DATA SHEET

Class 2, 500 V (DC) (flanged types) Miniature ceramic plate capacitors

Product specification
Supersedes data of 04 November 2002

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BCE Sud Passive Components
A former part of Philips Components

Miniature ceramic plate capacitors

Class 2, 500 V (DC) (flanged types)

FEATURES

- Professional circuits
- Coupling and decoupling
- Space saving
- High reliability
- High temperature circuits.

APPLICATIONS

In electronic circuits where non-linear change of capacitance with temperature is permissible and low losses are not essential, e.g. coupling and decoupling. Because of their small size, the capacitors are ideal for circuitry with high component density.

DESCRIPTION

The capacitors consist of a thin rectangular ceramic plate, both sides of which are metallized. The tinned connecting leads are secured using a high melting point solder. The capacitors are encapsulated in epoxy lacquer, which is resistant to all commonly used cleaning solvents. They have small dimensions and narrow tolerances on the lead spacing. The leads are provided with a flange. The flange guarantees that the leads are free of lacquer, and its shape allows soldering gasses to escape freely, ensuring excellent solderability. This makes the capacitors suitable for both hand-mounting and automatic insertion.

QUICK REFERENCE DATA

DESCRIPTION	VALUE
Capacitance range (E12 series)	100 to 4700 pF
Dielectric material	K2000
Rated DC voltage	500 V
Tolerance on capacitance	±10%
Sectional specification	IEC 60384-9 (2C2 and 2D1) EIA (X5S/X8U)
Climatic category (IEC 60068)	55/150/56

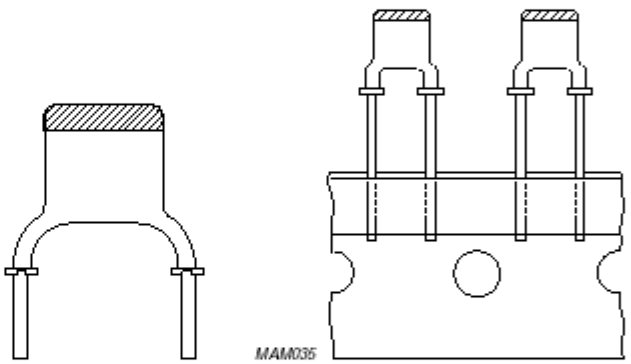
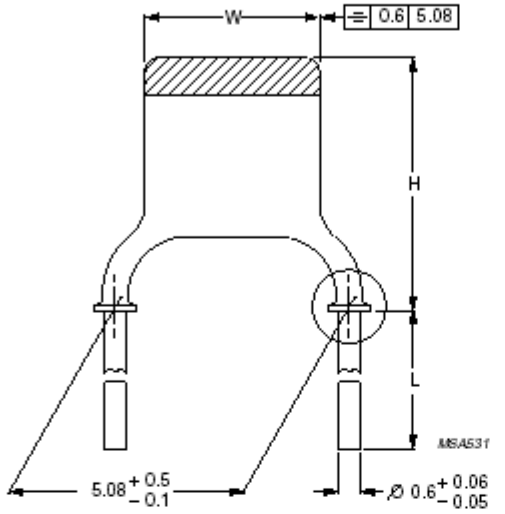


Fig.1 Outlines.

Miniature ceramic plate capacitors

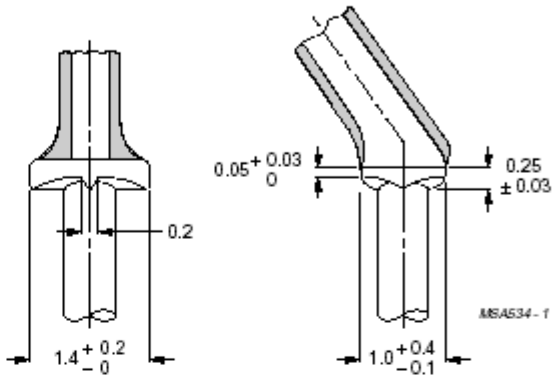
Class 2, 500 V (DC) (flanged types)

MECHANICAL DATA



Dimensions in mm.
For dimensions H, L and W see Tables 1 and 2.

Fig.2 Component outline.



Dimensions in mm.

Fig.3 Detail of flange.

Marking

The body of the capacitor is tan coloured. The temperature characteristic is indicated by the marking code 2C2 on the body in accordance with IEC recommendations. Capacitance value and voltage are indicated by a marking code on the body. Refer to tables 3 for marking codes.

Mounting

When bending, cutting or flattening, the leads should be relieved of the applied load by supporting them at the capacitor body.

Soldering conditions:

max. 265 °C, max. 10 s.

The capacitors are suitable for mounting on printed-circuit boards (hand-mounting or automatic insertion).

Physical dimensions

Table 1 Capacitor dimensions and mass

SIZE[1]	W[2] (mm)	H[2] (mm)	MASS (g)
I	3.6 (–1.1)	6.3 (–1.8)	≈0.14
IIA	3.9 (–1.4)	6.7 (–2.0)	≈0.15
IIB	4.5 (–1.8)	7.3 (–2.4)	≈0.15
III	5.3 (–1.8)	8.1 (–2.6)	≈0.17
IV	6.2 (–2.0)	9.0 (–2.7)	≈0.20
V	6.2 (–2.0)	11.2 (–3.1)	≈0.23

Notes

1. Unless indicated in Table 3 the thickness of the capacitors does not exceed 2.3 mm.
2. Tolerances are given between parentheses.

Miniature ceramic plate capacitors

Class 2, 500 V (DC) (flanged types)

PACKAGING

For details refer to this handbook, chapter *"Miniature ceramic plate capacitors"*, section *"General data"*.

ORDERING INFORMATION

Table 2 Catalogue numbers

PITCH P	LEAD DIAMETER d	CATALOGUE NUMBERS(1)			
		BULK PACKED		ON TAPE (REEL)	ON TAPE(2) (AMMOPACK)
		L ≥ 13 mm	L = 4 ±0.5 mm		
5.08 mm (0.2 inch)	0.6 mm (0.024 inch)	2222 655 09...	2222 655 19...	2222 655 53...	2222 655 63...

Notes

1. Catalogue numbers to be completed by adding the last 3-digit suffix for required capacitance value, see Table 3.
2. H_0 = 18.25 mm.

Miniature ceramic plate capacitors

Class 2, 500 V (DC) (flanged types)

Table 3 Preferred range of values

CAPACITANCE VALUE (pF)	SIZE (see Table 1)	MARKING CODE		SUFFIX OF CATALOGUE NUMBERS (see Table 2)
		VALUE	VOLTAGE[3] (V)	
100	I[1]	n10	500	101
120	I[2]	n12	500	121
150	I	n15	500	151
180	I	n18	500	181
220	I	n22	500	221
270	I	n27	500	271
330	I	n33	500	331
390	IIA	n39	500	391
470	IIA	n47	500	471
560	IIA	n56	500	561
680	IIB	n68	500	681
820	IIB	n82	500	821
1000	IIB	1n0	500	102
1200	III	1n2	500	122
1500	III	1n5	500	152
1800	III	1n8	500	182
2200	IV	2n2	500	222
2700	IV	2n7	500	272
3300	V	3n3	500	332
3900	V	3n9	500	392
4700	V	4n7	500	472

Notes

1. Maximum thickness 2.7 mm.
2. Maximum thickness 2.5 mm.
3. The voltage code may be marked on the front or rear side of the capacitor.

Miniature ceramic plate capacitors

Class 2, 500 V (DC) (flanged types)

ELECTRICAL CHARACTERISTICS

The capacitors meet the essential requirements of *"IEC 60384-9"*. Unless stated otherwise all electrical values apply at an ambient temperature of 20 ±1 °C, an atmospheric pressure of 86 to 106 kPa and a relative humidity of 63 to 67%.

DESCRIPTION	VALUE
Capacitance values measured at 1 kHz, 1 V	100 to 4 700 pF (E12 series)
Tolerance on the capacitance, after 1000 hours	±10%
Dielectric material	K2000
Rated DC voltage	500 V
DC test voltage; duration 1 minute	1 250 V
DC test voltage of coating; duration 1 minute	1 250 V
Insulation resistance at 500 V (DC) after 1 minute	>4000 MΩ
Tan δ measured at 1 kHz, 1 V	<3.5%
Category temperature range	−55 to +85 °C (2C2) and −55 to +150 °C (2D1)
Storage temperature range	−55 to +85 °C
Capacitance change as a function of temperature	see Fig.4
Capacitance change as a function of frequency	see Fig.5
Climatic category (IEC 60068)	55/150/56
Ageing	typical 1.5% per time decade

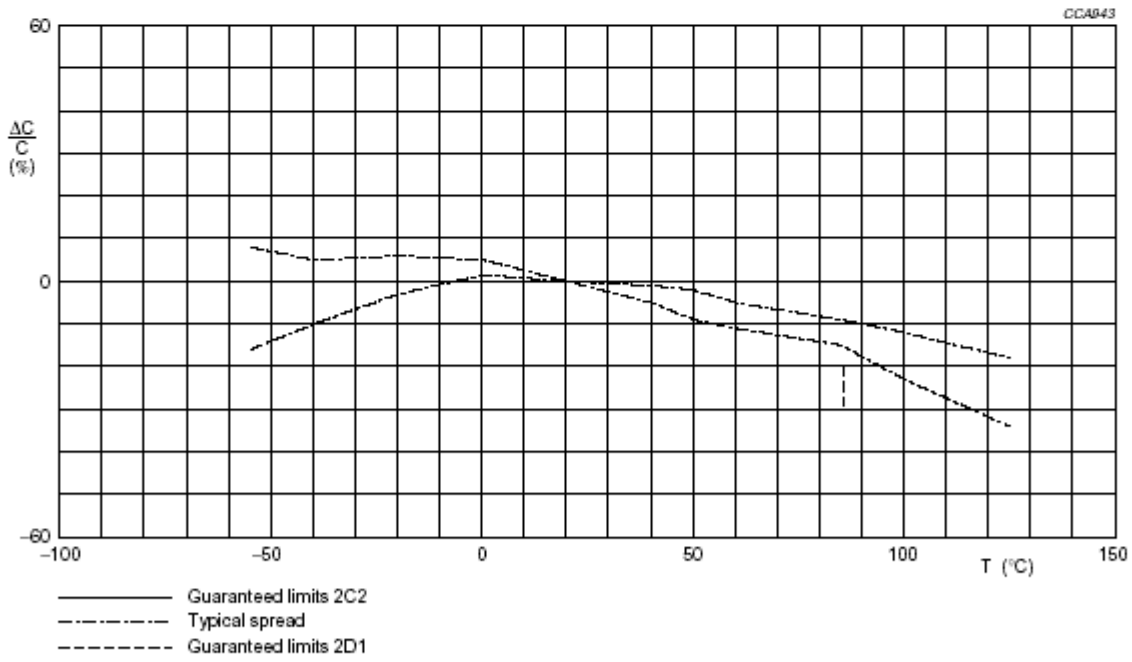
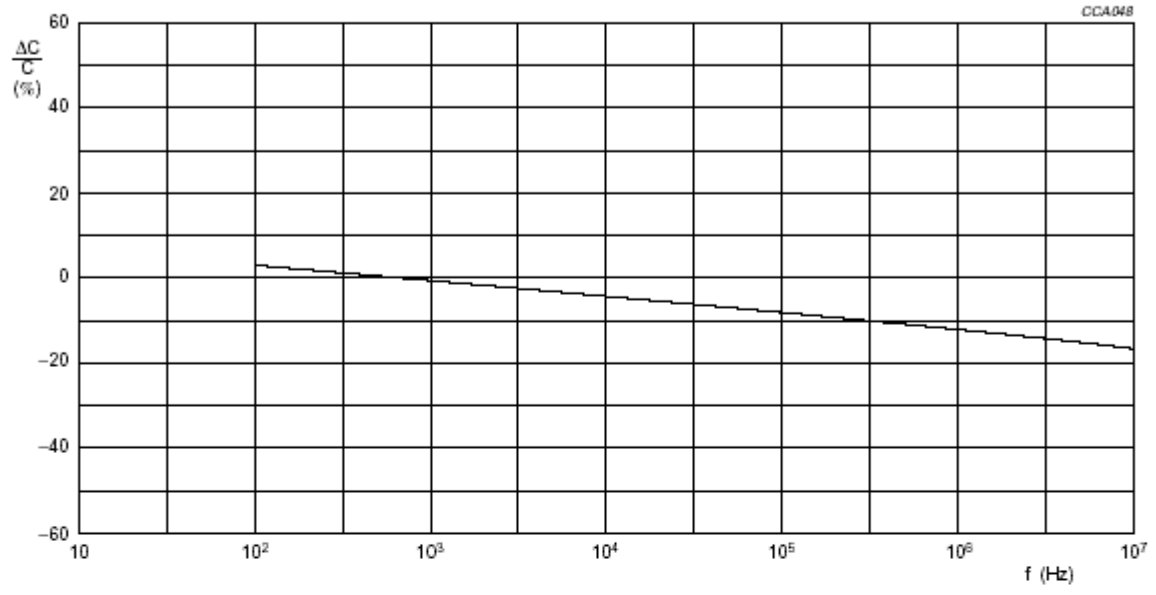


Fig.4 Typical capacitance change with respect to the capacitance at 20 °C as a function of temperature.



U = 1 V (DC).

Fig.5 Typical capacitance change with respect to the capacitance at 1 kHz as a function of frequency.

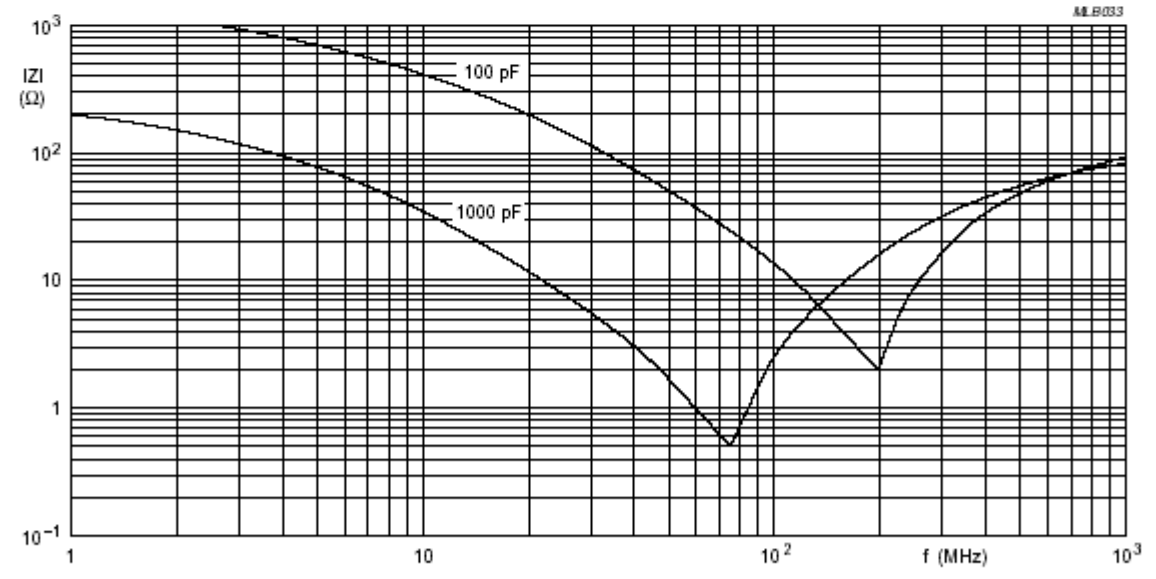


Fig.6 Typical impedance |Z| as a function of frequency.