

BS EN 62458:2011



BSI Standards Publication

Sound system equipment — Electroacoustic transducers — Measurement of large signal parameters

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee EPL/100, Audio, video and multimedia systems and equipment.

A list of organizations represented on this committee can be obtained on request to its secretary.

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 62458

March 2011

ICS 33.160.50

English version

**Sound system equipment -
Electroacoustic transducers -
Measurement of large signal parameters
(IEC 62458:2010)**

Equipements pour systèmes
électroacoustiques -
Transducteurs électroacoustiques -
Mesure des paramètres en grand signal
(CEI 62458:2010)

Elektroakustische Geräte -
Elektroakustische Wandler -
Messung von Großsignal-Parametern
(IEC 62458:2010)

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Foreword

The text of document 100/1624/FDIS, future edition 1 of IEC 62458, prepared by IEC/TC 100, Audio, video and multimedia systems and equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62458 on 2011-01-02.

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The following dates were fixed:

- | | | |
|--|-------|------------|
| – latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement | (dop) | 2011-10-02 |
| – latest date by which the national standards conflicting with the EN have to be withdrawn | (dow) | 2014-01-02 |

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 62458:2010 was approved by CENELEC as a European Standard without any modification.

Annex ZA

(normative)

Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application 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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60268-1	-	Sound system equipment - Part 1: General	HD 483.1 S2	-
IEC 60268-5 A1	2003 2007	Sound system equipment - Part 5: Loudspeakers	EN 60268-5 A1	2003 2009

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INTRODUCTION

Electro-mechanical-acoustical transducers such as loudspeaker drive units, loudspeaker systems, headphones, micro-speakers, shakers, and other actuators behave in a nonlinear manner at higher amplitudes. This limits the acoustical output and generates nonlinear signal distortion. Linear models fail in describing the large signal behaviour of such transducers and extended models have been developed which consider dominant nonlinearities in the motor and suspension. The free parameters of the large signal model have to be measured on the particular transducer by using static or dynamic methods. The large signal parameters show the physical cause of the signal distortion directly and are very important for the objective assessment of sound quality and failure diagnostics in development and manufacturing. Furthermore, the model and parameters identified for a particular transducer are the basis for predicting the maximum output and signal distortion for any input signal. The close relationship between causes and symptoms simplifies the interpretation of the harmonic and intermodulation distortion measured according to IEC 60268-5. Large signal parameters are valuable input data for the synthesis of loudspeaker systems and the development of electrical control systems dedicated to loudspeakers.

SOUND SYSTEM EQUIPMENT – ELECTROACOUSTICAL TRANSDUCERS – MEASUREMENT OF LARGE SIGNAL PARAMETERS

1 Scope

This International Standard applies to transducers such as loudspeaker drive units, loudspeaker systems, headphones, micro-speakers, shakers and other actuators using either an electro-dynamical or electro-magnetic motor coupled with a mechanical suspension. The large signal behaviour of the transducer is modelled by a lumped parameter model considering dominant nonlinearities such as force factor, stiffness and inductance as shown in Figure 1. The standard defines the basic terms and parameters of the model, the methods of measurements and the way the results should be reported.

2 Normative references

The following referenced documents are indispensable for the application 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*
Amendment 1 (2007)

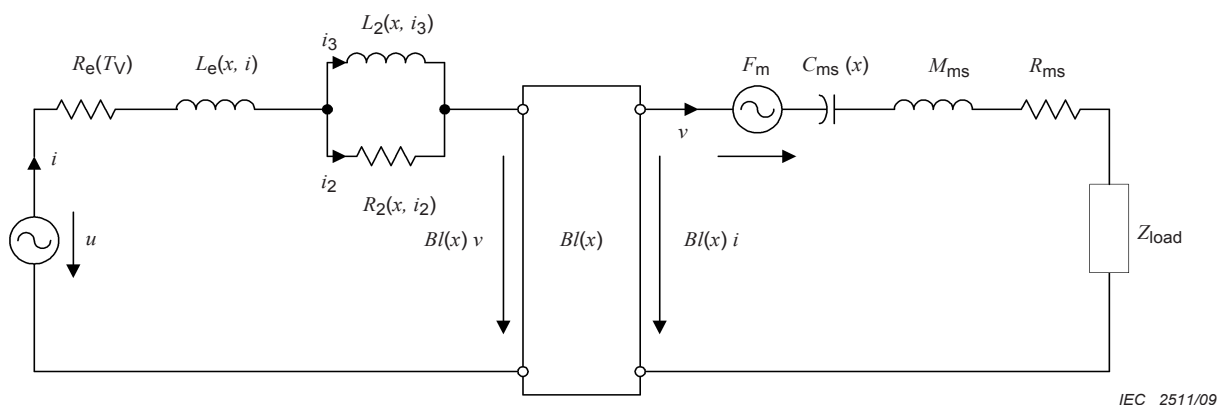
3 Terms and definitions

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

3.1

electro-mechanical equivalent circuit

electrical circuit of an electro-dynamical transducer, as shown in Figure 1



NOTE 1 This Figure shows an example of a lumped parameter model of an electro-dynamical transducer considering the dominant nonlinearities.

NOTE 2 Other equivalent circuits can be applied. Contrary to the results of linear modelling some parameters of the lumped elements are not constant but depend on instantaneous state variables (such as displacement x , velocity v , current i).

Figure 1 – Electro-dynamical transducer