SCTE · ISBE

STANDARDS

Interface Practices Subcommittee

AMERICAN NATIONAL STANDARD

ANSI/SCTE 44 2018

Test Method for DC Loop Resistance

NOTICE

The Society of Cable Telecommunications Engineers (SCTE) / International Society of Broadband Experts (ISBE) Standards and Operational Practices (hereafter called "documents") are intended to serve the public interest by providing specifications, test methods and procedures that promote uniformity of product, interchangeability, best practices and ultimately the long-term reliability of broadband communications facilities. These documents shall not in any way preclude any member or non-member of SCTE•ISBE from manufacturing or selling products not conforming to such documents, nor shall the existence of such standards preclude their voluntary use by those other than SCTE•ISBE members.

SCTE•ISBE assumes no obligations or liability whatsoever to any party who may adopt the documents. Such adopting party assumes all risks associated with adoption of these documents, and accepts full responsibility for any damage and/or claims arising from the adoption of such documents.

Attention is called to the possibility that implementation of this document may require the use of subject matter covered by patent rights. By publication of this document, no position is taken with respect to the existence or validity of any patent rights in connection therewith. SCTE•ISBE shall not be responsible for identifying patents for which a license may be required or for conducting inquiries into the legal validity or scope of those patents that are brought to its attention.

Patent holders who believe that they hold patents which are essential to the implementation of this document have been requested to provide information about those patents and any related licensing terms and conditions. Any such declarations made before or after publication of this document are available on the SCTE•ISBE web site at http://www.scte.org.

140 Philips Road
Exton, PA 19341

Table of Contents

List of Figures

List of Tables

1. Introduction

1.1. Executive Summary

When attempting to place standardized performance values on a product, it is necessary to also provide standardized test methods to ensure repeatability of measurements. This document is intended to provide such a test method for the performance requirement of DC Loop Resistance of coaxial cables.

1.2. Scope

This document is intended for use in determining the DC Loop Resistance of coaxial cables. Due to low resistances, a four-wire test method is used.

1.3. Benefits

This document is designed to benefit manufacturers and end users of product tested to this procedure by supplying a standardized method for determining DC Loop Resistance values of coaxial cable.

1.4. Intended Audience

This document is intended for anyone desiring to make industry standard DC Loop Resistance measurements of coaxial cable, or for anyone acquiring product purported to have been tested using this method.

1.5. Areas for Further Investigation or to be Added in Future Versions

There are none at this time.

2. Normative References

The following documents contain provisions, which, through reference in this text, constitute provisions of this document. At the time of Subcommittee approval, the editions indicated were valid. All documents are subject to revision; and while parties to any agreement based on this document are encouraged to investigate the possibility of applying the most recent editions of the documents listed below, they are reminded that newer editions of those documents might not be compatible with the referenced version.

2.1. SCTE References

- No normative references are applicable.

2.2. Standards from Other Organizations

- No normative references are applicable.

2.3. Published Materials

- No normative references are applicable.

3. Informative References

The following documents might provide valuable information to the reader but are not required when complying with this document.

3.1. SCTE References

- No informative references are applicable.

3.2. Standards from Other Organizations

- MIL-STD-202G (Table 107-II).

3.3. Published Materials

- No informative references are applicable.

4. Compliance Notation

shall	This word or the adjective "***required***" means that the item is an absolute requirement of this document.
shall not	This phrase means that the item is an absolute prohibition of this document.
forbidden	This word means the value specified shall never be used.
should	This word or the adjective "*recommended*" means that there may exist valid reasons in particular circumstances to ignore this item, but the full implications should be understood and the case carefully weighted before choosing a different course.
should not	This phrase means that there may exist valid reasons in particular circumstances when the listed behavior is acceptable or even useful, but the full implications should be understood and the case carefully weighed before implementing any behavior described with this label.
may	This word or the adjective "*optional*" means that this item is truly optional. One vendor may choose to include the item because a particular marketplace requires it or because it enhances the product, for example; another vendor may omit the same item.
deprecated	Use is permissible for legacy purposes only. Deprecated features may be removed from future versions of this document. Implementations should avoid use of deprecated features.

5. Equipement

- Keysight 34420A Micro-Ohm Meter or equivalent.
- Four wire test leads as required.
- Thermal chamber capable of maintaining 68°F (20°C)

6. Procedure

1. Strip approximately 1 inch (2.54 cm) of the insulation exposing the inner conductor on both ends of the cable under test. Also, expose enough outer conductor or braid to make a good connection with the test leads. Cables tested on a reel must be constructed with outer jacket insulation.
2. Calibrate the micro-ohm meter by connecting the leads together and performing the appropriate trim or calibration as required by the manufacturer.
3. Connect the measurement leads, see **Error! Reference source not found.**, one lead to the center conductor on one end of the cable, and the other lead directly to the same conductor on the opposite end. Measure DC resistance. Record this value as R_{cc}.
4. Following the same procedure connect one test lead to the outer conductor of the cable, and the other directly to the same conductor on the opposite end. Measure DC resistance. Record this value as R_{oc}.
5. After both conductors of the cable have been measured, determine temperature of test in degrees F.

Note: Cable should stabilize in its environment for 24 hours.

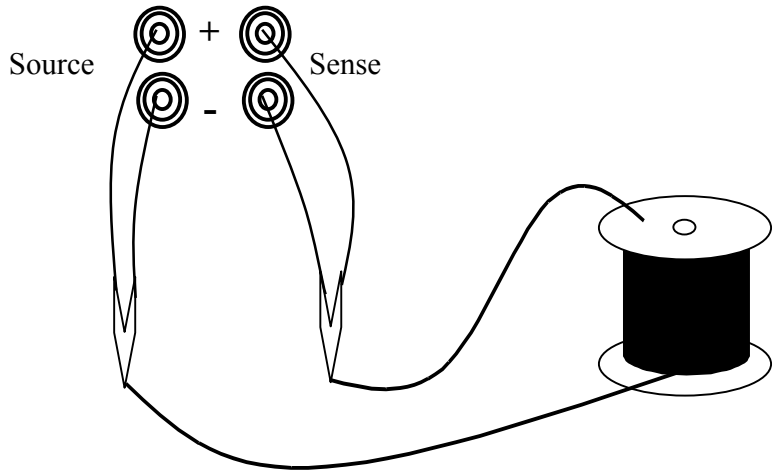

Figure 1 - 4 Wire DC Resistance Measurement

Note: Ensure a good connection of the leads to the conductor(s) under test.

Table 1 – Weight of specimen

Weight of specimen	Minimum duration (Hours)
1 ounce (28 grams and below)	0.25
Above 1 ounce (28 grams) to .3 pound (136 grams), inclusive	0.5
Above .3 pounds (136 grams) to 3 pounds (1.36 kilograms), inclusive	1
Above 3 pounds (1.36 kilograms) to 30 pounds (13.6 kilograms), inclusive	2
Above 30 pounds (13.6 kilograms) to 300 pounds (136 kilograms), inclusive	4
Above 300 pounds (136 kilograms)	8

7. Calculations

1. The conductor resistance varies with length and temperature. The conversion from per reel or length to specified values are as follows:
   $R_{Loop} = (R_{cc} + R_{oc})$

   Where:

   R_{cc} = Center Conductor Resistance
   R_{oc} = Outer Conductor Resistance

   Resistance, Ohms per 1000 feet = $(R_{Loop} * 1000)/L$ (feet)

   Resistance, Ohms per 1000 meter = $(R_{Loop} * 1000)/L$ (meters)

   Where:

   R_{Loop} = Measured Loop Resistance (Ohms)
   L = Length of Reel (Feet) or (Meters)

2. Resistance requirements are given at 68° F (20° C). Prior to measurement, the product shall be conditioned at 68° F (20° C) for a duration as stated in the following table, based on the products mass.

8. Report

Table 2 – Report table

Date of Test		
Specimen Identification (Type, Reel #, etc.)		
Resistance	Inner Conductor	
	Outer Conductor	
	Loop	
Specimen Length		
Temperature of Test		

9. Accuracy

The accuracy of this measurement depends on several factors. Since the DC resistance values are specified in Ohms/(1000 feet) or (km), one should measure a length ≥1000 feet for drop cable and a length ≥ 2000 feet for Trunk & Distribution type cable. Also, the accuracy of the recorded specimen length, the recorded temperature, and lead connections are important. Overall accuracy, however, can be assumed within the published accuracy figures for the meter itself considering the resistance value being measured.