



Mini-Circuits

COAXIAL

Precision Fixed Attenuator **BW-40N250W+**

50Ω 250W 40dB DC to 8000 MHz N-Male to N-Female

## THE BIG DEAL

- Wideband Operation, DC to 8000 MHz
- High Power Handling, 250W
- Excellent VSWR, 1.11 Typ.
- Excellent flatness,  $\pm 0.4$  dB Typ.
- Uni-directional power rating



Generic photo used for illustration purposes only

## APPLICATIONS

- Test and Measurement Equipment
- LTE & 5G MIMO Infrastructure
- Satellite Communications
- Radar, EW, and ECM Defense Systems

|            |                    |
|------------|--------------------|
| Model No.  | BW-40N250W+        |
| Case Style | GH3249             |
| Connectors | N-Male to N-Female |

**+RoHS Compliant**

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

## PRODUCT OVERVIEW

Mini-Circuits' BW-40N250W+ is a 40 dB coaxial precision fixed unidirectional attenuator providing high power handling of up to 250W over the DC to 8 GHz frequency range. This model supports many of high-power applications requiring precise attenuation over a broad frequency range including high-power measurement, instrumentation, and more. It provides excellent VSWR (1.11 typ.), outstanding attenuation flatness ( $\pm 0.7$  dB) and excellent thermal stability from -55 to 125 °C. It features rugged construction with N-male to N-female connectors and heat dissipation fins for efficient cooling.

## KEY FEATURES

| Features                                        | Advantages                                                                                                                                                                                    |
|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Wideband Operation, DC to 8000 MHz              | Wide frequency range makes the BW-40N250W+ suitable for a wide variety of applications.                                                                                                       |
| High power handling to 250W                     | Supports high-power test lab and system applications by protecting sensitive test equipment that is often damaged when exposed to high RF input power.                                        |
| Excellent VSWR, 1.1:1 typ.                      | Well-matched for 50Ω systems; reduces effects of phase variation                                                                                                                              |
| Excellent flatness, $\pm 0.7$ dB                | Provides consistent attenuation performance across the entire frequency band.                                                                                                                 |
| Rugged construction                             | Excellent durability for a long lifetime of use                                                                                                                                               |
| Wide operating temperature range, -55 to 125 °C | Designed with heat dissipation fins for efficient cooling, the BW-40N250W+ provides reliable performance over extreme operating conditions. Note: See max power derating at high temperature. |



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## ELECTRICAL SPECIFICATIONS AT 25°C

| Parameter                                | Condition (MHz) | Min.  | Typ.  | Max.  | Units |
|------------------------------------------|-----------------|-------|-------|-------|-------|
| Frequency Range                          | -               | DC    | -     | 8000  | MHz   |
| Attenuation                              | DC-2000         | 38.75 | 40.33 | 41.25 | dB    |
|                                          | 2000-4000       | 38.75 | 40.38 | 41.25 |       |
|                                          | 4000-6000       | 38.5  | 40.07 | 41.5  |       |
|                                          | 6000-8000       | 38    | 39.46 | 42    |       |
| Attenuation Flatness (±)                 | DC-8000         | -     | 0.4   | -     | dB    |
| VSWR                                     | DC-2000         | -     | 1.04  | 1.20  | :1    |
|                                          | 2000-4000       | -     | 1.10  | 1.35  |       |
|                                          | 4000-6000       | -     | 1.16  | 1.40  |       |
|                                          | 6000-8000       | -     | 1.08  | 1.50  |       |
| Input Power (N- Male Input) <sup>1</sup> | DC-8000         | -     | -     | 250   | W     |
| Input Power (N- Female Output)           | DC-8000         | -     | -     | 15    | W     |

1. Max. input power at 25°C ambient, derate to 25W at 125°C.

## ABSOLUTE MAXIMUM RATINGS

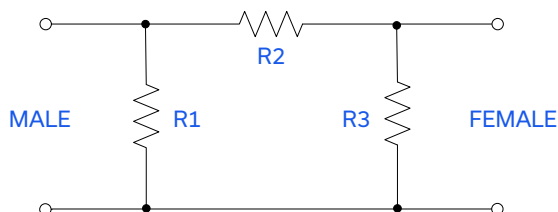
| Parameter                     | Ratings           |
|-------------------------------|-------------------|
| Operating Case Temperature    | -55 °C to +125 °C |
| Storage Temperature           | -55 °C to +125 °C |
| Input Power (N-Male Input)    | 250 Watt          |
| Input Power (N-Female Output) | 15 Watt           |
| Input Peak Power <sup>2</sup> | 1000 Watt.        |

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

2. Peak power &lt;5 μSEC. PW, /&lt;0.1% duty cycle.

▲ This model is uni-directional relative to the specific power rating i.e the power rating at the N-Male port is not equal to the power rating for signals input to the N-Female port.

## FUNCTIONAL DIAGRAM





## COAXIAL

# Precision Fixed Attenuator **BW-40N250W+**

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50  $\Omega$  250W 40dB DC to 8000 MHz N-Male to N-Female

### COAXIAL CONNECTIONS

|        |          |
|--------|----------|
| Input  | N-Male   |
| Output | N-Female |

### CONNECTOR SPECIFICATIONS

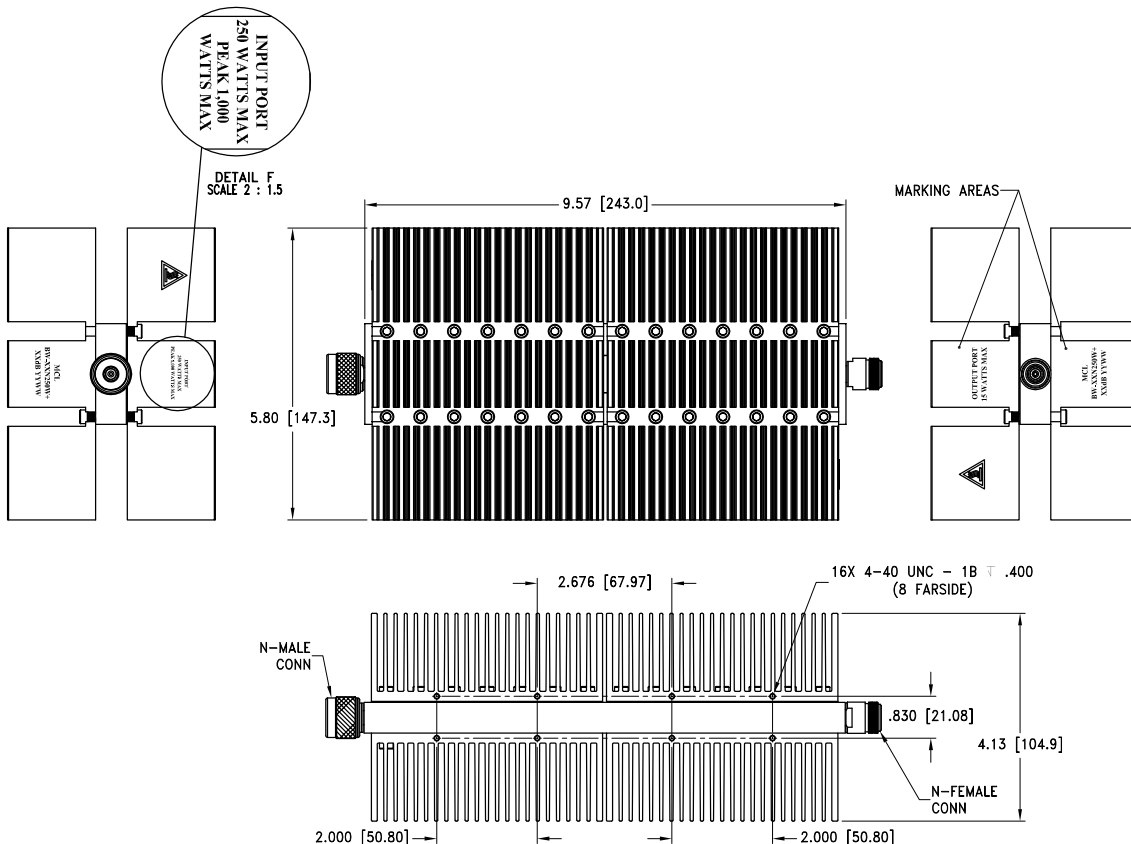
| Description     | Connector 1                    | Connector 2 |
|-----------------|--------------------------------|-------------|
| Type            | N-Male                         | N-Female    |
| Orientation     | Straight                       |             |
| Mounting Type   | Standard                       |             |
| Impedance       | 50 $\Omega$                    |             |
| Coupling Nuts   | Stainless Steel, Silver Plated |             |
| Center Contacts | BeCu, Silver Plated            |             |

### MECHANICAL SPECIFICATIONS

|                             |                                                                                       |
|-----------------------------|---------------------------------------------------------------------------------------|
| Housing                     | Aluminum Alloy, Chemical Conversion Coat                                              |
| Heat Sinks                  | Aluminum Alloy, Black Anodize Finish (0.5°C/Watt) <sup>1</sup>                        |
| Internal Resistive Elements | Beryllium Oxide Or Aluminum Nitride Ceramic With Thick Film And/Or Thin Film Resistor |

1. Heat sink thermal rise (calculated)

### OUTLINE DRAWING



Weight (MAX.): 3820 grams

Dimensions are in inches (mm). Tolerances: 2 PL  $\pm$ .05[1.27]; 3 PL  $\pm$ .030[.77]





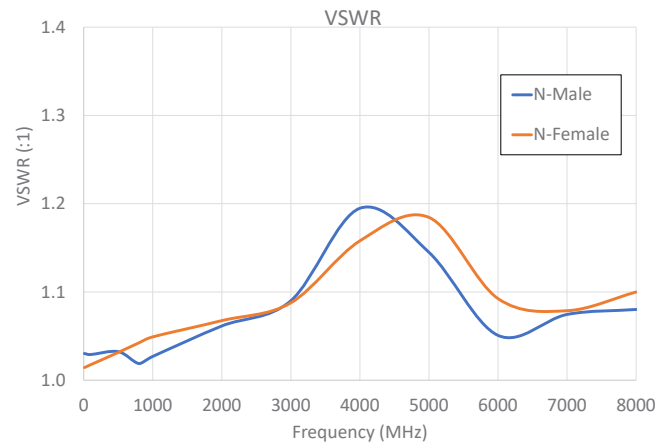
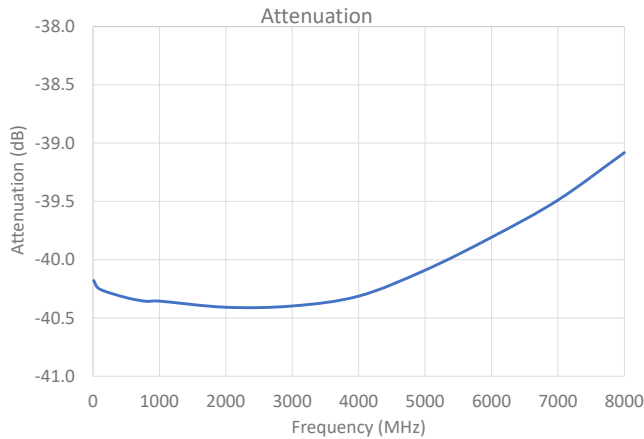
COAXIAL

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50Ω 250W 40dB DC to 8000 MHz N-Male to N-Female

## TYPICAL PERFORMANCE CURVES



### 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)



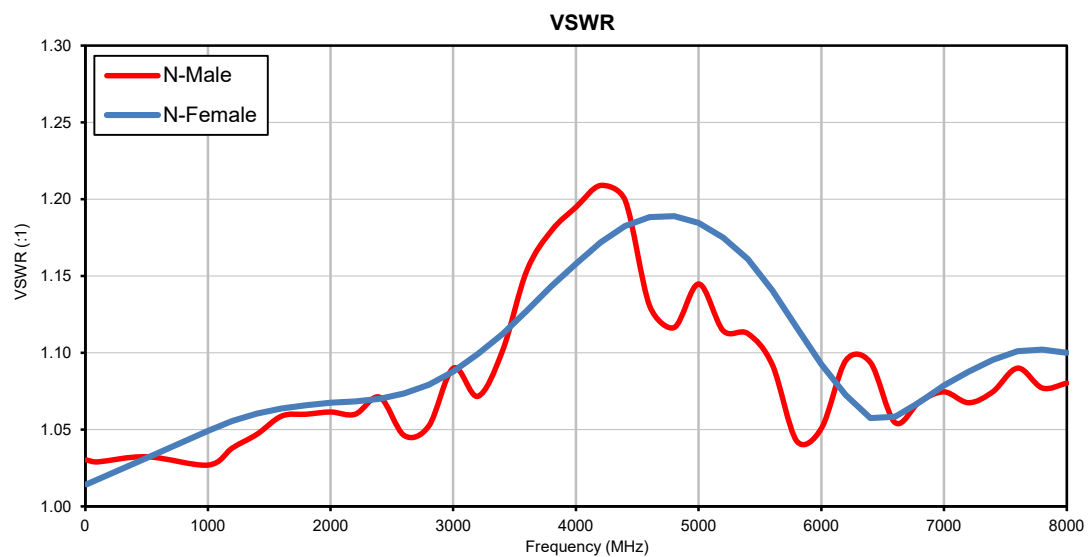
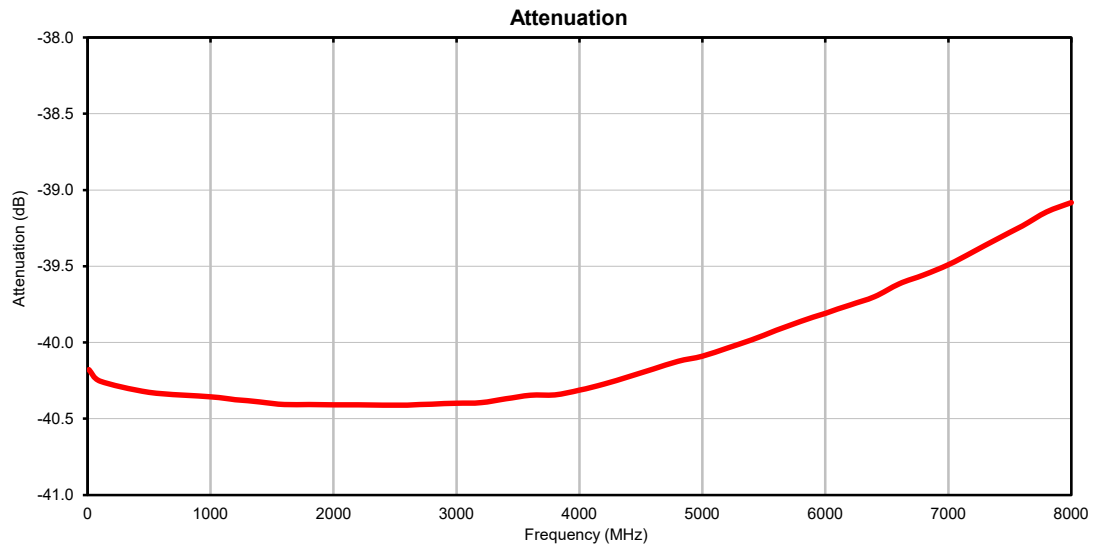
# Fixed Attenuator

# BW-40N250W+

## Typical Performance Data

| FREQUENCY<br>(MHz) | ATTENUATION<br>(dB) | VSWR (:1) |          |
|--------------------|---------------------|-----------|----------|
|                    |                     | N-Male    | N-Female |
| 10                 | 40.18               | 1.03      | 1.01     |
| 100                | 40.25               | 1.03      | 1.02     |
| 500                | 40.33               | 1.03      | 1.03     |
| 1000               | 40.36               | 1.03      | 1.05     |
| 1200               | 40.37               | 1.04      | 1.06     |
| 1400               | 40.39               | 1.05      | 1.06     |
| 1600               | 40.41               | 1.06      | 1.06     |
| 1800               | 40.41               | 1.06      | 1.07     |
| 2000               | 40.41               | 1.06      | 1.07     |
| 2200               | 40.41               | 1.06      | 1.07     |
| 2400               | 40.41               | 1.07      | 1.07     |
| 2600               | 40.41               | 1.05      | 1.07     |
| 2800               | 40.40               | 1.05      | 1.08     |
| 3000               | 40.40               | 1.09      | 1.09     |
| 3200               | 40.39               | 1.07      | 1.10     |
| 3400               | 40.37               | 1.10      | 1.11     |
| 3600               | 40.35               | 1.15      | 1.13     |
| 3800               | 40.34               | 1.18      | 1.14     |
| 4000               | 40.31               | 1.19      | 1.16     |
| 4200               | 40.27               | 1.21      | 1.17     |
| 4400               | 40.22               | 1.20      | 1.18     |
| 4600               | 40.17               | 1.13      | 1.19     |
| 4800               | 40.12               | 1.12      | 1.19     |
| 5000               | 40.09               | 1.14      | 1.18     |
| 5200               | 40.04               | 1.11      | 1.18     |
| 5400               | 39.98               | 1.11      | 1.16     |
| 5600               | 39.92               | 1.09      | 1.14     |
| 5800               | 39.86               | 1.04      | 1.12     |
| 6000               | 39.81               | 1.05      | 1.09     |
| 6200               | 39.75               | 1.10      | 1.07     |
| 6400               | 39.70               | 1.09      | 1.06     |
| 6600               | 39.61               | 1.05      | 1.06     |
| 6800               | 39.56               | 1.07      | 1.07     |
| 7000               | 39.49               | 1.07      | 1.08     |
| 7200               | 39.41               | 1.07      | 1.09     |
| 7400               | 39.32               | 1.07      | 1.10     |
| 7600               | 39.24               | 1.09      | 1.10     |
| 7800               | 39.14               | 1.08      | 1.10     |
| 8000               | 39.08               | 1.08      | 1.10     |

## Typical Performance Curves

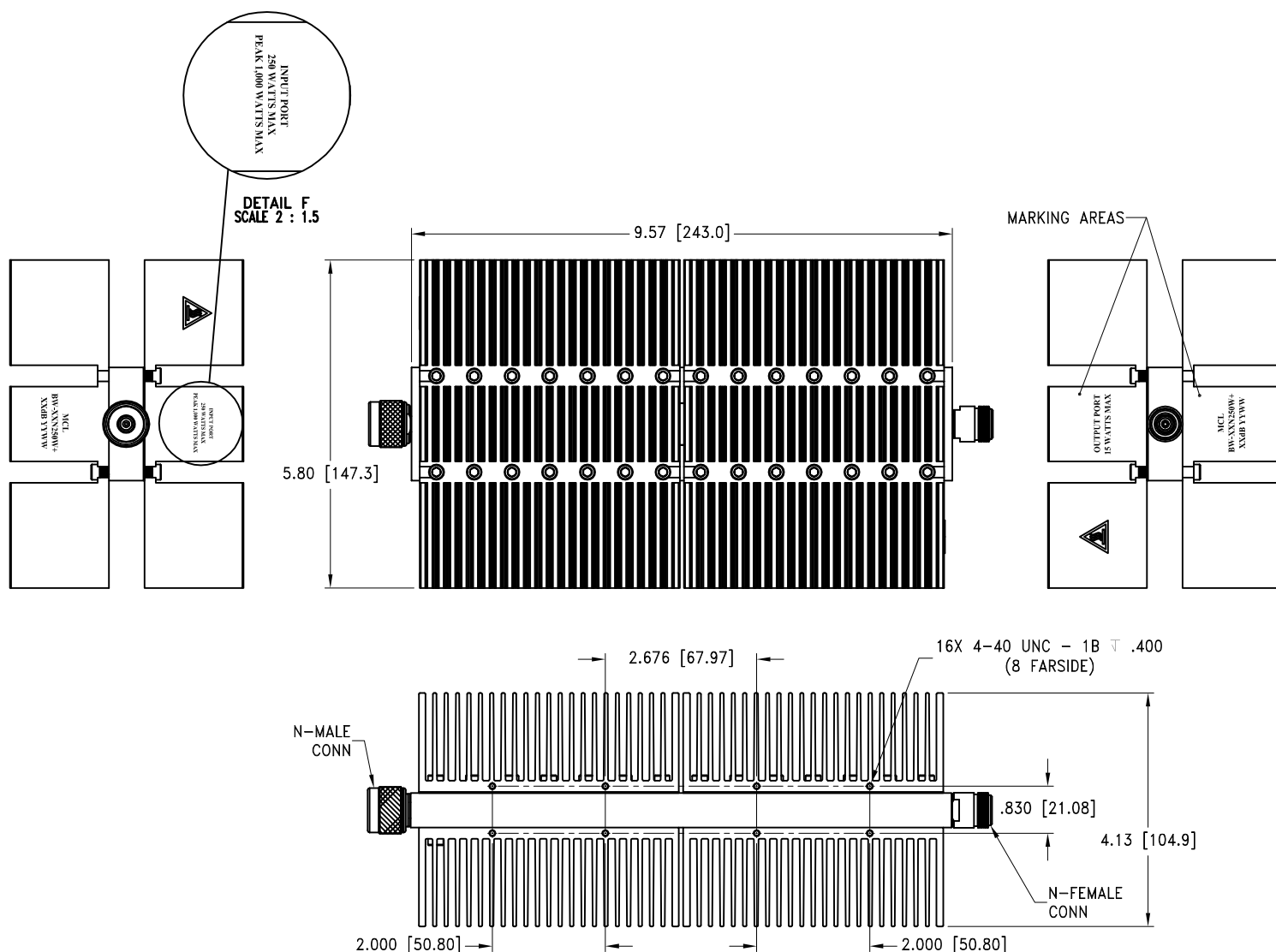


# Case Style

## Outline Dimensions

**GH**

**GH3249**



Weight (MAX.): 3820 grams

Dimensions are in inches (mm). Tolerances: 2 Pl.  $\pm .05$  [1.27]; 3 Pl.  $\pm .030$  [.77]

### Notes:

1. Case material: Aluminum alloy
2. Case Finish: Chemical conversion coat
3. Heat sinks material: Aluminum alloy
4. Heat sinks Finish: Black anodize

**Mini-Circuits®**

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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 125° C<br>Ambient Environment                                               | Individual Model Data Sheet          |
| Storage Temperature        | -55° to 125° C<br>Ambient Environment                                               | Individual Model Data Sheet          |
| Thermal Shock              | -55° to 125°C, 5 cycles                                                             | MIL-STD-202, Method 107              |
| Vibration (High Frequency) | 20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36) | MIL-STD-202, Method 204, Condition D |
| Mechanical Shock           | 100g, 6ms sawtooth, 3 shocks each direction 3 axes (total 18)                       | MIL-STD-202, Method 213, Condition I |
| Connector Durability       | 500 mating/unmating cycles                                                          | MIL-PRF-39012E, PARAGRAPH 4.6.12     |