

Stacked Polymer Tantalum Capacitors – Advanced Packaging Technology

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Many customers' designs require the use of high capacitance values for bulk energy storage. For applications in the AMS market — such as phased radar arrays — this is typically achieved by using many capacitors in parallel. Tantalum polymer devices are quite often the best choice for these applications, due to their volumetric efficiency and low ESR.

Vishay has now introduced a polymer capacitor “stack” solution to the market, which provides much higher capacitance values in a relatively small footprint. These stacked capacitors offer military grade performance for high reliability applications. The addition of these stacked capacitor solutions has also greatly expanded the range of available ratings for polymer capacitors. These devices come fully tested as a single integrated device compatible with standard PCB assembly.

Use of these stacked solutions to create a large capacitance bank allows circuit designers to maximize the use of available height and minimize total board space requirements. Furthermore, these devices include side by side stacks — eliminating the need for individual landing pads and associated keep-out areas between pads — for extremely dense configurations. Energy density for the total solution (energy / unit area of PCB) is greatly expanded. Single devices in the range of 2800 μF / 16 V, 900 μF / 30 V, 280 μF / 50 V, and 130 μF / 75 V are available.

This paper will explore these advantages and benefits using specific examples, while highlighting best practices in design.