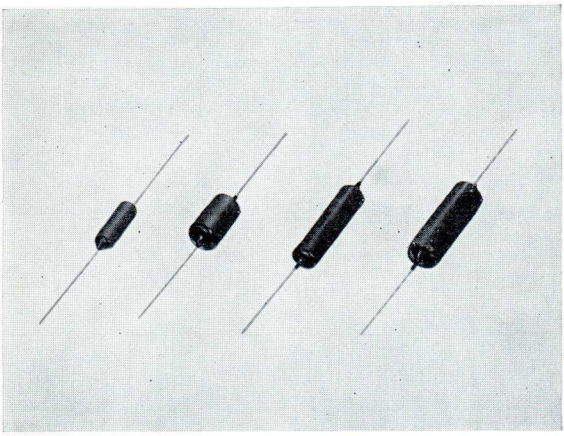
C296 series - POLYESTER CAPACITORS

TUBULAR FOIL TYPE



This capacitor is a very reliable general purpose capacitor for electronic circuits. It has found widespread acceptance not only in the radio and television industry, but also in industrial electronics. The dielectric is polyethyleneterephtalate foil.

Specification. For specification and characteristics see pp. C66–C69.

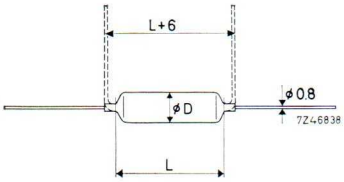
Composition of the type number C296A./A...

working voltage
A = 160 V_{dc}
C = 400 V_{dc}

capacitance code
A = 10%

Example: The type number of a 2200 pF/400 V capacitor is C296AC/A2K2.

TUBULAR FOIL TYPE



capacitance	capacitance code	max. dimensions (mm)			
		160 V_{dc} **C296AA/A...**		400 V_{dc} **C296AC/A...**	
		D	L	D	L
1000 pF	1K			7.5	18
1500	1K5			7.5	18
2200	2K2			7.5	18
3300	3K3			7.5	18
4700	4K7			7.5	18
6800	6K8			7.5	18
0.010 μF	10K	7.5	18	7.5	18
0.015	15K	7.5	18	7.5	18
0.022	22K	7.5	18	8.5	18
0.033	33K	7.5	18	10	18
0.047	47K	8	18	11.5	18
0.068	68K	9	18	9.5	32
0.10	100K	10.5	18	11	32
0.15	150K	12	18	12.5	32
0.22	220K	10	32	14.5	32
0.33	330K	12	32	17	32
0.47	470K	14	32	19.5	32
0.68	680K	16	32		
1.0	1M	18.5	32		

Intermediate values according to the E12 range are available on request. The dimensions are identical to those of the next higher value in the standard E6 range.
The standard capacitance tolerance is $\pm 10\%$.

SPECIFICATION

Type	C 280
Working temperature range	−40/+85°C
Working voltage	without derating up to 85 °C
Permissible overvoltage during 1 min. per hour	250 V_{dc} types: 40% 400 V_{dc} and 630 V_{dc} types: 25%
Permissible alternating voltage (50–60 c/s)	250 V_{dc} types: 160 V_{ac} 400 V_{dc} types: 250 V_{ac} 630 V_{dc} types: 300 V_{ac}
Permissible alternating voltage at other frequencies	250 V_{dc} types: page C69, fig. 7 400 V_{dc} types: page C69, fig. 8 630 V_{dc} types: for the time being the same as for the 400 V_{dc} types
Maximum capacitance drift during life:	
d.c. loaded	Δ C max ±5%
a.c. loaded	for B = 12.5 mm: Δ C max = 25% B = 17.5 mm: Δ C max = 20% B = 22.5 mm: Δ C max = 15% B = 30 mm: Δ C max = 10%
Test voltage (d.c.) during 1 minute	2 × rated d.c. voltage
Breakdown voltage of encasing	—
Insulation resistance at 20°C:	
for C ≤ 0.33 μF	R ≥ 30.000 MΩ
for C > 0,33 μF	RC ≥ 10.000 sec.
Losses (tan δ) at 1 kc/s	250 V_{dc} types: ≤ 75 × 10^{-4} 400 V_{dc} and 630 V_{dc} types: ≤ 30 × 10^{-4}
Climatic group number	40/085/21 (IEC)
Pulse loads	steepness < 10V/μsec
Resonance frequency	page C69, fig. 6
Capacitance versus temperature	page C68, fig. 1: 250V_{dc} types: curve I 400V_{dc} and 630V_{dc} types: curve II
Losses versus temperature	page C68, fig. 2: 250V_{dc} types: curve I 400V_{dc} and 630V_{dc} types: curve II
Insulation resistance versus temperature	page C68, fig. 3: 250V_{dc} types: curve I 400V_{dc} and 630V_{dc} types: curve II
Capacitance versus frequency	page C68, fig. 4
Losses versus frequency	page C69, fig. 5: 250V_{dc} types: curve I 400V_{dc} and 630V_{dc} types: curve II

SPECIFICATION

C 281	C 296
−55/+85 °C	−40/+85 °C
without derating up to 85 °C	without derating up to 85 °C
250 V_{dc} types: 40%	—
400 V_{dc} types: 25%	—
250 V_{dc} types: 160 V_{ac}	160 V_{dc} types: 90 V_{ac}
400 V_{dc} types: 250 V_{ac}	400 V_{dc} types: 150 V_{ac}
250 V_{dc} types: page C69, fig. 7	160 V_{dc} types: page C69, fig. 7
400 V_{dc} types: page C69, fig. 8	400 V_{dc} types: page C69, fig. 8
ΔC max ± 3%	ΔC max ± 5%
for L = 14 mm ΔC max = 25%	ΔC max ± 5%
L = 17.5 mm ΔC max = 20%	
L = 23 mm ΔC max = 15%	
L = 30 mm ΔC max = 10%	
2 × rated d.c. voltage	2 × rated d.c. voltage
> 2500 V_{ac}	—
R ≥ 30.000 MΩ	R ≥ 50.000 MΩ
RC ≥ 10.000 sec	RC ≥ 16.500 sec
250 V_{dc} and 400 V_{dc} types with polyethyleneterephtalate dielectric: ≤ 75 × 10^{-4}	≤ 60 × 10^{-4}
400 V_{dc} types with polycarbonate dielectric: ≤ 30 × 10^{-4}	
55/085/56 (IEC)	40/085/21 (IEC)
steepness < 10V/μsec	—
page C69, fig. 6	page C69, fig. 6
page C68, fig. 1 – 250 V_{dc} and 400 V_{dc} types with polyethleneterephtalate dielectric: curve I 400 V_{dc} types with polycarbonate dielectric: curve II	page C68, fig. 1, curve 1
page C68, fig. 2 – 250 V_{dc} and 400 V_{dc} types with polyethleneterephtalate dielectric: curve I 400 V_{dc} types with polycarbonate dielectric: curve II	page C68, fig. 2, curve 1
page C68, fig. 3 – 250 V_{dc} and 400 V_{dc} types with polyethyleneterephtalate dielectric: curve I 400 V_{dc} types with polycarbonate dielectric: curve II	page C68, fig. 3, curve I
page C68, fig. 4	page C68, fig. 4
page C69, fig. 5 – 250 V_{dc} and 400 V_{dc} types with polyethyleneterephtalate dielectric: curve I 400 V_{dc} types with polycarbonate dielectric: curve II	page C69, fig. 5, curve I

CHARACTERISTICS

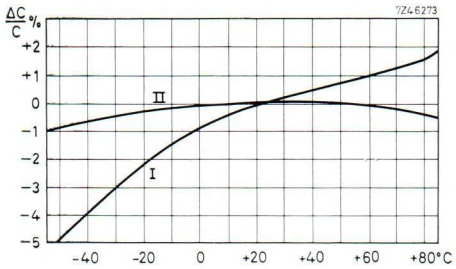


Fig. 1
Capacitance
versus temperature

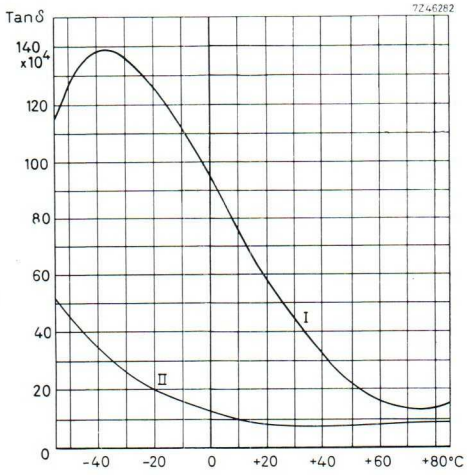


Fig. 2
Losses versus temperature
at 1 kc/s

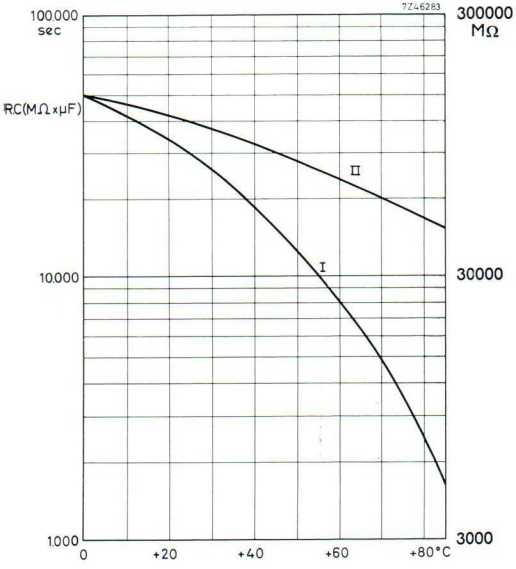


Fig. 3
Insulation resistance
versus temperature

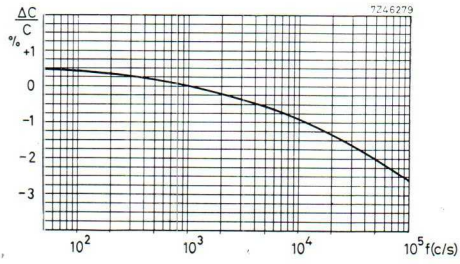


Fig. 4
Capacitance
versus frequency

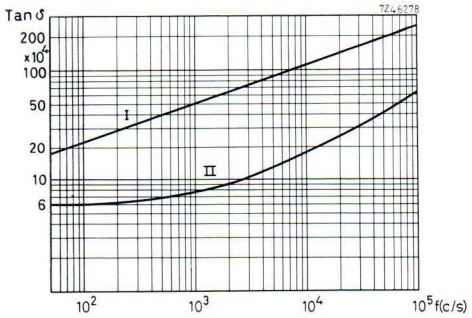
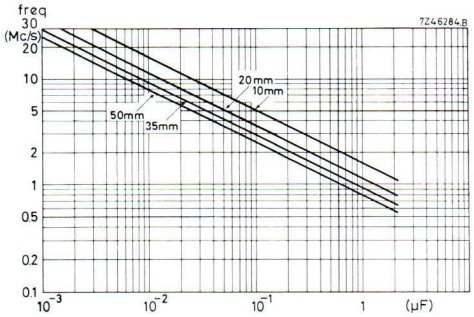


Fig. 5
Losses versus frequency

Fig. 6
Resonance frequency versus capacitance at different total wire lengths.



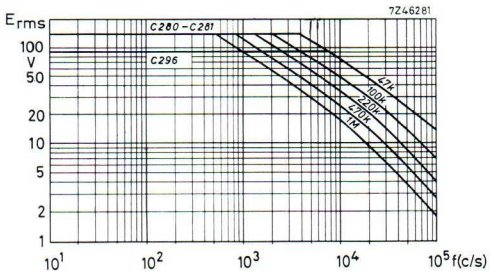


Fig. 7
Permissible alternating voltage versus frequency for capacitors rated 250 V_{dc} (160 V_{dc} for the C296 series)

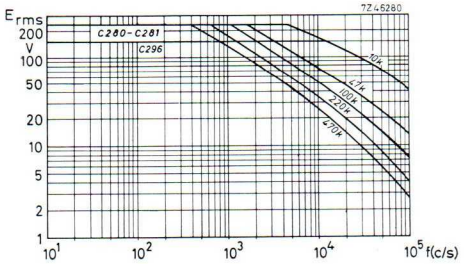


Fig. 8
Permissible alternating voltage versus frequency for capacitors rated 400 V_{dc}