Society of Cable Telecommunications Engineers

ENGINEERING COMMITTEE
Interface Practices Subcommittee

AMERICAN NATIONAL STANDARD

ANSI/SCTE 47 2007

Test Method for Coaxial Cable Attenuation

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1.0 SCOPE

1.1. Measurement technique for determining attenuation of coaxial cable at various selected frequencies.

2.0 EQUIPMENT

2.1. Network Analyzer: Agilent 8753 or equivalent 75-ohm network analyzer. Minimum loss matching pads may be used if necessary.

2.2. Network analyzer calibration kit, appropriate for the connector type being used. Standard Agilent calibration kits (85039B F-Type and 85036B N-Type) are specified to 3 GHz.

2.3. Environmental chamber or room capable of maintaining 68°F (20°C) and large enough to accommodate cable sample to be tested.

2.4. Thermometer consisting of a digital multimeter and thermal probe or any device capable of accurately measuring the temperature inside the environmental chamber.

2.5. Cable preparation and connector installation tools as required.

2.6. Drop Cable Test

Proper “F” connector for size drop cable or the appropriate size laboratory connector.

2.7. Hardline Cable Test

Push-on type test connectors cable to “N” for the proper size of Hardline cable or the appropriate size field connector.

3.0 BLOCK DIAGRAM

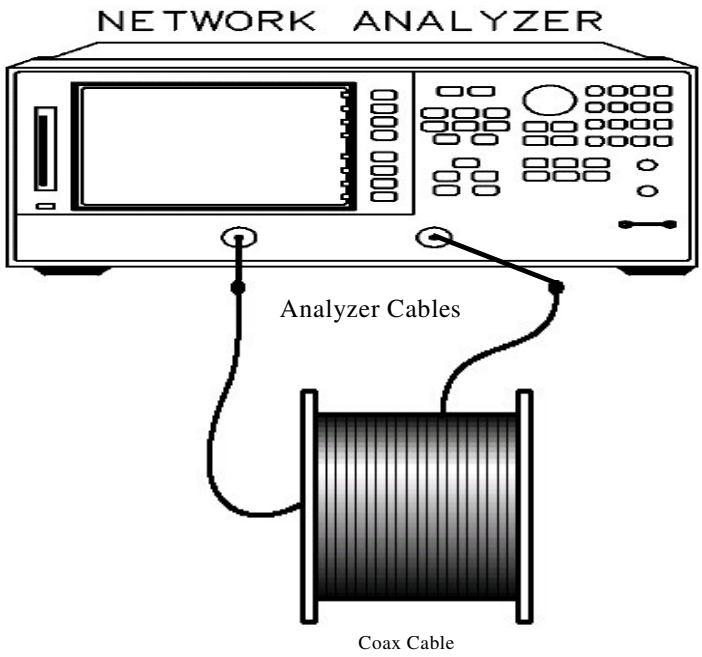

Figure 1 – Network Analyzer Test Setup

4.0 TEST SAMPLES

4.1. Prepare known lengths of cable. Samples should exhibit at least 0.5 dB loss at the lowest frequency tested.

4.2. Cut the ends of the cable and prepare them to accept the appropriate connector.

4.3. Install test connectors on the cable sample per the manufacturer's recommendations.

4.4. Place cable samples in an environmental chamber set to 68°F (20°C) and allow the test samples to stabilize at that temperature for a period of at least 2 hours.

5.0 TEST METHOD

5.1.Network Analyzer:

5.1.1. Prior to calibration and testing, allow the network analyzer to warm up as described in the operations manual.

5.1.2. Incorporate the desired frequency points in question to be measured within the analyzers register.

5.1.3. Set List Frequency to "Stepped" to utilize stepped list mode.

NOTE: When using "Stepped" all the listed frequency points are sorted as CW points in ascending order. The network analyzer measures each point and builds a single trace from the composite of all data. With the stepped CW sweep the sweep time is slower than when using a continuous sweep for the same number of points.

5.1.4. Attach test leads to the two ports of the analyzer.

5.1.5. Connect the test leads together using an adaptor from the appropriate calibration kit.

5.1.6. Select Calibration menu on analyzer and perform a "Thru" calibration.

NOTE: If minimum loss matching pads are required, make sure they are part of the transmission path during calibration or that the attenuation they contribute is measured separately and subtracted from the overall attenuation of the cable + minimum loss pad combination on a point-by-point basis.

5.1.7. Connect the cable ends to the test leads or test ports from the network analyzer and allow at least one full sweep across the entire frequency range..

5.1.8. Record signal loss at each frequency listed in the register or run automated program and print out results.

5.2.Attenuation Conversion

5.2.1. The conversion from dB/length to dB/100 feet is:

$$\text{Attenuation in dB/100 feet} = 100 \times \frac{\text{Attenuation (dB/length)}}{\text{Length (feet)}}$$

6.0 INSPECTION/REPORT FORM

Cable Type:		**Sample Number:**
Date:		
FREQUENCY MHz	**ATTENUATION dB/100 ft.**	**ATTENUATION (dB/100m)**