

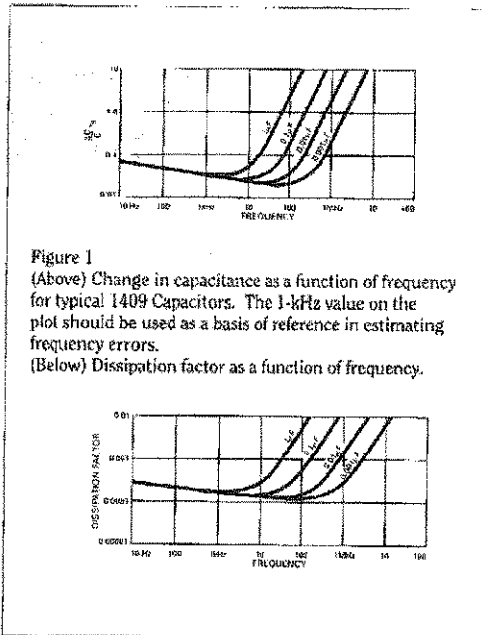
Reference or Working Standards with Long-Term Stability

- 0.001 to $1\mu\text{F}$
- $\pm 0.01\%$ /year stability
- Calibration accuracy $\pm 0.02\%$
- Two- and three-terminal calibration provided

The 1409 Standard Capacitors are fixed mica capacitors of very high stability for use as two- or three-terminal reference or working standards in the laboratory.

Typical capacitors, observed over more than 20 years, have shown random fluctuations of less than $\pm 0.01\%$ in measured capacitance with no evidence of systematic drift.

These capacitor units consist of a silvered-mica and foil pile, spring-held in a heavy metal clamping structure for mechanical stability. The units are selected for low dissipation factor and are stabilized by heat cycling. They are housed, with silica gel to provide continuous desiccation, in cast aluminum cases, sealed with high-temperature potting wax. A well is provided in the wall of the case for the insertion of a dial-type thermometer. Three jack-top binding posts are provided on the top of the case and removable plugs on the bottom, for convenient parallel connection without error.

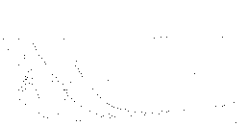


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Calibration: A certificate of calibration is supplied with each unit, giving both two- and three-terminal measured capacitances at 1kHz and at a specified temperature. The measured value is the capacitance added when the standard is plugged directly into binding posts. This value is obtained by comparison, to a precision better than $\pm 0.01\%$, with working standards whose absolute values are known to an accuracy typically $\pm 0.01\%$, determined and maintained in terms of reference standards periodically calibrated by the National Institute of Standards and Technology.

Adjustment Accuracy: Within $\pm 0.05\%$ of the nominal capacitance value (two terminal) marked on the case.

Stability: Capacitance change is less than 0.01% per year.

Temperature Coefficient of Capacitance: $+35 \pm 10$ ppm per degree C between 10° and 70°C.

Dissipation Factor: Less than 0.0003 at 1kHz and 23°C (See Figure 1).
Measured dissipation factor at 1kHz is stated in the certificate to an accuracy of ± 0.00005 .

Series Inductance: Typically 0.050 μ H for 1409-F and -L, 0.055 μ H for -T and -Y.

Series Resistance at 1MHz: 0.02 Ω , except for 1409-Y, which is 0.03 Ω .

Frequency Characteristics: See Figure 1. Series resistance varies as the square root of the frequency for frequencies above 100kHz.

Approximate Terminal Capacitance: From H terminal to case (G), 12 to 50pF. From L terminal (outside foils of capacitor) to case, 300 to 1300pF.

Leakage Resistance: 5000 ohm-farads or 100G Ω , whichever is the lesser.

Maximum Voltage: 500V pk up to 10kHz.

Mechanical: Sealed case.
Dimensions: (w x h x d): 1409-Y, 3.25 x 5.63 x 2.69in (83 x 143 x 69mm);
others, 3.25 x 4 x 2in (83 x 102 x 51mm).
Weight: 1.25lb (0.6kg) net, 4lb (1.9kg) shipping; the 1409-Y is heavier by approximately 1lb (0.5kg).

Ordering Information:	Description	Catalog Number
	1409 Standard Capacitor	
	1409-F, 0.001 μ F	1409-9706
	1409-L, 0.01 μ F	1409-9712
	1409-T, 0.1 μ F	1409-9720
	1409-Y, 1.0 μ F	1409-9725



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