



SLOVENSKI STANDARD

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Sectional specification: Fixed inductors with ceramic or ferrite core wound with copper wire for RF circuits

Sectional Specification: Fixed inductors with ceramic or ferrite core wound with copper wire for RF circuits

Rahmenspezifikation: Drahtgewickelte Spulen mit Keramik- oder Ferritkern für HF-Schaltungen

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| | | |
|-----------|----------------------------------|------------------------------------|
| 31.220.99 | Druge elektromehanske komponente | Other electromechanical components |
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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 129200

July 1994

Descriptors: Quality, electronic components, inductors

English version

Sectional specification: Fixed inductors with ceramic or ferrite core wound with copper wire for RF circuits

Spécification intermédiaire :
*À présent, cette spécification n'existe pas en
français*

Rahmenspezifikation: Drahtgewickelte Spulen mit
Keramik- oder Ferritkern für HF-Schaltungen

This European Standard was approved by the CENELEC Electronic Components Committee (CECC) on 9 August 1993. CENELEC members are bound to comply with 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 General Secretariat of the CECC 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 CECC General Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom. The membership of the CECC is identical, with the exception of the national electrotechnical committees of Greece, Iceland and Luxembourg.

CECC

CENELEC Electronic Components Committee
Comité des Composants Electroniques du CENELEC
CENELEC- Komitee für Bauelemente der Elektronik

General Secretariat: rue de Stassart 35, B-1050 Brussels

Foreword

The CENELEC Electronic Components Committee (CECC) is composed of those member countries of the European Committee for Electrotechnical Standardization (CENELEC) who wish to take part in a harmonized System for electronic components of assessed quality.

The object of the System is to facilitate international trade by the harmonization of the specifications and quality assessment procedures for electronic components, and by the grant of an internationally recognized Mark, or Certificate of Conformity. The components produced under the System are thereby acceptable in all member countries without further testing.

This specification was prepared by the German ONH under the Single Originator Procedure for approval and publication of CECC specifications (see RP 11 Part V).

The text of the draft based on document CECC(Secretariat)3264/01.93 was submitted to the formal vote; together with the voting report, circulated as document CECC(Secretariat)3385/07.93, it was approved by CECC as EN 129200 on 9 August 1993.

The following dates were fixed:

- latest date of announcement of the EN at national level (doa) 1993-11-08
- latest date of publication of an identical national standard (dop) 1994-05-08
- latest date of withdrawal of conflicting national standards (dow) 1995-05-08

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SECTION 1 - GENERAL1.1 Scope

This specification applies to fixed inductors for radiofrequency circuits with magnetic or non-magnetic core wound with copper wire for use in electronic equipment.

It prescribes preferred ratings and characteristics and selects from CECC 29 000 (EN 129 000 : 1993) the appropriate quality assessment procedures, measuring methods and gives general performance requirements for this type of inductor.

1.2 Related documents

| | | |
|------------------------------------|--------|--|
| ISO 3 | (1973) | Preferred numbers - Series of preferred numbers |
| IEC 51(Sec)257 | (1967) | Marking codes for inductors |
| IEC 63 | (1963) | Preferred number series for resistors and capacitors |
| Amendment No. 1 | (1967) | |
| Amendment No. 2 | (1977) | |
| IEC 68-1 | (1988) | Basic environmental testing procedures: General |
| CECC 29 000 (EN 129 000 : 1993) | | Generic specification: Fixed RF wound inductors |
| IEC 410 | (1973) | Sampling plans and procedures for inspection by attributes |
| IEC 286-1 | (1980) | Packaging of components for automatic handling; Part 1: Tape packaging of components with axial leads on continuous tapes |
| IEC 286-2 | (1985) | Packaging of components for automatic handling; Part 2: Tape packaging of components with unidirectional leads on continuous tapes |

1.3 Information to be given in a detail specification

Detail specifications shall be derived from the relevant blank detail specification.

Detail specifications shall not specify requirements inferior to those of the generic, sectional or blank detail specification. When more severe requirements are included, they shall be listed in 1.9 of the detail specification and indicated in the test schedules, for example by an asterisk.

Note: The information given in 1.3.1 may for convenience, be presented in tabular form.

The following information shall be given in each detail specification and the values quoted shall preferably be selected from those given in the appropriate clause of this sectional specification.

1.3.1 Outline drawing and dimensions

There shall be an illustration of the inductor as an aid to easy recognition and for comparison of the inductor with others. Dimensions and their associated tolerances, which affect interchangeability and mounting, shall be given in the detail specification. All dimensions shall to be stated in mm.

Normally the numerical values shall be given for the length, the width and height of the body and the wire spacing or for cylindrical types the body diameter, and the length and diameter of the terminations. When necessary, for example when different case sizes are covered by a detail specification, the dimensions and their associated tolerances shall be placed in a table below the drawing.

1.3.2 Mounting

The detail specification shall specify the method of mounting to be applied for the application of the vibration and the bump or shock tests. The design of the inductors may be such that special mounting fixtures are required in its use. In this case the detail specification shall describe the mounting fixtures and they shall be used in the application of the vibration and bump or shock tests.

NOTE - If recommendations for mounting for "normal" use are made, they shall be included in the detail specification under "1.8 Additional information (not for inspection purposes)". If they are included, a warning can be given that the full vibration, bump and shock performance may not be available if mounting methods other than those specified in 1.1 of the detail specification are used.

1.3.3 Ratings and characteristics

The ratings and characteristics shall be in accordance with the relevant clauses of this specification, together with the following:

(1) Rated inductance range

See 2.2.1

Note: When products approved to the detail specification have different ranges, the following statement should be added: "The range of inductance values available in each size is given in the current CECC 00 200 (Register of Approvals)".

(2) Particular characteristics

Additional characteristics may be listed, when they are considered necessary to specify adequately the component for design and application purposes.

(3) Soldering

The detail specification shall prescribe the test methods, severities and requirements applicable for the solderability test and the resistance to soldering heat test.

1.3.4 Marking

The detail specification shall specify the content of the marking on the inductor and on the package. Deviations from 1.5 shall be specifically stated.

1.4 Terminology

In addition to the applicable terms and definitions of CECC 29 000 (EN 129 000 : 1993) the following definitions apply:

1.4.1 Rated current (I_R)

The maximum r.m.s. value of the current, at which an inductor may be operated continuously at the temperature.

Note: The current may consist of d.c. current only, A.C. current only or of a combination of both.

For testing purposes d.c. current is mandatory. High frequencies require a reduction of current in regard to temperature rise by magnetic and skin effect losses.

1.4.2 Incremental current (I_{CR})

That value of polarising direct current when superimposed on the alternating measuring current will cause a reduction in measured inductance value of 10 %.

1.5 Marking

1.5.1 The information given in the marking is normally selected from the following list; the relative importance of each item is indicated by it's position in the list:

- 1) Rated inductance *)
- 2) Tolerance on rated inductance *)
- 3) Manufacturer's name or trade mark
- 4) Manufacturer's type designation
- 5) Year and month (or week) of manufacture *)

- 6) Rated current

- 7) Climatic category

- 8) Reference to the detail specification
- 9) CECC mark

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Note *) Coded marking according to IEC 51(Sec)257 shall be used.

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1.5.2 The inductor shall be marked with 1), 5) and 2) above and with as many as possible of the remaining items as is considered necessary. Any duplication of information in the marking on the inductor should be avoided.

1.5.3 The package containing the inductor(s) shall be clearly marked with all the information listed in 1.5.1.

1.5.4 Any additional marking shall be so applied that no confusion can arise.

SECTION 2 - PREFERRED RATINGS AND CHARACTERISTICS2.1 Preferred climatic categories

The inductors covered by this specification are classified into climatic categories according to the general rules given in IEC 68-1.

The lower and upper category temperature and the duration of the damp heat, steady state test shall be chosen from the following:

Lower category temperature: - 55 °C, - 40 °C and - 25 °C

Upper category temperature: + 85 °C, + 100 °C, + 125 °C and + 150 °C

Duration of the damp heat,
steady state test: 4, 10, 21 and 56 days

The severities for the cold and dry heat tests are the lower and the upper category temperatures respectively.

iTeh STANDARD PREVIEW2.2 Preferred values of ratings**(standards.iteh.ai)**2.2.1 Rated inductance (L_R)

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Preferred values of rated inductance are:

1 - 1,2 - 1,5 - 1,8 - 2,2 - 2,7 - 3,3 - 3,9 - 4,7 -
5,6 - 6,8 - and 8,2 and their decimal multiples.

These values conform to the E 12 series of preferred values given in IEC 63: Preferred number series for resistors and inductors.

If other values are required they shall preferably be chosen from the E24 series.

2.2.2 Tolerance on rated inductance

Preferred tolerance on rated inductance are $\pm 5 \%$, $\pm 10 \%$
and $\pm 20 \%$.

2.2.3 Rated temperature (T_R)

The standard value of rated temperature is 85 °C.
If derating or uprating of current is permitted,
the relevant specification shall give guidance e.g.
by an appropriate illustration as given below which
is not subject to testing.

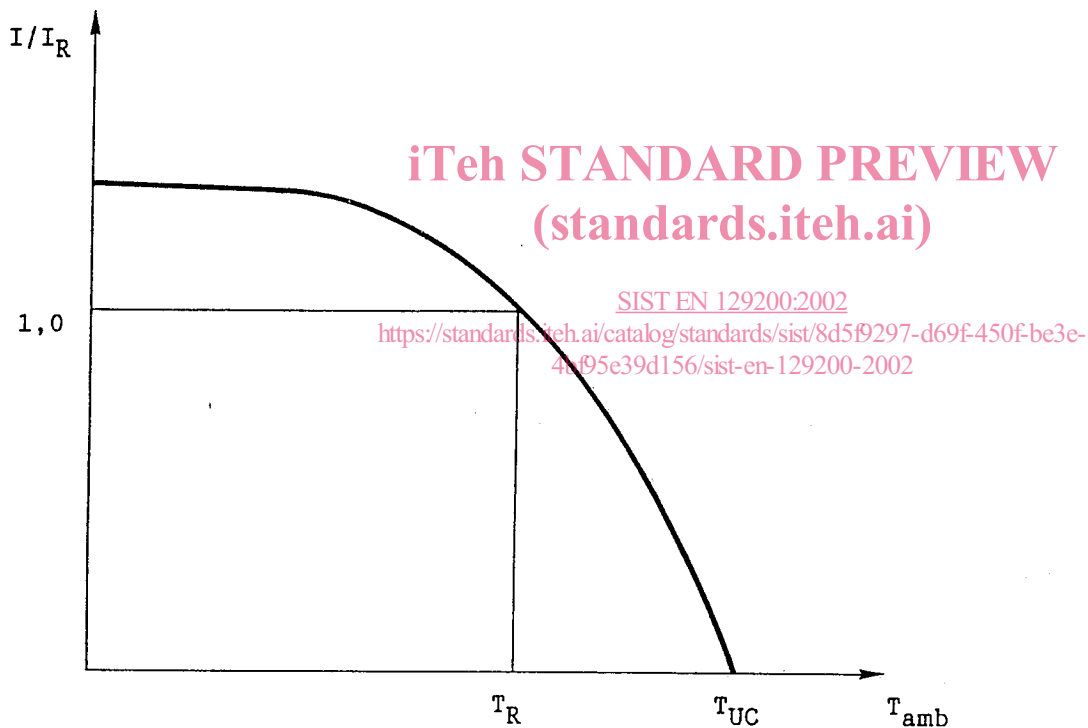


Figure 1: Permissible current versus temperature

I : load current
 I_R : rated current
 T_{amb} : ambient temperature
 T_R : rated temperature
 T_{UC} : upper category temperature

SECTION 3 - QUALITY ASSESSMENT PROCEDURES3.1 Primary stage of manufacture

The primary stage of manufacture is the winding of the inductor element.

3.2 Structurally similar components

Inductors considered as being structurally similar are inductors produced with similar processes and materials, though they may be of different sizes and inductance and current values.

3.3 Certified test records

The information required in 3.5.1 of CECC 29 000 (EN 129 000 : 1993) shall be made available when prescribed in the detail specification and when requested by a purchaser. After the endurance test the parameters for which variables information is required are the inductance, Q, the resonant frequency and the d.c. resistance.

3.4 Qualification approval

The procedures for qualification approval testing are given in 3.4 of CECC 29 000 (EN 129 000 : 1993). The schedule to be used for qualification approval testing on the basis of lot-by-lot and periodic tests is given in 3.5 of this specification. The procedure using a fixed sample size schedule is given in 3.4.1 and 3.4.2 below. For the two procedures the sample sizes and the number of permissible defectives shall be of comparable order. The test conditions and requirements shall be the same.

3.4.1 Sampling

The fixed sample size procedure is described in 3.4.2 (2) of CECC 29 000 (EN 129 000 : 1993). The sample shall be representative of the range of inductors for which approval is sought. This may or may not be the complete range covered by the detail specification.

The sample shall consist of specimens having the smallest and largest sizes, and for these sizes the lowest and highest inductances. When there are more than four sizes, an intermediate size shall also be tested. Thus for the approval of a range, testing, is required of either four or six values (inductance/size combinations). When the range consists of less than four values, the number of specimens to be tested shall be that required for four values.

Spares are permitted as follows:

- (1) One per value which may be used to replace the permitted defective in Group "0".
- (2) One per value which may be used as replacements for specimens which are defective because of incidents not attributable to the manufacturer.

The numbers given in Group "0" assume that all groups are applicable. If this is not so the numbers may be reduced accordingly.

When additional groups are introduced into the qualification approval test schedule, the number of specimens required for Group "0" shall be increased by the same number as that required for the additional groups.

Table 1 gives the number of samples to be tested in each group or sub-group together the permissible number of defectives for qualification approval tests.

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3.4.2 Tests

The complete series of tests specified in Table 1 and Annex A are required for the approval of inductors covered by one detail specification. The tests of each group shall be carried out in the order given.

The whole sample shall be subjected to the tests of Group "0" and then divided for the other groups.

Specimens found defective during the tests of Group "0" shall not be used for the other groups.

"One defective" is counted when an inductor has not satisfied the whole or a part of the tests of a group.

The approval is granted when the number of defectives does not exceed the specified number of permissible defectives for each group or sub-group and the total number of permissible defectives.

Note: Table 1 and Annex A together form the fixed sample size test schedule, for which Table 1 includes the details for the sampling and permissible defectives for the different tests or groups of tests. Annex A together with the details of test contained in Section 4 gives a complete summary of test conditions and performance requirements and indicates where for example for the test method or conditions of test a choice has to be made in the detail specification.