

ANSI/CTA Standard

**Personal Sound Amplification Performance
Criteria**

ANSI/CTA-2051

January 2017



**Consumer
Technology
Association™**

NOTICE

Consumer Technology Association (CTA)TM Standards, Bulletins and other technical publications are designed to serve the public interest through eliminating misunderstandings between manufacturers and purchasers, facilitating interchangeability and improvement of products, and assisting the purchaser in selecting and obtaining with minimum delay the proper product for his particular need. Existence of such Standards, Bulletins and other technical publications shall not in any respect preclude any member or nonmember of the Consumer Technology Association from manufacturing or selling products not conforming to such Standards, Bulletins or other technical publications, nor shall the existence of such Standards, Bulletins and other technical publications preclude their voluntary use by those other than Consumer Technology Association members, whether the standard is to be used either domestically or internationally.

Standards, Bulletins and other technical publications are adopted by the Consumer Technology Association in accordance with the American National Standards Institute (ANSI) patent policy. By such action, the Consumer Technology Association does not assume any liability to any patent owner, nor does it assume any obligation whatever to parties adopting the Standard, Bulletin or other technical publication.

This document does not purport to address all safety problems associated with its use or all applicable regulatory requirements. It is the responsibility of the user of this document to establish appropriate safety and health practices and to determine the applicability of regulatory limitations before its use.

This document is copyrighted by the Consumer Technology Association (CTA)TM and may not be reproduced, in whole or part, without written permission. Federal copyright law prohibits unauthorized reproduction of this document by any means. Organizations may obtain permission to reproduce a limited number of copies by entering into a license agreement. Requests to reproduce text, data, charts, figures or other material should be made to the Consumer Technology Association (CTA)TM.

(Formulated under the cognizance of the CTA **R6 Portable, Handheld and In-Vehicle Electronics Committee.**)

Published by
©CONSUMER TECHNOLOGY ASSOCIATION 2017
Technology & Standards Department
www.cta.tech

All rights reserved

FOREWORD

This standard was developed by the Consumer Technology Association's R6 Portable Handheld and In-Vehicle Electronics Committee.

(This page intentionally left blank.)

CONTENTS

1 Scope	1
2 Normative References	1
2.1.1 Normative Reference List	1
2.1.2 Normative Reference Acquisition	1
2.2 Informative References	1
2.2.1 Informative Reference List.....	1
2.2.2 Informative Reference Acquisition	2
2.3 Compliance Notation	3
3 Definitions	3
3.1 Symbols and Abbreviations	5
4 Criteria for Standardization	5
4.1 Frequency Response Bandwidth (Category 1).....	6
4.2 Frequency Response Smoothness (Category 1)	10
4.3 Maximum Acoustic Output (Category 1)	10
4.4 Distortion Control Limits (Category 1)	10
4.4.1 Output Distortion	10
4.4.2 Input Distortion	10
4.5 Self-generated Noise Levels (Category 1)	11
4.6 High Frequency Gain Provided (Category 2).....	11
4.7 Battery Life (Category 2).....	11
4.8 Latency (Category 2).....	12
4.9 RF-Immunity (Category 2).....	12
4.10 Fixed or Level Dependent Frequency Equalization - Tone Control (Category 3)	12
4.11 Level Dependent Gain/Compression (Category 3).....	12
4.12 SNR Enhancement (Category 3)	12
4.13 Noise Reduction (Category 3)	12
4.14 Feedback Control / Cancellation (Category 3).....	12
4.15 Personalization (Category 3)	13
4.15.1 General.....	13
4.15.2 Specification and Reporting	13
4.16 Device Coupling to the Ear (Category 3).....	13
4.17 Wireless Connectivity (Category 3)	13
Annex A: Maximum Acoustic Output	14

(This page intentionally left blank.)

Personal Sound Amplification Performance Criteria

1 Scope

This standard includes technical performance metrics and associated target values for consumer products that provide personal sound amplification and/or enhancement to a user. Products shall meet the stated requirements to be considered as compliant to this standard. Personal sound amplification may be a single function within a larger set of device capabilities.

Descriptions of feature specific device performance baselines and metrics of measurement are described. Device performance capabilities have been divided into feature specific sub-sections that identify: required minimum performance values, metrics of measurement necessary to identify feature specific performance values, and methods of reporting prescribed to each feature specific value.

2 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.

2.1.1 Normative Reference List

1. ANSI S3.22-2009, Specification of hearing aid characteristics
2. IEC-60118-0-2015, Electroacoustics – Hearing aids – Part 0: Measurement of the performance characteristics of hearing aids
3. IEC-60118-7-2005, Electroacoustics – Hearing aids – Part 7: Measurement of the performance characteristics of hearing aids for quality inspection for delivery

2.1.2 Normative Reference Acquisition

1. Acoustical Society of America, 1305 Walt Whitman Road, Suite 300 Melville, NY 11747, 516-576-2360, https://global.ihf.com/home_page_asa.cfm?&rid=ASA
2. International Electrotechnical Commission, 3, rue de Varembé P.O. Box 131 CH - 1211 Geneva 20 – Switzerland, +41 22 919 02 11, <http://www.iec.ch/>
3. International Electrotechnical Commission, 3, rue de Varembé P.O. Box 131 CH - 1211 Geneva 20 – Switzerland, +41 22 919 02 11, <http://www.iec.ch/>

2.2 Informative References

The following references contain provisions that, through reference in this text, constitute informative provisions of this standard. At the time of publication, the edition indicated was 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 edition of the standard indicated below.

2.2.1 Informative Reference List

1. ANSI/S1.1-2013, Acoustical terminology
2. ANSI/S3.2-2009, Method for measuring the intelligibility of speech over communication systems
3. ANSI/S3.25-2009, Occluded Ear Simulator
4. ANSI/S3.30-1995(R2008), Bioacoustical terminology
5. ANSI/S3.35-2010, Method of measurement of performance characteristics of hearing aids under simulated real-ear working conditions
6. ANSI/S3.42-Part1-1992(R2012), Part 1: Testing hearing aids with broad-band noise signal