

**METALLISED POLYESTER  
FILM CAPACITORS**  
Radial leads—lacquered

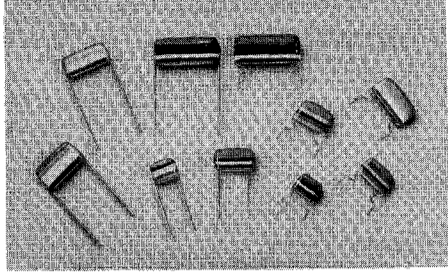
**C280**  
Series

**QUICK REFERENCE DATA**

Designed for coupling and decoupling applications on printed wiring boards.

Capacitance ranges (E6 Series)

250V working	0.01 to 2.2	$\mu\text{F}$
400V working	0.01 to 1.0	$\mu\text{F}$



**DIELECTRIC**

250V version  
400V version

polyethyleneterephthalate film  
polycarbonate film

**CASING**

Hard, water repellent, lacquer.

**TERMINATIONS**

Two styles are available, long wire or crimped and cropped, both have radial leads of solder coated wire. Leads are spaced suitable for use with printed wiring boards having a 2.54mm (0.1 in) grid.

**TYPE NUMBER DESIGNATION**

250V version  
400V version

C280AE/....  
C280CF/....

**SPECIAL FEATURES**

These capacitors are manufactured by using 'extended' techniques, resulting in low inherent inductance. Both versions may be subjected to short term overvoltage, making them suitable for use in anode and screen circuits. The crimped and cropped style of termination, overcomes many of the problems associated with dimensional tolerances of printed wiring boards, facilitates immediate assembly into the boards (no prior cropping is required) and improves the component solderability when using solder wave techniques. These advantages are obtained with only a 4mm increase in height over the alternative long wire style.

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JANUARY 1972

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**ELECTRICAL DATA**

Unless otherwise specified, all electrical characteristics apply at an ambient temperature of  $20 \pm 5^\circ\text{C}$ , atmospheric pressure of  $10^5\text{N/m}^2$  and a relative humidity of 75% max.

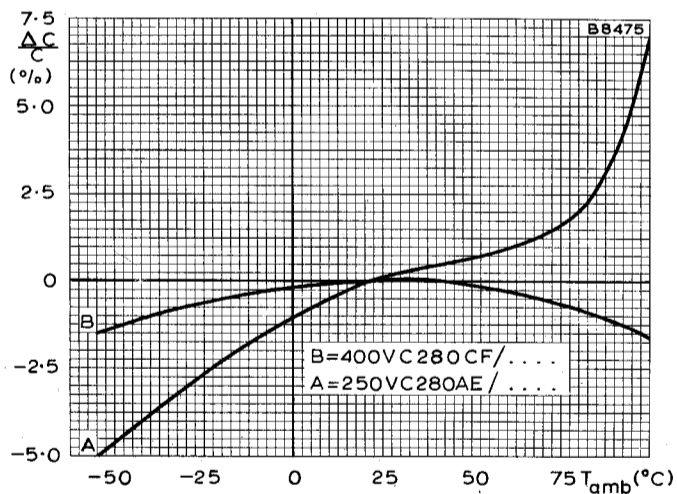
	Conditions	C280AE/.... (250V)	C280CF/.... (400V)	
Capacitance range (E6 Series)	-	0.01 to 2.2 $\mu\text{F}$	0.01 to 1 $\mu\text{F}$	
Capacitance tolerance	0.01 to 0.22 $\mu\text{F}$	$\pm 20\%$	$\pm 20\%$	
	0.33 to 2.2 $\mu\text{F}$	$\pm 10\%$	$\pm 10\%$	
Rated voltage (d.c.)	over the category temperature range	250V	400V	
Rated voltage (r.m.s.) (see note on page 4)	f=50Hz, minimum source impedance >1k $\Omega$	160V	200V	
Rated current (mean)	-	400mA	400mA	
Tangent of loss angle (tan $\delta$ )	f=1kHz	$< 75 \times 10^{-4}$	$< 30 \times 10^{-4}$	
	f=10kHz	$< 250 \times 10^{-4}$	$< 100 \times 10^{-4}$	
Category temperature range	-	-40 to +85 $^\circ\text{C}$	-40 to +85 $^\circ\text{C}$	
Extended temperature range	Voltage derating 1.25% per degC	+85 to +100 $^\circ\text{C}$	+85 to +100 $^\circ\text{C}$	
Insulation resistance	0.01 to 0.33 $\mu\text{F}$	>30 000M $\Omega$	>30 000M $\Omega$	
	0.47 to 2.2 $\mu\text{F}$	>10 000M $\Omega \cdot \mu\text{F}$	>10 000M $\Omega \cdot \mu\text{F}$	
Maximum rate of change of voltage (see note on page 4)	Capacitor length L (see page 2)			
		= 12.5mm	20V/ $\mu\text{s}$	30V/ $\mu\text{s}$
		= 17.5mm	10V/ $\mu\text{s}$	20V/ $\mu\text{s}$
		= 22.5mm	7V/ $\mu\text{s}$	10V/ $\mu\text{s}$
		= 30 mm	5V/ $\mu\text{s}$	8V/ $\mu\text{s}$
Surge voltage (d.c.)	1 min per hour	350V	500V	
Long term stability (d.c.)	1.5 $\times$ rated voltage	<2%	<2%	
Long term stability (a.c.)	Capacitor length L (see page 2)			
		= 12.5mm	<25%	<25%
		= 17.5mm	<20%	<20%
		= 22.5mm	<15%	<15%
		= 30 mm	<10%	<10%

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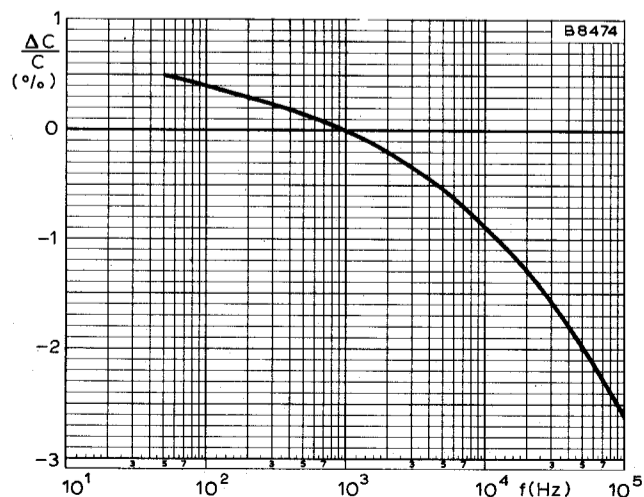
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**METALLISED POLYESTER  
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Series



TYPICAL CAPACITANCE CHANGE AS A FUNCTION OF AMBIENT TEMPERATURE



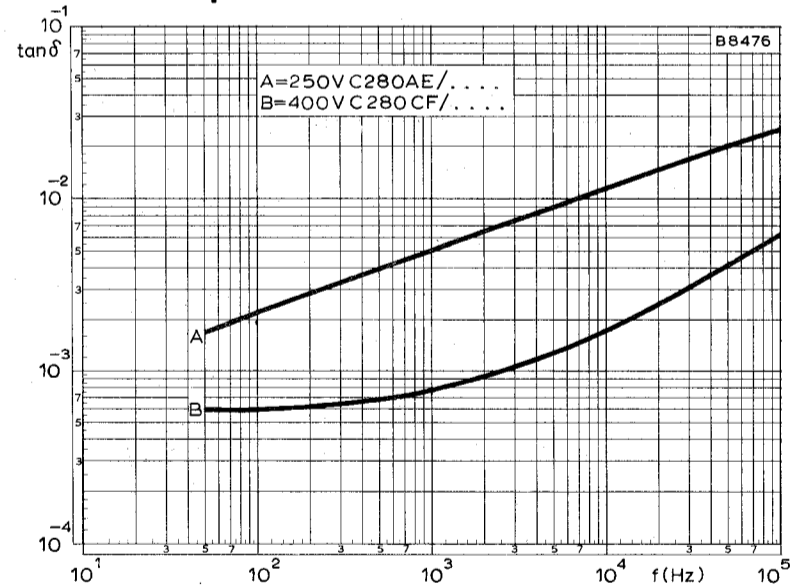
TYPICAL CAPACITANCE CHANGE AS A FUNCTION OF FREQUENCY

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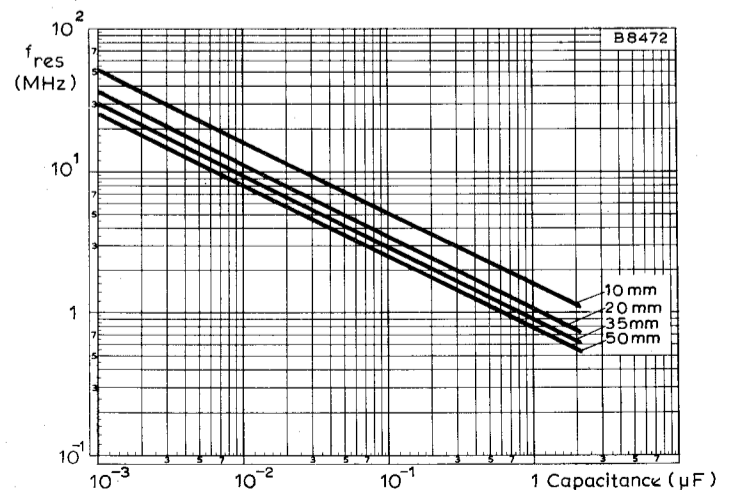
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**METALLISED POLYESTER  
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**C280**  
Series



TYPICAL TAN  $\delta$  AS A FUNCTION OF FREQUENCY

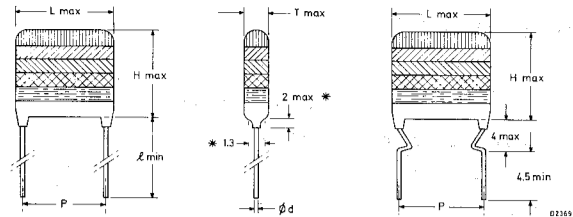


SELF RESONANCE FREQUENCY AS A FUNCTION OF CAPACITANCE FOR VARIOUS TOTAL LEAD LENGTHS

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DIMENSIONS AND TYPE NUMBERS



250V version

Capacitance (μF)	Dimensions in millimetres						Type number	
	L	H	T	d	l	P	long wire C280AE	crimped C280AE
0.010	12.5	9	4	0.6	16	10.2 (0.4in)	/P10K	/P10K/040
0.015	12.5	9	4	0.6	16	10.2 (0.4in)	/P15K	/P15K/040
0.022	12.5	9	4	0.6	16	10.2 (0.4in)	/P22K	/P22K/040
0.033	12.5	9	4	0.6	16	10.2 (0.4in)	/P33K	/P33K/040
0.047	12.5	9	4	0.6	16	10.2 (0.4in)	/P47K	/P47K/040
0.068	12.5	10	5	0.6	16	10.2 (0.4in)	/P68K	/P68K/040
0.10	12.5	11	6	0.6	16	10.2 (0.4in)	/P100K	/P100K/040
0.15	17.5	11	6	0.8	18	15.3 (0.6in)	/P150K	/P150K/060
0.22	17.5	12	7	0.8	18	15.3 (0.6in)	/P220K	/P220K/060
0.33	22.5	11.5	6.5	0.8	21	20.3 (0.8in)	/A330K	/A330K/080
0.47	22.5	12.5	7.5	0.8	21	20.3 (0.8in)	/A470K	/A470K/080
0.68	22.5	14.5	9.5	0.8	21	20.3 (0.8in)	/A680K	/A680K/080
1.0	30	14.5	9.5	0.8	21	27.9 (1.1in)	/A1M	/A1M/110
1.5	30	18	10.5	0.8	21	27.9 (1.1in)	/A1M5	/A1M5/110
2.2	30	20.5	12.5	0.8	21	27.9 (1.1in)	/A2M2	/A2M2/110

400V version

Capacitance (μF)	Dimensions in millimetres						Type number	
	L	H	T	d	l	P	long wire C280CF	crimped C280CF
0.010	12.5	9	4	0.6	16	10.2 (0.4in)	/P10K	/P10K/040
0.015	12.5	9	4	0.6	16	10.2 (0.4in)	/P15K	/P15K/040
0.022	12.5	9	4	0.6	16	10.2 (0.4in)	/P22K	/P22K/040
0.033	12.5	10	5	0.6	16	10.2 (0.4in)	/P33K	/P33K/040
0.047	12.5	11	6	0.6	16	10.2 (0.4in)	/P47K	/P47K/040
0.068	17.5	11	6	0.8	18	15.3 (0.6in)	/P68K	/P68K/060
0.10	17.5	12	7	0.8	18	15.3 (0.6in)	/P100K	/P100K/060
0.15	22.5	11.5	6.5	0.8	21	20.3 (0.8in)	/P150K	/P150K/080
0.22	22.5	12.5	7.5	0.8	21	20.3 (0.8in)	/P220K	/P220K/080
0.33	22.5	14.5	9.5	0.8	21	20.3 (0.8in)	/A330K	/A330K/080
0.47	30	14.5	9.5	0.8	21	27.9 (1.1in)	/A470K	/A470K/110
0.68	30	18	10	0.8	21	27.9 (1.1in)	/A680K	/A680K/110
1.0	30	20	12	0.8	21	27.9 (1.1in)	/A1M	/A1M/110

NOTE (reference table page 3)

These two ratings are required in connection with the calculation of maximum permissible alternating voltage. See METALLISED FILM CAPACITORS - INTRODUCTORY NOTES, and graph on page 8.

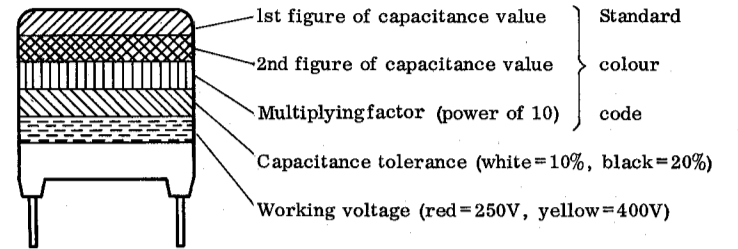
SOLDERING CONDITIONS

5 seconds max. at 250°C max.

MARKING

These capacitors are coded with: Capacitance  
Tolerance  
Rated voltage

The method of marking is shown below:-



Standard colour code

- Black = 0
- Brown = 1
- Red = 2
- Orange = 3
- Yellow = 4
- Green = 5
- Blue = 6
- Violet = 7
- Grey = 8
- White = 9

ORDERING PROCEDURE

These capacitors should be ordered by their full type number as shown in the table on page 2.

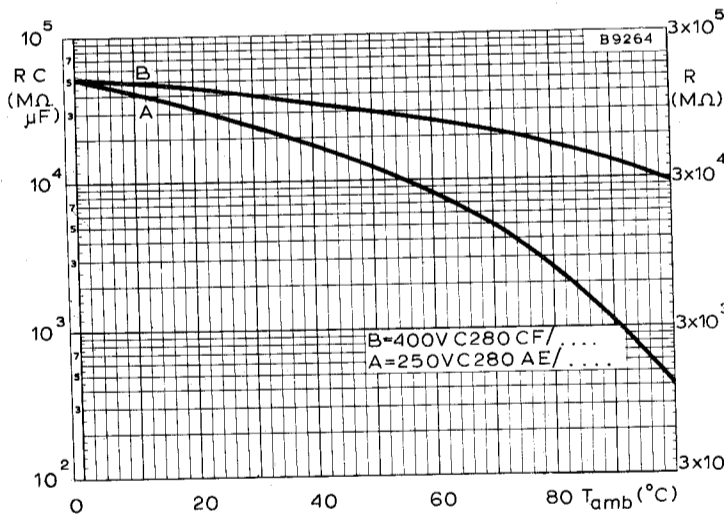
Examples:-

A 0.1μF ±20%, 250V working capacitor with long wire style terminations, should be ordered by quoting the full type number C280AE/P100K.

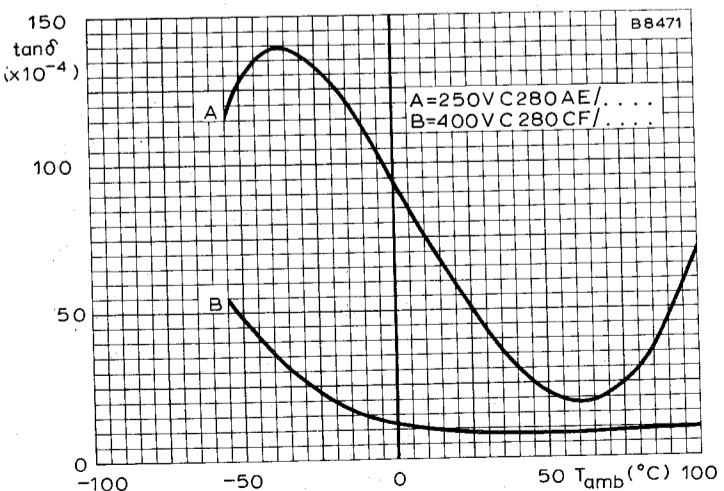
A 0.1μF ±20%, 250V working capacitor with crimped and cropped terminations, should be ordered by quoting the full type number C280AE/P100K/040.

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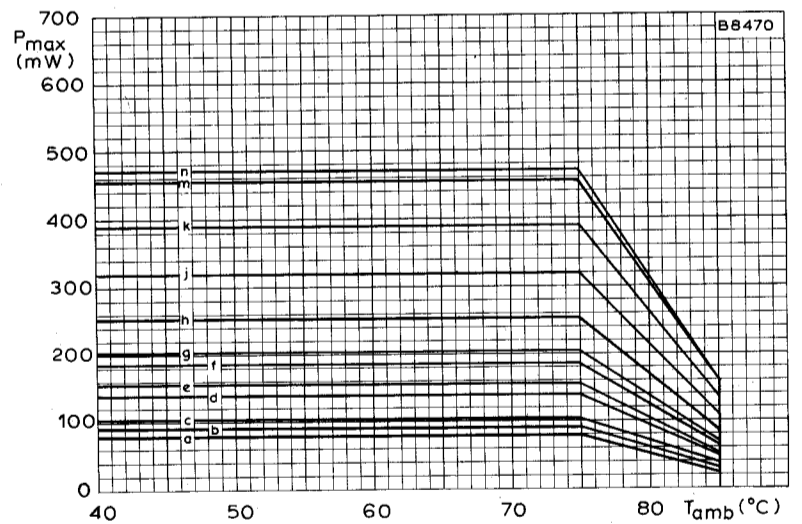


TYPICAL INSULATION RESISTANCE AS A FUNCTION OF AMBIENT TEMPERATURE



TYPICAL TAN δ AS A FUNCTION OF AMBIENT TEMPERATURE AT f=1kHz

ALTERNATING VOLTAGE RATINGS



MAXIMUM PERMISSIBLE POWER DISSIPATION AS A FUNCTION OF AMBIENT TEMPERATURE

TABLE OF CASE SIZES

Curve	Dimensions in millimetres		
	L	H	T
a	12.5	9	4
b	12.5	10	5
c	12.5	11	6
d	17.5	11	6
e	17.5	12	7
f	22.5	11.5	6.5
g	22.5	12.5	7.5
h	22.5	14.5	9.5
j	30	14.5	9.5
k	30	18	10
m	30	20	12
n	30	20.5	12.5

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