



MIT PASSIVEN IN DIE TECHNIK-ZUKUNFT

StackiCap™ High Voltage High CV MLCC

Syfer StackiCap™ surface mount MLCCs are designed to provide high CV in compact packages and offer the greatest volumetric efficiency and CV per unit mass of any high voltage X7R ceramic capacitors available.

Combined with **FlexiCap™** stress relieving terminations these parts have the potential to replace film and tantalum capacitors and make many stacked products obsolete.

Downsizing Potential

Offering significant increases in available capacitance StackiCap™ can offer significant downsizing over existing technology, below are some images showing the benefits.

StackiCap size 1812 to 3640

Stacked assemblies up to 8060

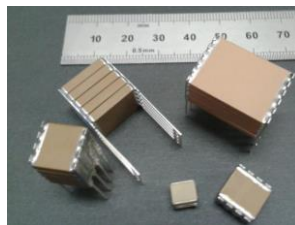
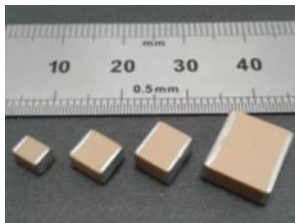
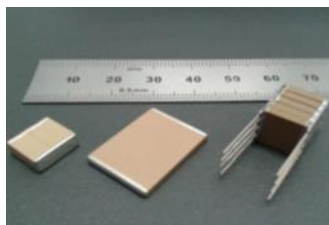
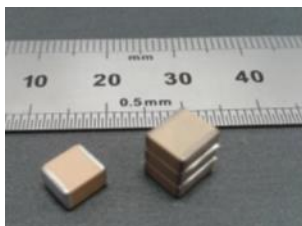


Figure 1 shows the initial StackiCap™ product range sizes of 1812, 2220, 2225 and 3640. 5550 and 8060 development sizes are not shown. Figure 2 shows a range of stacked and stacked leaded assemblies of sizes 2225, 3640, 5550 and 8060 up to a maximum of 5 in a stack. Figures 3 and 4 show examples of what can be replaced with a single StackiCap™ component. In the most extreme cases an 8060 1kV 470nF could be replaced with a single 2220 1kV 470nF and a 3640 1kV 180nF could be replaced with a single 1812 1kV 180nF, these are 10:1 and 7:1 footprint reductions respectively.

Figures 3

Figures 4

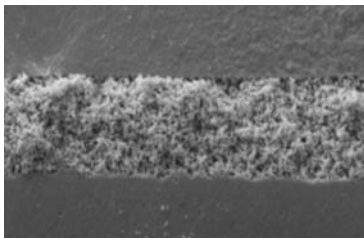
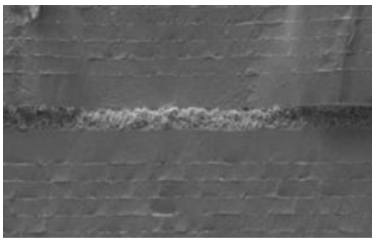


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The Technology Behind StackiCap™

After a series of trials and iterations Syfer have developed a single chip solution to electro-mechanical failure limitation, StackiCap™. The novel and patent pending aspect, GB Pat. App. 1210261.2, is an inbuilt stress relieving layer which allows the capacitor to exhibit the electrical and physical behaviour of multiple, thinner, components whilst exploiting the manufacture and process benefits of being a single unit. The stress relieving layer is made up of a combination of already utilised material systems and is formed during the standard manufacturing process. The layer is positioned in the place/s where mechanical stress is the greatest allowing for mechanical decoupling of the multiple component layers with 2,3 and 4 “stack” versions trialled at this point. With FlexiCap™ flexible termination material and no need to attach components together to form a stack there is no need for a lead frame allowing for standard tape and reel packaging with pick and place capability.

SEM Micrograph of fracture sections showing the stress relieving “spongy” layer



Chip Size	1812	2220	3640
200/250V	1.0µF	2.2µF	5.6µF
500V	470nF	1.2µF	2.7µF
630V	330nF	1.0µF	2.2µF
1KV	180nF	470nF	1µF
1.2KV	100nF	220nF	470nF
1.5KV	56nF	150nF	330nF
2KV	33nF	100nF	150nF

Maximum capacitance

Up to 5.6µF

Maximum voltage

Up to 2kV



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Latest News

10nF Safety Certified MLCCs



MLCC's have been used in automotive applications for years, but the big change being seen is the voltage rating and size of components now being used. This new revolution in MLCC technology, used in control electronics, is being driven by modern on-board charging systems - PHEV & EV where mains ac is involved. Knowles brand Syfer has responded to demands by increasing its range of 250V ac X1/Y2 Safety Certified capacitors to 10nF.

Safety Certified capacitors comply with international UL and TÜV specifications to offer designers the option of using a surface mount ceramic multilayer capacitor to replace leaded film types. Offering the benefits of simple pick-and-place assembly, reduced board space required and lower profile, they are also available in a FlexiCap™ version to reduce the risk of mechanical cracking.

Knowles's high voltage capacitor expertise means the range offers among the highest range available of capacitance values in certain case sizes. Applications include: modems, AC-DC power supplies and where lightning strike or other voltage transients represent a threat to electronic equipment.

- Surface mount multilayer ceramic capacitors
- Meet Class Y2/X1, X1 and X2 requirements
- Approved for mains ac voltages, up to 250Vac
- Approved by UL and TÜV
- Sizes 1808, 1812, 2211, 2215 and 2220
- Smaller sizes suitable for use in equipment certified to EN60950
- Certification specifications for larger sizes include IEC/EN6038414, UL/CSA60950 and UL60384-14
- Surface mount package
- Reduces board area and height restrictions
- Reduced assembly costs over conventional through hole components
- FlexiCap™ option available on all sizes