



AE-AN-TR-004-TR Multicoax Series Environmental Performance

Purpose:

This application note provides detailed information on how the TR Multicoax Series performs in different environmental conditions.

Temperature Rating:

- Using MIL-STD 810G testing standards, we compiled the following data. MIL-STD 810G is a standard issued by the United States Army's Developmental Test Command. The standard consists of a series of various environmental tests to prove that equipment qualifies to the standards needed to survive in the field.
- The resulting temperature test of the TR Multicoax Series connectors shows us that the safe operating temperatures for the device land in the -40 to 120°C range, with the maximum temperature being 125°C before material deformation.

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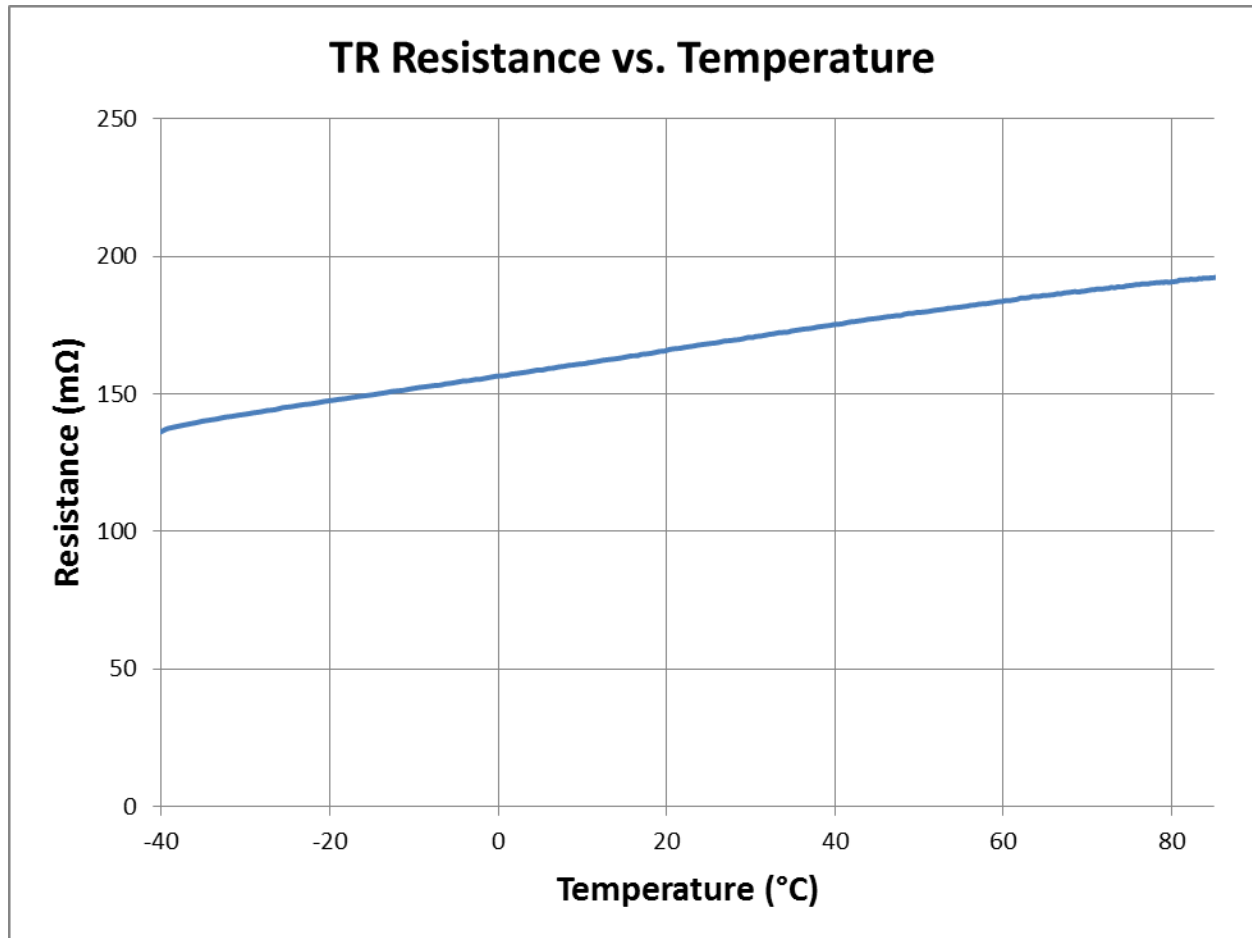


Figure 1: Resistance Tolerance: $\pm 17 \text{ m}\Omega$ at (21.1 °C)

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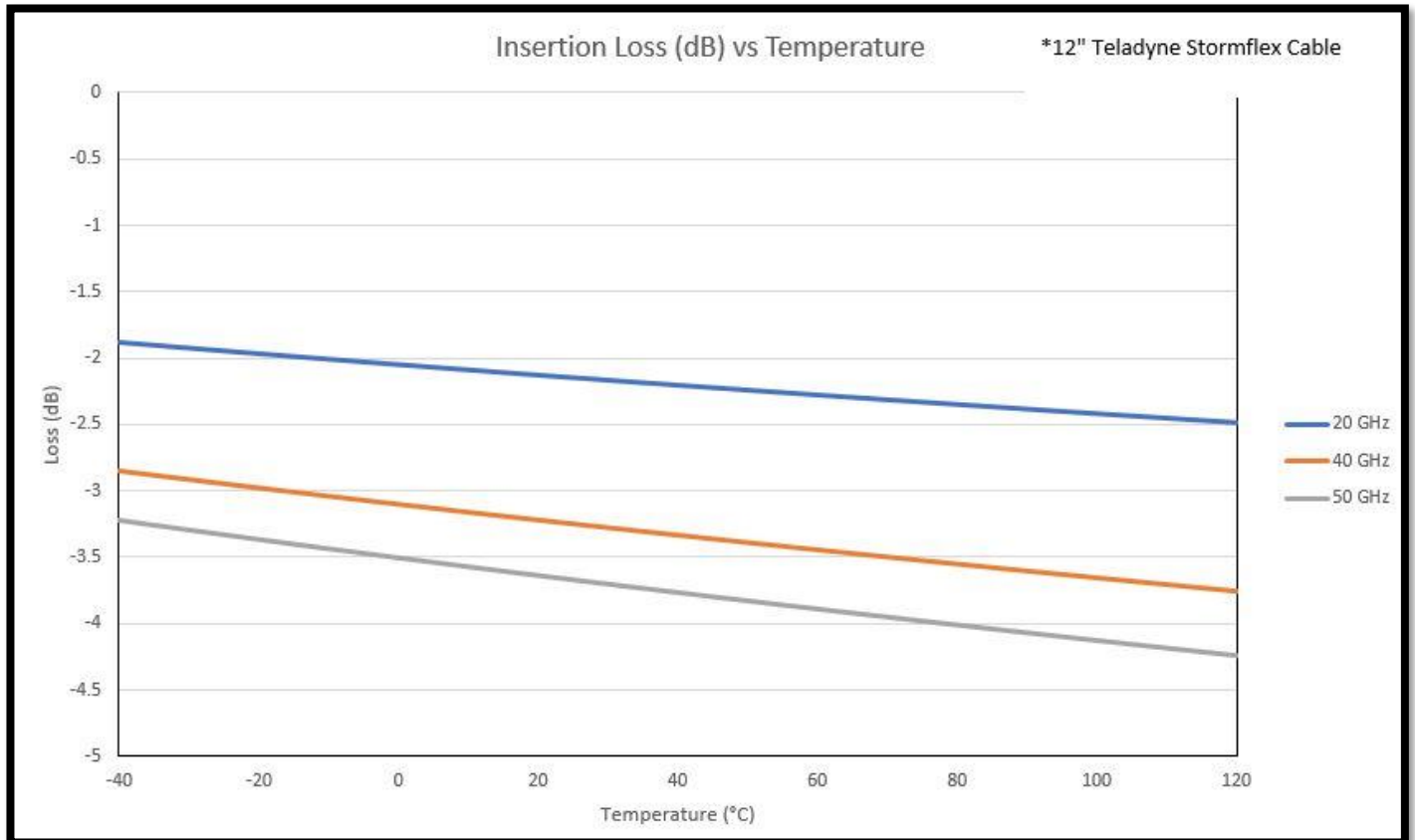


Figure 2: Insertion Loss vs. Temperature

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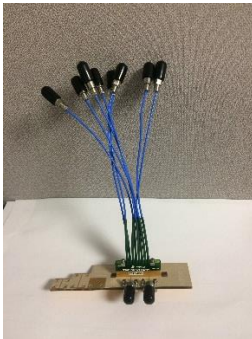
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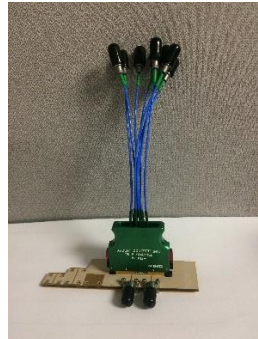
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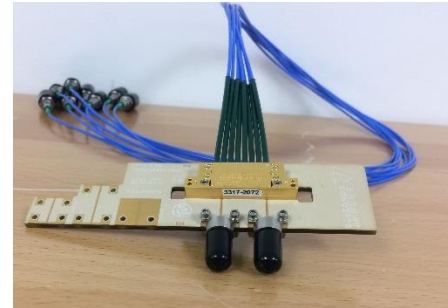
Evaluation Kit Temperature Performance:



**Figure 2: TR Straight
Mount on Evaluation
Board**



**Figure 3: TR Quick Latch
on Evaluation Board**



**Figure 4: TR Right Angle on
Evaluation Board**

Above you can see three of our TR Multicoax Series Connectors attached to the evaluation boards. Amphenol Ardent supplies evaluation kits upon request, allowing our customers to test our promised performance themselves.

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The following graph depicts the S-parameter data of the TR Multicoax Series Connectors, tracking performance under various temperature tests on Amphenol Ardent’s own evaluation kit. As you can see the performance stays very consistent in that -40 to 120°C range stated earlier.

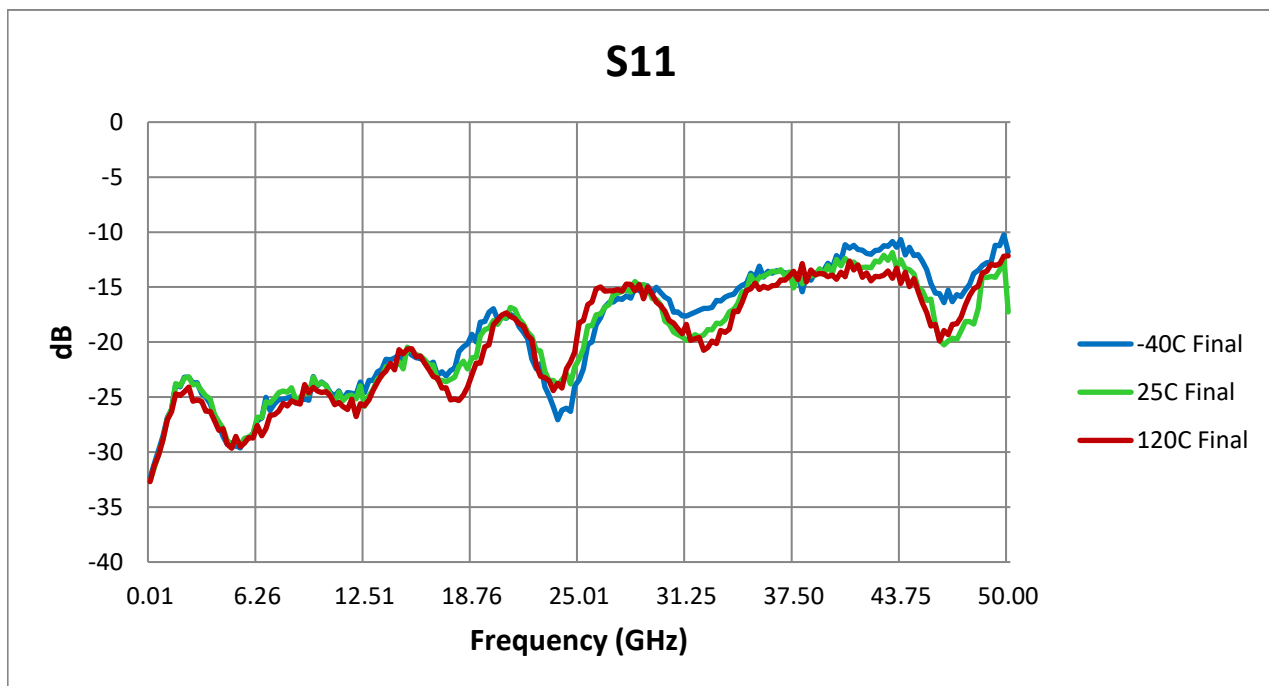


Figure 2: S-parameter data for -40 to 120°C temperature range

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Humidity and Frost Rating:

- We tested the TR Multicoax Series connector for both frost and humidity standards, and again it met the United States Army's Developmental Test Command MIL-STD 810G standard.

Tension Performance:

As tension is applied to the cable of a TR Multicoax Series Assembly, the geometry of the cable will change. As the cable stretches the coax center conductor will contract.

- The maximum pull strength the TR Multicoax Series Assembly can handle before at risk of failing electrically is 2.5 lbs. of tension static load.

NOTE: The minimum pull force required for an open varies, the average value is 5.5 lbs.

NOTE: A static load is defined as not having rotational moment pull forces or variable pull force loads.

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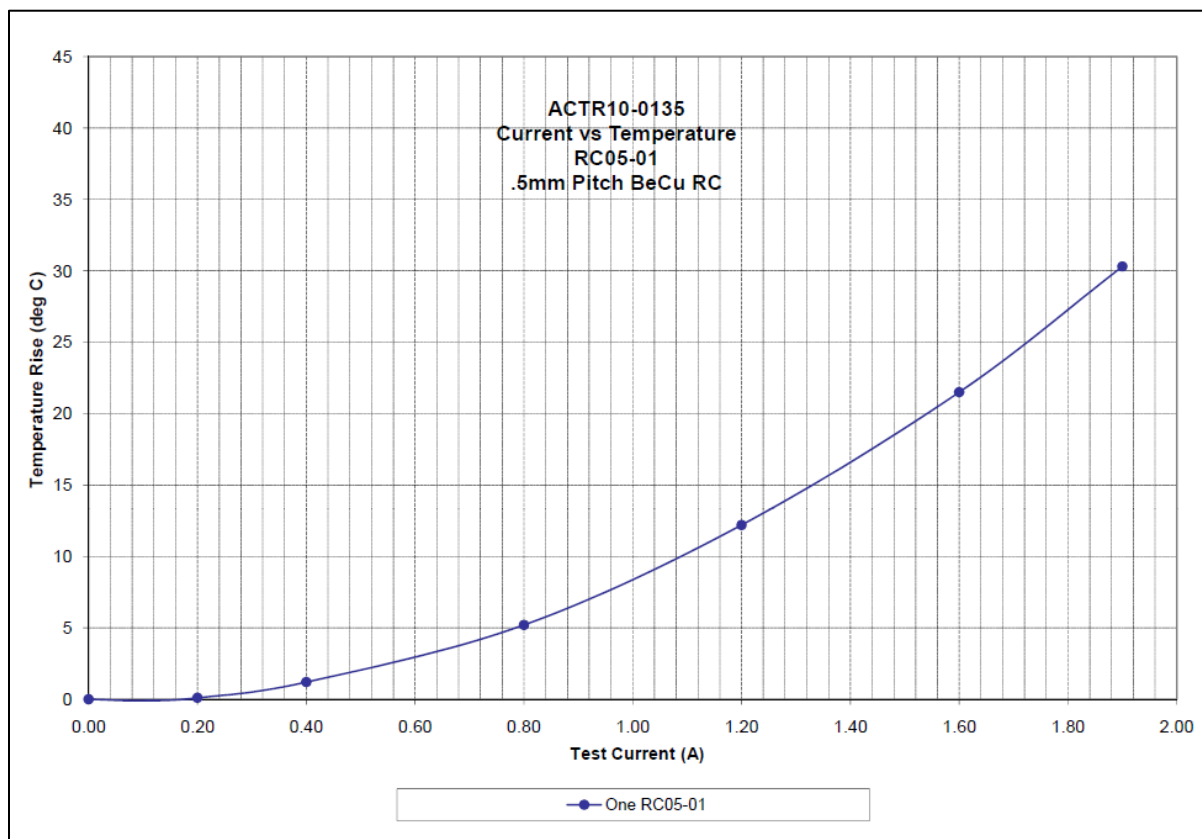
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Current Capacity:

The graph below shows the temperature rise from room temperature (approximately 22.5°C) as current is increased. Amphenol Ardent defines the max current to occur at the point where the temperature rises to 30°C. However, the test data was considered for only one contact, as more contacts are used the faster and higher the temperature will go over a given average amperage.

NOTE: The safe working current for a TR Multicoax Series is 1 Amp/channel.



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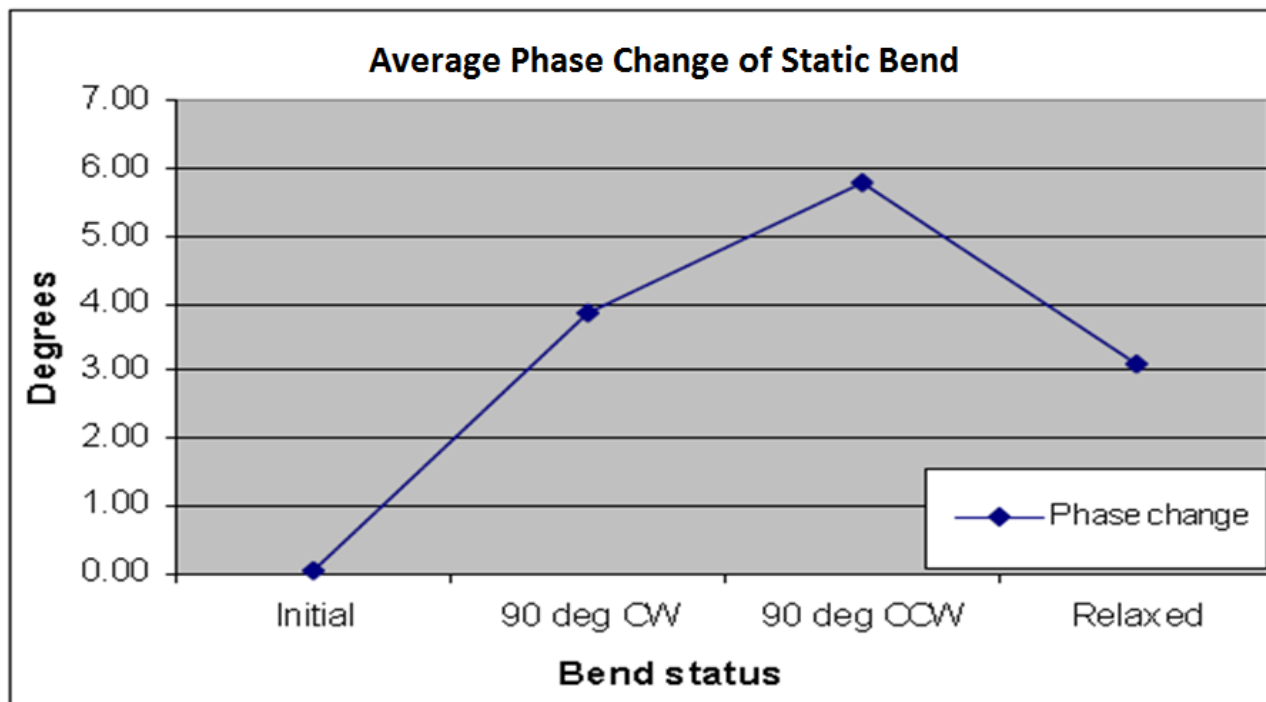
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Bend Radius:

Minimum Centerline Bend Radius: .100" /2.54mm



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Application Note Summary:

- TR Multicoax Series is designed to meet MIL-STD 810G for temperature humidity and frost.
- Maximum temperature before Material Deformation: 125°C.
- Maximum pull strength before at risk of failing electrically is 2.5 lbs. of tension static load.
- Minimum pull force required for an open varies, the average value is 5.5 lbs.
- The safe working current for a TR Multicoax Series is 1 Amp/channel.

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Who Is Amphenol Ardent Concepts?

Amphenol Ardent Concepts is a leading designer and manufacturer of high performance multicoax and coaxial assemblies, connectors, and sockets used in the development of next generation semiconductors and electronics systems. Our core technology is the smallest, fastest, most electrically efficient compression mount connector technology worldwide. As data rate requirements increase and devices and systems shrink, Ardent's products deliver superior signal integrity in a dense footprint that can be reusable across programs to maximize cost savings.

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