Researchers at the University of South Florida invented a capacitor bank which is an essential element for various electronic components including High Voltage Converters and Energy Storage Devices. The capacitor is one of the most important elements in electronics and is routinely used in dynamic random access memory circuits, integrated circuits and energy storage devices. It is a component which has the ability to store energy in the form of an electrical charge producing a potential difference across its plates. Conventional technologies enable formation of a capacitor bank through a large number of small and deep holes on the silicon substrate. Coating of the surface conductive layers in deep holes is not an easy task. Moreover, deep holes are difficult to clean and any residual contamination degrades the performance. Hence, there is a need for a manufacturing process which will make the fabrication of capacitors easier, as well as improve the reliability and precision of capacitance.

Our researchers have developed a method to fabricate the topological capacitors. The invention utilizes reversed topology to grow poles on the substrate instead of holes. A group of capacitive elements are formed by individual capacitive elements which are separated by a trench extending to the insulative interface. The surface area of the capacitor utilized in the prior method in accordance with the present invention remains the same. The reversed surface topology employed by the present invention has many advantages. The process is very efficient, is reinforced with structural strength, and is suitable for mass production.

**ADVANTAGES:**
- More reliable components
- Easier fabrication
- Precise control of capacitance value
- Ease of cleaning the entire capacitor bank on a substrate

**A Process for the Topology and Ground Isolations of Each Capacitor**

**An Example of Nine Capacitors Formed by the Anisotropic Etching Process**

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