



Soft termination MLCC for high resistance to mechanical and thermal stress - CS series

Soft termination multilayer ceramic capacitors – CS series, 0402 ~ 1812



Yageo has developed soft termination MLCCs (CS series) to solve the cracking issue caused by mechanical stress and thermal fatigue which has bothered industrial applications for a long time. Applications like power supplies and on battery lines are particularly concerned by the crack induced short-circuit failure.

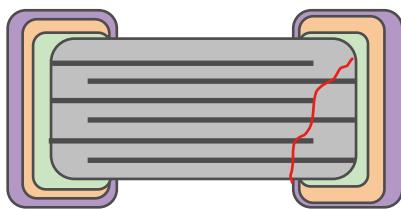


Fig.1 Typical Bending and Temperature Cycling Crack

The soft termination capacitors are designed with incorporating a "cushion layer" of conductive polymer-Ag into the normal termination structure to provide extra elasticity and effectively absorb external stress, thus improving the ability to resist cracking and overall product reliability.

Yageo's X7R and NPO series soft termination capacitors are offered in case sizes from 0402 to 1812 with a capacitance range of 0.47pF to 47μF and rated voltage up to 3 KV. These are targeted for use in high flexure stress circuit boards, applications on switching power supplies, and telecom base station. These high performance soft termination capacitors feature a flexible termination system, which is lead-free to meet

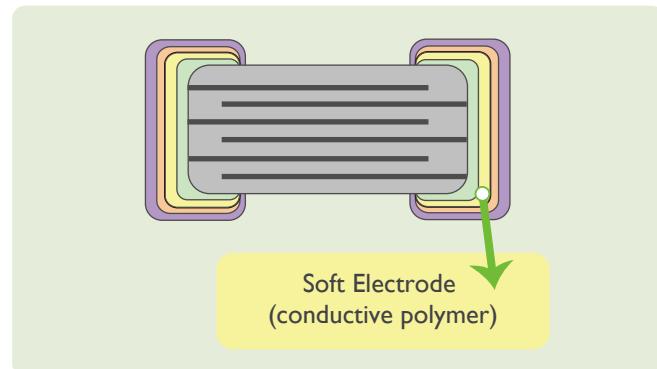


Fig. 2 Structure of Termination with Polymer Ag

RoHS requirements. It is applied between the copper electrode and the nickel barrier, and offer improved thermal and mechanical properties. This provides customers another choice when more robustness is required by variety of applications.

The effect of soft termination is very noticeable as shown in the following pictures. With same bending test condition, the MLCC with soft termination shows no crack while conventional

After the Test

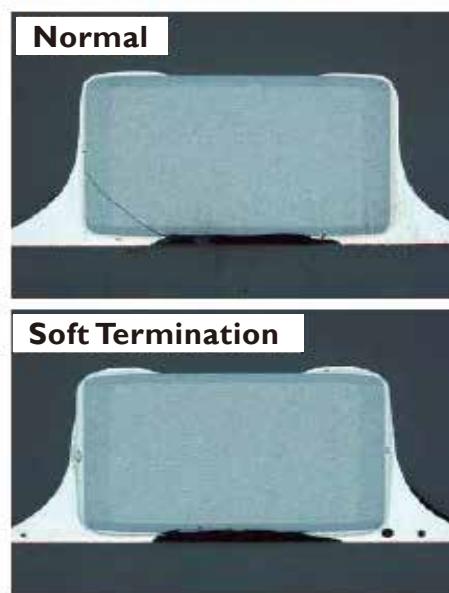


Fig. 3 Cross Sections of MLCCs after Bending Test

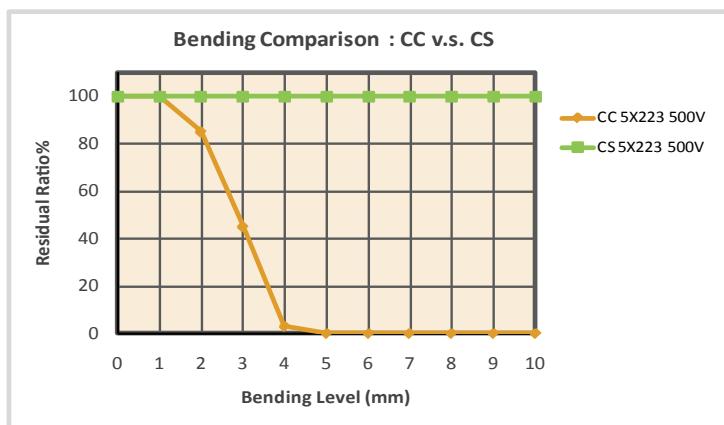


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MLCC without soft termination shows a typical bending crack.

An example of X7R 0805/22nF/500V clearly reveals the comparison of cracking resistance level between the conventional MLCC and soft termination MLCC. The pieces without soft termination start showing failure under 2mm test board flexure while the pieces with soft termination withstand more deflection show no failure under 10mm test board flexure.

► **Fig. 4** Comparison of Cracking Resistance under Bending (Normal Termination vs Soft Termination)

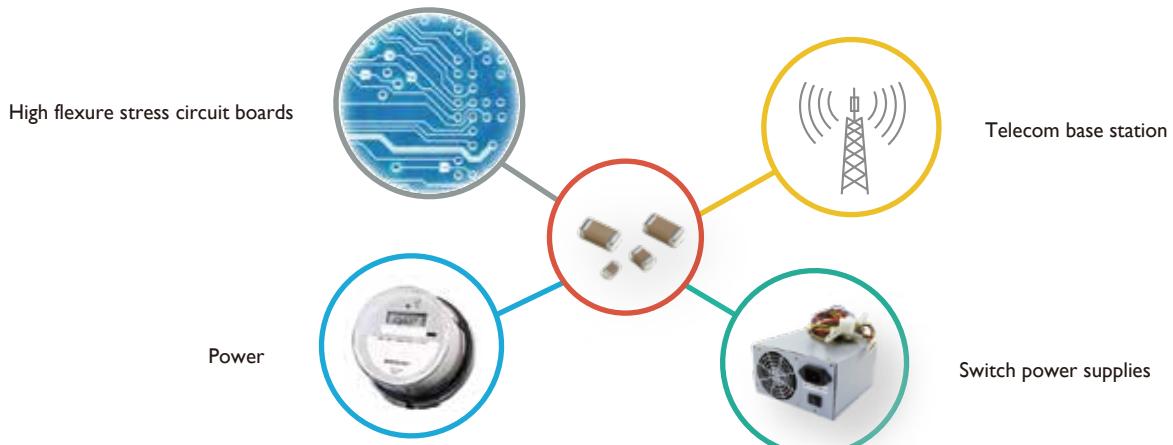


Features

- Flexible termination system
- RoHS compliant & halogen-free
- Increased mechanical performance
- Improved resistance to thermal stresses

Applications

- High flexure stress circuit boards
- Switch power supplies
- Telecom base station
- Power



Yageo's CS Series Application Map

About Yageo

Established in 1977, the Yageo Corporation has become the world's leading total service provider of passive components with capabilities on a global scale, including production and sales facilities in Asia, Europe and the Americas. Yageo's broad product offerings are targeting at key vertical markets, including applications for consumer electronics, computer & peripherals, industrial/power, alternative energy, and automotive.

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