

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:

CONDENSATEURS FIXES CHIPSES AU TANTALE MONTES EN SURFACE

Harmonized System of Quality Assessment for
Electronic Components

BLANK DETAIL SPECIFICATION:

TANTALUM SURFACE MOUNTING CAPACITORS

Harmonisiertes Gütebestätigungssystem für
Bauelemente der Elektronik

VORDRUCK FÜR BAUARTSPEZIFIKATION:

OBERFLÄCHENMONTIERBARE TANTALKONDENSATOREN



2

Edition
Issue
Ausgabe

CECC 30 801

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Documents

Document Sharing Hub

Information about the System may be obtained from:



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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: Qualified Products List (QPL)
- 5 CECC 00 300: CECC Publications and their related national documents
- 6 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 acceptable in all member countries without further testing.

This blank detail specification has been formally approved by the CECC, and has been prepared for those countries taking part in the System who wish to issue national harmonized specifications for

Tantalum surface mounting capacitors.

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. Copies of it can be obtained from the addresses shown on the blue fly sheet.

PREFACE

This blank detail specification was prepared by CECC Working Group 3: "Capacitors". It is a revised version of CECC 30 801 (1980).

It is based, wherever possible, on the Publications of the International Electrotechnical Commission and in particular on IEC 384-3-1: Blank detail specification: Fixed tantalum chip capacitors. Assessment level E (First edition) 1989.

The text of this blank detail 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.

<u>Document</u>	<u>Voting Date</u>	<u>Report on the Voting</u>
CECC(Secretariat)2277	September 1988	CECC(Secretariat)2395

Effective Date:

This issue 2 of CECC 30 801 shall become effective for all new qualification approvals from 1. October 1990... Issue 1 shall remain valid for existing qualification approvals until further notice.

IDENTIFICATION OF THE DETAIL SPECIFICATION (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 allotted 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).
- [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, but [7] should always contain an illustration of the general outer appearance of the component.
- [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.

For [5] and [6] the text to be given in the DS should be suitable for an entry in CECC 00 200 (QPL) and CECC 00 300 (Library List).

/1/ Specification available from:.....	/2/ CECC .. - .. 
/3/ ELECTRONIC COMPONENTS OF ASSESSED QUALITY- DETAIL SPECIFICATION IN ACCORDANCE WITH: 	/4/
/1/ OUTLINE DRAWING (first angle projection):	/5/ DETAIL SPECIFICATION FOR TANTALUM SURFACE MOUNTING CAPACITOR
	/6/ TYPICAL CONSTRUCTION (Examples):
	/8/ ASSESSMENT LEVEL E

/9/

QUICK REFERENCE DATA: Rated capacitance range, capacitance tolerance, rated voltage range, climatic category, performance grade

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

1. General data1.1 Recommended method of mounting

The capacitors are mounted by their terminations.
See 1.3.2 of the sectional specification CECC 30 800 (Issue 2).

1.2 DimensionsTable 1

Case size reference	Dimensions (in mm)							
	l	w	h	d				

Note 1: When there is no case size reference, Table 1 may be omitted and the dimensions shall be given in Table 2, which then becomes Table 1.

Note 2: The dimensions shall be given as maximum dimensions or as nominal dimensions with a tolerance.

1.3 Ratings and characteristics

Capacitance range	(See Table 2A)
Tolerance on rated capacitance	
Rated voltage	(See Table 2A)
Category voltage (if applicable)	(See Table 2A)
Climatic category	
Rated temperature	
Variation of capacitance with temperature	(See Table 2B)
Tangent of loss angle	(See Table 2B)
Leakage current	(See Table 2B)
Impedance (if required)	(See Table 2C)
Surge voltage	

Table 2A

Rated voltage				
Category voltage (1)				
Rated capacitance	Case size	Case size	Case size	Case size

(1) If different from the rated voltage.

Table 2B

Characteristics at high and low temperature

U _R (V)	C _R (μF)	Capacitance change (%)			Maximum values						
					Tangent of loss angle (%)				Leakage current (μA)		
		T _A	T _R	T _B	T _A	20 °C	T _R	T _B	20 °C	T _R	T _{B₁}

T_A: Lower category temperatureT_B: Upper category temperatureT_R: Rated temperature

1): Measured with category voltage

Table 2C

Impedance at 100 kHz (if required)

Case size	Impedance (Ω)

1.4 Related documents

Generic specification : CECC 30 000 (Issue 3, Amendments 1 to 6)
Sectional specification : CECC 30 800 (Issue 2)

1.5 Marking

The marking of the capacitor and of the packing shall be in accordance with the requirements of 1.5 of the sectional specification CECC 30 800 (Issue 2).

Note: The details of the marking of the component and of packing shall be given in full in the detail specification.

1.6 Ordering information

Orders for capacitors covered by this specification shall contain, in clear or in coded form, the following minimum information:

- (1) Rated capacitance
- (2) Tolerance on rated capacitance
- (3) Rated voltage (d.c.)
- (4) Number and issue reference of detail specification and case size reference
- (5) Packaging (bulk or taped; if taped, according to IEC 286-3)

1.7 Certified test records

Required/not required.

1.8 Additional information (not for inspection purposes)

1.9 Additional or increased severities or requirements to those specified in the generic and/or sectional specification

Note: Additions or increased requirements should be specified only when essential.

Table 3

Other characteristics

This table is to be used for defining characteristics which are additional to or tighter than those given in the sectional specification.
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2. Qualification approval and Inspection requirements

2.1 Procedures

- 2.1.1 For Qualification Approval the procedures shall be in accordance with 3.4 of the sectional specification CECC 30 800 (Issue 2).
- 2.1.2 For Quality conformance Inspection the test schedule (Table 4) includes sampling, periodicity, severities and requirements. The formation of inspection lots is covered by 3.5.1 of the sectional specification CECC 30 800 (Issue 2).

Notes to Tables 4A and 4B

- (1) Clause numbers of tests and performance requirements refer to the sectional specification CECC 30 800 (Issue 2)
- (2) D = destructive
 ND = non destructive
 P = periodicity (in months)
 n = number of specimens (sample size)
 pd = number of permissible defectives (acceptance criterion)
 IL = inspection level (selected from IEC 410)
 AQL= acceptable quality level (selected from IEC 410)
- (3) Not applicable to surface mounting capacitors, which according to their detail specification shall only be mounted on alumina substrates

Table 4 A
Lot-by-lot inspection (Group A and B)

Clause number and test (1)	D or ND (2)	Conditions of test (1)	IL (2)	AQL	Performance requirements (1)
<u>SUB-GROUP A1</u>	ND		S-4	2,5%	
4.4 Visual examination					As in 4.4.2
4.4 Dimensions (Detail)					Marking legible, see 1.5 See Table 1 of the detail specification
<u>SUB-GROUP A2</u>	ND		II	1,0%	
4.5.1 Leakage current		Protective resistor: 1 000 Ω			$\leq 0,02 C_U \mu A/\mu F.V$ or $\leq 1 \mu A, R_R$ whichever is the greater
4.5.2 Capacitance		Frequency: ... Hz Bias ... V (if required)			Within specified tolerance
4.5.3 Tangent of loss angle		Frequency: ... Hz			$\leq 0,06$ for $U_R \geq 10 V$ $\leq 0,08$ for $6,3 V < U_R \leq 10 V$ $\leq 0,1$ for $U_R < 6,3 V$
4.5.4 Impedance (if required)		Frequency: 100 kHz			As in Table 2C
<u>SUB-GROUP B1</u>	D		S-3	2,5%	
4.7 Solderability		Method:...			
4.18 Solvent resistance of the marking (if required)		Solvent: Solvent temperature:... Method 1 Rubbing material: Cotton wool Recovery:...			Marking legible
4.7.2 Final measurement		Visual examination			As in 4.7.2

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Table 4B
Periodic tests

Clause number and test (1)	D or ND (2)	Conditions of test (1)	P	n (2)	pd	Performance requirements (1)
<u>SUB-GROUP C1</u>	D		3	12	1	
4.6.1 Initial measurements		Capacitance Tangent of loss angle				
4.6 Resistance to soldering heat		Method: ... Duration:....s				
4.17 Component solvent resistance (if required)		Solvent: ... Solvent temperature: ... Method 2 Recovery:...				
4.6.3 Final measurement		Visual examination Capacitance Tangent of loss angle				As in 4.6.3 $\left \frac{\Delta C}{C} \right \leq \dots \%$ $\tan \delta \leq \dots$
<u>SUB-GROUP C2</u>	D		3	12	1	
4.9 Substrate bending test (3)		Capacitance (with board in bent position) Deflection:...mm Number of bends:...				$\left \frac{\Delta C}{C} \right \leq \dots \%$
4.9.6 Final measurement		Visual examination				No visible damage
<u>SUB-GROUP C3</u>	D					
4.3 Mounting		Visual examination Leakage current Capacitance Tangent of loss angle Impedance (if required)				No visible damage $\leq 0,02 C_R U_R \mu A / \mu F.V$ or $\leq 1 \mu A$, whichever is the greater $\left \frac{\Delta C}{C} \right \leq 3\%$ of value measured in Group 0 $\leq 0,06$ for $U_R \geq 10V$ $\leq 0,08$ for $6,3V \leq U_R < 10V$ $\leq 0,1$ for $U_R < 6,3V$ As in Table 2C

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Clause number and test (1)	D or ND (2)	Conditions of test (1)	P	n (2)	pd	Performance requirements (1)
<u>SUB-GROUP C 3.1</u>	D		6	18	1	
4.8 Shear test		Visual examination				No visible damage
4.10.1 Initial measurements		Not required, see Sub-Group C3				
4.10 Rapid change of temperature		T _A = Lower category temperature T _B = Upper category temperature Five cycles Duration t = 30 min Recovery: 1 h to 2 h				
4.10.3 Final measurements		Leakage current Capacitance Tangent of loss angle				$\leq$ initial limit $\left \frac{\Delta C}{C} \right \leq 5\%$ Style I $\leq 10\%$ Style II of value measured in Group C3 $\leq$ initial limit
4.11 Climatic sequence (Style I only)						
4.11.1 Initial measurement		Not required				
4.11.2 Dry heat		Temperature: Upper category temperature Duration: 16 h				
4.11.3 Damp heat, cyclic, Test Db, first cycle						
4.11.4 Cold		Temperature: Lower category temperature Duration: 2 h				
4.11.5 Damp heat, cyclic, Test Db, remaining cycles		Recovery: 1 h to 2 h				

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Clause number and test (1)	D or ND (2)	Conditions of test (1)	P	n	pd	Performance requirements (1)
4.11.6 Final measurements		Visual examination Leakage current Capacitance Tangent of loss angle				No visible damage Marking legible $\leq$ initial limit $\left \frac{\Delta C}{C} \right \leq 10\%$ of value measured in in Group C3 $\leq 1,2$ times initial limit
<u>SUB-GROUP C 3.2</u>	D		6	9	1	
4.12 Damp heat, steady state (Style I only)		Recovery: 1 h to 2 h				
4.12.1 Initial measurements		Not required, see Group C3				
4.12.3 Final measurements		Visual examination Leakage current Capacitance Tangent of loss angle				No visible damage Marking legible $\leq$ initial limit $\left \frac{\Delta C}{C} \right \leq 10\%$ of value measured in Group C3 $\leq 1,2$ times initial limit
<u>SUB-GROUP C 3.3</u>	D		3	24	1	
4.15 Endurance		Duration: 2 000 h Ambient temperature: ... C° (as applicable) Applied voltage: ... V Recovery: 1 h to 2 h				
4.15.1 Initial measurement		Not required, see Group C3				
4.15.3 Final measurements		Visual examination Leakage current				No visible damage Marking legible ≤ 2 times initial limit

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Clause number and test (1)	D or ND (2)	Conditions of test (1)	P	n	pd	Performance requirements (1)
		Capacitance				$\left \frac{\Delta C}{C} \right \leq 10 \% \text{ of value measured in Group C3}$
		Tangent of loss angle				$\leq 1,5 \text{ times initial limit}$
SUB-GROUP C 3.4	D		6	15	1	
4.13 Characteristics at high and low temperature		The capacitors shall be measured at each temperature step				
		Step 1: 20 °C				
		Leakage current				$\leq \text{initial limit as reference value}$
		Capacitance				$\leq \text{initial limit}$
		Tangent of loss angle				
		Step 2: Lower category temperature				
		Capacitance				$- 12 \% \leq \frac{\Delta C}{C} \leq 0 \% \text{ of value measured in Step 1}$
		Tangent of loss angle				$\leq 0,12 \text{ for } U_R \geq 10 \text{ V}$ $\leq 0,15 \text{ for } 6,3 \text{ V} \leq U_R < 10 \text{ V}$ $\leq 0,2 \text{ for } U_R < 6,3 \text{ V}$
		Step 3: 20 °C				
		Leakage current				initial limit
		Capacitance				$\left \frac{\Delta C}{C} \right \leq 5 \% \text{ of value measured in Step 1}$
		Tangent of loss angle				$\leq \text{initial limit}$
		Step 4: 85 °C				
		Leakage current				$\leq 0,2 C U_R \mu\text{A}/\mu\text{F}\times\text{V}$ or $\leq 10 \mu\text{A}$, whichever is the greater
		Capacitance				$\frac{\Delta C}{C} \leq + 10 \% \text{ of value measured in Step 1}$
		Tangent of loss angle				$\leq 0,12 \text{ for } U_R \geq 10 \text{ V}$ $\leq 0,15 \text{ for } 6,3 \text{ V} \leq U_R < 10 \text{ V}$ $\leq 0,2 \text{ for } U_R < 6,3 \text{ V}$

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Clause number and test (1)	D or ND (2)	Conditions of test (1)	P	n	pd	Performance requirements (1)
				(2)		
		Step 5: 125 °C (if applicable) Leakage current Capacitance Tangent of loss angle Step 6: 20 °C Leakage current Capacitance Tangent of loss angle				$\leq 0,25 C_R U_R \mu A / \mu F \times V$ or $\leq 12,5 \mu A$, whichever is the greater $\frac{\Delta C}{C} \leq + 15 \%$ of value measured in Step 1 $\leq 0,15$ for $U_R \geq 6,3 V$ $\leq 0,2$ for $U_R < 6,3 V$)) As in Step 3)
SUB-GROUP C 3.5A	D		12	6	1	
4.14 Surge voltage		Number of cycles: 1 000 Temperature: ... °C Voltage: 1,3 U_R and/or 1,3 U_C as applicable Protective resistor: (1 000 + 100) Ω Duration of charge: 30 s Duration of discharge: 5 min 30 s				
Initial measurements		Not required, see Group C3				
4.14.2 Final measurements		Leakage current Capacitance Tangent of loss angle				$\leq$ initial limit $\left \frac{\Delta C}{C} \right \leq 10 \%$ of value measured in Group C3 $\leq$ initial limit

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