

CTA Standard

Low Frequency Immunity of Tuners in a Cable System

CTA-544-C R-2014

(Formerly CEA-544-C R-2014)

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**Consumer
Technology
Association**

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(Formulated under the cognizance of the CTA **R4 Video Systems Committee**.)

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FOREWORD

This standard was developed under the auspices of the Consumer Electronics Association (CEA) R4 Video Systems Committee.

Signals on cable systems below channel 2 may cause interference on broadcast receivers, especially on the low VHF channels. The return data channel signals for television cable and internet services using cable connection in the range of 5 to 42 MHz are generated by return devices such as in-home internet modems, set top boxes and two-way cable ready television receivers, any of which may be in close proximity to television receivers tuned to low VHF channels. CEA-544-C references the levels to which the tuner should be immune in the 5 – 54 MHz range, and it describes a test method to determine the tuner's immunity at those levels.

CEA-544-C supersedes CEA-544-B.

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Low Frequency Immunity of Tuners in a Cable System

1 Scope

CEA-544-C defines the measurement procedures for the low frequency (5-54 MHz) immunity of tuners in a cable system, based on requirements in FCC regulations that define the assumed levels of the desired signal, low frequency interference and the required receiver immunity. These procedures define the specific tests needed to determine compliance with the requirements.

2 References

The following regulatory references contain provisions that, through reference in this text, constitute normative provisions of this standard.

2.1 Regulatory References

2.1.1 Regulatory Reference List

FCC Regulations, 47 C.F.R. 76.605, Multichannel Video and Cable Television Service, Technical Standards

FCC Regulations, 47 C.F.R. 15.123(c)(1), Labeling of Digital Cable Ready Products

FCC Regulations, 47 C.F.R. 15.38, Incorporations by Reference

2.1.2 Regulatory Reference Acquisition

FCC Regulations:

- FCC Regulations, <http://www.access.gpo.gov/nara/cfr/cfr-table-search.html>

3 Requirements

A television receiver or video cassette recorder (VCR) in the play-thru mode (i.e., output to the TV receiver on Ch 3/4) tuned to any channel, shall have an interference output at least 53 dB below the desired signal at the IF output of the tuner within the 6 MHz IF bandwidth, which is typically 41 MHz to 47 MHz, when measured according to the procedure in CEA-544-B with signal levels as follows:

- | | | | |
|----|----------------------|--------------------|-----------------|
| a) | Interfering carrier: | -7 dBm (42 dBmV) | 5 MHz – 30 MHz |
| | | -25 dBm (24 dBmV) | 30 MHz – 41 MHz |
| | | -49 dBm (0 dBmV) | 41 MHz – 48 MHz |
| | | -59 dBm (-10 dBmV) | 48 MHz – 54 MHz |

NOTE—These levels were standardized here and subsequently used by Uni-Dir-PICS-I01-030903 which became codified by reference in FCC regulations. See 47 C.F.R. 15.123(c)(1) and 47 C.F.R. 15.38.

- b) Desired TV visual carrier: -49 dBm (0dBmV)

NOTE—This level is the minimum allowed by FCC 47 C.F.R. Part 76.605.

4 Measurement Procedure for Immunity of TV Tuners to Harmonically Generated Interference

4.1 Objective

The objective of this measurement procedure is to determine the level of interfering signals that generate harmonics in the tuner or leak through the tuner, causing visible interference in a nominal desired signal at the intermediate frequency (IF) output of a tuner under test.

The interfering input signal is referenced to a 75 ohm load, and the tuner is then substituted for this load.

4.2 Measurement of Interference Immunity