Surface Mount Chip Capacitors

FlexiCap™

X7R

Polymer Termination FlexiCap™- a lead free termination

MLCC's are widely used in electronic circuit design for a multitude of applications. Their small package size, technical performance and suitability for automated assembly makes them the component of choice for the specifier.

However, despite the technical benefits, ceramic components are brittle and need careful handling on the production floor. In some circumstances they may be prone to mechanical stress damage if not used in an appropriate manner. Board flexing, depanelisation, mounting through hole components, poor storage and automatic testing may all result in cracking.

Careful process control is important at all stages of circuit board assembly and transportation - from component placement to test and packaging. Any significant board flexing may result in stress fractures in ceramic devices that may not always be evident during the board assembly process. Sometimes it may be the end customer who finds out - when equipment fails!

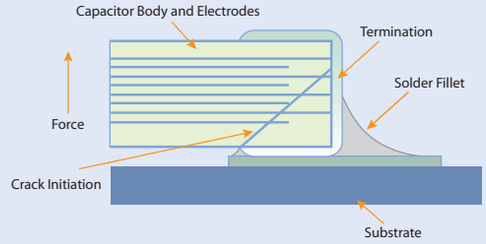
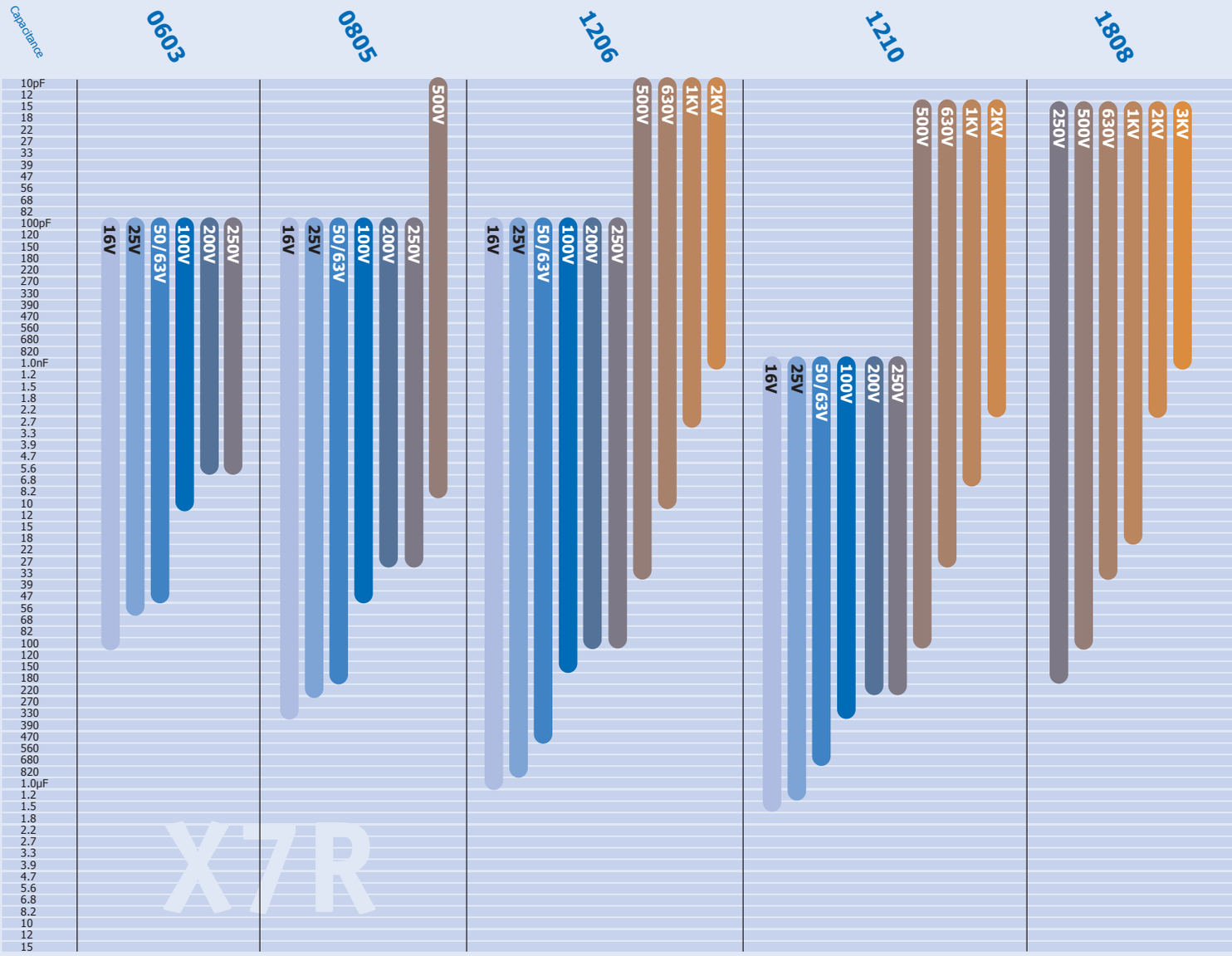


Fig 1. Typical Mechanical Crack



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With traditional termination materials and assembly, the chain of materials from bare PCB to soldered termination, provides no flexibility. In circumstances where excessive stress is applied - the weakest link fails. This means the ceramic itself, which may fail short circuit.

Syfer has the solution - FlexiCap™

FlexiCap™ has been developed as a result of listening to customers' experiences of stress damage to MLCC's from many manufacturers, often caused by variations in production processes.

Our answer is a proprietary flexible epoxy polymer termination material, that is applied to the device under the usual nickel barrier finish. FlexiCap™ will accommodate a greater degree of board bending than conventional capacitors.

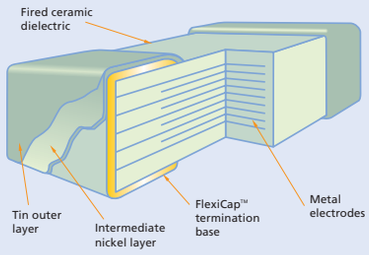
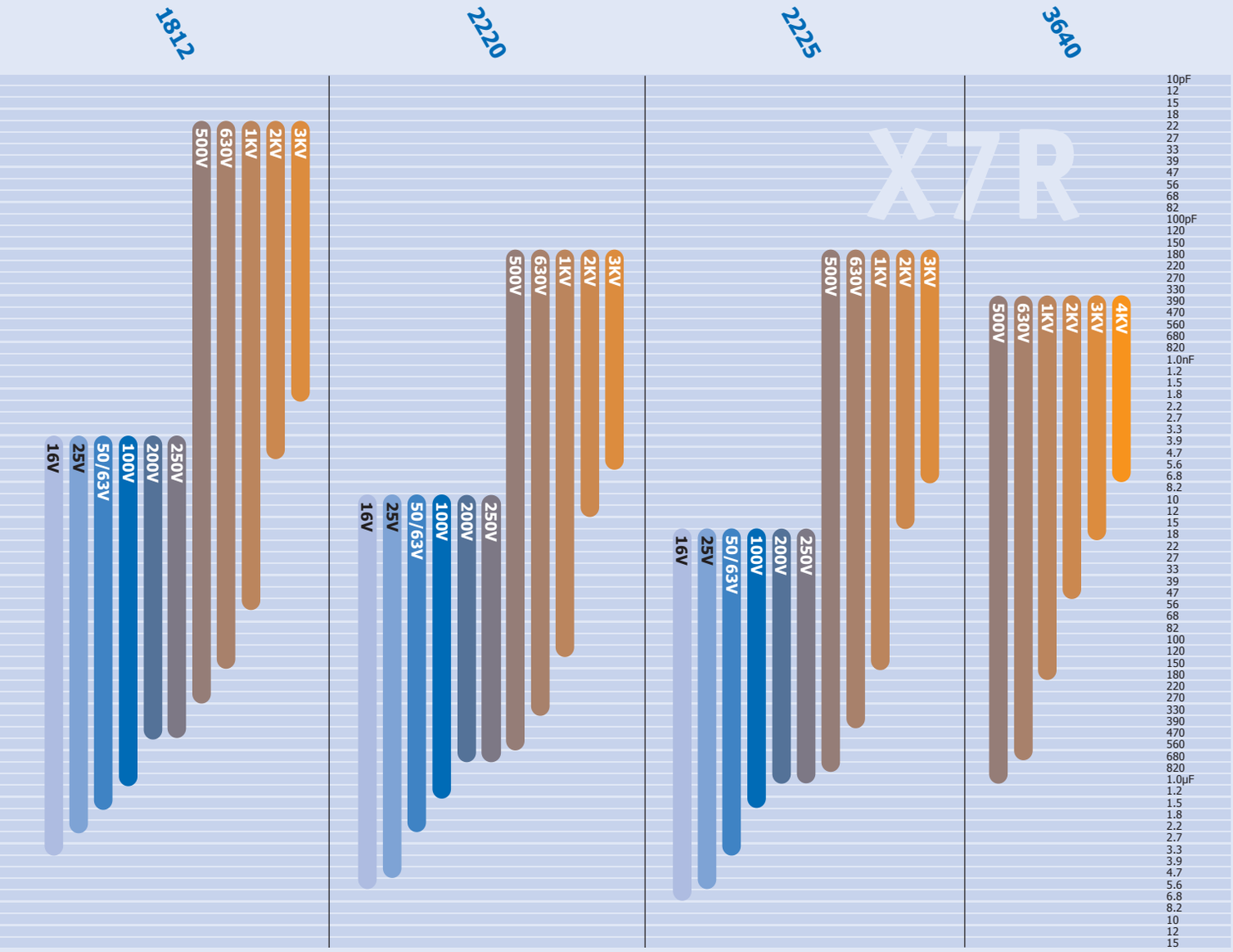


Fig 2. FlexiCap™ MLCC cross section



notes

Shown above are standard and high voltage ranges of X7R chip capacitors which are available with FlexiCap™ terminations. Please refer to our sales office if you require other products in our range with this new termination.

For all other mechanical and electrical details please refer to the relevant sections of this catalogue.

For ordering information see page 30.

SYFER TECHNOLOGY LIMITED
A DOVER Company

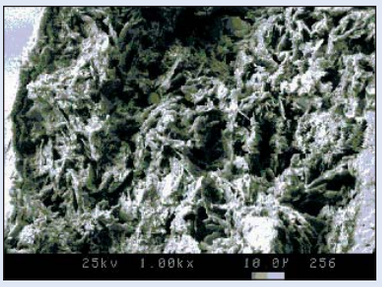
FlexiCap™ Application Notes

FlexiCap™ benefits

The benefit to the user is to facilitate a wider process window - giving a greater safety margin and substantially reducing the typical root causes of mechanical stress cracking.

FlexiCap™ may be soldered using your traditional wave or reflow solder techniques and needs no adjustment to equipment or current processes.

Syfer has delivered millions of FlexiCap™ components and during that time has collected substantial test and reliability data, working in partnership with customers world wide, to eliminate mechanical cracking.



● Picture taken at 1,000x magnification using a SEM to demonstrate the fibrous nature of the FlexiCap™ termination that absorbs increased levels of mechanical stress.

Summary of PCB bend test results

The bend tests conducted have proved that the FlexiCap™ termination withstands a greater level of mechanical stress before mechanical cracking occurs.

Typical examples:

Product	Mean bend (mm) Standard Term.	Mean bend (mm) FlexiCap™	Improvement with FlexiCap™
0603 X7R	1.6	6.4	+ 400%
0805 X7R	3.6	6.3	+ 75%
1206 X7R	3.4	6.4	+ 88%
1812 X7R	3.2	6.0	+ 88%
2220 X7R	3.2	6.1	+ 91%

Application Notes

FlexiCap™ may be handled, stored and transported in the same manner as standard terminated capacitors. The requirements for mounting and soldering FlexiCap™ are the same as for standard SMD capacitors.

For customers currently using standard terminated capacitors there should be no requirement to change the assembly process when converting to FlexiCap™.

Based upon board bend tests in accordance with IEC 60384-1 the amount of board bending required to mechanically crack a polymer terminated capacitor is significantly increased compared with standard terminated capacitors.

It must be stressed however, that capacitor users must not assume that the use of FlexiCap™ terminated capacitors will totally eliminate mechanical cracking. Good process controls are still required for this objective to be achieved.

Ordering Information

0805	Y	100	0101	J	X	T	□□□
Type No Chip Size	**Termination** Y = FlexiCap™	**Voltage** 016 = 16V 025 = 25V 050 = 50V 063 = 63V 100 = 100V 200 = 200V 250 = 250V 500 = 500V 630 = 630V 1K0 = 1kV 2K0 = 2kV 3K0 = 3kV 4K0 = 4kV 5K0 = 5kV	**Capacitance** First digit - 0 Second digit - First significant figure of capacitance value Third digit - Second significant figure of capacitance value Fourth digit - Number of zeros following. For values that do not fit the model above, insert the capacitance code letter for the decimal point e.g. 13N6 = 13.6nF	**Tolerance** Stable class J = ±5% K = ±10% M = ±20%	**Dielectric** X = X7R	**Packaging** T = 178mm (7") reel R = 330mm (13") reel B = Bulk pack tubs	**Suffix Code** Used for specific customer requirements

notes

1. For details of the FlexiCap™ range see pages 28/29.