



Decade Capacitance PCB

Part number 120067

This decade capacitance PCB is not exactly a decade adjustable piece of test gear. In order to make it truly adjustable in decade format it would nearly double the cost of the product. Instead we opted to put sets of 4 or 5 equal value capacitors in series. Below is the dial cross reference to capacitance.

This board uses several MLCC low ESR capacitors and can be adjusted from 2pF up to 100uF. The capacitance can be turned off by turning all knobs all the way to the left. Capacitance can be added across the dials. Ex: Dial1=50pF and Dial2=1000pF then the total capacitance is 1050pF. The switches are break before make contact configuration. The PCB measures 2.0" square. The PCB comes with 3 different ways to hook up your wires: male 0.1" header, female 0.1" header, and a flying lead spring cage connection. Schematics and EagleCAD files are available for download at www.Atlanta-Robotics.com.

Dial 1:

- 0
- 2pF (10pF *5 caps in series)
- 2.5pF (10pF *4 caps in series)
- 3.3pF (10pF *3 caps in series)
- 5.0pF (10pF *2 caps in series)
- 10pF (10pF cap)
- 25pF (100pF *4 caps in series)
- 33pF (100pF *3 caps in series)
- 50pF (100pF *2 caps in series)
- 100pF (100pF cap)

Dial 2:

- 0
- 200pF (0.001uF *5 caps in series)
- 250pF (0.001uF *4 caps in series)
- 333pF (0.001uF *3 caps in series)
- 500pF (0.001uF *2 caps in series)
- 1000pF (0.001uF cap)
- 2500pF (0.01uF *4 caps in series)
- 3333pF (0.01uF *3 caps in series)
- 5000pF (0.01uF *2 caps in series) (misabeled as 5000uF on PC)
- 0.01uF (0.01uF cap)

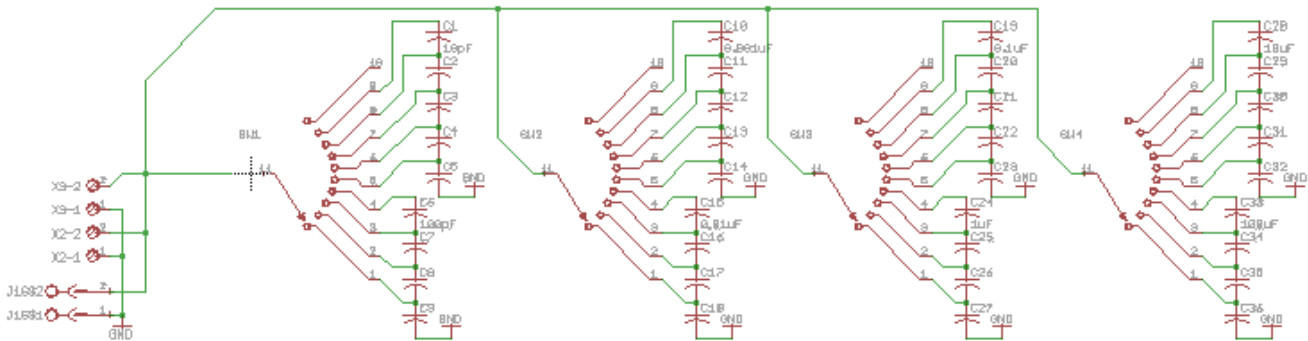
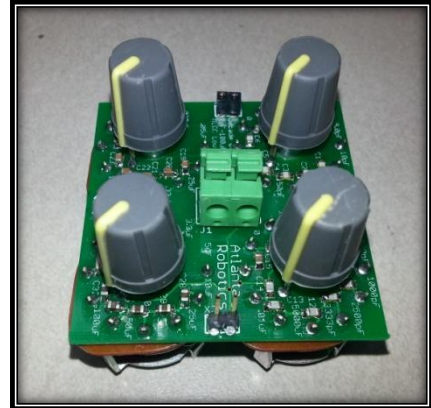
Dial 3:

- 0
- 0.02uF (0.1uF *5 caps in series)

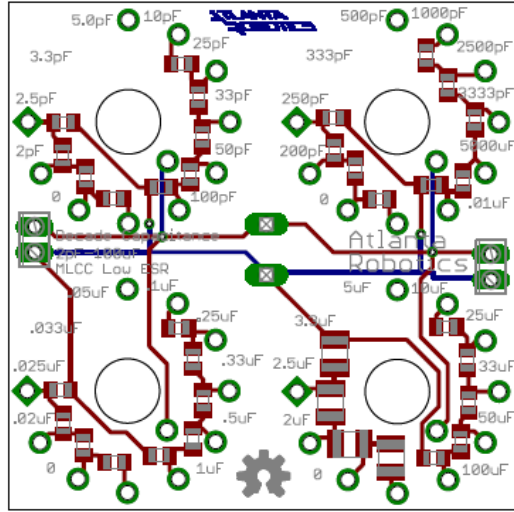
- 0.025uF (0.1uF *4 caps in series)
- 0.033uF (0.1uF *3 caps in series)
- 0.05uF (0.1uF *2 caps in series)
- 0.1uF (0.1uF cap)
- 0.25uF (1.0uF *4 caps in series)
- 0.33uF (1.0uF *3 caps in series)
- 0.50uF (1.0uF *2 caps in series)
- 1.0uF (1.0uF cap)

Dial 4:

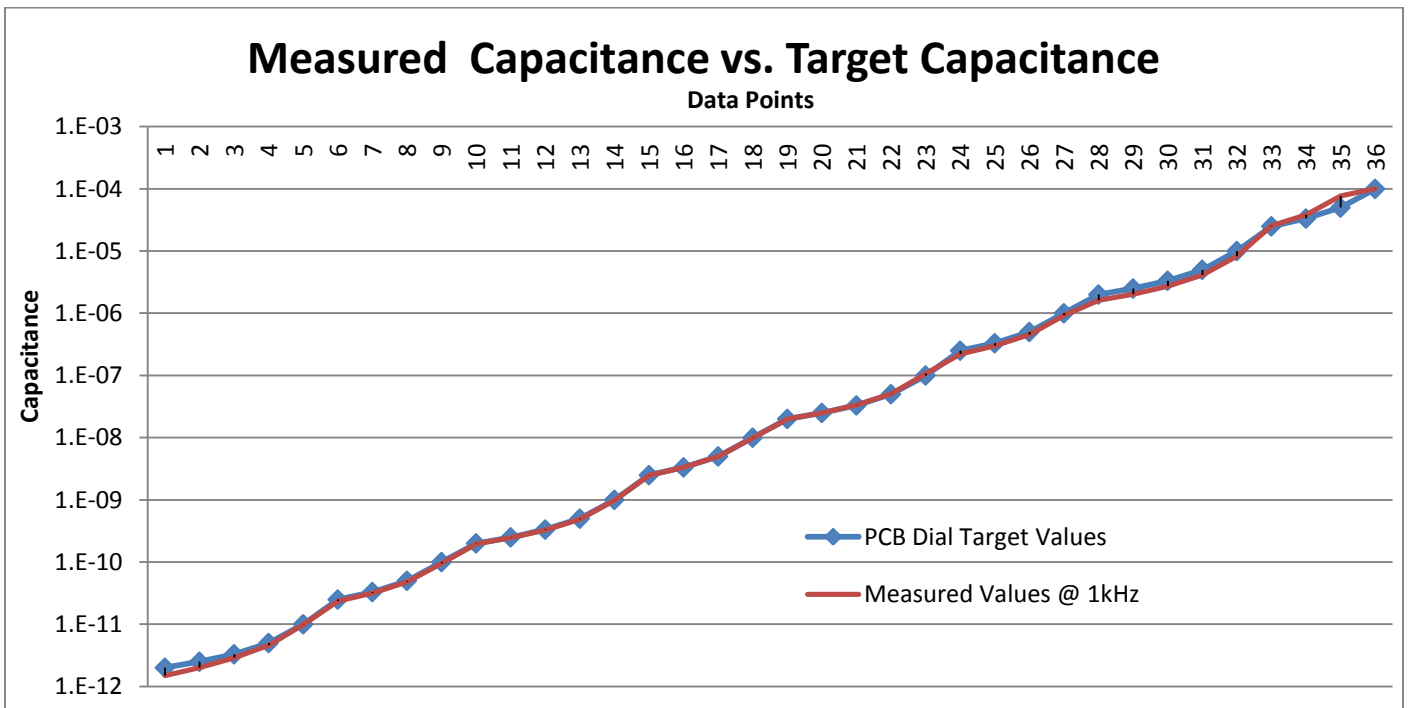
- 0
- 2uF (10uF *5 caps in series)
- 2.5uF (10uF *4 caps in series)
- 3.3uF (10uF *3 caps in series)
- 5uF (10uF *2 caps in series)
- 10uF (10uF cap)
- 25uF (100uF *4 caps in series)
- 33uF (100uF *3 caps in series)
- 50uF (100uF *2 caps in series)
- 100uF (100uF caps)



EagleCAD Schematic



PCB layout (not to scale)



Dial Position:
Farads

Decade Capacitance PCB RESULTS		Measured	Offset applied from open capacitance	Measured w/offset
	<u>Values</u>	<u>Cp@1kHz</u>	<u>Cp-ADJUST</u>	<u>Cp@100kHz</u>
	OPEN	1.68E-11	0.00E+00	1.61E+01
2.00E-12	2pF	1.83E-11	1.50E-12	1.75E+01
2.50E-12	2.5pF	1.88E-11	2.00E-12	1.82E+01
3.30E-12	3.3pF	1.97E-11	2.90E-12	1.91E+01
5.00E-12	5.0pF	2.14E-11	4.60E-12	2.08E+01
1.00E-11	10pF	2.67E-11	9.90E-12	2.62E+01
2.50E-11	25pF	4.03E-11	2.35E-11	3.98E+01
3.30E-11	33pF	4.84E-11	3.16E-11	4.79E+01
5.00E-11	50pF	6.46E-11	4.78E-11	6.42E+01
1.00E-10	100pF	1.12E-10	9.53E-11	1.12E+02
2.00E-10	200pF	2.14E-10	1.97E-10	
2.50E-10	250pF	2.63E-10	2.47E-10	
3.33E-10	333pF	3.45E-10	3.29E-10	
5.00E-10	500pF	5.09E-10	4.92E-10	
1.00E-09	1000pF	1.01E-09	9.89E-10	
2.50E-09	2500pf	2.51E-09	2.49E-09	
3.33E-09	3333pF	3.33E-09	3.32E-09	
5.00E-09	5000pF	4.98E-09	4.97E-09	
1.00E-08	0.01uF	9.90E-09	9.88E-09	
2.00E-08	0.02uF	1.99E-08	1.99E-08	
2.50E-08	0.025uF	2.50E-08	2.50E-08	
3.30E-08	0.033uF	3.37E-08	3.37E-08	
5.00E-08	0.05uF	5.11E-08	5.11E-08	
1.00E-07	0.1uF	1.07E-07	1.07E-07	
2.50E-07	0.25uF	2.21E-07	2.21E-07	
3.30E-07	0.33uF	2.99E-07	2.99E-07	
5.00E-07	0.5uF	4.54E-07	4.54E-07	
1.00E-06	1uF	9.21E-07	9.21E-07	
2.00E-06	2uF	1.61E-06	1.61E-06	1.54E+00
2.50E-06	2.5uF	2.01E-06	2.01E-06	1.93E+00
3.33E-06	3.3uF	2.73E-06	2.73E-06	2.64E+00
5.00E-06	5uF	4.11E-06	4.11E-06	4.08E+00
1.00E-05	10uF	8.24E-06	8.24E-06	7.51E+00
2.50E-05	25uF	2.55E-05	2.55E-05	
3.33E-05	33uF	3.83E-05	3.83E-05	
5.00E-05	50uF	7.66E-05	7.66E-05	
1.00E-04	100uF	1.01E-04	1.01E-04	