



Mini-Circuits

HAND  
FLEX™

# Coaxial Cable

086-3SMR+

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

## THE BIG DEAL

- Wideband frequency coverage, DC to 18 GHz
- Low Loss, 0.3 dB at 18 GHz
- Excellent Return Loss, 21 dB at 18 GHz
- Hand formable to almost any custom shape without special bending tools
- 6mm bend radius for tight installations
- Anti-torque nut prevents cable stress during installation
- Insulated outer jacket standard<sup>1</sup>
- Connector interface, meets MIL-STD-348
- Ideal for interconnect of assembled systems



Generic photo used for illustration purposes only

|            |                      |
|------------|----------------------|
| Model No.  | 086-3SMR+            |
| Case Style | KP1679-3             |
| Connectors | Right Angle SMA-Male |

## APPLICATIONS

- Replacement for custom bent 0.086" semi-rigid cables
- Communication receivers and transmitters
- Military and aerospace system
- Environmental and test chambers

### +RoHS Compliant

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

## PRODUCT OVERVIEW

The 086 Series Hand-Flex™ Coaxial Cables are ideal for interconnection of coaxial components or sub-systems. 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 gold plated, brass 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. |
| 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 33 dB to 6 GHz and 21 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: <ul style="list-style-type: none"><li>• 211W at 0.5 GHz</li><li>• 35W at 18 GHz</li></ul> | Mini-Circuits 086 Cable series can support medium to high RF power levels enabling these cables to be used in the transmit path. NOTE: 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 connector body during installation alleviating risk of stress to the connector/cable interface.                                                                                                      |
| Jacketed and Unjacketed options                                                                                           | Standard 086 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. Un-jacketed versions are available upon request.                                                                  |
| Right angle SMA connectors                                                                                                | Avoids multiple right angle bends and improves reliability.                                                                                                                                                                                                                                   |

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## ELECTRICAL SPECIFICATIONS AT +25°C

| Parameter           | Frequency (GHz) | Min. | Typ. | Max. | Units  |
|---------------------|-----------------|------|------|------|--------|
| Frequency Range     |                 | DC   |      | 18   | GHz    |
| Length <sup>2</sup> |                 | 3    |      |      | inches |
| Insertion Loss      | DC - 2          | —    | 0.14 | 0.32 | dB     |
|                     | 2 - 6           | —    | 0.23 | 0.56 |        |
|                     | 6 - 10          | —    | 0.24 | 0.73 |        |
|                     | 10 - 18         | —    | 0.39 | 1.00 |        |
| Return Loss         | DC - 2          | 23   | 31   | —    | dB     |
|                     | 2 - 6           | 23   | 25   | —    |        |
|                     | 6 - 10          | 17   | 23   | —    |        |
|                     | 10 - 18         | 16   | 18   | —    |        |

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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**086-3SMR+**

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

## CABLE CONSTRUCTION



Center Conductor: Silver Plated Copper Clad Steel

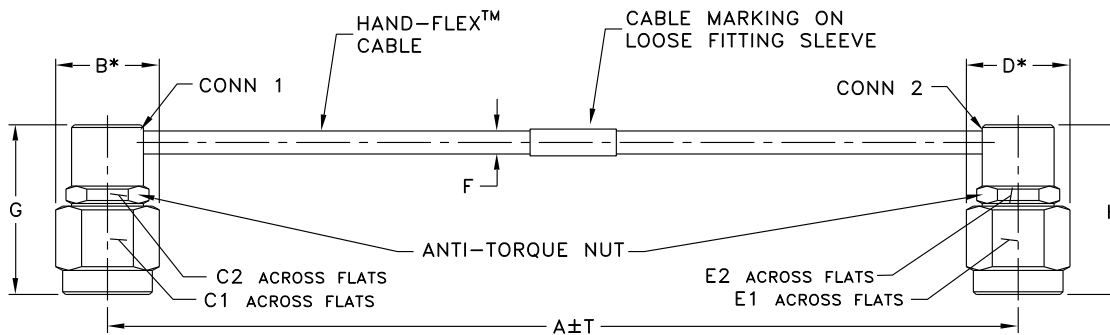
Dielectric: Solid PTFE

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: Brass, Gold Plated

## OUTLINE DRAWING



\* OVERALL CONNECTOR DIMENSION  
(CONNECTOR SHAPE MAY VARY)

## OUTLINE DIMENSIONS (Inch/mm)

| A     | B    | C1   | C2   | D    | E1   | E2   | F    | G     | H     | T    | wt    |
|-------|------|------|------|------|------|------|------|-------|-------|------|-------|
| 3.0   | .36  | .313 | .250 | .36  | .313 | .250 | .108 | 0.634 | 0.634 | 0.05 | grams |
| 76.20 | 9.14 | 7.95 | 6.35 | 9.14 | 7.95 | 6.35 | 2.74 | 16.10 | 16.10 | 1.27 | 8.17  |

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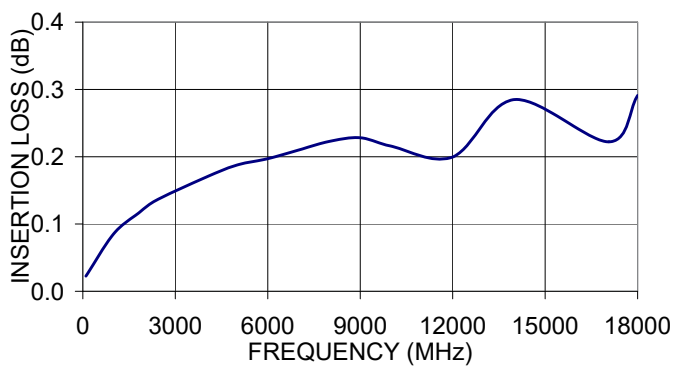
086-3SMR+

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

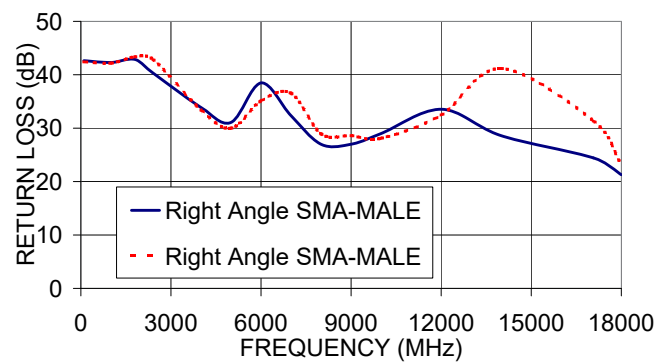
## TYPICAL PERFORMANCE DATA AND CHARTS

| Frequency<br>(MHz) | Insertion Loss<br>(dB) | Return Loss<br>(dB)     |                         |
|--------------------|------------------------|-------------------------|-------------------------|
|                    |                        | Right Angle<br>SMA-Male | Right Angle<br>SMA-Male |
| 100                | 0.02                   | 42.6                    | 42.4                    |
| 1000               | 0.09                   | 42.3                    | 42.2                    |
| 1800               | 0.12                   | 42.9                    | 43.4                    |
| 2404               | 0.14                   | 40.3                    | 42.9                    |
| 4001               | 0.17                   | 33.9                    | 33.4                    |
| 5000               | 0.19                   | 31.1                    | 30.0                    |
| 6000               | 0.20                   | 38.5                    | 35.1                    |
| 7001               | 0.21                   | 32.3                    | 36.6                    |
| 8001               | 0.22                   | 27.0                    | 28.9                    |
| 9000               | 0.23                   | 27.0                    | 28.6                    |
| 10000              | 0.22                   | 29.0                    | 28.1                    |
| 12001              | 0.20                   | 33.5                    | 32.5                    |
| 14001              | 0.28                   | 28.6                    | 41.2                    |
| 17069              | 0.22                   | 24.4                    | 31.4                    |
| 18000              | 0.29                   | 21.3                    | 23.2                    |

086-3SMR+  
INSERTION LOSS



086-3SMR+  
RETURN LOSS

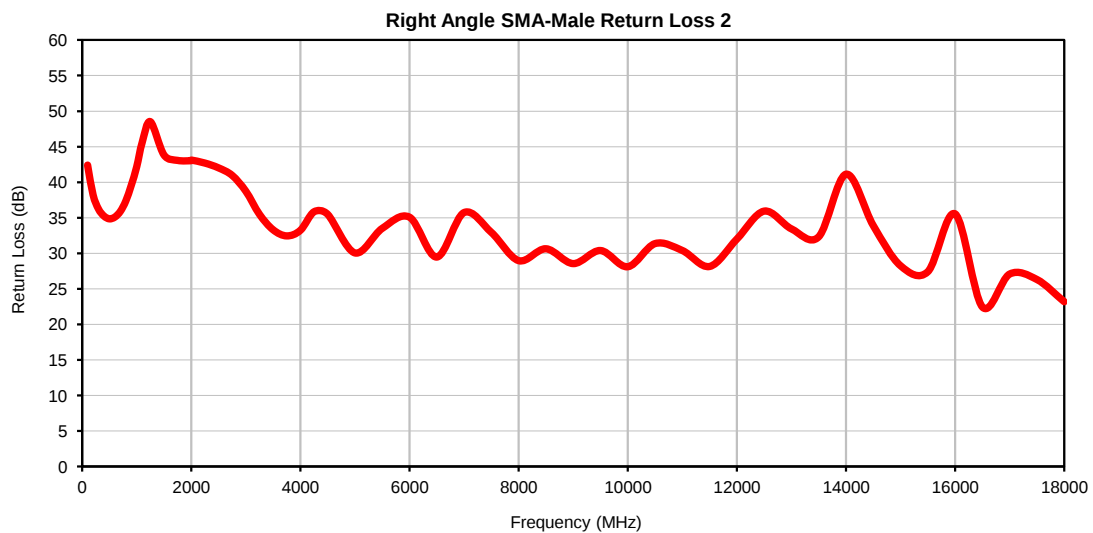
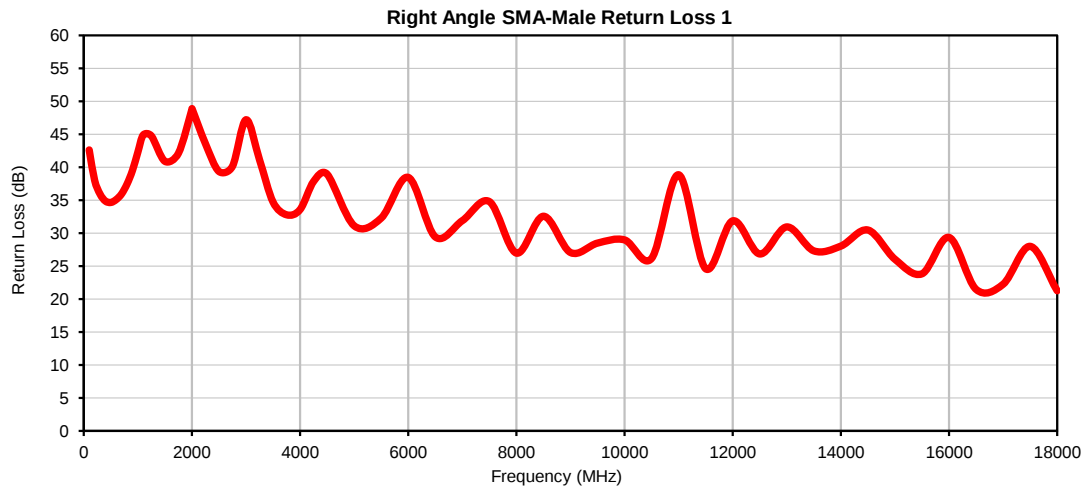


Mini-Circuits

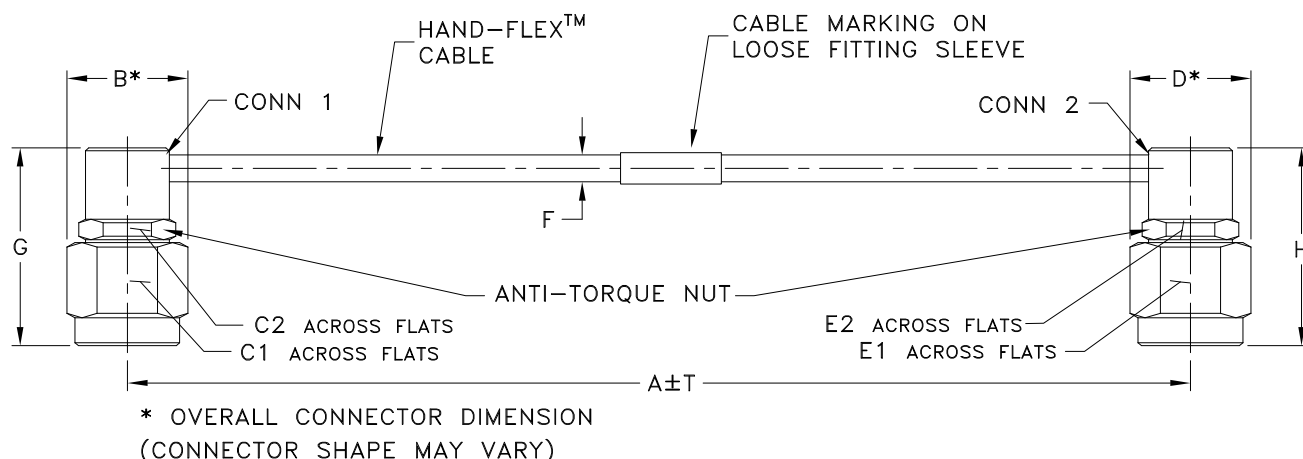
**Typical Performance Data**

| FREQUENCY<br>(MHz) | INSERTION<br>LOSS<br>(dB) | RIGHT ANGLE<br>SMA-MALE 1<br>RETURN LOSS<br>(dB) | RIGHT ANGLE<br>SMA-MALE 2<br>RETURN LOSS<br>(dB) |
|--------------------|---------------------------|--------------------------------------------------|--------------------------------------------------|
| 100.0              | 0.02                      | 42.6                                             | 42.4                                             |
| 200.0              | 0.03                      | 38.0                                             | 38.2                                             |
| 300.0              | 0.04                      | 36.0                                             | 36.2                                             |
| 400.0              | 0.05                      | 34.9                                             | 35.2                                             |
| 500.0              | 0.06                      | 34.7                                             | 34.9                                             |
| 600.0              | 0.06                      | 35.1                                             | 35.1                                             |
| 700.0              | 0.07                      | 36.0                                             | 35.9                                             |
| 800.0              | 0.07                      | 37.5                                             | 37.4                                             |
| 900.0              | 0.08                      | 39.5                                             | 39.6                                             |
| 1000.0             | 0.09                      | 42.3                                             | 42.2                                             |
| 1100.0             | 0.09                      | 44.9                                             | 45.6                                             |
| 1250.0             | 0.10                      | 44.8                                             | 48.5                                             |
| 1500.0             | 0.11                      | 40.9                                             | 43.8                                             |
| 1750.0             | 0.11                      | 42.1                                             | 43.1                                             |
| 2000.0             | 0.12                      | 48.8                                             | 43.0                                             |
| 2001.0             | 0.12                      | 48.9                                             | 43.1                                             |
| 2250.0             | 0.13                      | 43.6                                             | 42.7                                             |
| 2500.0             | 0.14                      | 39.4                                             | 42.0                                             |
| 2750.0             | 0.14                      | 40.2                                             | 41.0                                             |
| 3000.0             | 0.15                      | 47.2                                             | 38.7                                             |
| 3250.0             | 0.15                      | 41.1                                             | 35.5                                             |
| 3500.0             | 0.16                      | 34.7                                             | 33.3                                             |
| 3750.0             | 0.17                      | 32.8                                             | 32.5                                             |
| 4000.0             | 0.17                      | 33.6                                             | 33.2                                             |
| 4250.0             | 0.18                      | 37.9                                             | 35.8                                             |
| 4500.0             | 0.18                      | 39.0                                             | 35.5                                             |
| 5000.0             | 0.19                      | 31.1                                             | 30.1                                             |
| 5500.0             | 0.19                      | 32.3                                             | 33.5                                             |
| 6000.0             | 0.20                      | 38.5                                             | 35.1                                             |
| 6500.0             | 0.20                      | 29.5                                             | 29.5                                             |
| 7000.0             | 0.20                      | 31.9                                             | 35.7                                             |
| 7500.0             | 0.20                      | 34.8                                             | 32.9                                             |
| 8000.0             | 0.22                      | 27.0                                             | 29.0                                             |
| 8500.0             | 0.22                      | 32.6                                             | 30.6                                             |
| 9000.0             | 0.23                      | 27.1                                             | 28.6                                             |
| 9500.0             | 0.22                      | 28.5                                             | 30.4                                             |
| 10000.0            | 0.22                      | 29.0                                             | 28.1                                             |
| 10500.0            | 0.23                      | 26.2                                             | 31.4                                             |
| 11000.0            | 0.19                      | 38.9                                             | 30.4                                             |
| 11500.0            | 0.23                      | 24.6                                             | 28.1                                             |
| 12000.0            | 0.20                      | 31.9                                             | 32.0                                             |
| 12500.0            | 0.25                      | 26.9                                             | 35.9                                             |
| 13000.0            | 0.16                      | 31.0                                             | 33.4                                             |
| 13500.0            | 0.24                      | 27.3                                             | 32.3                                             |
| 14000.0            | 0.18                      | 28.1                                             | 41.1                                             |
| 14500.0            | 0.19                      | 30.5                                             | 33.9                                             |
| 15000.0            | 0.23                      | 26.1                                             | 28.2                                             |
| 15500.0            | 0.24                      | 23.9                                             | 27.4                                             |
| 16000.0            | 0.19                      | 29.4                                             | 35.6                                             |
| 16500.0            | 0.24                      | 21.5                                             | 22.4                                             |
| 17000.0            | 0.24                      | 22.3                                             | 27.1                                             |
| 17500.0            | 0.25                      | 28.0                                             | 26.3                                             |
| 18000.0            | 0.29                      | 21.3                                             | 23.2                                             |

## Typical Performance Curves



### Outline Dimensions



#### KP1679 SERIES

RIGHT ANGLE SMA MALE (CONN-1)

RIGHT ANGLE SMA MALE (CONN-2)

| CASE<br>STYLE # | A     |        | B             | C1             | C2             | D             | E1             | E2             | F                                   |                        | G               | H               | T    |      | WEIGHT<br>GRAMS |
|-----------------|-------|--------|---------------|----------------|----------------|---------------|----------------|----------------|-------------------------------------|------------------------|-----------------|-----------------|------|------|-----------------|
|                 | INCH  | MM     |               |                |                |               |                |                | 086U-<br>ASMR+                      | 086-<br>ASMR+          |                 |                 | INCH | MM   |                 |
| KP1679-2        | 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) | .089 $\pm$ .002<br>(2.26 $\pm$ .05) | .108 NOM<br>(2.74 NOM) | .654<br>(16.61) | .654<br>(16.61) | .05  | 1.27 | 7.71            |
| KP1679-3        | 3.00  | 76.20  |               |                |                |               |                |                |                                     |                        |                 |                 | .05  | 1.27 | 8.17            |
| KP1679-4        | 4.00  | 101.60 |               |                |                |               |                |                |                                     |                        |                 |                 | .05  | 1.27 | 8.63            |
| KP1679-5        | 5.00  | 127.00 |               |                |                |               |                |                |                                     |                        |                 |                 | .05  | 1.27 | 9.09            |
| KP1679-6        | 6.00  | 152.40 |               |                |                |               |                |                |                                     |                        |                 |                 | .05  | 1.27 | 9.54            |
| KP1679-7        | 7.00  | 177.80 |               |                |                |               |                |                |                                     |                        |                 |                 | .10  | 2.54 | 10.00           |
| KP1679-8        | 8.00  | 203.20 |               |                |                |               |                |                |                                     |                        |                 |                 | .10  | 2.54 | 10.46           |
| KP1679-9        | 9.00  | 228.60 |               |                |                |               |                |                |                                     |                        |                 |                 | .10  | 2.54 | 10.91           |
| KP1679-10       | 10.00 | 254.00 |               |                |                |               |                |                |                                     |                        |                 |                 | .10  | 2.54 | 11.37           |
| KP1679-11       | 11.00 | 279.40 |               |                |                |               |                |                |                                     |                        |                 |                 | .10  | 2.54 | 11.83           |
| KP1679-12       | 12.00 | 304.80 |               |                |                |               |                |                |                                     |                        |                 |                 | .10  | 2.54 | 12.28           |
| KP1679-14       | 14.00 | 355.60 |               |                |                |               |                |                |                                     |                        |                 |                 | .15  | 3.81 | 13.20           |
| KP1679-18       | 18.00 | 457.20 |               |                |                |               |                |                |                                     |                        |                 |                 | .15  | 3.81 | 15.03           |
| KP1679-24       | 24.00 | 609.60 |               |                |                |               |                |                |                                     |                        |                 |                 | .15  | 3.81 | 17.77           |

Unless otherwise specified dimensions are in inches (mm).

Tolerances: 2Pl.  $\pm$  .03; 3Pl.  $\pm$  .015

#### Note:

1. 086 Hand-Flex™ Coaxial Cable.
2. "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 | -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                     |                             |