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**Test Method for
Dielectric Withstand of Coaxial Cable**

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140 Philips Road

Exton, PA 19341

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1.0 SCOPE AND DEFINITIONS

- 1.1 The purpose of this document is to provide a test standard for detecting flaws in the insulation (sometimes referred to as the dielectric) of a completed coaxial cable. This test, usually referred to as a Hipot or Dielectric Withstand Test, verifies that the insulation can withstand a specified voltage applied between the center conductor and outer conductor for a specified time interval, without resulting in a dielectric breakdown. Upon successful completion of this hipot test, it can be concluded that the inner and outer conductors are properly insulated from each other.
- 1.2 Under normal operating conditions there will be a small amount of leakage current within the dielectric of any product (in this case the insulation between the center and outer conductors of a coaxial cable). However, if 2 conductors are not properly insulated from each other, the application of high voltage can cause dielectric breakdown. Dielectric breakdown results in excessive current flow that is substantially larger than the nominal leakage current for the dielectric material being tested.
- 1.3 Traditionally, either an AC or DC voltage may be used for the test. The DC voltage used should be the peak of the equivalent AC (RMS) voltage, or 1.414 times the AC (RMS) voltage.

2.0 AC VS. DC HIPOT TESTING

- 2.1 AC and DC hipot tests have inherent advantages and disadvantages depending on the application they are used for. Some advantages of an AC hipot test include: an AC voltage stresses a cable's insulation in both polarities; it is unnecessary to allow the coaxial cable to discharge; it is unnecessary to apply an AC voltage gradually. Some advantages of a DC hipot test include: a DC hipot doesn't need to have a high output current capacity; the application of a DC voltage allows the hipot to clearly display true leakage current; a DC hipot can be used to test highly capacitive products using far less power.
- 2.2 A hipot test is used to apply high voltage to the insulation of a coaxial cable and make sure that the leakage current produced is limited to an acceptable level. This leakage current is limited by the cable's shunt impedance resulting from the parallel capacitance and the insulation resistance between the two conductors.
- 2.3 A big advantage of the DC hipot test is that the current due to the capacitance falls to zero when the cable is exposed to a constant DC voltage. Therefore, the hipot measures and displays only the true resistive leakage current. Thus the test operator can be assured that the inductive reactance isn't coming into play when performing a DC hipot test. However, there is another current component to consider when applying a DC voltage to a coaxial cable. As the DC voltage