

| | | |
|------------|--|--|
| STN | Indukčné súčiastky Zabezpečenie spoľahlivosti | STN EN 62211 35 1065 |
|------------|--|--|

Inductive components - Reliability management

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 09/17

Obsahuje: EN 62211:2017, IEC 62211:2017

Oznámením tejto normy sa od 10.02.2020 ruší
STN EN 62211 (35 1065) z júla 2004

125462

Úrad pre normalizáciu, metrológiu a skúšobníctvo Slovenskej republiky, 2017
Podľa zákona č. 264/1999 Z. z. o technických požiadavkách na výrobky a o posudzovaní zhody a o zmene a doplnení niektorých zákonov v znení neskorších predpisov sa slovenská technická norma a časti slovenskej technickej normy môžu rozmnožovať alebo rozširovať len so súhlasom slovenského národného normalizačného orgánu.

EUROPEAN STANDARD

EN 62211

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 2017

ICS 29.100.10

Supersedes EN 62211:2004

English Version

**Inductive components - Reliability management
(IEC 62211:2017)**Composants inductifs - Gestion de la fiabilité
(IEC 62211:2017)Induktive Bauelemente - Zuverlässigkeitsmanagement
(IEC 62211:2017)

This European Standard was approved by CENELEC on 2017-02-10. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

EN 62211:2017**European foreword**

The text of document 51/1150/FDIS, future edition 2 of IEC 62211, prepared by IEC/TC 51 "Magnetic components, ferrite and magnetic powder materials" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62211:2017.

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) 2017-11-10
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2020-02-10

This document supersedes EN 62211:2004.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 62211:2017 was approved by CENELEC as a European Standard without any modification.

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

| | | |
|----------------|------|------------------------------|
| IEC 60068-2-20 | NOTE | Harmonized as EN 60068-2-20. |
| IEC 60068-2-21 | NOTE | Harmonized as EN 60068-2-21. |
| IEC 60068-2-54 | NOTE | Harmonized as EN 60068-2-54. |
| IEC 60068-3-13 | NOTE | Harmonized as EN 60068-3-13. |

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 1 When 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

| <u>Publication</u> | <u>Year</u> | <u>Title</u> | <u>EN/HD</u> | <u>Year</u> |
|--------------------|-------------|--|---------------|-------------|
| 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 60068-2-14 | - | Environmental testing - Part 2-14: Tests - Test N: Change of temperature | EN 60068-2-14 | - |
| IEC 60068-2-27 | - | Environmental testing - Part 2-27: Tests - Test Ea and guidance: Shock | EN 60068-2-27 | - |
| IEC 60068-2-30 | - | Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle) | EN 60068-2-30 | - |
| IEC 60068-2-58 | - | Environmental testing - Part 2-58: Tests - Test Td: Test methods for solderability, resistance to dissolution of metallization and to soldering heat of surface mounting devices (SMD) | EN 60068-2-58 | - |
| IEC 60068-2-78 | - | Environmental testing - Part 2-78: Tests - Test Cab: Damp heat, steady state | EN 60068-2-78 | - |
| IEC 60424 | Series | Ferrite cores - Guidelines on the limits of surface irregularities | EN 60424 | Series |
| IEC 61007 (mod) | 1994 | Transformers and inductors for use in electronic and telecommunication equipment - Measuring methods and test procedures | EN 61007 | 1997 |
| IEC 61248 | Series | Transformers and inductors for use in electronic and telecommunication equipment | EN 61248 | Series |



INTERNATIONAL STANDARD

Inductive components – Reliability management





THIS PUBLICATION IS COPYRIGHT PROTECTED
Copyright © 2017 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

IEC Central Office
 3, rue de Varembe
 CH-1211 Geneva 20
 Switzerland

Tel.: +41 22 919 02 11
 Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

IEC Catalogue - webstore.iec.ch/catalogue

The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

IEC publications search - www.iec.ch/searchpub

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and also once a month by email.

Electropedia - www.electropedia.org

The world's leading online dictionary of electronic and electrical terms containing 20 000 terms and definitions in English and French, with equivalent terms in 16 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary

65 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: csc@iec.ch.



IEC 62211

Edition 2.0 2017-01

INTERNATIONAL STANDARD

Inductive components – Reliability management

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 29.100.10

ISBN 978-2-8322-3771-7

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

| | |
|---|----|
| FOREWORD..... | 3 |
| 1 Scope..... | 5 |
| 2 Normative references | 5 |
| 3 Terms and definitions | 6 |
| 4 Component families..... | 6 |
| 5 Test samples..... | 7 |
| 5.1 Classification by application..... | 7 |
| 5.2 Numbering of samples and content of test report | 7 |
| 5.3 Pre-treatment of test samples | 8 |
| 5.3.1 Magnetic pre-treatment..... | 8 |
| 5.3.2 Mechanical pre-treatment | 8 |
| 5.3.3 Exposure to reflow temperature profile | 8 |
| 6 Failure criteria | 8 |
| 7 Test conditions and specification of the minimum requirements | 11 |
| 8 Test sequence..... | 14 |
| 9 Test evaluation..... | 14 |
| Bibliography..... | 15 |
| | |
| Table 1 – General mechanical failure criteria | 9 |
| Table 2 – Electrical failure criteria..... | 10 |
| Table 3 – Test conditions..... | 12 |

INTERNATIONAL ELECTROTECHNICAL COMMISSION

INDUCTIVE COMPONENTS – RELIABILITY MANAGEMENT

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.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62211 has been prepared by IEC technical committee 51: Magnetic components, ferrite and magnetic powder materials.

This second edition cancels and replaces the first edition published in 2003. This edition constitutes a technical revision.

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

- a) continuous shock and mechanical shock are integrated in the test conditions;
- b) the normative references in Table 3 are changed.

The text of this standard is based on the following documents:

| FDIS | Report on voting |
|--------------|------------------|
| 51/1150/FDIS | 51/1158/RVD |

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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

A bilingual version of this publication may be issued at a later date.

INDUCTIVE COMPONENTS – RELIABILITY MANAGEMENT

1 Scope

This document is applicable to inductive components (chokes and transformers) based on magnetically soft materials. These are components based especially on laminated iron sheets, iron powder materials (including alloys), as well as ferrites and amorphous or crystalline metal band cores.

Winding assemblies mean wire winding assemblies as well as multilayer and stacking technologies of planar technology including coils based on non-magnetic materials. Discrete type components and the different types of surface mount inductive components (SMD) are also considered in this document.

The reliability of assemblies of inductive components based on several technologies such as glued types, types with clamps (clips), impregnated (varnished) types as well as (vacuum) potted types can also be checked with this document.

The subsequent determinations can be applied either for the primary qualification of inductive components or for all manners of requalification examinations (design, process, change of production facility). They can also be applied for the monitoring of products out of actual manufacturing processes.

This document sets up a broad basis of electric and mechanical criteria of failure test procedures.

If manufacturers advertise compliance with this standard in their data sheets, customers can request data to demonstrate compliance with this standard. The customers can also request the product to be in compliance with this standard by a recognised body.

Customers and manufacturers can elect to perform additional testing and acceptance criteria different than those defined in this standard.

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

IEC 60068-2-2, *Environmental testing – Part 2-2: Tests – Test B: Dry heat*

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

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

IEC 60068-2-27, *Environmental testing – Part 2-27: Tests – Test Ea and guidance: Shock*

IEC 60068-2-30, *Environmental testing – Part 2-30: Tests – Test Db: Damp heat, cyclic (12 h + 12 h cycle)*

IEC 60068-2-58, *Environmental testing – Part 2-58: Tests – 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 – Test Cab: Damp heat, steady state*

IEC 60424 (all parts), *Ferrite cores – Guidelines on the limits of surface irregularities*

IEC 61007:1994, *Transformers and inductors for use in electronic and telecommunication equipment – Measuring methods and test procedures*

IEC 61248 (all parts), *Transformers and inductors for use in electronic and telecommunication equipment*

koniec náhľadu – text ďalej pokračuje v platenej verzii STN