | 660.40  |               |                |                |               |                |                |                          |                          | .20  | 5.08  | 34.32        |  |  |  |  |  |  |  |  |
| KQ1506-30    | 30.00 | 762.00  |               |                |                |               |                |                |                          |                          | .20  | 5.08  | 38.89        |  |  |  |  |  |  |  |  |
| KQ1506-32    | 32.00 | 812.80  |               |                |                |               |                |                |                          |                          | .20  | 5.08  | 41.18        |  |  |  |  |  |  |  |  |
| KQ1506-36    | 36.00 | 914.40  |               |                |                |               |                |                |                          |                          | .30  | 7.62  | 45.75        |  |  |  |  |  |  |  |  |
| KQ1506-39.4  | 39.37 | 1000.00 |               |                |                |               |                |                |                          |                          | .30  | 7.62  | 49.63        |  |  |  |  |  |  |  |  |
| KQ1506-40    | 40.00 | 1016.00 |               |                |                |               |                |                |                          |                          | .30  | 7.62  | 50.32        |  |  |  |  |  |  |  |  |
| KQ1506-48    | 48.00 | 1219.20 |               |                |                |               |                |                |                          |                          | .40  | 10.16 | 61.75        |  |  |  |  |  |  |  |  |
| KQ1506-50    | 50.00 | 1270.00 |               |                |                |               |                |                |                          |                          | .40  | 10.16 | 72.15        |  |  |  |  |  |  |  |  |
| KQ1506-59.1  | 59.06 | 1500.00 |               |                |                |               |                |                |                          |                          | .40  | 10.16 | 73.18        |  |  |  |  |  |  |  |  |
| KQ1506-60    | 60.00 | 1524.00 |               |                |                |               |                |                |                          |                          | .40  | 10.16 | 73.18        |  |  |  |  |  |  |  |  |
| KQ1506-72    | 72.00 | 1828.80 |               |                |                |               |                |                |                          |                          | .40  | 10.16 | 86.90        |  |  |  |  |  |  |  |  |
| KQ1506-78.7  | 78.74 | 2000.00 |               |                |                |               |                |                |                          |                          | .40  | 10.16 | 94.55        |  |  |  |  |  |  |  |  |
|              |       |         |               |                |                |               |                |                |                          |                          |      |       |              |  |  |  |  |  |  |  |  |
|              |       |         |               |                |                |               |                |                |                          |                          |      |       |              |  |  |  |  |  |  |  |  |
|              |       |         |               |                |                |               |                |                |                          |                          |      |       |              |  |  |  |  |  |  |  |  |
|              |       |         |               |                |                |               |                |                |                          |                          |      |       |              |  |  |  |  |  |  |  |  |
|              |       |         |               |                |                |               |                |                |                          |                          |      |       |              |  |  |  |  |  |  |  |  |
|              |       |         |               |                |                |               |                |                |                          |                          |      |       |              |  |  |  |  |  |  |  |  |
|              |       |         |               |                |                |               |                |                |                          |                          |      |       |              |  |  |  |  |  |  |  |  |
|              |       |         |               |                |                |               |                |                |                          |                          |      |       |              |  |  |  |  |  |  |  |  |
|              |       |         |               |                |                |               |                |                |                          |                          |      |       |              |  |  |  |  |  |  |  |  |
|              |       |         |               |                |                |               |                |                |                          |                          |      |       |              |  |  |  |  |  |  |  |  |

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



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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.

| <b>Specification</b>  | <b>Test/Inspection Condition</b>   | <b>Reference/Spec</b>            |
|-----------------------|--|----------------------------------|
| Operating Temperature | -45° C to 125° C<br>Ambient Environment                                      | Individual Model Data Sheet      |
| Storage Temperature   | -45° C to 125° C<br>Ambient Environment                                      | Individual Model Data Sheet      |
| Thermal Shock         | -55° to 125°C, 100 Cycles  | MIL-STD-202, 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                     |                                  |
| Connector Durability  | 500 mating/unmating cycles   | MIL-PRF-39012E, PARAGRAPH 4.6.12 |