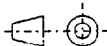
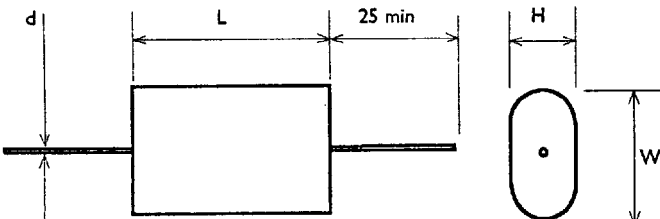


BRITISH STANDARDS INSTITUTION 2 PARK STREET, LONDON	BS CECC 31 201-006 
Specification available from: AS SHOWN IN PD 9002, CECC 00 200 and  I.C.W.Ltd Miners Road Llay Industrial Estate WREXHAM Clwyd LL12 0PJ	ISSUE 1 OCTOBER 1992
ELECTRONIC COMPONENTS OF ASSESSED QUALITY DETAIL SPECIFICATION IN ACCORDANCE WITH BS CECC 30 000: 1984 BS CECC 31 200: 1981	MANUFACTURER'S TYPE NUMBER PWAP
Outline and dimensions First angle projection   All dimensions in mm Marking information: see clause 1.5	SEE PD 9002 AND CECC 00 200 For ordering information see clause 1.6 FIXED METALLIZED POLYPROPYLENE FILM DIELECTRIC D.C. CAPACITOR TYPICAL CONSTRUCTION: OVAL WRAP AND END FILL AXIAL TERMINATIONS ASSESSMENT LEVEL E

QUICK REFERENCE DATA

Capacitance range	10 nF to 100 μ F
Capacitance tolerance	$\pm 1\%$, $\pm 2\%$, $\pm 5\%$, $\pm 10\%$, $\pm 20\%$
Rated voltage ranges	160 V d.c. to 1 600 V d.c.
Climatic category	55/100/56
Performance grade	1 (Long life)
Stability grade	2

Refer to Qualified Products List PD 9002 and/or CECC 00 200 for details of manufacturers approved to this specification

1 General data

1.1 Method of mounting for vibration and bump tests

Each capacitor shall be mounted on a printed circuit board, with the greatest flat area of the body being pressed firmly against the mounting surface and fixed by soldering the leads, which shall be bent through 90° at a point 6 mm to 6,5 mm from the point of emergence of the termination. Units of mass of 3g or greater shall also have their bodies clamped.

Those capacitors identified in Table 1, page 3, as having tinned copper braid terminations as an option shall be similarly mounted on a printed circuit board, with the braids soldered directly to binding posts at a point 6 mm to 6.5 mm from the point of emergence of the termination. These components shall also have their bodies clamped.

1.2 Dimensions

Table 1

Case size reference	L max	W max	T max	d min	d - nom	d max
Dimensions (in mm)						
1	20,0	10,5	5,5	0,55	0,6	0,66
2	20,0	11,5	7,0	0,55	0,6	0,66
3	20,0	12,5	8,0	0,55	0,6	0,66
4	20,0	13,5	8,5	0,55	0,6	0,66
5	20,0	16,0	11,0	0,55	0,6	0,66
6	20,0	18,0	13,5	0,55	0,6	0,66
7	30,0	7,5	6,0	0,55	0,6	0,66
8	30,0	9,0	7,5	0,55	0,6	0,66
9	30,0	12,5	8,0	0,55	0,6	0,66
10	30,0	14,5	10,0	0,75	0,8	0,88
11	30,0	16,5	12,0	0,75	0,8	0,88
12	30,0	18,5	14,0	0,75	0,8	0,88
13	30,0	20,0	15,0	0,75	0,8	0,88
14	30,0	23,5	19,0	0,75	0,8	0,88
15	30,0	28,0	23,5	0,75	0,8	0,88
16	34,0	20,5	15,5	0,75	0,8	0,88
17	34,0	24,0	19,5	0,75	0,8	0,88
18	34,0	27,0	22,5	0,75	0,8	0,88
19	34,0	29,5	25,0	0,75	0,8	0,88
20	34,0	34,5	30,0	0,75	0,8	0,88
21	47,0	19,5	17,0	0,75	0,8	0,88
22	47,0	24,0	20,0	0,75	0,8	0,88
23	47,0	26,0	22,0	0,75	0,8	0,88
24	47,0	28,0	23,0	0,75	0,8	0,88
25	47,0	31,0	26,0	0,75	0,8	0,88
26	47,0	34,0	28,5	0,75	0,8	0,88
27	47,0	37,5	33,0	0,75	0,8	0,88
28	47,0	40,0	34,5	0,75	0,8	0,88
29*	47,0	44,0	40,0	0,75	0,8	0,88
30*	47,0	47,5	42,5	0,75	0,8	0,88
31*	47,0	52,0	47,0	0,75	0,8	0,88
32*	47,0	62,0	57,0	0,75	0,8	0,88
33*	60,0	46,0	41,0	0,75	0,8	0,88
34*	60,0	49,0	44,0	0,75	0,8	0,88
35*	60,0	54,0	49,0	0,75	0,8	0,88
36*	60,0	59,0	54,0	0,75	0,8	0,88

Note: Case sizes marked * are available with tinned copper braid terminations (6,3 mm - 130/0.147 mm) for extra physical strength and current carrying capacity.

1.3 Ratings and characteristics

Capacitance range	10 nF to 100 μ F The preferred values of rated capacitance conform to the E6 values of IEC 63 (See Table 2). Where the use of other values is essential they shall be chosen from that document	
Tolerance on rated capacitance	$\pm 1 \%$, $\pm 2 \%$, $\pm 5 \%$, $\pm 10 \%$, $\pm 20 \%$	
Rated voltage	160 Vd.c., 250 Vd.c., 400 Vd.c. 630 Vd.c., 1,0 kVd.c., 1,6 kVd.c. (See Table 2)	
Climatic category	55/100/56	
Rated temperature	85 °C	
Tangent of the loss angle (@1 kHz)	$C_R \leq 1,0 \mu F \leq 10 \times 10^{-4}$ $1,0 \mu F < C_R \leq 22 \mu F \leq 15 \times 10^{-4}$ $22 \mu F < C_R \leq 40 \times 10^{-4}$	
Insulation resistance:		
Measuring point 1a	$C_R \leq 330 \text{ nF}$ $C_R > 330 \text{ nF}$	$> 100 \text{ G}\Omega$ $> 30 \text{ ks}$
Measuring point 1c (between terminations connected together and foil or V-block)		$> 100 \text{ G}\Omega$

Table 2
Values of capacitance related to voltages and case sizes

Rated voltage (V @ 85 °C)	160	250	400	630	1 000	1 600
Category voltage (V @ 100 °C)	110	175	280	440	700	1 120
Rated capacitance	Case size reference					
10 nF						7
15 nF						7
22 nF						8
33 nF						9
47 nF						10
68 nF				1		11
100 nF			1	2	11	12
150 nF		1	2	4	12	14
220 nF		2	4	9	14	21
330 nF		3	5	10	15	22
470 nF	2	5	6	11	21	23
680 nF	3	6	12	13	22	24
1.0 µF	5	11	13	16	24	27
1.5 µF	10	13	14	17	26	29
2.2 µF	11	14	15	19	28	
3.3 µF	12	15	19	24		
4.7 µF	16	18	20	26		
6.8 µF	17	20	26	28		
10 µF	18	25	28	30		
15 µF	23	27	30			
22 µF	25	29	34			
33 µF	27	33	36			
47 µF	29	35				
68 µF	31					
100 µF	32					

Note: The preferred case size reference for values of rated capacitance lying between those given above is that corresponding to the next higher value.