

CECC



VARISTANCES BASSE TENSION POUR MATERIEL TELEPHONIQUE

SECTIONAL SPECIFICATION:
LOW VOLTAGE VARISTORS
PRIMARILY FOR TELEPHONY
APPLICATIONS

T

RAHMENSPEZIFIKATION:
NIEDERSpannungs-
Varistoren
Vorzugsweise für
Telephonie-Anwendungen

CECC 42100

1978



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Cette page bleue doit être insérée après le "Sommaire" de la CECC 42 100 (Edition 1)	This blue page should be inserted after the "Contents" page of CECC 42 100 (Issue 1)	Dieses blaue Blatt sollte nach der "Inhaltsangabe" von CECC 42 100 (Ausgabe 1) eingesetzt werden
PREMIERE MODIFICATION A LA CECC 42 100 : SPECIFICATION INTERMEDIAIRE : VARIANCES BASSE TENSION POUR MATERIEL TELEPHONIQUE	1ST AMENDMENT TO CECC 42 100 : SECTIONAL SPECIFICATION : LOW VOLTAGE VARISTORS, PRIMARILY FOR TELEPHONY APPLICATIONS	1. ERGÄNZUNG ZU CECC 42 100 : RAHMENSPEZIFIKATION : NIEDERSpannungsVARISTOREN VORZUGSWEISE FÜR TELEPHONIE - ANWENDUNGEN
Les modifications suivantes doivent être effectuées à la main à l'Édition 1 (1975) de la CECC 42 100 :	The following amendments to Issue 1 (1978) of CECC 42 100 should be made in manuscript :	Bei der Ausgabe 1 (1978) der CECC 42 100 sind folgende Änderungen handschriftlich vorzunehmen :
1. Page 1. Après 3.3 ajouter : "ANNEXE A - Programme d'essai sur échantillonnage fixe." 2. Page 8. Supprimer la "NOTE" après 3.3. 3. Page 2. Supprimer la page 2 et insérer la nouvelle page 2 Modification 1 1981.	1. Page 1. After 3.3 add : "APPENDIX A - Fixed sample size qualification approval test schedule." 2. Page 8. Delete the "NOTE" after 3.3. 3. Page 2. Remove existing page 2 and replace by page 2 Amendment 1 1981.	1. Seite 1. Nach Abschnitt 3.3 hinzufügen : "ANHANG A - Prüfplan für Gütebestätigung bei fester Stichprobengröße." 2. Seite 8. Die "Anmerkung" nach dem Abschnitt 3.3 ist zu streichen. 3. Seite 2. Die Seite 2 ist durch die neue Seite 2 Änderung 1 zu ersetzen.
4. Insérer les nouvelles pages 9 à 12 (Annexe A) 1981.	4. Insert the new pages 9, 10, 11 and 12 (Appendix A).	4. Die neuen Seiten 10 bis 13 (Anhang A) sind hinzuzufügen.

CECC 42 100 Ausgabe 1 Änderung 1 1981

CECC 42 100 Issue 1 Amendment 1 1981

CECC 42 100 Edition 1 Modification 1 1981

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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 detail specifications for LOW VOLTAGE VARISTORS PRIMARILY FOR TELEPHONY APPLICATIONS. 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 sectional specification was prepared by CECC Working Group 4 : "Resistors".

This is one of a series of sectional specifications, all relating to the generic specification printed as CECC 42 000.

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 sectional specification was circulated to the CECC for voting in the documents listed below and was ratified by the CECC for printing as a CECC Specification.

<u>Document</u>	<u>Voting Date</u>	<u>Report on the Voting</u>
CECC(Secretariat)378	November 1975	CECC(Secretariat)516
CECC(Secretariat)530	November 1976	CECC(Secretariat)635
CECC(Secretariat)531	November 1976	CECC(Secretariat)608
CECC(Secretariat)676	March 1978	CECC(Secretariat)707

SECTION 1 - SCOPE

- 1 This sectional specification prescribes the preferred values for characteristics and ratings and also the inspection requirements for disc type low voltage varistors of assessed quality primarily for telephony application, having a rated dissipation of not more than 2 W and a reference voltage of not more than 100 V. It selects from the generic specification, CECC 42 000, the appropriate methods of test to be used in detail specifications derived from this specification.

Associated with this specification are one or more blank detail specifications each referenced by a CECC number. A blank detail specification which has been completed as specified in 2.5 of this specification forms a detail specification. These detail specifications may be used for the granting of qualification approval to a varistor and for the performance of quality conformance inspection in accordance with the CECC System.

SECTION 2 - PREFERRED CHARACTERISTICS,RATINGS AND SEVERITIES FOR ENVIRONMENTAL TESTS2.1 Characteristics

The values prescribed in detail specifications shall preferably be selected from the following :

2.1.1 Climatic category

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

The standard severities for the cold, dry heat and damp heat, steady state, tests are within the following ranges :

Cold: Test A (IEC 68-2-1) - 10 to - 55 °C

Dry heat: Test B (IEC 68-2-2) + 40 to + 85 °C

Damp heat, steady state: Test C (IEC 68-2-3) 4 to 56 days

Values selected within these ranges shall be chosen from those listed in the relevant tests of IEC 68-2.

The severities for the cold and dry heat tests are the lower and upper category temperatures. For some varistors, these temperatures will occur between two of the preferred temperatures given in IEC 68-2. In this case, the nearest preferred temperature within the category temperature range of the varistors shall be chosen for this severity.

2.1.2 Temperature coefficient2.1.2.1 Temperature coefficient of current (for types having a current at reference voltage $\geq 100 \mu A$)

Temperature coefficient of current at the reference voltage $< 0,8 \text{ }^{\circ}\text{C}$.

2.1.2.2 Temperature coefficient of voltage (for types having a current at reference voltage $< 100 \mu A$)

Temperature coefficient of voltage at a current of 1 mA : $< 0,1 \text{ }^{\circ}\text{C}$.

2.1.3 Limits for change in current

The standard limits for change in current in each of the tests are given below.

Title of test and paragraph number (See NOTE 1)	Change in current (See NOTE 2)	
	Current at reference voltage $\geq 100 \mu A$	Current at reference voltage $< 100 \mu A$
4.10.2 Resistance to soldering heat	$\pm 10 \%$	$\leq 40 \mu A$
4.11 Robustness of terminations		
4.12 Rapid change of temperature		
C1.1 Overload	$\pm 15 \%$	
C1.3 Pulse endurance	$\pm 20 \%$	
4.16 Climatic sequence	$\pm 30 \%$	
4.17 Damp heat, steady state		

NOTE 1 : The paragraph numbers refer to CECC 42 000.

NOTE 2 : Percentage limits are given for application to materials of which silicon carbide is the prototype. Limits are given in microamperes for application to materials of which zinc oxide is the prototype.

2.1.4 Reference voltage

The reference voltages are 25; 32; 36; 40; 48; 50; 60; 63; 66; 80 and 100 V. The values which are underlined shall be used in future designs.

2.1.5 Maximum current at reference voltage

The standard values of maximum current are :

0,01 0,05 0,5 0,9 1 1,5 1,7 3 5 9 and
15 mA.

2.1.6 Non-linearity (See 2.2.6 and Appendix C1.2 of CECC 42 000)

V_{max} : The value of voltage under pulse conditions
is given in the detail specification and
should not exceed 145 V.

2.2 Ratings

The values prescribed in detail specifications shall preferably
be selected from the following :

2.2.1 Rated dissipation

The standard values of rated dissipation at 25°C are :

0,1 0,2 0,5 and 1 W.

2.2.2 Insulation resistance

The standard limit for insulation resistance shall be
10 MΩ or, after damp heat testing, 1MΩ.

2.3 Severities for environmental tests

Test severities prescribed in detail specifications shall preferably
be selected from the following :

2.3.1 Soldering

Test T (IEC 68-2-20)

Solderability : Solder bath method at 230 ± 10 °C; or,
Solder globule method, duration 3 s max

Resistance to
soldering heat: Test T_b (IEC 68-2-20A)
Method 1A.

2.3.2 Shock

Test E_a (IEC 68-2-27)

Pulse shape : half sine

Acceleration : 490 m/s^2

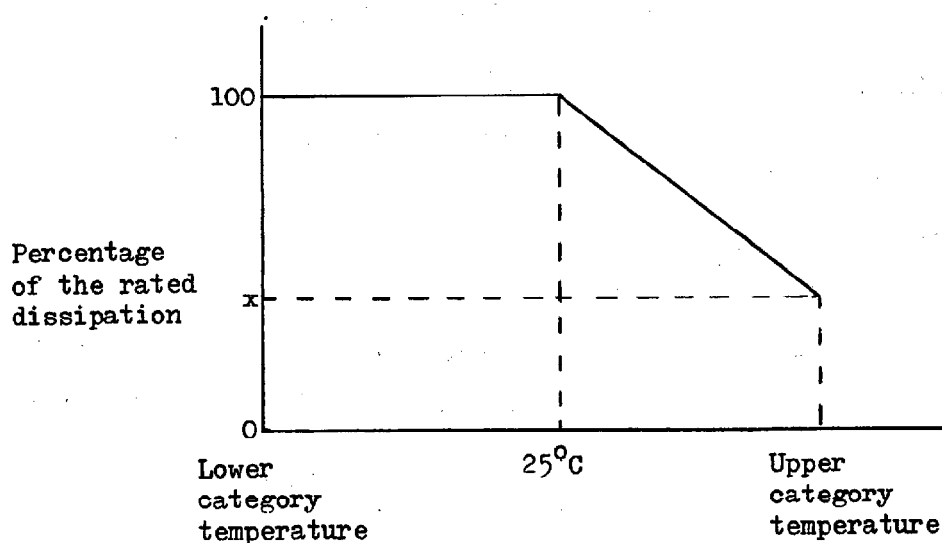
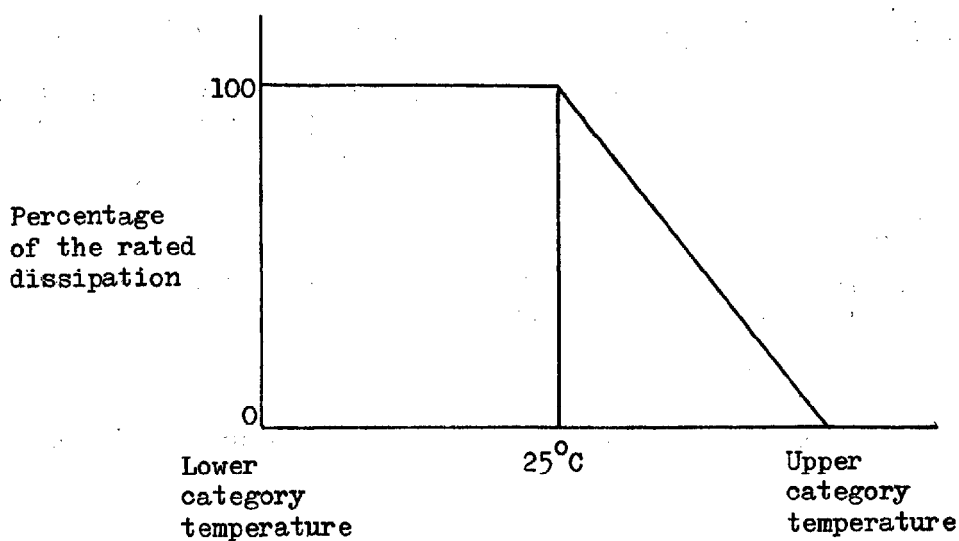
Pulse duration : 11 ms

Severity : 3 successive shocks in any one direction
per specimen. Separate specimens to be
used for any one direction.

Mounting : Normal mounting means, in such a manner
that there shall be no parasitic vibration.

2.4 Derating

One of the following derating curves shall be applied :



2.5 Information to be given in a detail specification

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

NOTE : The information given in 2.5.1 to 2.5.6 may, for convenience, be presented in tabular form.

2.5.1 Style See 2.2.3 of CECC 42 000

2.5.2 Reference voltage

See 2.1.4

2.5.3 Maximum current at reference voltage

See 2.1.5

2.5.4 Non-linearity

See 2.1.6

2.5.5 Rated dissipation

See 2.2.1

2.5.6 Dimensions

The numerical value, in millimetres, shall be given for such of the following dimensions as are applicable and it shall be stated which dimensions are suitable for gauging.

Maximum body diameter	: D
Maximum body thickness, including terminations of styles with wire terminations	: W
Diameter of wire terminations	: d
Length of wire terminations	: l
Distance between wire terminations	: A
Height of exposed segment of metallized face (for styles mounted by pressure contact)	: H

The detail specification shall state such other dimensional information as will adequately describe the varistor.

2.5.7 Climatic category

See 2.1.1

2.5.8 Temperature coefficient (of current, or of voltage)

See 2.1.2

2.5.9 Marking See 2.4 of CECC 42 000

The varistors may be colour coded in a manner stated in the National Specification.

(An alpha-numeric code to indicate the style is under consideration).

2.5.10 Ordering information

The detail specification shall indicate that the following information is required when ordering varistors:

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

2.5.11 Additional information (not for inspection purposes)

The detail specification may include information (which is not required to be verified by the inspection procedure), such as circuit diagrams, curves, drawings and notes needed for the clarification of the detail specification.

SECTION 3 - INSPECTION3.1 Formation of inspection lots

An inspection lot shall consist of varistors of the same style. It should be representative of those extremes of maximum current at reference voltage which have been produced during the period.

Where a lot is formed from specimens of different termination variants, that lot shall contain an equal portion of each termination variant.

3.2 Test methods

Test methods shall be selected from those given in CECC 42 000 or, failing that, shall be described in the detail specification.

3.3 Qualification approval

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 following test schedule.*

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

APPENDIX A

(See Note 1) Fixed sample size qualification approval test schedule

Clause Number and Test	Conditions of Test	Performance requirements	Defectives permitted								
			(See Note 2)								
			n	c	t						
GROUP 0 (Non-destructive)			56	2	2						
4.2.1	Visual examination	As in 4.2.1.	+4								
4.2.2	Marking	As in 4.2.2									
4.2.3	Dimensions (gauging)	As in the detail specification									
4.3	Current at reference voltage	Reference voltage : --- V I : $\leq$ --- mA									
GROUP 1 (Destructive)			8	1	3						
C1.2	Voltage under pulse conditions	Peak current : (As specified in the detail specification) $V_{max} : --- V$									
4.5	Temperature coefficient of ---	Reference voltage : --- V. <u>or</u> (Measuring current 1mA). <table><tr><td>25/LCT</td><td>25/UCT</td></tr><tr><td colspan="2">$\Delta --- \leq$</td></tr><tr><td>--- %/°C</td><td>--- %/°C</td></tr></table>	25/LCT	25/UCT	$\Delta --- \leq$		--- %/°C	--- %/°C			
25/LCT	25/UCT										
$\Delta --- \leq$											
--- %/°C	--- %/°C										
4.7	Voltage proof	(Insulated varistors only) As in 4.7.3									
4.14	Shock	Pulse shape : Half sine Acceleration : 490 m/s ² Pulse duration : 11 ms (See Note 3) Visual examination Current at reference voltage Reference voltage --- V As in 4.14.3 $\Delta I : \leq ---$									
GROUP 2 (Destructive)			8	1							
4.11	Robustness of terminations	Test appropriate to the type of termination. Visual examination Current at reference voltage Reference voltage : --- V As in 4.11.6 $\Delta I : \leq ---$									

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(See Note 1)

Clause Number and Test	Conditions of Test	Performance requirements	Defectives permitted		
			(See Note 2)		
n	c	t			
4.10.1 Soldering- Solderability	(See Note 4) Solder bath method $230 \pm 10^{\circ}\text{C}$	The terminations shall be uniformly tinned.			
<u>GROUP 3</u> (Destructive) Cl.3 Pulse endurance	Visual examination Current at reference voltage Reference voltage : --- V Voltage under pulse conditions Insulation resistance (Insulated varistors only)	As in Cl.3.4 $\Delta I : \leq \text{---}$ $V_{\text{max}} : \text{--- V}$ $R : \geq 10 \text{ M}\Omega$	8	1	
<u>GROUP 4</u> (Destructive) 4.17 Damp heat, steady state	4 specimens No applied voltage Other 4 specimens Applied voltage : --- V Visual examination Current at reference voltage Reference voltage : --- V Insulation resistance (Insulated varistors only)	As in 4.17.3.1 $\Delta I : \leq \text{---}$ $R : \geq 1 \text{ M}\Omega$	8	1	
<u>GROUP 5</u> (Destructive) 4.10.2 Soldering - resistance to heat	Method 1A of IEC 68-2-20A Visual examination Current at reference voltage Reference voltage : --- V	As in 4.10.2.4 $\Delta I : \leq \text{---}$	8	1	

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(See Note 1)

Clause Number and Test	Conditions of Test	Performance requirements	Defectives permitted		
			(See Note 2)		
			n	c	t
4.12 Rapid change of temperature	$T_A : (LCT) ^\circ C$ $T_B : (UCT) ^\circ C$ Visual examination Current at reference voltage Reference voltage : --- V.	As in 4.12.4 $\Delta I : \leq ---$			
GROUP 6 (Destructive) 4.16 Climatic sequence -Dry heat -Damp heat, cyclic, first cycle -Cold -Damp heat, cyclic, remaining cycles -Final measure- ments	(Low air pressure test not applicable) Reference voltage : --- V. Reference voltage : --- V Visual examination Current at reference voltage Reference voltage : --- V.	As in 4.16.9.1 $\Delta I : \leq ---$	8	1	
GROUP 7 (Destructive) Cl.1 Overload 4.18 Flammability	Visual examination Current at reference voltage Reference voltage : --- V Voltage under pulse conditions (In accordance with the conditions and requirements of the national method)	As in Cl.1.4 $\Delta I : \leq ---$ $V_{max} : --- V$	8	1	

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