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INTERNATIONAL STANDARD

NORME INTERNATIONALE

Portable multimedia equipment – Determination of battery duration – Part 1: Powered loudspeaker equipment

Matériel multimédia portable – Détermination de la durée des batteries – Partie 1: Haut-parleurs alimentés par batteries

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PORTABLE MULTIMEDIA EQUIPMENT – DETERMINATION OF BATTERY DURATION –

Part 1: Powered loudspeaker equipment

FOREWORD

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The text of this International Standard is based on the following documents:

Draft	Report on voting
100/3546/CDV	100/3596/RVC

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

A list of all parts in the IEC 63296 series, published under the general title *Portable multimedia equipment – Determination of battery duration*, can be found on the IEC website.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

INTRODUCTION

This document specifies methods of measurement for battery duration on powered loudspeaker equipment. The operating time of a battery-powered powered loudspeaker varies greatly depending on the reproduced sound pressure from the loudspeaker. Since the reproduced sound pressure of a powered loudspeaker varies depending on the purpose of use, it is a measurement method that measures the battery operating time at different sound pressures.

IEC 63296 series currently consists of the following planned or published parts:

– Part 1: Powered loudspeaker equipment
– Part 2: Headphones and earphones with active noise-cancelling functions
– Part 3: Personal sound amplification equipment

PORTABLE MULTIMEDIA EQUIPMENT – DETERMINATION OF BATTERY DURATION –

Part 1: Powered loudspeaker equipment

1 Scope

This part of IEC 63296 specifies the methods for measuring the battery duration at defined sound pressure levels for continuous music playback of battery-powered loudspeaker equipment. A primary battery or secondary battery can be used as a power source for the loudspeaker and its composite equipment. In the case of composite equipment, this method for the measurement of battery duration can be applied under the condition of powered loudspeaker playback only.

NOTE Loudspeakers designed for short hearing distances are not within the scope of this document.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60268-1, *Sound system equipment – Part 1: General*

IEC 60268-5:2003, *Sound system equipment – Part 5: Loudspeakers*
IEC 60268-5:2003/AMD1:2007

IEC 61672-1, *Electroacoustics – Sound level meters – Part 1: Specifications*

IEC 61938, *Multimedia systems – Guide to the recommended characteristics of analogue interfaces to achieve interoperability (GMT)*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

3.1.1
battery
power storage equipment that is capable of powering equipment such that the equipment can provide its primary functions

3.1.2
battery duration
time during which the equipment can provide its main function using its built-in power source

3.1.3
powered loudspeaker
battery-driven loudspeaker system with built-in amplifier

3.1.4
equipment under test
EUT
equipment to be measured using the methods described in this document

Note 1 to entry: Other terminology used is device under test (DUT) or unit under test (UUT).

Note 2 to entry: This note applies to the French language only.

3.1.5
free-field condition
environment in which the sound pressure decreases with the distance from a point source

EXAMPLE Anechoic room

3.1.6
input terminal
terminal for audio signal input

3.1.7
receiver
radio receiver and wireless receiver circuit such as Wi-Fi and Bluetooth

3.1.8
reference axis
line that passes through the reference plane at the reference point

Note 1 to entry: The manufacturer shall specify the direction.

Note 2 to entry: If not specified, the axis is perpendicular to the air reference plane passing through the reference point of the speaker system in accordance with IEC 60268-5.

3.1.9
reproduced sound pressure level
A-weighted and time-weighted sound level at a point 1 m on the reference axis

Note 1 to entry: When measured at a distance other than 1 m, it is specified as a value converted to 1 m.

Note 2 to entry: Unless otherwise specified, the reference sound pressure is 20 µPa for airborne sound.

Note 3 to entry: The reproduced sound pressure level is expressed in dBA.

3.1.10
smart speaker
equipment for audio playback with internal microphone for voice recognition and communication

3.2 Abbreviated terms

AM amplitude modulation

dB decibel

dBA A-weighted decibel

dB_{FS} decibels relative to full scale

FM frequency modulation

kPa kilopascal

RMS root mean square

SPL sound pressure level

4 Measurement conditions

4.1 General

Unless otherwise specified, items related to acoustic characteristics are performed in accordance with IEC 60268-5. Connection is based on IEC 61938.

4.2 Environmental conditions

- Air pressure 86 kPa to 106 kPa
- Ambient temperature 15 °C to 35 °C, preferably at 20 °C
- Relative humidity 25 % to 75 %

4.3 Acoustical environment

SPL measurements shall be made under the free-field conditions specified in IEC 60268-5:2003, 5.2.

4.4 Input signal

4.4.1 Test signal

The simulated programme signal specified by IEC 60268-1 is used. The crest factor shall be a noise signal of 2, the deviation shall be within ±10 %, and a reference voltage measurement signal of 1,0 V RMS measured with an RMS voltmeter. For the digital signal, a simulated programme signal recorded at a recording level of −10 dB_{FS} is used.

4.4.2 Receiver

The radio receiver uses a standard signal generator, and the modulation of the test signal is 30 % modulated for both the AM broadcast receiver and the FM broadcast receiver. DAB/DAB+ receivers and digital wireless receivers, including Wi-Fi and Bluetooth receivers, use a test signal recorded at a recording level of −10 dB_{FS}.

4.4.3 Other digital equipment

Use a test signal recorded at a recording level of −10 dB_{FS}.

NOTE If compressed recording is used, level before compression is −10 dB.

4.5 Sound level meter

Measurements in free-field condition shall be made using a sound level meter having a known calibration. A Class 1 certified meter as specified in IEC 61672-1 with A-weighting, as specified in IEC 60268-1, shall be used.

4.6 Reproduced sound pressure level

Reproduced sound pressure level is a value assumed by the manufacturer and is selected from the values given in a) to c). If any other value is used, specify the purpose together with the value in the measurement report. In addition, values measured at different reproduced sound pressure levels can specify multiple battery duration results for each sound pressure.

a) 60 dBA: reproduced sound pressure level designed for use close to an intended listener. This situation assumes listening at a quiet room at low volume.

b) 70 dBA: reproduced sound pressure level intended for use at medium sound level. This situation assumes listening at a typical volume.

c) 80 dBA: reproduced sound pressure level intended for use at high sound level. This situation assumes listening outdoors or at a loud volume.

4.7 Background noise

In the environment related to sound-pressure measurement, background noise shall be 10 dB or less of the measured value.

4.8 Measurement accuracy

The total error of the measured value shall be within ±2 dB.

4.9 Battery

Dry batteries (primary batteries) shall be unused with the standard capacity of the type specified by the manufacturer.

Rechargeable batteries (secondary batteries) shall be those attached to the equipment or activated with a standard capacity of the type specified by the manufacturer in accordance with the instruction manual, etc. They shall be fully charged in accordance with the EUT's instruction manual.

5 Measurement method

5.1 General

Connect the EUT and measuring instruments as described in Figure 1. Measures or tests are performed on the EUT equipment in its factory shipping condition, unless otherwise specified. If there is an input signal or video output that affects the battery duration, the setting is determined by the manufacturer and clearly stated. This document recommends the order stated in Figure 2 for the measurement procedure.

NOTE Annex A shows an example of the measurement arrangement.

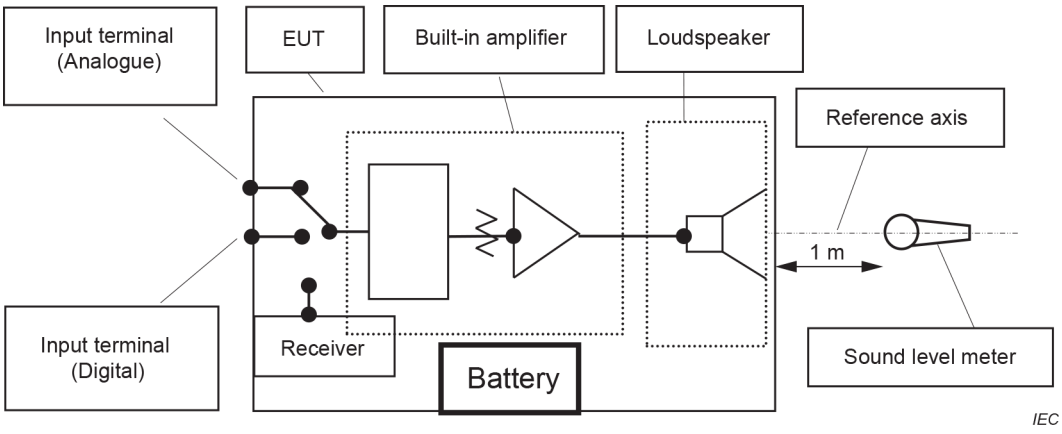

Figure 1 – Connection diagram of equipment

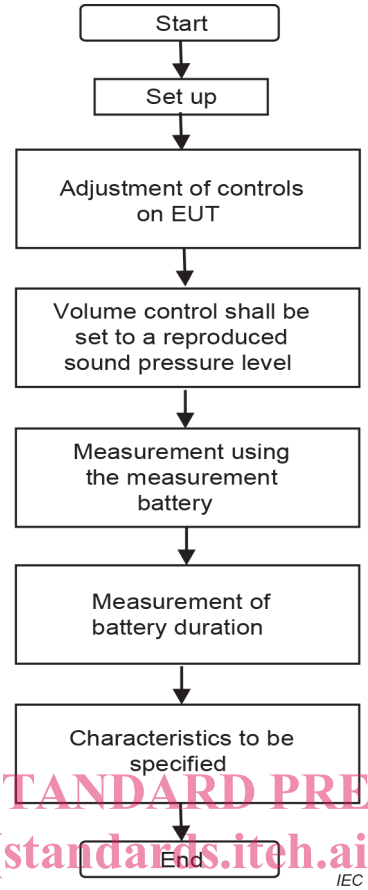

Figure 2 – Order of measurement

5.2 Operating condition

Set to a condition that is continuous sound output.

NOTE A smart loudspeaker can specify the continuous music playback time excluding the standby time.

5.3 Adjustment of controls

The EUT is installed in its shipping condition, and the volume control shall be set to a reproduced sound pressure level specified in 4.6, measured 1 m from the loudspeaker by the sound level meter. If the specified output cannot be obtained due to the coarseness of the resolution of the volume control circuit, the input signal level may be adjusted within the resolution range of the volume controller. If the reason is clearly stated, one may measure using settings other than these conditions.

5.4 Measurement of battery duration

After setting up the EUT to the measurement conditions, start the measurement using the measurement battery. Measure the time until the sound is interrupted, or abnormal operation is performed. The state where the sound is interrupted is a state where the sound output from the speaker is stopped and does not include a state where the sound is distorted or the sound pressure is low. If the sound pressure changes by more than 3 dB during measurement, specify the state.