

Method of measurement of non-linearity in resistors

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NATIONAL FOREWORD

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Method of measurement of non-linearity in resistors
(IEC 60440:2012)

Méthode de mesure
de la non-linéarité des résistances
(CEI 60440:2012)

Verfahren zur Messung
der Nichtlinearität von Widerständen
(IEC 60440:2012)

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

The text of document 40/2155/FDIS, future edition 1 of IEC 60440, prepared by IEC/TC 40 "Capacitors and resistors for electronic equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60440:2012.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2013-05-17
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2015-08-17

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In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60027 Series	NOTE	Harmonised as EN 60027 Series (not modified).
ISO 80000-1	NOTE	Harmonised as EN ISO 80000-1.

Annex ZA
(normative)

**Normative references to international publications
with their corresponding European publications**

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 60068-1	-	Environmental testing - Part 1: General and guidance	EN 60068-1	-

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METHOD OF MEASUREMENT OF NON-LINEARITY IN RESISTORS

1 Scope

Non-linearity testing is a method to evaluate the integrity of a resistive element. It may be applied as an effective inline screening method suitable to detect and eliminate potential infant mortality failures in passive components. The method is fairly rapid, convenient, and the associated equipment is relatively inexpensive.

Typical effects causing non-linearity on resistors are e.g. inhomogeneous spots within a resistive film, traces of film left in the spiraling grooves, or contact instability between a connecting lead or termination and the resistive element.

This International Standard specifies a method of measurement and associated test conditions to assess the magnitude of non-linear distortion generated in a resistor. This method is applied if prescribed by a relevant component specification, or if agreed between a customer and a manufacturer.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60068-1, *Environmental testing – Part 1: General and guidance*

3 Terms and definitions

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

3.1

electromotive force

e.m.f.

difference in potential that tends to give rise to an electric current

3.2

non-linearity

deviation of a component's impedance from Ohm's law, resulting in voltage of harmonic frequencies when subjected to sinusoidal current

3.3

third harmonic ratio

A_3

ratio of the fundamental voltage over the e.m.f. of the third harmonic

Note 1 to entry: The third harmonic ratio is expressed in dB.

Note 2 to entry: The third harmonic ratio has been addressed before as third harmonic attenuation. This historic convention is misleading as it wrongly suggests harmonic frequencies originating from the test equipment being attenuated or filtered by the components under test. The misleading term should therefore be avoided.