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Sectional Specification: Wirewound surface mounting inductors

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Rahmenspezifikation: Drahtgewickelte oberflächenmontierbare Spulen

Spécification intermédiaire: (n'existe pas en français)

Ta slovenski standard je istoveten z: **EN 129100:1993**

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31.220.99	Druge elektromehanske komponente	Other electromechanical components

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EUROPEAN STANDARD
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Drahtgewickelte oberflächen — montierbare Spulen

This European Standard was approved by CENELEC Electronic Components Committee (CECC) on 23 April 1992. 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 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 Central 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

Central Secretariat: Gartenstr. 179, W-6000 Frankfurt/Main 70

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 harmoniztion of the specifications and quality assessment procedures for electronic components, and by the grant of an internationally recognised 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 CECC WG 12, Magnetic components: Magnetic wound components.

The text of the draft based on document CECC (Secretariat) 2864 was submitted to the formal vote; together with the voting report, circulated as document CECC (Secretariat) 3057, it was approved by CECC as EN 129100 on 23 April 1992.

The following dates were fixed:

- latest date of announcement of the EN at national level (doa) 1993-06-17
- latest date of publication of an identical national standard (dop) 1993-12-17
- latest date of declaration of national standard's obsolescence 1993-12-17
- latest date of withdrawal of conflicting national standards (dow) 2003-06-17

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SECTION 1 - GENERAL

1.1 Scope

This specification applies to wire wound fixed rectangular shaped surface mounting (SM) inductors with a magnetic or non-magnetic core for use in electronic equipment. These inductors are intended to be mounted directly onto substrates or boards by their terminations.

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

1.2 Related documents

ISO 3	Preferred numbers - Series of preferred numbers
IEC 51(Sec)257	Marking codes for inductors
IEC 63	Preferred number series for resistors and capacitors
Amendment No. 1	
Amendment No. 2	
IEC 68	Basic environmental testing procedures
CECC 29 000	Generic specification: Fixed RF wound inductors
IEC 410	Sampling plans and procedures for inspection by attributes
IEC 286-3	Packaging of components for automatic handling; Part 3: Packaging of leadless components on continuous tapes.

Note: The above references apply to the current editions except for IEC 68.

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 be stated in mm.

Normally the numerical values shall be given for the length, the width and height of the body. When necessary, for example when a number of items (sizes and inductance ranges) is covered by a detail specification, the dimensions and their associated tolerances shall be placed in a table below the drawing.

When the configuration is other than described above, the detail specification shall state such dimensional information as will adequately describe the inductor.

1.3.2 Mounting

The detail specification shall give guidance on method of mounting for normal use. Mounting for test and measurement purposes (when required) shall be in accordance with 4.1.

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 Firms, Products and Services Approved under the CECC System)".

(2) Particular characteristics

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

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 Surface mounting inductor

An inductor whose small dimensions and nature or shape of terminations make it suitable for surface mounting on hybrid circuits or printed boards.

1.4.2 Performance grade 1 inductors (long life)

Inductors for long-life applications with stringent requirements for the electrical parameters.

1.4.3 Performance grade 2 inductors (general purpose)

Inductors for general application, where the stringent requirements for grade 1 inductors are not necessary.

1.4.4 Rated current (I_R)

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

1.4.5 Incremental current (I_{CR})

That value of polarising direct current which 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 (in clear or code)

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

1.5.2 When the detail specification requires marking the inductors shall be clearly marked with as many as possible of the above items as is considered useful. Any duplication of information in the marking on the inductor should be avoided.

If coded marking is applied, the codes as given in IEC xxx (at present 51(Sec)257) shall be used.

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 CHARACTERISTICS

2.1 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, - 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

Note: With continuous operation at 125 °C in excess of the endurance test time, accelerated ageing has to be considered (see detail specification).

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

2.2 Preferred values of ratings

2.2.1 Rated inductance (L_R)

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 capacitors.

2.2.2 Tolerance on rated inductance

The preferred tolerance on rated inductance is ± 10 %.
If other tolerances are required they shall be preferably either ± 5 % or ± 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.

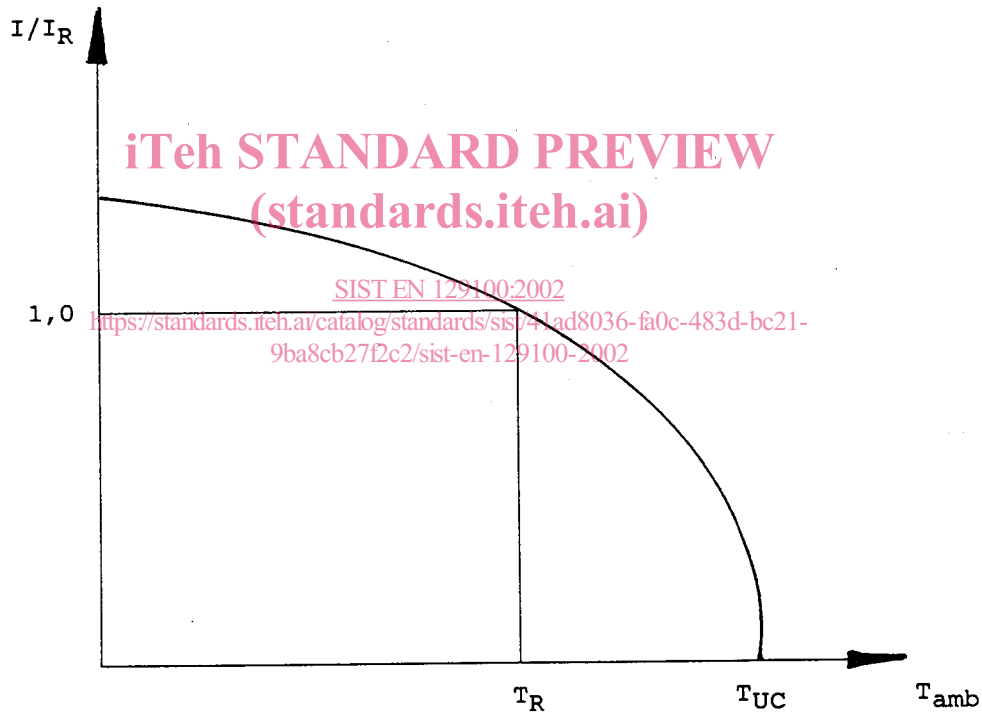

Figure 1: Permissible current versus temperature

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

SECTION 3 - QUALITY ASSESSMENT PROCEDURES

3.1 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 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, 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. 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. 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.