



**NSAI**  
Standards

Irish Standard  
I.S. EN IEC 60938-1:2021

# Fixed inductors for electromagnetic interference suppression - Part 1: Generic specification

**I.S. EN IEC 60938-1:2021**

*Incorporating amendments/corrigenda/National Annexes issued since publication:*

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## National Foreword

I.S. EN IEC 60938-1:2021 is the adopted Irish version of the European Document EN IEC 60938-1:2021, Fixed inductors for electromagnetic interference suppression - Part 1: Generic specification

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**EN IEC 60938-1**

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 2021

ICS 29.100.10; 31.020

Supersedes EN 60938-1:1999 and all of its amendments  
and corrigenda (if any)

English Version

**Fixed inductors for electromagnetic interference suppression -  
Part 1: Generic specification  
(IEC 60938-1:2021)**

Inductances fixes d'antiparasitage - Partie 1: Spécification  
générique  
(IEC 60938-1:2021)

Drosseln zur Unterdrückung elektromagnetischer  
Störungen - Teil 1: Fachgrundspezifikation  
(IEC 60938-1:2021)

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## **EN IEC 60938-1:2021 (E)**

### **European foreword**

The text of document 40/2834/FDIS, future edition 3 of IEC 60938-1, 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 IEC 60938-1:2021.

The following dates are fixed:

- latest date by which the document has to be implemented at national (dop) 2022-04-21 level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting with the (dow) 2024-07-21 document have to be withdrawn

This document supersedes EN 60938-1:1999 and all of its amendments and corrigenda (if any).

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In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 61558-1 NOTE Harmonized as EN IEC 61558-1

## Annex ZA (normative)

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

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: [www.cenelec.eu](http://www.cenelec.eu).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60027	series	Letter symbols to be used in electrical technology	EN IEC 60027	series
IEC 60050	series	International electrotechnical vocabulary (IEV)		
IEC 60060-1	-	High-voltage test techniques - Part 1: General definitions and test requirements	EN 60060-1	-
IEC 60062	-	Marking codes for resistors and capacitors	EN 60062	-
IEC 60068-1	-	Environmental testing - Part 1: General and guidance	EN 60068-1	-
IEC 60068-2-1	-	Environmental testing - Part 2-1: Tests Test A: Cold	EN 60068-2-1	-
IEC 60068-2-2	-	Environmental testing - Part 2-2: Tests Test B: Dry heat	EN 60068-2-2	-
IEC 60068-2-6	-	Environmental testing - Part 2-6: Tests Test Fc: Vibration (sinusoidal)	EN 60068-2-6	-
IEC 60068-2-13	-	Environmental testing - Part 2-13: Tests Test M: Low air pressure	EN IEC 60068-2-13	-
IEC 60068-2-14	-	Environmental testing - Part 2-14: Tests Test N: Change of temperature	EN 60068-2-14	-
IEC 60068-2-17	-	Basic environmental testing procedures Part 2-17: Tests - Test Q: Sealing	EN 60068-2-17	-
IEC 60068-2-20	-	Environmental testing - Part 2-20: Tests Test T: Test methods for solderability and resistance to soldering heat of devices with leads	EN IEC 60068-2-20	-
IEC 60068-2-21	-	Environmental testing - Part 2-21: Tests Test U: Robustness of terminations and integral mounting devices	EN 60068-2-21	-
IEC 60068-2-27	-	Environmental testing - Part 2-27: Tests Test Ea and guidance: Shock	EN 60068-2-27	-

## EN IEC 60938-1:2021 (E)

IEC 60068-2-30	-	Environmental testing - Part 2-30: Tests -EN 60068-2-30 Test Db: Damp heat, cyclic	-
IEC 60068-2-45	-	Basic environmental testing procedures -EN 60068-2-45 Part 2-45: Tests - Test XA and guidance: Immersion in cleaning solvents	-
IEC 60068-2-58	-	Environmental testing - Part 2-58: Tests -EN 60068-2-58 Test Td: Test methods for solderability, resistance to dissolution of metallization and to soldering heat of surface mounting devices (SMD)	-
IEC 60068-2-78	-	Environmental testing - Part 2-78: Tests -EN 60068-2-78 Test Cab: Damp heat, steady-state	-
IEC 60335-1	-	Household and similar electrical appliances- - Part 1: General requirements	-
IEC 60617	-	Graphical symbols for diagrams	-
IEC 60695-2-11	-	Fire hazard testing - Part 2-11:EN 60695-2-11 Glowing/hot-wire based test methods - Glow-wire flammability test method for end products (GWEPT)	-
IEC 60695-2-12	-	Fire hazard testing - Part 2-12:EN 60695-2-12 Glowing/hot-wire based test methods - Glow-wire flammability index (GWFI) test method for materials	-
IEC 60695-2-13	-	Fire hazard testing - Part 2-13:EN 60695-2-13 Glowing/hot-wire based test methods - Glow-wire ignition temperature (GWIT) test method for materials	-
IEC 60695-10-2	-	Fire hazard testing - Part 10-2: AbnormalEN 60695-10-2 heat - Ball pressure test method	-
IEC 60695-11-10	-	Fire hazard testing - Part 11-10: TestEN 60695-11-10 flames - 50 W horizontal and vertical flame test methods	-
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IEC 80000-6	-	Quantities and units - Part 6:EN 80000-6 Electromagnetism	-
CISPR 17	-	Methods of measurement of theEN 55017 suppression characteristics of passive EMC filtering devices	-





**IEC 60938-1**

Edition 3.0 2021-06

# **INTERNATIONAL STANDARD**

# **NORME INTERNATIONALE**

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**Fixed inductors for electromagnetic interference suppression –  
Part 1: Generic specification**

**Inductances fixes d'antiparasitage –  
Partie 1: Spécification générique**





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**IEC 60938-1**

Edition 3.0 2021-06

# **INTERNATIONAL STANDARD**

# **NORME INTERNATIONALE**

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**Fixed inductors for electromagnetic interference suppression –  
Part 1: Generic specification**

**Inductances fixes d'antiparasitage –  
Partie 1: Spécification générique**

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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### **FIXED INDUCTORS FOR ELECTROMAGNETIC INTERFERENCE SUPPRESSION –**

#### **Part 1: Generic specification**

#### **FOREWORD**

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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IEC 60938-1 has been prepared by IEC technical committee 40: Capacitors and resistors for electronic equipment. It is an International Standard.

This third edition cancels and replaces the second edition published in 1999. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) material tests added;
- b) improved readability and clear separation between test descriptions in the generic spec and requirements in the sectional specification;
- c) creepage and clearance requirements are now defined in sectional specifications only;
- d) AC testing for voltage test included.

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

FDIS	Report on voting
40/2834/FDIS	40/2851/RVD

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 60938 series, published under the general title *Fixed inductors for electromagnetic interference suppression*, 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](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/standardsdev/publications](http://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](http://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

The specification system for fixed inductors for electromagnetic interference suppression is structured in a hierarchical system consisting of the following specification types.

### **Generic specification**

The generic specification covers all subjects mainly common to the family of fixed inductors for electromagnetic interference suppression, such as terminology, methods of measurement and tests. Where the individual subjects require the prescription conditions or parameters specific to the particular sub-family or type of inductor, such prescriptions are required to be given by one of the subordinate specifications.

For the scope of fixed inductors, the numeric reference to the generic specification is IEC 60938-1.

### **Sectional specification**

Sectional specifications cover all subjects additional to those given in the generic specification, which are specific to a defined sub-group of fixed inductors for electromagnetic interference suppression. These subjects normally are preferred values for dimensions and characteristics, relevant prescriptions for test methods given in the generic specification, prescriptions for sampling and for the preparation of specimen, recommended test severities and preferred acceptance criteria. The sectional specification also outlines the structure and scope of the test schedules, which are to be applied in all subordinate detail specifications.

For the scope of fixed inductors for electromagnetic interference suppression, the numeric reference to the only sectional specification is 60938-2 for line chokes.

### **Detail specification**

Detail specifications give directly, or by making reference to other specifications, all information necessary to completely describe a given type and range of fixed inductors for electromagnetic interference suppression, including prescriptions of all values for dimensions and characteristics. They also give all information required for all applied test severities and acceptance criteria, and the completed test schedules.

Detail specifications can be either specifications within the IEC system, another specification system linked to IEC, or specified by the manufacturer or user.

### **Blank detail specification**

The hierarchical system of specifications can be supplemented by one or more blank detail specifications to a sectional specification, which are used to ensure a uniform presentation of detail specifications. The blank detail specifications provide the specification writer with a template on the layout to be adopted and on the information to be given and with guidance for the preparation of detail specifications in line with the requirements of the superior generic or sectional specifications. Blank detail specifications are not considered to be relevant specifications since they do not themselves describe any particular component.

The presence of an established hierarchical specification system with blank detail specifications permits the preparation of detail specifications, even outside of the relevant IEC technical committee.

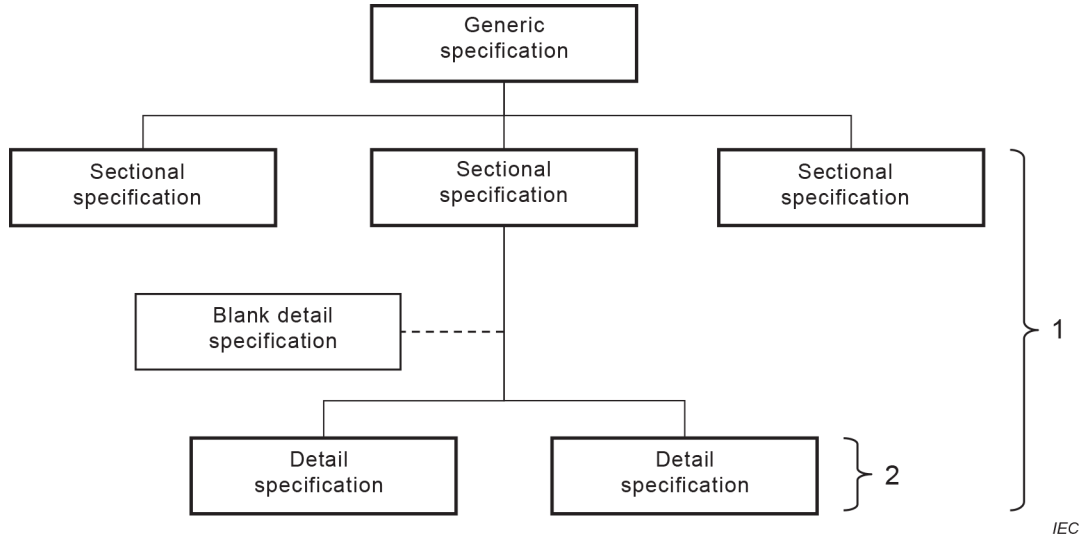
For the scope of fixed inductors for electromagnetic interference suppression, the numeric references to blank detail specifications are, for example, IEC 60938-2-1, if related to the sectional specification IEC 60938-2.



### Relevant specification

In this system, the term "relevant specification" addresses subordinate specifications containing specific requirements, where applicable (see Figure 1).

Any generic or sectional specification can use abstract and universal references to subordinate specifications of either hierarchical level by use of the expression "relevant specification".



#### Key

- 1) Indicates the range of "relevant specifications" to the superior generic specification, where applicable.
- 2) Indicates the range of "relevant specifications" to the superior sectional specification, where applicable.

**Figure 1 – Relevant specification**

# FIXED INDUCTORS FOR ELECTROMAGNETIC INTERFERENCE SUPPRESSION –

## Part 1: Generic specification

### 1 Scope

This part of IEC 60938 applies to inductors designed for electromagnetic interference suppression intended for use within all kind of electric and electronic equipment.

In this generic specification, normative references and terms and definitions are given. It also prescribes general requirements and the suitable test and measurement procedures for interference suppression inductors. Annex B states special requirements for earth inductors.

### 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.

CISPR 17, *Methods of measurement of the suppression characteristics of passive EMC filtering devices*

IEC 60027 (all parts), *Letter symbols to be used in electrical technology*

IEC 60050 (all parts), *International Electrotechnical Vocabulary (IEV)* (available at [www.electropedia.org](http://www.electropedia.org))

IEC 60060-1, *High-voltage test techniques – Part 1: General definitions and test requirements*

IEC 60062, *Marking codes for resistors and capacitors*

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

IEC 60068-2-1, *Environmental testing – Part 2-1: Tests – Tests A: Cold*

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IEC 60068-2-6, *Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-13, *Environmental testing – Part 2-13: Tests – Test M: Low air pressure*

IEC 60068-2-14, *Environmental testing – Part 2-14: Tests – Test N: Change of temperature*

IEC 60068-2-17, *Basic environmental testing procedures – Part 2-17: Tests – Test Q: Sealing*

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