

Förderverein für Elektrotechnische Normung (FEN) e. V.
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
POUR MONTAGE EN SURFACE
(CHIPSES)**

Harmonized System of Quality Assessment for
Electronic Components

BLANK DETAIL SPECIFICATION:

**FIXED LOW POWER
NON-WIREWOUND
SURFACE MOUNTING
(CHIP) RESISTORS**

Harmonisiertes Gütebestätigungssystem für
Bauelemente der Elektronik

VORDRUCK
FÜR BAUARTSPEZIFIKATION:

**NIEDRIG BELASTBARE
NICHTDRAHTGEWICKELTE
FESTWIDERSTÄNDE
FÜR OBERFLÄCHENMONTAGE
(CHIPWIDERSTÄNDE)**



1

Edition
Issue
Ausgabe

CECC 40 401

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Documents

Document Sharing Hub

Information about the System may be obtained from:



FEN Secretariat
and
CECC General Secretariat
Stresemannallee 15
D-6000 Frankfurt/Main 70
Telefon: Int.+ (49) 69 6 30 82 83
Telex 4-12871 vdetz d
Telefax Int.+ (49) 69 6 30 82 83 (Gr. 2/3)
or from the National Authorized Institutions
of the participating countries listed
who can supply copies of:

- 1 The Internal Regulations of the FEN e.V.
- 2 CECC Specifications of the FEN and National Specifications for the System
- 3 CECC 00 200: Qualified Products List (QPL)
- 4 CECC 00 300: CECC Publications and their related national documents

Austria

Österreichischer Verband
für Elektrotechnik
Eschenbachgasse 9
A-1010 Vienna

Belgium

Comité Electrotechnique Belge
Galerie Ravenstein 3
Boîte 11
B-1000 Brussels

Denmark

Dansk Elektroteknisk Komite
Strandgade 36
DK-1401 Copenhagen K

Finland

Finnish Electrotechnical
Standards Association
P.O. Box 134
SF-00211 Helsinki 21

France

Union Technique de l'Electricité
Participation française au CECC
12, Place des Etats-Unis
F-75783 Paris Cedex 16

Germany

Deutsche Elektrotechnische
Kommission im DIN und VDE
Stresemannallee 15
D-6000 Frankfurt/Main 70

Ireland

EOLAS- The Irish Science and
Technology Agency
Glasnevin
IRL-Dublin 9

Italy

Comitato Elettrotecnico Italiano
Viale Monza, 259
I-20126 Milan

Netherlands

Nederlands Elektrotechnisch Comité
Postbus 5059
NL-2600 GB Delft

Norway

Norsk Elektroteknisk Komite
P.O. Box 280
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N-0212 Oslo 2

Portugal

Instituto Português da Qualidade
Rua José Estêvão, 83A
P-1199 Lisbon Codex

Spain

Asociación Electrotécnica y Electrónica Española
Comité Español del CECC
Avda. de Brasil, 7
E-28020 Madrid 20

Sweden

Svenska Elektriska Kommissionen
Box 1284
S-16428 Kistå-Stockholm

Switzerland

Schweizerischer Elektrotechnischer
Verein
Postfach
CH- 8008 Zürich

United Kingdom

British Electrotechnical Committee
British Standards Institution
2, Park Street
GB-London W1A 2BS

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 accepted by all member countries without further testing.

This specification has been formally approved by the CECC, and has been prepared for those countries taking part of the System who wish to issue national harmonized specifications for FIXED LOW POWER NON-WIREWOUND SURFACE MOUNTING (CHIP) RESISTORS. It should be read in conjunction with the current regulations for the CECC System.

At the date of printing of this specification, the member countries of the CECC are Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom, and copies of it can be obtained from the addresses shown on the blue fly sheet.

Preface

This specification was prepared by CECC WG 4A: Fixed Resistors.

It is based, wherever possible, on the Publications of the International Electrotechnical Commission.

The text of this specification was circulated to the CECC for voting in the document indicated below and was ratified by the President of the CECC for printing as a CECC Specification.

Document	Date of voting	Report on the Voting
CECC (Secretariat)1931	May 1986	CECC (Secretariat)2084

CECC 40 401 Issue 1

Identification of the DS and the component

The first page of the DS should have the layout recommended on page 3.

The numbers in square brackets correspond to the indications to be completed thereunder.

- [1] The name of the National Standards Organization under whose authority the DS is published and, if applicable, the organization from whom the DS is available
 - [2] The CECC symbol and the number allocated to the DS by the CECC General Secretariat
 - [3] The number and issue number of the CECC generic and sectional specification as relevant; also national reference if different.
 - [4] If different from the CECC number, the national number of the DS, date of issue and any further information required by the national system, together with any amendment numbers.
 - [5] A brief description of the component or range of components.
 - [6] Information on typical construction (where applicable).
- For [5] and [6] the text to be given in the DS should be suitable for an entry in CECC 00 2000 (QPL) and CECC 00 300 (Library list).
- [7] An outline drawing with main dimensions which are of importance for interchangeability and/or reference to the appropriate national or international document for outlines. Alternatively, this drawing may be given in an annex to the DS.
 - [8] The level(s) of quality assessment covered by the DS.
 - [9] Reference data giving information on the most important properties of the component which allow comparison between the various component types intended for the same, or for similar, applications.

CECC 40 401 Issue 1

Specification available from:	[1]	CECC 40 401-XXX	[2]
		Page 1 of --	
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 SURFACE MOUNTING (CHIP) RESISTORS	[5]
		Ceramic body with a resistive layer	[6]
		End terminations for mounting on (a) printed boards and/or (b) alumina sub-strate (non) insulated	
All dimensions in millimetres		ASSESSMENT LEVEL 'S'	[8]
			[9]

Mounting

The detail specification shall give full information in this section regarding the recommended method of mounting the resistors by it. It shall state:

- the preferred sub-strate to be used;
- any glues, together with their curing temperatures and times;
- soldering methods, temperatures and times;
- cleaning solvents.

The detail specification shall also give in this section a warning of any precautions which should be taken in the assembly of the resistors.

Table 1.

Style	Rated dissipation (See S/C 1.1) (W at 70 °C)	Limiting element voltage (V d.c. or a.c. r.m.s.)	Dimensions (mm)				
			L		W		H
			min.	max.	min.	max.	max.

Information about manufacturers who have components qualified to this detail specification is available in the current CECC 00 200: Qualified Products List.

CECC 40 401 Issue 1

1 Ratings and characteristics

1) Resistance range	As given in the Qualified Products List
Standard tolerances on rated resistance	$\pm$ --- %
Climatic category	---/---/---
Limit of resistance change after 1000 h endurance test	$\pm$ (--- %R + --- Ω)
Temperature characteristic of resistance (20 °C to 70 °C)	$\Delta R: \leq \pm$ --- %R $\Delta R/RAT: < \pm$ --- p.p.m./K)

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 parameters 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.

1.1 Derating

When mounted on a --- mm thick --- [state material] sub-strate resistors covered by this specification are derated according to the following curve:

[Derating curve to be given]

2 Marking

The marking of the components and the package shall be in accordance with the requirements of 2.4 of CECC 40 000 and 2.5.10 of CECC 40 400.

1) The preferred values are those of the E12 series of IEC 63. Where the use of intermediate values is essential, they should, wherever possible, be chosen from a series in that document.

CECC 40 401 Issue 1

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
- Tolerance
- Temperature coefficient of resistance (if more than one is available)
- Number and issue reference of detail specification and style reference
- Packaging instructions.

5 Certified test records

The detail specification shall indicate in this clause whether or not Certified Test Records shall be prepared in accordance with 3.5 of CECC 40 000.

6 Delayed delivery

The provisions of 3.6 of CECC 40 000 shall apply.

7 Additional information

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.

CECC 40 401 Issue 1

8 Inspection requirements (See table 2)

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

8.2 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 annex 'A' to CECC 40 000. The conditions of test and the performance requirements shall be identical to those prescribed for the quality conformance inspection in the detail specification.

CECC 40 401 Issue 1

See Notes 1, 2 and 3.

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 (if applicable)				As in 4.3.2
Sub-Group A2	Non-destructive	S-4	1,0 %	
4.3.3 Dimensions (gauging)	Items L, W and H			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 %	
D4.2 Voltage proof	(Insulated resistors only)			As in D4.2.3
D4.1 Insulation resistance	(Insulated resistors only)			$R \geq 1 \text{ M}\Omega$
Sub-Group B2	Destructive	S-3	2,5 %	
D4.3.1 Soldering-solderability (if applicable) (See Note 4)	(The detail specification shall state whether ageing is required) Visual examination			As in D4.3.1.5
4.11 Overload	Unless otherwise specified in the detail specification, the resistors shall be mounted as in D.4.4 The applied voltage shall be 2,5 times the rated voltage or twice the limiting element voltage, whichever is the less. Duration: 2 s Visual examination Resistance			As in 4.11.3 $\Delta R: \leq \pm (--- \%R + ---\Omega)$

Notes on page 10.

CECC 40 401 Issue 1

See Note 1

Clause number and test	Conditions of test	Sample size and criterion of acceptability (See Note 3)			Performance requirements
		P	n	c	
<u>Group C Inspection</u>					
To be carried out on a sampling basis, at the periodicity given in column 'P'					
<u>Sub-Group C1</u>	Destructive	3	20	1	No open circuits when the board is in the bent position As in D4.6.6 $\Delta R: \leq \pm (--- \%R + ---\Omega)$
<u>Half of the sample</u>					
The resistors shall be mounted as in D4.4 on the printed board					
D4.6 Bond strength of end face plating (See Note 5)	Electrical continuity				
	Visual examination				
	Resistance				
<u>Other half of the sample</u>					
The resistors shall be mounted as in D4.4 on the printed board					
D4.5 Adhesion	Visual examination (Attributable only to the component)				
4.16 Rapid change of temperature	T _A : Lower category temperature T _B : Upper category temperature				
	Visual examination				
	Resistance				
As in 4.16.4 $\Delta R: \leq \pm (--- \%R + ---\Omega)$					
<u>All of the sample</u>					
4.20 Climatic sequence					
- Dry heat					
- Damp heat, cyclic, first cycle					
- Cold					
- Low air pressure	(Not applicable)				
- Damp heat, cyclic, remaining cycles					
- d.c. load					
- Final measurements	Visual examination				There shall be no visible damage to the resistor
	Resistance				$\Delta R: \leq \pm (--- \%R + ---\Omega)$

Notes on page 10.

CECC 40 401 Issue 1

See Notes 1 and 3

Clause number and test	Conditions of test	Sample size and criterion of acceptability (See Note 3)			Performance requirements						
		P	n	c							
<u>Sub-Group C2</u>	Destructive	3	20	1							
The resistors shall be mounted as in D4.4 on the substrate spaced apart by a distance equal to the maximum dimension of the resistor.											
4.24.1 Endurance at 70 °C	Duration: 1000 h Examination at 48 h, 500 h and 1000 h Visual examination Resistance				There shall be no visible damage to the resistor $\Delta R: \leq \pm (-- \%R + -- \Omega)$						
<u>Sub-Group C3</u>	Destructive	3	10	1							
D4.3.2 Soldering-Resistance to solder heat (See Note 4)	Visual examination Resistance				As in D4.3.2.5 $\Delta R: \leq \pm (-- \%R + -- \Omega)$						
<u>Group D Inspection</u>											
To be carried out on a sampling basis, at the periodicity given in column 'P'											
<u>Sub-Group D1</u>	Destructive	12	20	1							
The resistors shall be mounted as in D4.4 on the substrate											
4.7 Temperature characteristic of resistance					<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										
4.21 Damp heat, steady state	As in 4.21.2.2 Visual examination Resistance				There shall be no visible damage to the resistor $\Delta R: \leq \pm (-- \%R + -- \Omega)$						

Notes on page 10.

CECC 40 401 Issue 1