

SCTE • ISBE **S T A N D A R D S**

Interface Practices Subcommittee

AMERICAN NATIONAL STANDARD

ANSI/SCTE 109 2016

**Test Procedure for Common Path Distortion
(CPD)**

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>.

All Rights Reserved

© Society of Cable Telecommunications Engineers, Inc. 2018
140 Philips Road
Exton, PA 19341

Table of Contents

Title	Page Number
NOTICE	2
Table of Contents	3
1. Scope	4
2. Normative References	4
2.1. SCTE References	4
2.2. Standards from Other Organizations	4
2.3. Published Materials	4
3. Informative References	4
3.1. SCTE References	4
3.2. Standards from Other Organizations	5
3.3. Published Materials	5
4. Compliance Notation	5
5. Abbreviations and Definitions	5
5.1. Abbreviations	5
5.2. Definitions	5
6. Equipment Requirements	6
7. Upstream Passband Characterization	6
8. Stimulus Setup	7
9. Equipment Setup (passive device)	8
10. Equipment setup (power passing device)	8
11. Test procedure	9
12. Calculating cpd	10
13. Appendix A: Data recording Template	12

List of Figures

Title	Page Number
Figure 1 - Upstream Passband Characterization	7
Figure 2 – Stimulus setup	7
Figure 3 – Test setup for passive device	8
Figure 4 - Test setup for power passing device	9
Figure 5 – Spectral response with no apparent CPD	9
Figure 6 - Thermal cycle profile	10
Figure 7 – Spectral response with CPD	11

1. Scope

The purpose of this document is to establish the standard methodology used to measure Common Path Distortion (CPD) in Cable Telecommunications Systems.

Please note that this procedure is a very unique procedure for measuring Common Path Distortion and distinguishes itself from other similar procedures in the following ways:

- Single port measurement, measures reflected energy
- Inject two forward carriers separated by 6 MHz and measure return beat at 6 MHz
- Used to verify performance of single port passives such as terminators or passives with all other ports terminated. Designed to be consistent with the mechanisms that cause common path distortion in outside plant.

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

- ANSI/SCTE 144 2012: Test Method for Insertion Gain and Loss, Frequency Response and Bandwidth

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.

Each of these procedures targets a different measurement for a unique purpose. They are independent, are specifically applicable to the device being measured, use the test equipment commonly available at the manufacturing sites used to make the device being tested, and directly measure the impairment that must be controlled. The key differences are whether they are designed for actives or passives and whether they are single port or two port measurements. Other differences are the types of distortion products being measured and the filters required to do so.

3.1. SCTE References

- ANSI/SCTE 115 2011: Test Method for Reverse Path (Upstream) Intermodulation Using Two Carriers