



***Society of Cable
Telecommunications
Engineers***

**ENGINEERING COMMITTEE
Interface Practices Subcommittee**

AMERICAN NATIONAL STANDARD

ANSI/SCTE 82 2007

**Test Method for Low Frequency
and Spurious Disturbances**

NOTICE

The Society of Cable Telecommunications Engineers (SCTE) Standards are intended to serve the public interest by providing specifications, test methods and procedures that promote uniformity of product, interchangeability and ultimately the long term reliability of broadband communications facilities. These documents shall not in any way preclude any member or nonmember of SCTE 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 members, whether used domestically or internationally.

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

Attention is called to the possibility that implementation of this standard may require use of subject matter covered by patent rights. By publication of this standard, no position is taken with respect to the existence or validity of any patent rights in connection therewith. SCTE 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 standard 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 web site at <http://www.scte.org>.

All Rights Reserved

© Society of Cable Telecommunications Engineers, Inc. 2003, 2007

140 Philips Road

Exton, PA 19341

TABLE OF CONTENTS

1.0	SCOPE AND DEFINITIONS	1
2.0	INFORMATIVE REFERENCES	1
3.0	EQUIPMENT	1
4.0	SETUP	2
5.0	PROCEDURE	5
6.0	APPENDIX 1 – SPECIAL TEST CONSIDERATIONS	9
7.0	APPENDIX 2 – MODULATION SIDEBAND LEVEL TO ACTUAL CARRIER LEVEL CORRECTION FACTOR (METHOD 1)	10
8.0	APPENDIX 3 – SIDEBAND LEVEL VS. PERCENT MODULATION ...	11
9.0	APPENDIX 4 – TEST REPORT	12

1.0 SCOPE AND DEFINITIONS

1.1 Scope

To define and measure low frequency and spurious disturbances caused by switched mode power supplies or other active devices in broadband Cable Telecommunications equipment.

1.2 Definitions

- 1.2.1 Low Frequency and Spurious Disturbances: The result of unwanted harmonic components related to the switching rate of the power supply, or frequencies generated by other active components, which exceed the system noise level within and outside the Device Under Test (DUT) system passband.
- 1.2.2 Amplitude Modulation (AM) Distortion: Amplitude Modulation caused by the interaction of a carrier signal and an undesired Low Frequency or Spurious Disturbance present in the DUT. Spurious disturbances below 1 kHz can be more accurately measured using the procedure, ANSI/SCTE 16 2007 entitled, "Test Procedure for Hum Modulation". Possible dynamic range limitations in the measurement instruments used in this procedure could cause large errors for spurious signal levels which exist at frequencies closer than 1 kHz to the carrier.

2.0 INFORMATIVE REFERENCES

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

1. ANSI/SCTE 16 2007 Test Procedure for Hum Modulation
2. ANSI/SCTE 96 2003 Cable Telecommunications Testing Guidelines

3.0 EQUIPMENT

- 3.1 The general equipment required for this test is shown in Figures 1 and 2. It is described and specified in ANSI/SCTE 96 2003, Test Procedures Introduction.
- 3.2 SA (Spectrum Analyzer), minimum input frequency range of 5 MHz to 1.002 GHz.
- 3.3 BA (Baseband Analyzer), minimum input frequency range of 5 Hz to 10 MHz.

Note: A FFT (Fast Fourier Transform Analyzer) may be used, but the user must make certain that its input frequency range is sufficient to capture all significant

harmonics of the DUT power supply switching frequency.
A BA (or FFT) is only required if Method 1 for AM Distortion (see 4.3.1) is used.

- 3.4 SG (Signal Generator). If Method 1 for AM Distortion (see 4.3.1) is used, SG must be capable of TV (downward-only AM) square-wave modulation.
- 3.5 BPF (Bandpass Filter(s)) for the frequencies under test
- 3.6 Low-noise post-amplifier of known gain (if required – see 5.1.4, 5.2.7, and 5.3.6)
- 3.7 AC/RF Power Inserter with sufficient current capability for the DUT and a minimum RF frequency range of 5 MHz to 1 GHz.

Note: AC/RF Power Inserters may not be required under certain test conditions. Refer to Appendix 1 for special test considerations.

- 3.8 Cables, pads, terminations, and adapters as required.

4.0 SETUP

- 4.1 Follow all calibration requirements recommended by the manufacturers of the signal generator, SA, and BA (or FFT), including adequate warm-up and stabilization time.
- 4.2 Forward/Reverse Band Low Frequency and Spurious Disturbance Equipment Set-up.

- 4.2.1 Connect the test equipment as shown in Figure 1.

Note: AC Power should be inserted into the output port of the DUT to obtain optimum isolation.

- 4.2.2 Configure the DUT with all appropriate fuses/power links in place. Ensure the test equipment is protected from AC by the power inserters or by utilizing AC-blocking adapters.