

# Standard Capacitance Reference or Working Standards

## SCA Series p. 1 of 2

High-stability, cost-effective capacitance standards with low temperature coefficients, low losses, and a wide range of values.

- Capacitance values from 1 pF to 10,000  $\mu$ F
- Custom values available
- Mechanically stabilized capacitors
- Stability: <100 ppm/year
- Excellent TC: as low as 10 ppm/ $^{\circ}$ C
- Low loss: D as low as 0.0002



SCA-100nF

## SPECIFICATIONS

Nominal value	Model	Adjustment to nominal	Temperature coefficient (ppm/ $^{\circ}$ C)	Calibration* frequency	Dissipation (typical)	Stability (per year)	Max voltage		Terminals	Capacitor type
							Peak (V)	Max Frequency		
1 pF	SCA-1pF	$\pm 0.1$ pF	+20 to +40	1 kHz	0.002	$\pm 0.1$ pF	500	10 kHz	2 bnc + gnd	Air capacitors
1.9 pF	SCA-1.9pF	$\pm 0.1$ pF	+20 to +40	1 kHz	0.002	$\pm 0.1$ pF	500	10 kHz		
10 pF	SCA-10pF	$\pm 0.1$ pF	+20 to +40	1 kHz	0.002	$\pm 0.1$ pF	500	10 kHz		
19 pF	SCA-19pF	$\pm 0.1$ pF	+20 to +40	1 kHz	0.001	$\pm 0.1$ pF	500	10 kHz		
100 pF	SCA-100pF	$\pm 0.1$ pF	+20	1 kHz	0.0005	$\pm 0.1$ pF	500	10 kHz		
190 pF	SCA-190pF	$\pm 0.1$ pF	+20	1 kHz	0.0005	$\pm 0.1$ pF	500	10 kHz	2 bp's + gnd	Silvered mica mechanically stabilized hermetically sealed
1 nF	SCA-1nF	$\pm 0.02\%$	+20	1 kHz	0.0003	$\pm 100$ ppm	500	10 kHz		
1.9 nF	SCA-1.9nF	$\pm 0.02\%$	+20	1 kHz	0.0003	$\pm 100$ ppm	500	10 kHz		
10 nF	SCA-10nF	$\pm 0.02\%$	+20	1 kHz	0.0003	$\pm 100$ ppm	500	10 kHz		
19 nF	SCA-19nF	$\pm 0.02\%$	+20	1 kHz	0.0003	$\pm 100$ ppm	500	10 kHz		
100 nF	SCA-100nF	$\pm 0.02\%$	+20	1 kHz	0.0003	$\pm 100$ ppm	500	10 kHz		
190 nF	SCA-190nF	$\pm 0.02\%$	+20	1 kHz	0.0003	$\pm 100$ ppm	500	10 kHz		
1 $\mu$ F	SCA-1 $\mu$ F	$\pm 0.02\%$	+20	1 kHz	0.0002	$\pm 100$ ppm	500	10 kHz		
1.9 $\mu$ F	SCA-1.9 $\mu$ F	$\pm 0.02\%$	+20	1 kHz	0.0002	$\pm 100$ ppm	100	10 kHz		
5 $\mu$ F	SCA-5 $\mu$ F	$\pm 0.02\%$	$\pm 50$	1 kHz	0.0005	$\pm 200$ ppm	100	10 kHz		
10 $\mu$ F	SCA-10 $\mu$ F	$\pm 0.04\%$	$\pm 50$	100 Hz	0.0005	$\pm 200$ ppm	22 Vrms†	1 kHz		
19 $\mu$ F	SCA-19 $\mu$ F	$\pm 0.04\%$	$\pm 50$	100 Hz	0.0005	$\pm 200$ ppm	44 Vrms†	1 kHz		
100 $\mu$ F	SCA-100 $\mu$ F	$\pm 0.05\%$	$\pm 50$	100 Hz	0.001	$\pm 500$ ppm	22 Vrms†	1 kHz		
190 $\mu$ F	SCA-190 $\mu$ F	$\pm 0.05\%$	$\pm 50$	100 Hz	0.001	$\pm 500$ ppm	22 Vrms†	1 kHz		
1,000 $\mu$ F	SCA-1000 $\mu$ F	$\pm 0.4\%$	-150	100 Hz	0.001	$\pm 500$ ppm	22 Vrms†	1 kHz		
5,000 $\mu$ F	SCA-5000 $\mu$ F	$\pm 2\%$	-150	100 Hz	0.001	--	22 Vrms†	1 kHz		
10,000 $\mu$ F	SCA-10000 $\mu$ F	$\pm 2\%$	-150	100 Hz	0.001	--	22 Vrms†	1 kHz	Polypropylene	
XXX F	SCA-XXX	customer-selected value and power specifications								

\* Calibrated at "series model" setup

† Maximum allowable Vrms; subject to maximum Vdc = 50 V and max Vrms = (39000/f) for C = 10  $\mu$ F; (26000/f) for C = 19  $\mu$ F; (13000/f) for C  $\geq$  100 $\mu$ F, where f = frequency (in Hz).

### Environment:

**Operating:** +10 to +40 $^{\circ}$ C, <80% RH  
**Storage:** -20 to +65 $^{\circ}$ C

### Calibration Conditions:

Calibrated at 23 $^{\circ}$ C, <80% RH, Traceable to SI

### Mechanical:

Values	Dimensions	Weight
$\leq 190$ $\mu$ F	8.6 cm H x 10.5 cm W x 12.7 cm D (3.4" x 4.15" x 5")	0.73 kg (1.6 lb)
1,000 $\mu$ F	31 cm W x 8.9 cm H x 10.2 cm D (12.2" x 3.5" x 4")	1.7 kg (3.8 lb)
5,000 $\mu$ F	53.3 cm W x 27.3 cm H x 44.5 cm D (21" x 10.75" x 17.5")	27.2 kg (60 lb)
10,000 $\mu$ F		36.3 kg (80 lb)

### Transit Case:

Optional **Model SRC-100** lightweight transit case with handle, suitable for transporting and storing two units. The case provides mechanical protection and insulation from temperature changes during transportation or shipping.



SRC-100 Transit Case



**IET LABS, INC.** in the **GenRad** Tradition  
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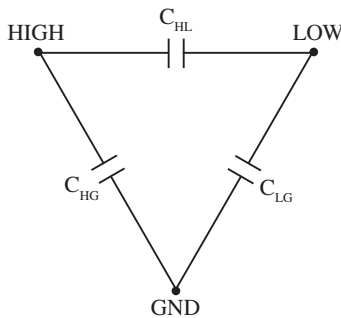
SCA/07-28-2011

# Standard Capacitance Reference or Working Standards

SCA Series p. 2 of 2

## CONNECTION SCHEMATICS FOR LOW VALUES

Low-value SCA's have 3 terminals -- **HI** and **LO**, and **GND**. The capacitance of the unit is shown as  $C_{HL}$ . There is additional capacitance to the case shown by  $C_{HG}$  and  $C_{LG}$ . These capacitances will add to  $C_{HL}$  unless the 3rd terminal, **GND**, is connected to the **GUARD** of the measuring instrument.



SCA-1nF

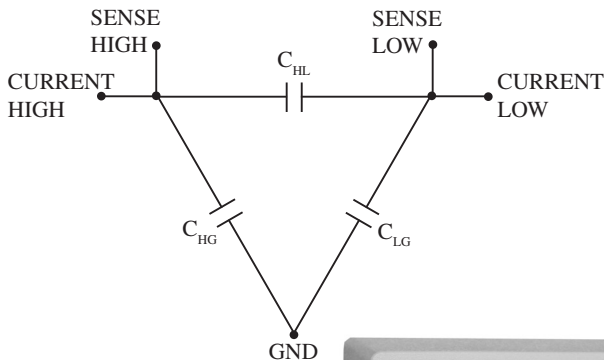


SCA-100nF

Low SCA Units

## CONNECTION SCHEMATICS FOR HIGH VALUES

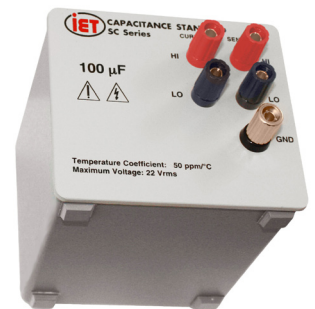
High-value SCA's have 5 binding posts -- **HI CURRENT**, **HI SENSE**, **LO CURRENT**, **LO SENSE**, and **GND**. This 4-terminal connection circuit has special wiring and low-resistance conductors to minimize dissipation and parasitic inductance, and improve frequency characteristics.



SCA-10,000µF



SCA-1,000µF



SCA-100µF

## ORDERING INFORMATION

Capacitance Standard  
Custom value  
Transit case for 2 units

Select from table above  
**SCA-XXX**  
**SRC-100**



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