

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 CHIPSES
A DIELECTRIQUE EN CERAMIQUE
MULTICOUCHE**

Harmonized System of Quality Assessment for
Electronic Components

DETAIL SPECIFICATION:

**FIXED MULTILAYER
CERAMIC CHIP
CAPACITORS**

Harmonisiertes Gütebestätigungssystem für
Bauelemente der Elektronik

BAUARTSPEZIFIKATION:

**VIELSCHICHTKERAMIK-CHIP-
KONDENSATOREN**

1

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Information about the System may be obtained from:



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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 CECC Specifications of the FEN and National Specifications for the System
- 3 CECC 00 200: Qualified Products List (QPL) (biannual issues January and July, with three-monthly amendments)
- 4 CECC 00 300: CECC Publications and their related national documents (biannual issues June and December, with three-monthly amendments)

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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.

The text of this detail specification was circulated to the members of CECC WG 3 and was approved for publication under the accelerated procedure for the acceptance of detail specifications in accordance with Decision 10 of the minutes of the CECC CD in document CECC(Secretariat)1838.

Secretariat Note

This detail specification was originally drafted by members of CECC WG 3 and discussed as document

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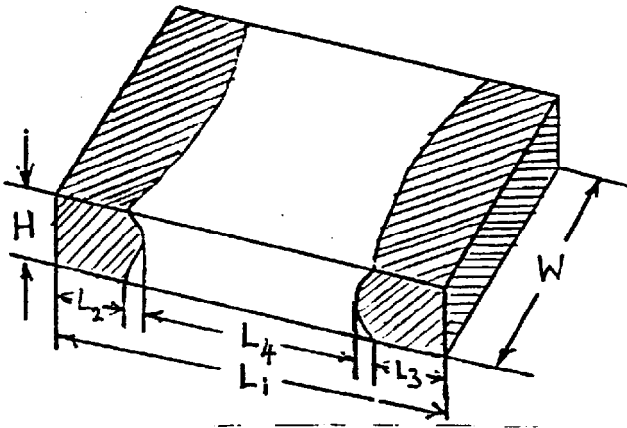
by WG 3 at its last meeting in Scheveningen in 1987 with the decision to publish a revised version without voting.

The revision was carried out by a German delegate of WG 3.

To allow early publication, this detail specification is issued initially in English only.

Corresponding versions in French and German will follow on request of ONHs.

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HARMONISED DETAIL SPECIFICATION	CECC 32 101-801 Issue 1 : May 1988	
Specification available from:- CECC General Secretariat	Page 1 of 18 pages	
ELECTRONIC COMPONENTS OF ASSESSED QUALITY - DETAIL SPECIFICATION IN ACCORDANCE WITH: CECC 30 000 Issue 3, Amendments 1 to 5 CECC 32 100 Issue 1	MANUFACTURERS' TYPE NUMBERS See CECC 00 200 For ordering information see clause 1.6	
Outline and dimensions: 	DETAIL SPECIFICATION FOR FIXED MULTILAYER CERAMIC CHIP CAPACITORS RECTANGULAR CONSTRUCTION WITH METALLIZED SOLDERABLE TERMINATIONS SUITABLE FOR SURFACE MOUNTING	
The end surfaces indicated by shading are metallized. See Table 1	ASSESSMENT LEVEL E PLUS ADDITIONAL ASSESSMENT See clause 1.9	

QUICK REFERENCE DATA:

Rated capacitance range	0.47 pF to 82 000 pF (Class 1) 10 pF to 6 800 nF (Class 2)
Capacitance tolerances	$\pm 1\%$, $\pm 2\%$, $\pm 5\%$ and $\pm 10\%$ (Class 1) $\pm 5\%$, $\pm 10\%$, $\pm 20\%$ and $-20 +80\%$ (Class 2)
Rated voltages	50 V, 63 V, 100 V and 200 V
Climatic category	55/125/56 (Sub-classes 1B CG, 2C1, 2R1 and 2X1) 25/085/56 (Sub-class 2F4)

Note:- It is intended that this detail specification should replace national detail specifications BS 9075 N001, BS 9075 F0056 and BS 9075 F0062.

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

1. GENERAL DATA

1.1 Methods of mounting

For normal use the capacitors may be mounted by hand soldering, infra-red soldering, wave soldering or condensation soldering.

For tests carried out in accordance with Table 4B Group C3 the mounting shall be in accordance with clause 4.4 of CECC 32 100 using both glass-epoxy FR 4 printed board 1,6 mm thick and alumina of minimum purity 98 % as the mounting substrates. The method of CECC 32 100 clause 4.4.2 shall be used for mounting the capacitors on glass-epoxy and the method of clause 4.4.3 for mounting the capacitors on alumina. The numbers to be mounted on each substrate for the various groups are as follows:

Group 3.1 14 on glass-epoxy, 13 on alumina

Group 3.2 23 on glass-epoxy, 22 on alumina

Group 3.3 25 on glass-epoxy, 25 on alumina

Group 3.4 None on glass-epoxy, 80 on alumina.

1.2 Dimensions

TABLE 1 DIMENSIONS (mm)

	Case Size	L ₁	W	H max	L ₂ and L ₃		L ₄ min
					min	max	
(1)	0504	1,25 ± 0,2	1,0 ± 0,2	1,0	0,10	0,4	0,4
	0603	1,6 ± 0,3	0,8 ± 0,2	0,8	0,10	0,4	0,4
	0805	2,0 ± 0,3	1,25 ± 0,3	1,3	0,13	0,75	0,5
(1)	0907	2,3 ± 0,3	1,8 ± 0,3	1,3	0,13	0,75	0,5
	1206	3,2 ± 0,3	1,6 ± 0,3	1,6	0,25	0,75	1,4
	1210	3,2 ± 0,3	2,5 ± 0,3	1,8	0,25	0,75	1,4
(1)	1505	3,8 ± 0,3	1,25 ± 0,3	1,3	0,25	1,0	1,4
	1808	4,5 ± 0,3	2,0 ± 0,3	1,8	0,25	1,0	2,2
	1812	4,5 ± 0,3	3,2 ± 0,3	1,8	0,25	1,0	2,2
(1)	2220	5,7 ± 0,4	5,0 ± 0,4	1,8	0,25	1,0	2,9
	2225	5,7 ± 0,4	6,3 ± 0,4	1,8	0,25	1,0	2,9

Note 1 The 0504, 0907, 1505 and 2225 sizes are non-preferred and are not recommended for use in new designs.

Note 2 Where solder dipping is employed the positive tolerance on L₁ and W and the maximum value of H shall be increased by 0,3 mm.

Note 3 Dimension L₄ is the minimum distance at any point between the end metallizations.

Note 4 Closer tolerances for L₁ and W may be available from individual manufacturers approved to this specification.

1.3 Ratings and Characteristics

Capacitance range

Minimum capacitance for each size of chip:

0,47 pF (Class 1), 10 pF (Class 2)

Maximum capacitance: See Tables 2A to 2E

Tolerance on rated capacitance
with letter codes from IEC 62

Class 1

$C_R < 10 \text{ pF}$	$C_R \geq 10 \text{ pF}$
$\pm 0,25 \text{ pF (C)}$	$\pm 1 \% \text{ (F)}$
$\pm 0,5 \text{ pF (D)}$	$\pm 2 \% \text{ (G)}$
$\pm 1,0 \text{ pF (F)}$	$\pm 5 \% \text{ (J)}$
	$\pm 10 \% \text{ (K)}$

Class 2

Sub-classes 2C1, 2R1 and 2X1 :
 $\pm 5\% \text{ (J)}$, $\pm 10\% \text{ (K)}$, $\pm 20\% \text{ (M)}$,
 $-20\% +80\% \text{ (Z)}$

Sub-class 2F4 : $\pm 20\% \text{ (M)}$, $-20\% +80\% \text{ (Z)}$

Rated voltage

See Tables 2A to 2E

Climatic category

Sub-classes 1B CG, 2C1, 2R1, 2X1 :
55/125/56
Sub-class 2F4 : 25/085/56

Rated temperature

Sub-classes 1B CG, 2C1, 2R1, 2X1 : 125°C
Sub-class 2F4 : 85°C

Tangent of loss angle

As clause 4.6.2 of CECC 32 100
For sub-class 2C1, variant A, at -55°C
 $\tan \delta \leq 0.040$.

Insulation resistance

Sub-classes 1B CG, 2C1, 2R1, 2X1 :
100 G Ω or 1000 s, whichever is less
Sub-class 2F4 :
10 G Ω or 100 s, whichever is less

Temperature coefficient

Sub- Class	Nominal TC and tolerance $10^{-6}/^\circ\text{C}$	Limits of cap. change parts per thousand			Cyclic drift
		-55°C	85°C	125°C	
1B CG	0 ± 30	-2,25 +4,05	-1,95 +1,95	-3,15 +3,23	0,3% or 0,05 pF whichever is greater

Multiplying factor for TC tolerance (see CECC 32 100 clause 2.2.5)

Capacitance pF	$C \geq 50$	$50 > C \geq 40$	$40 > C \geq 25$	$25 > C \geq 10$	$10 > C \geq 1$
Multiplying factor	1	1,25	2	5	50

Temperature characteristic
of capacitance

Sub-class	No voltage applied	Rated voltage applied
2C1	±20%	+20% -30%
2F4	+30% -80%	+30% -90%
2R1	±15%	Not applicable
2X1	±15%	+15% -25%

Termination material

Material	Code
Gold palladium	C
Silver	E
Silver palladium	F
Silver palladium (high leach resistant)	A
Solder dipped	H
Nickel barrier/solder plated	J
Nickel barrier/solder dipped	K
Other (see note 2)	L

Note 1. Code H may be combined with any of the others, for example FH.

Note 2. Other metallization systems for which a manufacturer holds qualification approval may be specified by the code letter L and details of the system stated on the certificate of conformity.

TABLE 2A MAXIMUM CAPACITANCE BY CASE SIZE - SUB-CLASS 1B CG

Case Size		Rated Voltage			
		50 V (2)	63 V	100 V	200 V (2)
		pF	pF	pF	pF
(1)	0504	750	750	500	280
	0603	750	750	500	280
	0805	1 500	1 500	1 000	560
(1)	0907	3 900	3 900	2 200	1 200
	1206	5 600	5 600	3 900	1 800
	1210	10 000	10 000	5 600	3 900
(1)	1505	3 900	3 900	2 200	1 200
	1808	15 000	15 000	8 200	4 700
	1812	18 000	18 000	15 000	10 000
	2220	56 000	56 000	27 000	15 000
(1)	2225	82 000	82 000	47 000	27 000

See page 6 for notes to Tables 2A to 2E inclusive.