

Multilayer Varistors

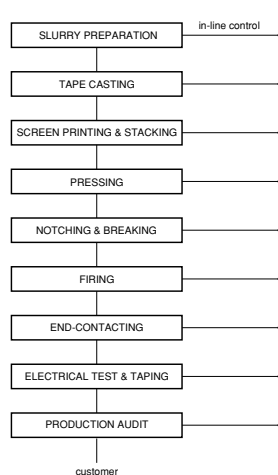
GENERAL

Varistors provide reliable and economical protection against high voltage transients and surges which may be produced, for example, by lightning, switching or electrical noise on AC or DC power lines. Multilayer Varistors have the advantage over transient suppressor diodes as they can absorb much higher transient energies and can suppress positive and negative transients.

The Multilayer Varistor (MLV), based on our proven Zinc Oxide Varistor technology, fulfils today's demand for high-energy low profile surface mount EMI and ESD protection devices.

Its multilayer architecture provides an even distribution of the absorbed energy within the component, allowing a high surge current due to its high electrode area. Leadless construction eliminates the inductance due to the connecting wires, dramatically reducing response time to below a nanosecond.

VARISTOR MANUFACTURING PROCESS



Manufacturing process flow chart.

In order to guarantee top performance and maximum reliability, close in-line control is maintained over the automated manufacturing techniques. The manufacturing process flow chart shows each step of the manufacturing process, clearly indicating the emphasis on in-line control.

Each major step in the manufacturing process shown in the manufacturing process flow chart is described in the following sections:

Slurry preparation

Incoming materials are checked, weighed, milled and mixed for several hours to make a homogeneous mixture.

Tape casting

A thin film of mixture is deposited, with a closely monitored thickness, on a carrier tape and dried in a tunnel.

FEATURES

- Low voltage range: down to 4 V_{RMS}
- High energy absorption capability with respect to size of component
- Response time faster than 1 ns, clamping the transient the instant it occurs
- Low stand-by power - virtually no power absorption while in stand-by condition
- Low capacitance values, allowing the protection of digital circuits
- Wide operational temperature range, from -55 to 125 °C, making it suitable for a wide range of applications such as mobile telephony, data transmissions, consumer goods and automotive applications

Screen printing and stacking

Substrate is removed and electrodes are printed on the ceramic using highly conductive platinum paste. The printed foils are precisely stacked on top of each other.

Pressing

The stack is hot pressed under 150 tons.

Notching and breaking

The plate formed by pressing is precisely divided by breakage in the final size of the desired MLV. The position of the electrodes within the component is accurately checked.

Firing

The parts are brought at high temperature to eliminate the binder and to create the PN junctions that will provide the desired varistor effect. This last step is done at a precise temperature above 1000 °C, depending on the required voltage of the varistor.

End-contacting

The fired ceramic parts are metallized on both contact edges by dipping in silver-palladium paste to guarantee an excellent contact to the inner electrodes. Solderability tests are carried out on each production batch.

Electrical test and taping

Each component is individually tested for compliance to voltage and capacitance characteristics prior to placing on tape.

Production audit

Electrical, mechanical and solderability tests are done on production sampling.