

ICS 17.140
CCS A 59



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 20242-2025

Replacing GB/T 20242-2006

**Acoustics - Measurement of real-ear acoustical performance
characteristics of hearing aids**

声学 助听器真耳声性能特性测量

(English Translation)

Issued on: August 1, 2025

Implemented on: February 1, 2026

**Issued by: State Administration for Market Regulation, Standardization
Administration of China**

Table of Contents

Preface
Introduction
1 Scope
2 Normative references
3 Terms and Definitions
4 Test setup diagram
5 Limitations
6 Test Equipment
6.1 Safety Requirements
6.2 Environmental Requirements
6.3 Test Signal
6.4 Sound Field Source
6.5 Coupled Sound Sources
6.6 Test Signal Range
6.7 Test signal level indication
6.8 Balance
6.9 Frequency
6.10 Harmonic Distortion
6.11 Probe Microphone Measurement
6.12 Noise Floor Measurements with Probe Microphones
6.13 Attenuation of the probe microphone relative to external signals
6.14 Analytical Characteristics
6.15 Output Reading
6.16 Graphical Printout
7 Test Conditions
7.1 Test area environmental conditions
7.2 Background Noise
7.3 Acoustic properties
7.4 Sound Field Characteristics
7.5 Calibration
7.6 Balance
7.7 Test Signal Level

7.8 Subject Position	
7.9 Tester Position	
7.10 Sound Field Reference Point Position	
7.11 Measurement point location	
7.12 Guidance to Subjects	
7.13 Wearing and coupling of hearing aids	
7.14 Operating conditions of hearing aids	
8 Measurement	
8.1 Overview	
8.2 Real Ear Unaided Response (REUR) Curve	
8.3 Real Ear Unaided Gain (REUG) Curve	
8.4 Real Ear Occlusion Response (REOR) Curve	
8.5 Real Ear Occlusion Gain (REOG) Curve	
8.6 Real Ear Response (REAR) Curve	
8.7 Real Ear Aid Gain (REAG) Curve	
8.8 Real Ear Insertion Gain (REIG) Curve	
8.9 Real Ear and Coupler Cavity Difference (RECD) Curve	
8.10 Real Ear and Audiometer Reading Difference (REDD) Curve	
9 Measurement uncertainty for performance requirements in Chapter 6	
Appendix A (Informative) Placement of the Probe Sound Pickup Hole at the Measurement Point	
A.1 Overview	
A.2 Visual Placement	
A.3 Acoustic Assisted Placement	
A.4 Sound Placement --- Method 1	
A.5 Sound Placement --- Method 2	
A.6 Geometry Placement	
Appendix B (Informative) Issues Related to RECD Measurement and Application	
B.1 Overview	
B.2 Influence of coupled sound sources	
B.3 Estimation of the sound pressure level produced by a hearing aid in the ear canal	
B.4 Correction of audiograms obtained with insert earphones and standard earplugs	
B.5 Correction of audiograms obtained using insert earphones and custom earmolds	
Appendix C (Informative) Relationship between the allowable interval, the corresponding acceptance interval and the maximum allowable measurement uncertainty	
Reference	

Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document replaces GB/T 20242-2006 "Methods for measuring the acoustic characteristics of real ears for hearing aids".

In addition to structural adjustments and editorial changes, the main technical changes are as follows.

- Added the definition and test method of the real ear and coupler cavity difference (RECD) (see 3.37, 8.9);
- Added the definition and test method of the real ear and audiometer reading difference (REDD) (see 3.38, 8.10);
- Added the International Speech Test Signal (ISTS) as the preferred speech-like test signal (see Chapter 6).

This document is equivalent to IEC 61669:2015 "Methods for measuring the real-ear acoustic characteristics of electroacoustic hearing aids".

The following minimal editorial changes have been made to this document.

- To be consistent with the existing standard series, the name of the standard is changed to "Measurement of Real Ear Acoustic Characteristics of Acoustic Hearing Aids".
- This document incorporates the amendments to IEC 61669:2015/Amd1.2025. The outer margins of the clauses involved are marked with Vertical double lines (||) are marked.

Introduction

Since hearing aids are affected by the acoustic characteristics and coupling characteristics of the human ear during actual use, their acoustic performance characteristics are different from those of the human ear.

The performance characteristics defined in GB/T 25102.100 and GB/T 25102.7 are very different. Therefore, when fitting different hearing aid wearers, when measuring the coupling characteristics and acoustic effects, it is very important to use a measurement method that takes into account the coupling characteristics and acoustic effects. This measurement method is called "real ear measurement" and it is sometimes used in non-ideal the accuracy and repeatability of measurements made under these conditions are affected by the following factors. the sound field, the test environment,, test signal characteristics, the hearing aid to be evaluated, test signal control methods, sound field source locations, and characteristics of data acquisition, analysis, and presentation, and the subject was allowed

a range of motion.

This document provides the terms and definitions used in the measurement of the real-ear acoustic performance characteristics of hearing aids and proposes the standards for the test procedure and result reporting.

The format is fixed, which specifies the necessary characteristics provided by the equipment manufacturer for real ear measurement and describes the tolerances for sound pressure level control and measurement.

Where possible, the source of the error is identified and suggested solutions are provided.

Measurement of real-ear acoustic performance characteristics of acoustic hearing aids

1 Scope

This document specifies the methods for measuring and evaluating the real-ear acoustic performance characteristics of air conduction hearing aids, as well as for measuring the specific acoustic characteristics of the human ear relevant to hearing aid applications.

Property recommendations and requirements.

The results of real ear acoustic characteristics measurements of hearing aids using nonlinear or analytical processing techniques are only valid for the test signals and test the test conditions are valid.

The purpose of this document is to ensure that the real-ear acoustic performance characteristics of a given hearing aid are measured on a given human ear, using other test equipment and test the results were reproducible across locations.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document.

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to this document.

Note: GB/T 3240-1982 Frequencies commonly used in acoustic measurements (ISO 266:1975, NEQ) terms) IEC 60318-5 Electroacoustics Head and ear simulators Part 5: Measurement of hearing aids and ear simulators coupled to the human ear Note. GB/T 25498.5-2017 Electroacoustics Head and Ear Simulators Part 5: Measurement of Hearing Aids and Hearing Aids Coupled to the Human Ear 2cm³ acoustic coupling cavity for headphones (IEC 60318-5:2006, IDT) IEC 60601-1 Medical electrical equipment Part 1: General requirements for basic safety and essential performance Note. GB 9706.1-2020 Medical electrical equipment Part 1: General requirements for basic safety and essential performance (IEC 60601-1:2012, IDT) IEC 60601-1-2