

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

CECC



Système Harmonisé d'Assurance de la Qualité
des Composants Electroniques

SPECIFICATION PARTICULIERE CADRE:

RESISTANCES FIXES NON- BOBINEES A FAIBLE DISSIPATION

Harmonized System of Quality Assessment for
Electronic Components

BLANK DETAIL SPECIFICATION:

FIXED LOW POWER NON-WIREWOUND RESISTORS

Harmonisiertes Gütebestätigungssystem für
Bauelemente der Elektronik

VORDRUCK FÜR
BAUARTSPEZIFIKATION:

NICHTDRAHTGEWICKELTE FESTWIDERSTÄNDE KLEINER BELASTBARKEIT

2 Edition
Issue
Ausgabe

CECC 40101

Cette page bleue doit être insérée après la page de garde de la CECC 40 101 Edition 2 (1981)

MODIFICATION 1 A LA CECC 40 101 (Edition 2) :

SPECIFICATION PARTICULIERE CADRE:

RESISTANCES FIXES NON-BOBINES A FAIBLE DISSIPATION

Supprimer la page 2 de la CECC 40 101 Edition 2 et insérer les nouvelles pages 1a et 2 de la CECC 40 101 Edition 2 Modification 1.

Les modifications suivantes doivent être effectuées à la main:

TABEAU 2

(page 6)

En sous-groupe B2, essai "4.15.1 Soudure - Soudabilité", colonne 2, insérer avant le texte existant: "Méthode 1" et en colonne 5, supprimer le texte existant et insérer "Comme en 4.15.1.2.1".

En sous-groupe B2, essai "4.11 Surcharge", colonne 2, supprimer les deux dernières lignes du tableau et insérer "15 s 1 à 4 W".

(page 8)

En sous-groupe C1, essai "4.15.2 Soudure - Résistance à la chaleur", colonne 6, modifier "4.15.2.4 en "4.15.2.3".

This blue page shall be inserted after the title page of CECC 40 101 Issue 2 (1981)

AMENDMENT 1 TO CECC 40 101 (Issue 2) :

BLANK DETAIL SPECIFICATION :

FIXED LOW POWER NON-WIREWOUND RESISTORS

Remove page 2 of CECC 40 101 Issue 2 and insert new pages 1a and 2 of CECC 40 101 Issue 2 Amendment 1.

The following amendments shall be made in manuscript:

TABLE 2

(page 6)

In Sub-Group B2, Test "4.15.1 Soldering - Solderability", Column 2, insert before the existing test "Method 1" and in Column 5 delete the existing text and insert "As in 4.15.1.2.1".

In Sub-Group B2, Test "4.11 Overload", Column 2, delete the last two lines of the table and insert "15 s 1 to 4 W".

(page 8)

In Sub-Group C1, Test "4.15.2 Soldering - Resistance to heat", Column 2, amend the reference of the IEC document to "IEC 68-2-20" and in Column 6, amend "4.15.2.4" to read "4.15.2.3".

Dieses blaue Blatt ist nach dem Titelblatt der CECC 40 101 Ausgabe 2 (1981) einzusetzen

ÄNDERUNG 1 ZU CECC 40 101 (Ausgabe 2) :

VORDRUCK FÜR BAUARTSPEZIFIKATIONEN:

NICHTDRAHTGEWICKELTE FESTWIDERSTÄNDE
KLEINER BELASTBARKEIT

Seite 2 der CECC 40 101 Ausgabe 2 ist herauszunehmen und die neuen Seiten 1a und 2 der CECC 40 101 Ausgabe 2 Änderung 1 sind einzusetzen.

Folgende Änderungen sind handschriftlich vorzunehmen:

TABELLE 2

(Seite 6)

In Untergruppe B2, Prüfung "4.15.1 Löten - Lötbarkeit", Spalte 2, ist vor dem bestehenden Text einzusetzen "Verfahren 1" und in Spalte 5 ist der bestehende Text zu ersetzen durch "Wie in 4.15.1.2.1".

In Untergruppe B2, "4.11 Überlastprüfung", Spalte 2, sind die beiden letzten Zeilen der Tabelle zu ersetzen durch "15 s 1 bis 4 W".

(Seite 7)

In Untergruppe C1, Prüfung "4.15.2 Löten - Lötwärmebeständigkeit", Spalte 2, ist der Verweis auf das IEC-Schriftstück zu ändern in "IEC 68-2-20" und in Spalte 6 ist "4.15.2.4" zu berichtigen in "4.15.2.3".

CECC 40 101 Issue 2 Amendment 1 1986

CECC 40 101 Ausgabe 2 Änderung 1 1986

CECC 40 101 Edition 2 Modification 1 1986

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 member countries taking part in the System who wish to prepare and issue detail specifications for FIXED LOW POWER NON-WIREWOUND RESISTORS. It should be read in conjunction with document CECC 00 100 : Basic Rules (1974).

At the date of publication 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 addresses shown on the inside cover.

PREFACE

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

It is one of a series of blank detail specifications for fixed low power non-wirewound resistors, all relating to the generic specification printed as CECC 40 000 and the sectional specification printed as CECC 40 100.

The text of the first issue of this blank detail specification (1974) was circulated to the CECC for voting in the documents listed below :

<u>Document</u>	<u>Date of Vote</u>	<u>Report on the Voting</u>
CECC(Secretariat)60	10 January 1972	CECC(Secretariat) 89
CECC(Secretariat)83	30 June 1972	CECC(Secretariat)118
CECC(Secretariat)99	23 October 1972	CECC(Secretariat)140

This second issue of the blank detail specification results from amendments or additions to the text of Issue 1 which were circulated to the CECC for voting in the documents listed below and was approved by the CECC Management Committee for printing as a CECC specification:

<u>Document</u>	<u>Date of Vote</u>	<u>Report on the Voting</u>
CECC(Secretariat)334	27 May 1975	CECC(Secretariat)396
CECC(Secretariat)337	27 May 1975	CECC(Secretariat)405
CECC(Secretariat)501	20 June 1976	CECC(Secretariat)600
CECC(Secretariat)709	28 June 1978	CECC(Secretariat)752
CECC(Secretariat)949	15 June 1980	CECC(Secretariat)977

Amendment 1 to Issue 2 of this blank detail specification results from amendments to the text which were circulated to the CECC for voting in the documents listed below and were approved by the President of the CECC for publication:

<u>Voting document</u>	<u>Date of voting</u>	<u>Report on the voting</u>
CECC(Secretariat)948	June 1980	CECC(Secretariat)976
CECC(Secretariat)1447	March 1984	CECC(Secretariat)1611

Implementation

This Issue 2 of CECC 40 101 shall come into effect for use in preparation of new detail specifications from its date of publication (March 1981).

Issue 1 of CECC 40 101 shall remain valid for an overlap period for existing approvals, or for components going through the approval procedure, until 1 March 1982.

Amendment 1 of Issue 2 of CECC 40 101 shall become effective for all new qualification approvals on 1 May 1986. It shall become effective for all other qualification approvals by 1 May 1987.

Key for page 3

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

Identification of the harmonized detail specification

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

Identification of the resistor

- [5] A short description of the type of resistor.
- [6] Information on typical construction (where applicable) e.g. metal film helically cut.
- [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.

Specifications available from :- [1]	CECC 40 101-XXX [2] page 1 of 12 
ELECTRONIC COMPONENTS OF ASSESSED QUALITY IN ACCORDANCE WITH : [3]	[4]
Outline and dimensions :- (See Table 1) (First angle projection) [7]	FIXED LOW POWER NON-WIREWOUND RESISTORS [5]
	[6]
	ASSESSMENT LEVEL "S" [8]

Note 1 : Other shapes are permitted within the dimensions given

Note 2 : These resistors are (not) suitable for printed wiring applications

TABLE 1

[9]

Style	Rated dissipation (W at 70°C)	Limiting element voltage (V d.c. or a.c. rms.)	Isolation voltage (V d.c. or a.c. peak)	Maximum dimensions		d		
				L	D	min	nom	max

All dimensions in millimetres

1. RATINGS AND CHARACTERISTICS

*Resistance range ---Ω to ---Ω

Standard selection tolerances ± -- %

Climatic category -/-/-

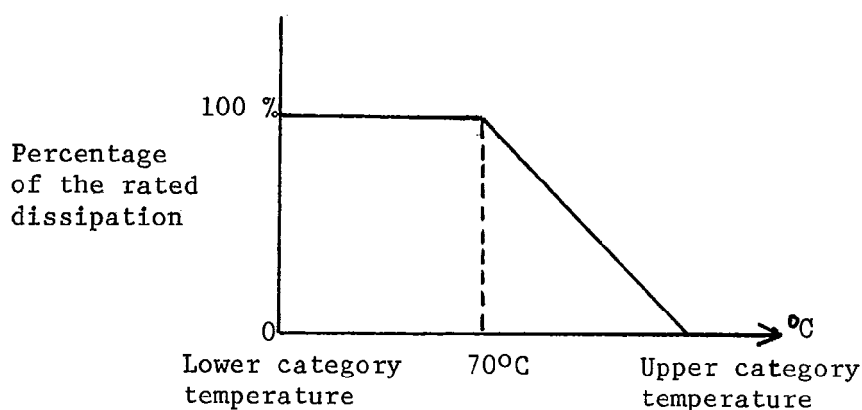
*The preferred values are those of the E-- series of IEC 63. Where the use of intermediate values is essential, they should, wherever possible, be chosen from a series in that document.

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

Vibration severity	10 Hz to 500 Hz; 0,75 mm or 98 m/s ² (whichever is the less severe)
Low air pressure	8,5 kPa (85 mbar)
Limit of resistance change after 1 000 h endurance test	$\pm$ (-- %R+ -- Ω)
Temperature characteristic of resistance (20 to 70°C)	$\Delta R : \leq \pm$ -- %R($\Delta R/R\Delta T : \leq \pm$ -- ppm/K)

1.1 Derating

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



Note : Various parameters have been precisely specified for this component. It should not be assumed that any parameter not specified will remain unchanged from one component to another.

Should, for any reason, it be necessary for further parameter(s) to be controlled, then a new fuller specification should be used.

The additional test method(s) shall be fully described, and appropriate limits, AQL's and Inspection levels specified.

2. MARKING

The marking of the component and package shall be in accordance with the requirements of 2.4 of CECC 40 000.

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 resistors covered by this specification shall contain the following information :

- Resistance value
- Tolerance
- Style and national specification number of this detail specification

5. CERTIFIED TEST RECORDS

National Authorized Institutions shall indicate in this clause whether certified test records shall be prepared in accordance with 3.5 of CECC 40 000.

6. 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 for the clarification of the detail specification.

7. INSPECTION REQUIREMENTS (See Table 2)

7.1 When drying is called for, Procedure I of 4.2 of CECC 40 000 shall be used.

7.2 When the manufacturer desires to obtain qualification approval by adopting the fixed sample size procedure (See 3.3.3 of CECC 40 000) use shall be made of the test schedule given in Appendix A to CECC 40 100. The conditions of test and the performance requirements shall be identical to those prescribed for the quality conformance inspection in the detail specification.

(See Notes 1 and 2)

TABLE 2

Clause Number and Test	Conditions of Test	I L	A Q L	Performance Requirements								
GROUP A INSPECTION												
To be conducted on a sampling basis, lot-by-lot												
Sub-Group A1 (Non-destructive)		S-4	1,0%									
4.3.1	Visual examination			As in 4.3.1								
4.3.2	Marking			As in 4.3.2								
Sub-Group A2 (Non-destructive)		S-4	1,0%									
4.3.3	Dimensions (gauging)	A gauge-plate of ...mm shall be used.		As specified in Table 1								
4.4	Resistance			As in 4.4.2								
GROUP B INSPECTION												
To be conducted on a sampling basis, lot-by-lot												
Sub-Group B1 (Non-destructive)		S-3	1,0%									
4.6	Voltage proof	(Insulated resistors only)		As in 4.6.3								
Sub-Group B2 (Destructive)		S-3	2,5%									
4.15.1	Soldering - Solderability	Method 1 (The detail specification shall state whether the terminations are suitable for printed wiring)		As in 4.15.1 - 2.1 The terminations shall be uniformly tinned.								
4.11	Overload											
		<table><tr><th>Test duration</th><th>Rated dissipation</th></tr><tr><td>1 s</td><td>0,063 W</td></tr><tr><td>5 s</td><td>0,125 to 0,75W</td></tr><tr><td>"15 s</td><td>1 to 4 W".</td></tr></table>	Test duration	Rated dissipation	1 s	0,063 W	5 s	0,125 to 0,75W	"15 s	1 to 4 W".		
Test duration	Rated dissipation											
1 s	0,063 W											
5 s	0,125 to 0,75W											
"15 s	1 to 4 W".											
		The applied voltage shall be 2,5 times the rated voltage or twice the limiting element voltage, whichever is the less.										
		Visual examination		As in 4.11.3								
		Resistance		$\Delta R: \leq \pm(-\%R+ -\Omega)$								

Notes on page 12

- 6 -

CECC 40 101 Issue 2

(See Notes 1 and 2)

Clause Number and Test	Conditions of Test	I L	A Q L	Performance Requirements
<u>Sub-Group B3 (Non-destructive)</u>		S-3	2,5%	
4.7 Temperature character- istic of resistance	This test is applicable only where a temperature coefficient of resistance of less than 50 ppm/K is claimed. One cycle of 20°C to 70°C to 20°C only.			$\Delta R : \leq \text{--- \%R}$

Notes on page 12

- 7 -

CECC 40 101 Issue 2

(See Notes 1 and 3)

Clause Number and Test		Conditions of Test	Sample size & criterion of acceptability (See Note 3)			Performance Requirements
			P	n	c	
GROUP C INSPECTION						
To be conducted on a sampling basis at the periodicity given in column "P"						
Sub-Group C1 (Destructive)			3	20	1	
<u>Half of the sample</u>						
4.14	Robustness of terminations	Tensile, bending and torsion tests. Visual examination Resistance				As in 4.14.6.1 $\Delta R: \leq \pm(-\%R+ -- \Omega)$
4.15.2	Soldering - Resistance to heat	(The detail specification shall state whether Method 1A or Method 1B of Test Tb of IEC 68-2-20 shall apply.) Visual examination Resistance				As in "4.15.2.3" $\Delta R: \leq \pm(-\%R+ -- \Omega)$
<u>Other half of the sample</u>						
4.16	Rapid change of temperature	T _A : Lower category temperature T _B : Upper category temperature Visual examination Resistance				As in 4.16.4 $\Delta R: \leq \pm(-\%R+ -- \Omega)$
4.19	Vibration	Procedure : B4 Frequency range : 10 Hz to 500 Hz Amplitude 0,75 mm or 98 m/s ² (whichever is the less severe) Sweep endurance : Total duration 6 h (See Note 4) Visual examination Resistance				As in 4.19.3 $\Delta R: \leq \pm(-\%R+ -- \Omega)$

Notes on page 12

- 8 -

CECC 40 101 Issue 2

(See Notes 1 and 3)

Clause Number and Test	Conditions of Test	Sample size & criterion of acceptability (See Note 3)			Performance Requirements
		P	n	c	
4.20	<u>All of the sample</u> Climatic sequence - Dry heat - Damp heat, cyclic, first cycle. - Cold - Low air pressure - Damp heat, cyclic, remaining cycles - D.C. load - Final measurements 8,5 kPa (85 mbar) Visual examination Resistance Insulation resistance (Insulated resistors only)				As in 4.20.8. $\Delta R: \leq \pm(-\%R + -\Omega)$ $R: \geq 100 \text{ M}\Omega$
<u>Sub-Group C2 (Destructive)</u>		3	20	1	
4.24.1	Endurance at 70°C Duration : 1 000 h Examination at 48, 500 and 1 000 h Visual examination Resistance Examination at 1 000h Insulation resistance (Insulated resistors only) The tests on one sample each year shall be extended to 8 000 h duration Examination at 2 000 4 000 & 8 000 h Resistance				As in 4.24.1.7 $\Delta R: \leq \pm(-\%R + -\Omega)$ $R: \geq 1 \text{ G}\Omega$ $\Delta R/R$: The results obtained are for information only
		12	20	-	

Notes on page 12

- 9 -

CECC 40 101 Issue 2

(See Notes 1 and 3)

Clause Number and Test	Conditions of Test	Sample size & criterion of acceptability (See Note 3)			Performance Requirements						
		P	n	c							
<u>Sub-Group C3 (Non-destructive)</u>		3	20	1	<table><tr><td>LCT /20</td><td>20 /UCT</td></tr><tr><td colspan="2">$\Delta R : \leq$</td></tr><tr><td>...%R</td><td>...%R</td></tr></table>	LCT /20	20 /UCT	$\Delta R : \leq$		...%R	...%R
LCT /20	20 /UCT										
$\Delta R : \leq$											
...%R	...%R										
4.7	Temperature characteristic of resistance										
<u>GROUP D INSPECTION</u>											
To be conducted on a sampling basis at the periodicity given in column "P"											
<u>Sub-Group D1 (Destructive)</u>		12	20	1							
4.21	Damp heat, steady state				As in 4.21.4 $\Delta R : \leq +(-\%R + -\Omega)$ $R : \geq 100 M\Omega$						
	Visual examination Resistance Insulation resistance (Insulated resistors only)										
<u>Sub-Group D2 (Destructive)</u>		36	20	1							
4.3.4	Dimensions (detail)				As specified in the detail specification						
4.24.3	Endurance at upper category temperature				As in 4.24.3.7 $\Delta R : \leq +(-\%R + -\Omega)$ $R : \geq 1 G\Omega$						
	Duration : 1 000 h Examination at 48, 500 and 1 000 h. Visual examination Resistance Examination at 1 000 h Insulation resistance (Insulated resistors only)										
<u>Sub-Group D3 (Destructive)</u>		36	20	1							
4.24	Endurance at other temperatures (if applicable)										
	This sub-group is only applicable if a derating curve other than that shown in 2.4 of CECC 40 100 is claimed in the detail specification. Duration : 1 000 h Examination at 48, 500 and 1 000 h Visual examination				As in 4.24.1.7						

Notes on page 12

(See Notes 1 and 3)

Clause Number and Test	Conditions of Test	Sample size & criterion of acceptability (See Note 3)			Performance Requirements
		p	n	c	
	Resistance Examination at 1 000 h Insulation resistance (Insulated resistors only)				$\Delta R: \leq \pm (\text{---}\%R + \text{---}\Omega)$ (As for Sub-Group C2) $R : \geq 1 \text{ G}\Omega$

Notes on page 12

- 11 -

CECC 40 101 Issue 2