

Förderverein für Elektrotechnische Normung (FEN) e. V.
Cenelec Electronic Components Committee

CECC

Système Harmonisé d'Assurance de la Qualité
des Composants Electroniques

SPECIFICATION PARTICULIERE:

CONDENSATEURS FIXES
ELECTROLYTIQUES
A L'ALUMINIUM
A ELECTROLYTE NON SOLIDE

Harmonized System of Quality Assessment for
Electronic Components

DETAIL SPECIFICATION:

FIXED ALUMINIUM ELECTROLYTIC
CAPACITORS WITH
NON-SOLID ELECTROLYTE

Harmonisiertes Gütebestätigungssystem für
Bauelemente der Elektronik

BAUARTSPEZIFIKATION:

ALUMINIUM-ELEKTROLYT-
FESTKONDENSATOREN
MIT FLÜSSIGEM ELEKTROLYTEN



1

Edition
Issue
Ausgabe

CECC 30 301-807

1993



Documents

Document Sharing Hub

Information about the System may be obtained from:



FEN e.V. Secretariat
and
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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 The Rules of Procedure of the System
- 3 CECC Specifications of the FEN and National Specifications for the System
- 4 CECC 00 200: Register of Firms, Products, and Services Approved under the CECC System
- 5 CECC 00 300: Register of National Documents Implementing CECC Publications and CECC European Standards
- 6 CECC 00 301: Register of CECC Specifications and Related Detail Specifications
- 7 Other CECC Publications and publicity 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 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 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 3 "Capacitors".

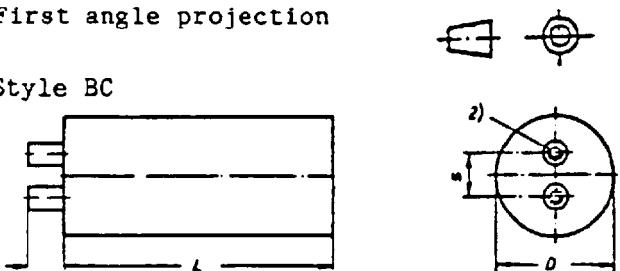
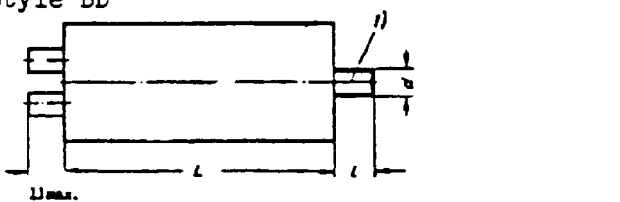
It is based, wherever possible, on the Publications of the International Electrotechnical Commission (IEC).

Secretariat Note

This detail specification was drafted by members of CEMEC WG PC 1A and discussed as documents CEMEC WG PC 1A(Divry)PN 12 and CECC WG3(da Costa)1A by WG3 at their meeting in Milan (1992) with the decision to publish it without voting as stated in the minutes of the meeting:

CECC WG3(Secretariat)247, item 15.1.1

To allow for early publication, this detail specification is issued initially in English only. Corresponding versions in French and German will follow on request of ONHs.

Specification available from: CECC General Secretariat	CECC 30 301-807 Issue 1 1993
ELECTRONIC COMPONENTS OF ASSESSED QUALITY - DETAIL SPECIFICATION IN ACCORDANCE WITH: EN 130 000 : 1993 CECC 30 300 Issue 2, Amdts 1 to 4	
First angle projection Style BC  Style BD  Notes: 1) thread M5, depth 8 mm min. - all dimensions in mm - pressure relief device mandatory - for D, L, s, d, l see Table 1 - The polarity must be clearly indicated.	WG-DETAIL SPECIFICATION FOR FIXED ALUMINIUM ELECTROLYTIC CAPACITORS WITH NON-SOLID ELECTROLYTE Polar Cylindrical Metallic case Screw terminations Style BC: Clamp mounting, Insulating sleeve Style BD: Stud mounting, Insulating sleeve optional Assessment level E

QUICK REFERENCE DATA:	Rated capacitance range (C_R): 220 μF to 220 000 μF Capacitance tolerance: -10/+30 % Rated voltage range (U_R): 16V to 400 V d.c. Climatic category: 40/085/56 Performance grade: long-life grade 5000 h Increased capacitance, lower impedance, lower ESR, and improved ripple current rating
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Circuit diagram Note: contact of minus pole to metallic case not defined	insulation (Optional for style BD) case 
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Information about manufacturers who have components qualified to this detail specification is available in the current CECC 00 200:
Register of Firms, Products, and Services Approved under the CECC System

It is intended that this specification should replace national specifications. Relevant numbers will be submitted by the National Committees and published under Issue 2 of this specification.

1. GENERAL DATA

1.1 METHOD OF MOUNTING FOR VIBRATION AND SHOCK TESTS

Style BC capacitors are to be mounted by their body which shall be rigidly clamped to the work surface. See 1.3.2 of CECC 30 300 Issue 2.

Style BD capacitors are to be mounted by their stud, reinforced with clamps supplied by the manufacturers.

See 1.3.2 of CECC 30 300 Issue 2.

1.2 DIMENSIONS

Table 1

Case size reference	Dimensions in mm				
	D ²⁾	L ²⁾	s	d ³⁾	l ³⁾
	max.	max.	$\pm 0,5$		
33		66			
34	37	86	12,7	M8	12 ± 1
35		109			
54		86			
55	52	109	22,2		
65	67	109	28,5	M12	$16 \pm 1,5$
75		109			
76	78	149	31,7		

2) including insulation sleeve if any

3) style BD only

1.3 RATINGS AND CHARACTERISTICS

Rated capacitance range (C_R)	220 μ F to 220 000 μ F
Tolerance on rated capacitance	-10/+30 %
Rated voltage range (U_R)	16 V to 400 V d.c.
Category voltage (U_C)	rated voltage
Climatic category	40/085/56
Rated temperature	85 °C
Rated ripple current	see Table 2B
Equivalent series resistance (ESR)	see Table 2B and sub-clause 1.8
Leakage current	see Table 2B
Impedance	see Table 2B

Table 2A

Values of capacitance and voltage related to case sizes (see Table 1)

Rated voltage (V d.c.)	16	25	40	63	100	200	250	350	385 or 400
Rated capacitance (μ F)	$D_{max.} \times L_{max.}$ Case size reference								
220									37 x 66 33
330								37 x 86 34	37 x 86 34
470								37 x 109 35	37 x 109 35
680						37 x 66 33	37 x 86 34	52 x 86 54	52 x 86 54
1 000						37 x 86 34	37 x 109 35	52 x 86 54	52 x 109 55
1 500						37 x 109 35	52 x 86 54	52 x 109 55	67 x 109 65
2 200					37 x 66 33	52 x 86 54	52 x 109 55	67 x 109 65	78 x 109 75
3 300				37 x 66 33	37 x 86 34	52 x 109 55	67 x 109 65	78 x 109 75	78 x 149 76
4 700				37 x 86 34	52 x 86 54	67 x 109 65	78 x 109 75	78 x 149 76	78 x 149 76
6 800				37 x 109 35	52 x 109 55	78 x 109 75	78 x 149 76		
10 000		37 x 66 33	37 x 86 34	52 x 86 54	52 x 109 55	78 x 149 76			
15 000	37 x 66 33	37 x 86 34	37 x 109 35	52 x 109 55	67 x 109 65				
22 000	37 x 86 34	37 x 109 35	52 x 86 54	67 x 109 65	78 x 149 76				
33 000	37 x 109 35	52 x 86 54	52 x 109 55	78 x 109 75					
47 000	52 x 86 54	52 x 109 55	67 x 109 65	78 x 149 76					
68 000	52 x 109 55	67 x 109 65	78 x 109 75						
100 000	67 x 109 65	78 x 109 75	78 x 149 76						
150 000	78 x 109 75	78 x 149 76							
220 000	78 x 149 76								

Table 2B

Equivalent series resistance ESR, impedance,
rated ripple current, and leakage current

Rated voltage (V d.c.)	Rated capacitance (at 20 °C and 100 Hz) (μF)	ESR ^{*)} max. (at 20 °C and 100 Hz) (Ohms)	Impedance ^{max.} (at 20 °C and 10 kHz) (Ohms)	Rated ripple current +) (at 85 °C and 100 Hz) (A)	Leakage ^{*)} current ^{max.} (at 20 °C and 5 min) (mA)
16	15 000	0,031	0,028	3,9	0,72
	22 000	0,025	0,022	4,8	1,1
	33 000	0,020	0,018	5,9	1,6
	47 000	0,017	0,016	6,5	2,3
	68 000	0,015	0,014	7,6	3,3
	100 000	0,013	0,013	9,1	4,8
	150 000	0,012	0,012	9,5	7,2
	220 000	0,011	0,011	11	11
25	10 000	0,036	0,032	3,6	0,75
	15 000	0,027	0,025	4,6	1,1
	22 000	0,022	0,020	5,6	1,7
	33 000	0,018	0,017	6,3	2,5
	47 000	0,016	0,015	7,3	3,5
	68 000	0,014	0,013	8,7	5,1
	100 000	0,013	0,012	9,2	7,5
	150 000	0,012	0,012	11	11
40	10 000	0,031	0,028	4,3	1,2
	15 000	0,024	0,022	5,4	1,8
	22 000	0,020	0,018	6,0	2,6
	33 000	0,016	0,015	7,3	4,0
	47 000	0,014	0,014	8,7	5,5
	68 000	0,013	0,013	9,2	8,1
	100 000	0,012	0,012	11	12

+) for information only, not for inspection purposes

*) see sub-clause 1.9

Table 2B, continued

Equivalent series resistance ESR, impedance,
rated ripple current and leakage current

Rated voltage (V d.c.)	Rated capacitance (at 20 °C and 100 Hz) (µF)	ESR _{max.} *) (at 20 °C and 100 Hz) (Ohms)	Impedance _{max.} (at 20 °C and 10 kHz) (Ohms)	Rated ripple current +) (at 85 °C and 100 Hz) (A)	Leakage *) current _{max.} (at 20 °C and 5 min) (mA)
63	3 300	0,062	0,055	2,7	0,63
	4 700	0,046	0,042	3,5	0,89
	6 800	0,035	0,032	4,5	1,3
	10 000	0,027	0,025	5,1	1,9
	15 000	0,021	0,020	6,4	2,8
	22 000	0,018	0,017	7,7	4,2
	33 000	0,015	0,015	8,5	6,2
	47 000	0,014	0,014	9,9	8,9
100	2 200	0,069	0,060	2,6	0,66
	3 300	0,049	0,043	3,4	0,99
	4 700	0,038	0,033	4,3	1,4
	6 800	0,029	0,026	5,5	2,0
	10 000	0,023	0,021	6,1	3,0
	15 000	0,019	0,018	7,5	4,5
	22 000	0,016	0,016	9,3	6,6
200	680	0,17	0,15	1,7	0,41
	1 000	0,12	0,10	2,2	0,60
	1 500	0,083	0,073	2,9	0,90
	2 200	0,060	0,053	3,4	1,3
	3 300	0,043	0,039	4,5	2,0
	4 700	0,033	0,030	5,7	2,8
	6 800	0,026	0,024	6,5	4,1
	10 000	0,021	0,021	8,1	6,0

+) for information only, not for inspection purposes

*) see sub-clause 1.9

Table 2B, continued

Equivalent series resistance ESR, impedance,
rated ripple current and leakage current

Rated voltage (V d.c.)	Rated capacitance (at 20 °C and 100 Hz) (μF)	ESR _{max.} ^{*)} (at 20 °C and 100 Hz) (Ohms)	Impedance _{max.} (at 20 °C and 10 kHz) (Ohms)	Rated ripple current ⁺⁾ (at 85 °C and 100 Hz) (A)	Leakage current _{max.} (at 20 °C and 5 min) (mA)
250	680	0,14	0,13	2,0	1,0
	1 000	0,10	0,090	2,6	1,5
	1 500	0,070	0,063	3,2	2,3
	2 200	0,051	0,046	4,1	3,3
	3 300	0,037	0,034	5,4	5,0
	4 700	0,029	0,027	6,1	7,1
	6 800	0,023	0,023	7,8	10
350	330	0,28	0,25	1,4	0,70
	470	0,20	0,18	1,9	0,99
	680	0,14	0,13	2,3	1,4
	1 000	0,10	0,090	2,6	2,1
	1 500	0,070	0,63	3,5	3,2
	2 200	0,051	0,046	4,6	4,6
	3 300	0,037	0,037	5,4	6,9
	4 700	0,029	0,029	6,9	9,9
385	220	0,56	0,51	0,91	0,51
	330	0,37	0,34	1,2	0,77
	470	0,27	0,25	1,6	1,1
	680	0,19	0,17	1,9	1,6
	1 000	0,13	0,12	2,6	2,3
	1 500	0,090	0,085	3,4	3,5
	2 200	0,065	0,062	4,1	5,1
	3 300	0,046	0,045	5,4	7,6
	4 700	0,036	0,036	6,2	11

+) for information only, not for inspection purposes

*) see sub-clause 1.9

Table 2B, continued

Equivalent series resistance ESR, impedance,
rated ripple current and leakage current

Rated voltage (V d.c.)	Rated capacitance (at 20 °C and 100 Hz) (µF)	ESR ^{*)} _{max.} (at 20 °C and 100 Hz) (Ohms)	Impedance _{max.} (at 20 °C and 10 kHz) (Ohms)	Rated ripple current ⁺⁾ (at 85 °C and 100 Hz) (A)	Leakage current _{max.} (at 20 °C and 5 min) (mA)
400	220	0,56	0,51	0,91	0,53
	330	0,37	0,34	1,2	0,79
	470	0,27	0,25	1,6	1,1
	680	0,19	0,17	1,9	1,6
	1 000	0,13	0,12	2,6	2,4
	1 500	0,090	0,085	3,4	3,6
	2 200	0,065	0,062	4,1	5,2
	3 300	0,046	0,045	5,4	7,9
	4 700	0,036	0,036	6,2	11

+) for information only, not for inspection purposes

*) see sub-clause 1.9

1.4 RELATED DOCUMENTS

Generic specification
Sectional specification

EN 130 000 : 1993
CECC 30 300, Issue 2, Amdts. 1 to 4

1.5 MARKING

See 2.4 of EN 130 000 with the following details:

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 its position in the list:

- (1) Rated capacitance
- (2) Rated voltage (d. c. voltage may be indicated by the symbol $\overline{\text{---}}$ or ---)
- (3) Polarity of the terminations
- (4) Tolerance on rated capacitance
- (5) Reference to the grade; the abbreviation "LL" may be used for marking purposes
- (6) Year and month (or week) of manufacture
- (7) Manufacturer's name or trade mark
- (8) Rated ripple current
- (9) Climatic category
- (10) Manufacturer's type designation
- (11) Reference to the detail specification
- (12) CECC Mark

1.5.2 The capacitor shall be clearly marked with (1) to (5) listed in 1.5.1 and with as many as possible of the remaining items as is considered necessary. Any duplication of information in the marking on the capacitor should be avoided.

1.5.3 The package containing the capacitor(s) shall be clearly marked with all the information given by the items (1), (2), (6), (7), (10) and (12) listed in 1.5.1 and as many of the remaining items considered necessary by the manufacturer.

1.5.4 Any additional marking shall be so applied that no confusion can arise.

1.6 ORDERING INFORMATION

Detail specification number, number of issue

Rated capacitance

Tolerance on rated capacitance

Rated d. c. voltage

Style

Ordering example for capacitor with rated capacitance 1000 μ F, tolerance on rated capacitance -10/+30 % (Q), rated voltage 250 V, and style BC:

CECC 30 301-807-1-1000-Q-250-BC

1.7 CERTIFIED TEST RECORDS OF RELEASED LOTS

Not required.

1.8 ADDITIONAL INFORMATION (not for inspection purposes)

1.8.1 Equivalent series resistance ESR, see Table 2B

In this specification, ESR limits are given instead of tangent of loss angle values. In no case are ESR limits less severe than corresponding maximum values of the tangent of the loss angle given in CECC 30 300. To ensure that this basic requirement is fulfilled, the following formula has been used:

$$ESR_{\max.} = \frac{\tan \delta_{\max.}}{2 \times \pi \times f \times C_{\max.}}$$

1.8.2 Vibration and shock performance

Full vibration and shock performance may not be available if mounting methods other than those specified in 1.1 of this specification are used.

1.8.3 Useful life

If useful life is to be indicated, the following definition of useful life applies:

A) Load Conditions

Load conditions for definition of useful life are:

- rated voltage
- rated ripple current (The peak voltage of the alternating voltage superimposed on the d. c. voltage must not exceed the value of the rated voltage.)
- rated temperature

CECC 30 301 - 807 Issue 1