

European Committee for Electrotechnical Standardization (CENELEC)  
Cenelec Electronic Components Committee

# CECC



Système Harmonisé d'Assurance de la Qualité  
des Composants Electroniques

SPECIFICATION PARTICULIERE CADRE:

## **VARISTANCES BASSE TENSION POUR MATERIEL TELEPHONIQUE**

(Niveau d'assurance de qualité P)

Harmonized System of Quality Assessment for  
Electronic Components

BLANK DETAIL SPECIFICATION:

## **LOW VOLTAGE VARISTORS PRIMARILY FOR TELEPHONY APPLICATIONS**

(Assessment level P)

Harmonisiertes Gütebestätigungssystem für  
Bauelemente der Elektronik

VORDRUCK FÜR  
BAUARTSPEZIFIKATION:

## **NIEDERSPANNUNGS- VARISTOREN VORZUGSWEISE FÜR TELEPHONIE-ANWENDUNGEN**

(Gütebestätigungsstufe P)

**1** Edition  
Issue  
Ausgabe

# CECC 42101

1978



**Documents**

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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 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 accepted by all member countries without further testing.

This document has been formally approved by the CECC, and has been prepared for those countries taking part in the System who wish to prepare and issue national harmonized detail specifications for LOW VOLTAGE VARISTORS PRIMARILY FOR TELEPHONY APPLICATIONS (ASSESSMENT LEVEL P). It should be read in conjunction with document CECC 00 100: Basic Rules (1974).

At the date of printing of this document, the member countries of the CECC are Belgium, Denmark, France, Germany, Ireland, Italy, the Netherlands, Norway, Sweden, Switzerland and the United Kingdom, and copies of it can be obtained from the National Committees of the CENELEC in these countries.

PREFACE

This blank detail specification was prepared by CECC Working Group 4 : "Resistors".

It is one of a series of blank detail specifications for low voltage resistors primarily for telephony applications, all relating to the sectional specification printed as CECC 42 100.

In accordance with the requirements of document CECC 00 100, it is based, wherever possible, on the Recommendations of the International Electrotechnical Commission.

The text of this blank detail specification was circulated to the CECC for voting in document CECC(Secretariat)378 in November 1975 and was ratified by the CECC for printing as a CECC Specification.

The numbers between square brackets on page 3 correspond to the following indications which should be given :

Identification of the harmonized detail specification

- [1] The name of National Standards Organization under whose authority the detail specification is drafted.
- [2] The CECC Symbol and the number allotted by the CECC General Secretariat to the completed detail specification.
- [3] The number and issue number of the national generic specification and sectional specification.
- [4] The national number of the detail specification, date of issue and any further information required by the national system together with any amendment numbers, if issued.

Identification of the varistor

- [5] A short description of the type of varistor
- [6] Information on typical construction (where applicable) for example : insulated disc.
- [7] Outline drawing with main dimensions which are of importance for interchangeability, and/or reference to the national or international documents for outlines. Alternatively, this drawing may be given in an appendix to the detail specification.
- [8] Application or group of applications covered, or, preferably, the level of quality assessment covered by the detail specification.
- [9] Reference data on the most important properties, to allow comparison between the various resistor types intended for the same, or for similar, applications.

|                                                                                                                                      |                |                                                                                                                                                                                                     |
|--------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [1]<br>Specification available from :                                                                                                | Page :<br>of : | CECC 42 101-XXX [2]<br>                                                                                          |
| ELECTRONIC COMPONENTS OF ASSESSED QUALITY [3]<br>IN ACCORDANCE WITH :                                                                |                | [4]                                                                                                                                                                                                 |
| Outline and dimensions : (See Table 1) [7]<br>(First angle projection)<br><br><br><br><br><br><br><br><br><br>Terminal connections : |                | LOW VOLTAGE VARISTORS [5]<br>PRIMARILY FOR<br>TELEPHONY APPLICATION<br><br>DISC TYPE, PROTECTED, [6]<br>WITH/WITHOUT<br>UNIDIRECTIONAL/AXIAL<br>WIRE TERMINATIONS(**)<br><br>ASSESSMENT LEVEL P [8] |

For ordering information, see 4.

[9]

NOTE : Other shapes are permitted within the dimensional envelope shown

TABLE 1

| Style | Max current<br>at reference<br>voltage<br>(mA) | Peak current for<br>voltage under<br>pulse conditions<br>(mA) | Dimensions |   |   |   |   |
|-------|------------------------------------------------|---------------------------------------------------------------|------------|---|---|---|---|
|       |                                                |                                                               | D          | W | d | l | A |
|       |                                                |                                                               |            |   |   |   |   |

All dimensions are in millimetres. See 2.5.6 of CECC 42 100.

# 1 RATINGS AND CHARACTERISTICS

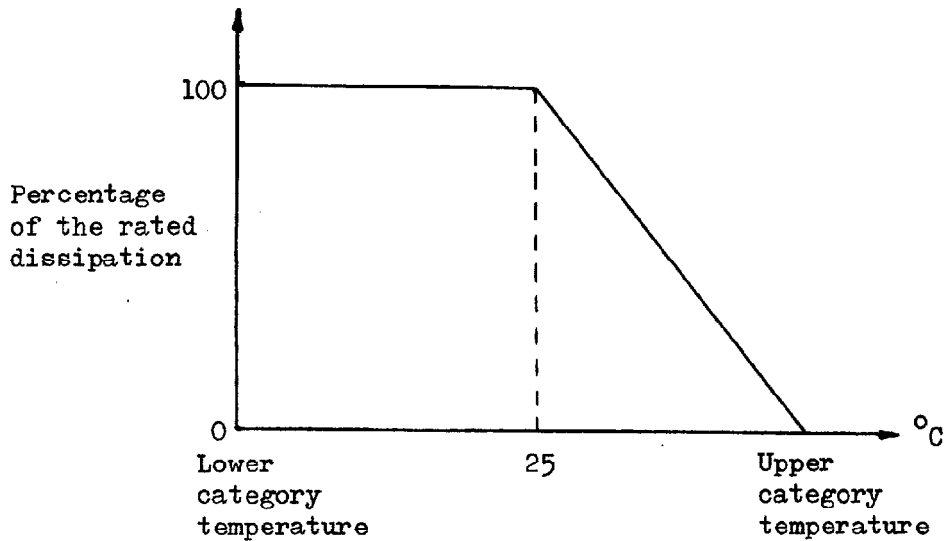
|                                                     |                        |
|-----------------------------------------------------|------------------------|
| Climatic category                                   | -/-/-                  |
| Reference voltage                                   | --- V                  |
| Rated dissipation                                   | --- W                  |
| Temperature coefficient of ---<br>(measured at ...) | --- $^{\circ}\text{C}$ |
| Non-linearity                                       | --- $V_{\text{max}}$   |

(\*\*) Delete as appropriate

See the relevant Qualified Products List for the availability of components made to this specification.

### 1.1 De-rating

Varistors covered by this specification are derated according to the curve :



## 2 MARKING

The marking of the component and the package shall be in accordance with the requirements of 2.4 of CECC 42 000.

## 3 RELATED DOCUMENTS

(National Authorized Institutions will complete this section, making reference to any documents, recommendations or specifications directly referred to in their national equivalent of this document.)

## 4 ORDERING INFORMATION

Orders for varistors covered by this specification shall contain the following information :

- reference voltage
- maximum current at reference voltage
- number of the detail specification and style reference

## 5 CERTIFIED TEST RECORDS (RCE)

Where certified test records are called for, they shall be prepared in accordance with 3.5 of CECC 42 000.

## 6 INSPECTION REQUIREMENTS(See table 2)

When it is desired to obtain qualification approval by adopting the fixed sample size procedure, (See 3.3.3 of CECC 42 000) use shall be made of the test schedule given for that purpose in CECC 42 100.

The conditions of test and the performance requirements shall be identical to those prescribed for quality conformance inspection in the detail specification.

TABLE 2

| Test<br>(See Note 1)                                                                           | D<br>or<br>ND | Conditions of Test                                                                                                                                       | IL<br>(See Note 2) | AQL  | Performance<br>Requirements<br>(See Note 1)                                              |
|------------------------------------------------------------------------------------------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------|------------------------------------------------------------------------------------------|
| <b>GROUP A INSPECTION</b>                                                                      |               |                                                                                                                                                          |                    |      |                                                                                          |
| To be conducted on a sampling basis, lot-by-lot                                                |               |                                                                                                                                                          |                    |      |                                                                                          |
| <u>Sub-Group A1</u><br>4.2.1 Visual examination                                                | ND            |                                                                                                                                                          | II                 | 4%   | As in 4.2.1                                                                              |
| <u>Sub-Group A2</u><br>4.2.2 Marking<br>4.2.3 Dimensions (gauging)                             | ND            |                                                                                                                                                          | II                 | 1%   | As in 4.2.2<br>As specified in Table 1.                                                  |
| <u>Sub-Group A3</u><br>Cl.2 Voltage under pulse conditions<br>4.3 Current at reference voltage | ND            | for peak current see Table 1.<br><br>Reference voltage : --- V                                                                                           | II                 | 1,5% | $V_{max} : --- V$<br><br>$I : \leq --- mA$                                               |
| <b>GROUP B INSPECTION</b>                                                                      |               |                                                                                                                                                          |                    |      |                                                                                          |
| To be conducted on a sampling basis, lot-by-lot                                                |               |                                                                                                                                                          |                    |      |                                                                                          |
| <u>Sub-Group B1</u><br>4.11 Robustness of terminations<br><br>4.10.1 Soldering - solderability | D             | Tensile and bending tests<br>Visual examination<br>Current at reference voltage<br>Reference voltage --- V<br>Solder bath method : $230 \pm 10^{\circ}C$ | S-3                | 2,5% | As in 4.11.6<br>$\Delta I : \leq ---$<br><br>The terminations shall be uniformly tinned. |
| <u>Sub-Group B3</u><br>Cl.1 Overload                                                           | D             | Visual examination<br>Current at reference voltage<br>Reference voltage --- V<br>Voltage under pulse conditions                                          | S-2                | 1,5% | As in Cl.1.4<br>$\Delta I : \leq ---$<br><br>$V_{max} : --- V$                           |

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| Test<br><br>(See Note 1)                                                                                   | D<br>or<br>ND | Conditions of Test                                                                                                                                                            | Sample size &<br>criterion of<br>acceptability<br>(See Note 3) |    |   | Performance<br>Requirements<br>(See Note 1)                                                                        |
|------------------------------------------------------------------------------------------------------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|----|---|--------------------------------------------------------------------------------------------------------------------|
|                                                                                                            |               |                                                                                                                                                                               | P                                                              | n  | c |                                                                                                                    |
| <u>GROUP C INSPECTION</u>                                                                                  |               |                                                                                                                                                                               |                                                                |    |   |                                                                                                                    |
| To be conducted on a sampling basis at the periodicity<br>given in column 'p'                              |               |                                                                                                                                                                               |                                                                |    |   |                                                                                                                    |
| <u>Sub-Group C1</u>                                                                                        | D             |                                                                                                                                                                               | 6                                                              | 8  | 1 |                                                                                                                    |
| Cl.3    Pulse endurance                                                                                    |               | Visual examination<br>Current at reference<br>voltage<br>Reference voltage ---- V<br>Voltage under pulse<br>conditions<br>Insulation resistance<br>(Insulated varistors only) |                                                                |    |   | As in Cl.3.4<br>$\Delta I : \leq \text{---}$<br><br>$V_{\text{max}} : \text{--- V}$<br><br>$R : \geq \dots \Omega$ |
| <u>Sub-Group C2</u>                                                                                        | D             |                                                                                                                                                                               | 6                                                              | 13 | 1 |                                                                                                                    |
| 4.10.2   Soldering -<br>Resistance to<br>solder heat                                                       |               | Method 1A of IEC 68-2-20A<br>Visual examination<br>Current at reference<br>voltage<br>Reference voltage ---- V                                                                |                                                                |    |   | As in 4.10.2.4<br>$\Delta I : \leq \text{---}$                                                                     |
| 4.12    Rapid change of<br>temperature                                                                     |               | $T_A$ : LCT (see Note 1)<br>$T_B$ : UCT (see Note 1)<br>Visual examination<br>Current at reference<br>voltage<br>Reference voltage ---- V                                     |                                                                |    |   | As in 4.12.4<br>$\Delta I : \leq \text{---}$                                                                       |
| <u>GROUP D INSPECTION</u>                                                                                  |               |                                                                                                                                                                               |                                                                |    |   |                                                                                                                    |
| To be conducted on a sampling basis at the periodicity<br>given in column 'p'                              |               |                                                                                                                                                                               |                                                                |    |   |                                                                                                                    |
| <u>Sub-Group D1</u>                                                                                        | D             |                                                                                                                                                                               | 12                                                             | 8  | 1 |                                                                                                                    |
| 4.16    Climatic<br>sequence<br><br>- Dry heat<br><br>- Damp heat,<br>cyclic,<br>first cycle<br><br>- Cold |               | (Low air pressure test not<br>applicable)<br><br>Reference voltage : ---- V                                                                                                   |                                                                |    |   |                                                                                                                    |

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| Test<br><br>(See Note 1)                                                                      | D<br>or<br>ND | Conditions of Test                                                                                                                                                                                                          | Sample size &<br>criterion of<br>acceptability<br>(See Note 3) |   |   | Performance<br>Requirements<br><br>(See Note 1)                                                                                    |        |        |        |  |   |   |
|-----------------------------------------------------------------------------------------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|---|---|------------------------------------------------------------------------------------------------------------------------------------|--------|--------|--------|--|---|---|
|                                                                                               |               |                                                                                                                                                                                                                             | P                                                              | n | c |                                                                                                                                    |        |        |        |  |   |   |
| 4.16 (cont.)<br>- Damp heat,<br>cyclic,<br>remaining<br>cycles<br><br>- Final<br>measurements |               | Reference voltage : --- V<br><br>Visual examination<br>Current at reference<br>voltage<br>Reference voltage --- V                                                                                                           |                                                                |   |   | As in 4.16.9.1<br>$\Delta I : \leq \text{---}$                                                                                     |        |        |        |  |   |   |
| <u>Sub-Group D2</u><br><br>4.17 Damp heat,<br>steady state                                    | D             | 4 specimens<br>No applied voltage<br>Other 4 specimens<br>Applied voltage of V =<br>Visual examination<br>Current at reference<br>voltage<br>Reference voltage --- V<br>Insulation resistance<br>(Insulated varistors only) | 24                                                             | 8 | 1 | As in 4.17.3.1<br>$\Delta I : \leq \text{---}$<br><br>$R \geq \dots \Omega$                                                        |        |        |        |  |   |   |
| <u>Sub-Group D3</u><br><br>4.5 Temperature<br>coefficient<br>of ---                           | ND            | Measured at ---                                                                                                                                                                                                             | 24                                                             | 8 | 1 | <table border="1"><tr><td>25/LCT</td><td>25/UCT</td></tr><tr><td colspan="2">% / °C</td></tr><tr><td>%</td><td>%</td></tr></table> | 25/LCT | 25/UCT | % / °C |  | % | % |
| 25/LCT                                                                                        | 25/UCT        |                                                                                                                                                                                                                             |                                                                |   |   |                                                                                                                                    |        |        |        |  |   |   |
| % / °C                                                                                        |               |                                                                                                                                                                                                                             |                                                                |   |   |                                                                                                                                    |        |        |        |  |   |   |
| %                                                                                             | %             |                                                                                                                                                                                                                             |                                                                |   |   |                                                                                                                                    |        |        |        |  |   |   |
| <u>Sub-Group D4</u><br><br>4.14 Shock                                                         | D             | Pulse shape : half sine<br>Acceleration : 490 m/s <sup>2</sup><br>Pulse duration : 11 ms<br>(See Note 4)<br>Visual examination<br>Current at reference<br>voltage<br>Reference voltage --- V                                | 24                                                             | 6 | 1 | As in 4.14.3<br>$\Delta I : \leq \text{---}$                                                                                       |        |        |        |  |   |   |
| <u>Sub-Group D5</u><br><br>4.18 Flammability                                                  | D             | (In accordance with the<br>conditions and requirements<br>of the national method)                                                                                                                                           | 24                                                             | 5 | 0 |                                                                                                                                    |        |        |        |  |   |   |

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NOTE 1 : Reference numbers of tests and performance requirements refer to CECC 42 000.

LCT = Lower category temperature

UCT = Upper category temperature

NOTE 2 : Inspection levels and AQL's are selected from IEC 410.

NOTE 3 : In this table :

- D = Destructive
- ND = Non-destructive
- p = periodicity (in months)
- n = sample size
- c = acceptance criterion  
(number of permitted defectives)

NOTE 4 : The varistors shall be mounted by their normal means in such a manner that there shall be no parasitic vibration.