ANSI/CTA Standard

Standard Method of Measurement for Subwoofers

ANSI/CTA-2010-B

(Formerly ANSI/CEA-2010-B)

November 2014

ANSI Accredited Standards Developer

Consumer Technology Association™

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(Formulated under the cognizance of the CTA **R3 Audio Systems Committee**.)

Published by
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Technology & Standards Department
www.cta.tech

FOREWORD

The purpose of the tests described in this standard is to provide data that will help the consumer understand how loud in volume, and how low in frequency, the subwoofer is capable of operating. The reporting format of the test results should also help the consumer determine which subwoofers may work well with different full-range loudspeaker systems which carry ANSI/CEA-2034 ratings.

This standard describes how to measure and report the maximum usable sound pressure level of a subwoofer, and how to measure and report the input impedance of a passive subwoofer. It also describes how to calculate and report the required output power of the amplifier needed for the consumer to get the desired SPL from a passive subwoofer.

Finally, it includes a number of informational annexes to help readers gain a more thorough understanding of techniques for acquiring loudspeaker data in both anechoic and non-anechoic environments.

When used properly this standard should assist manufacturers in accurately measuring the capabilities of a subwoofer and specifying them to consumers. Using this in conjunction with ANSI/CEA-2034 Standard Method of Measurement for In-Home Loudspeakers for full-range loudspeaker systems, the ANSI/CEA-2010-B subwoofer ratings should make it easier for the consumer to select, purchase, and enjoy a subwoofer that will complement their main full-range loudspeaker system.

This standard was developed by the Consumer Electronics Association's Audio Systems Committee (CEA R3 Committee).

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Figures

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STANDARD METHOD OF MEASUREMENT FOR SUBWOOFERS

1 Scope

This standard defines a method for measuring the audio performance of subwoofers, both passive and powered.

2 Revision History

2.1 CEA-2010-A

Increased measurement distance from 1 m to 3 m
Corrected procedure for averaging to be done using pressure
Added Table A-3 showing example invoking rule of non-measurable SPL within one of the bandwidths

2.2 CEA-2010-B

Modified the Forward
Include passive subwoofer
Added section for testing the maximum continuous SPL
Added 80 Hz to 160 Hz test frequencies to the maximum peak SPL test
Modified the distortion threshold for the maximum peak SPL test and separated the thresholds into three separate bands. These thresholds correspond to masking thresholds for test tones of 100 dB SPL.
Added a procedure to correlate the maximum peak SPL results with the maximum continuous SPL in order to derive a broad band (from 20 Hz to 160 Hz) SPL.
Added a section for impedance measurement of passive subwoofers
Added a section for recommended amplifier size for passive subwoofers
Added a section about frequency response overlap between the subwoofer & full-range systems to gauge usefulness together
Added an appendix listing the test equipment required for the measurements specified in CEA-2010-B
Moved the section on Ground Plane Measurements to an appendix
Moved the section on Room Correction Factor to an appendix
Added an appendix for the alternate determination of maximum continuous SPL in a non-anechoic environment
Added a section for matching a subwoofer to a full-range system using ANSI/CEA-2034 ratings
Added a section for consolidated reporting requirements
Added Normative References section
Added Definitions
Added Symbols & Abbreviations
Added requirement for recording environmental conditions during testing

3 References

3.1 Normative References

The following standards contain provisions that, through reference in this text, constitute normative provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed here.