

Advantages of MLV Technology



Transient Voltage Suppression Solutions – MultiLayer Varistors

Designers must take careful precautions so that transient surges do not destroy sensitive CMOS circuitry. Typically designers must harden circuitry from transient surges that range from sub nanosecond ESD pulses to slow speed, higher power transients such as automotive alternator load dump or power line transients.

Multilayer Varistors (MLVs) are an effective solution to suppress transient voltages. MLVs have electrical and physical advantages over traditional means of transient protection – such as zener diodes. MLVs are available in operating voltages as low as 3.3 volts and energy ratings as high as 3 joules.

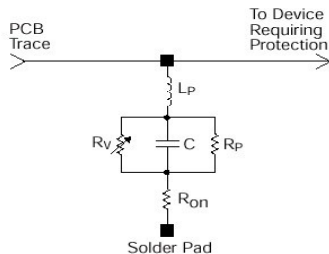
Physical Advantages

The primary physical advantages MLVs exhibit small size. MLVs are available in case sizes from 0402 to 2220. AVX MLVs are also lead free and have standard Nickel barrier terminations with tin alloy plated finish.

Electrical Advantages

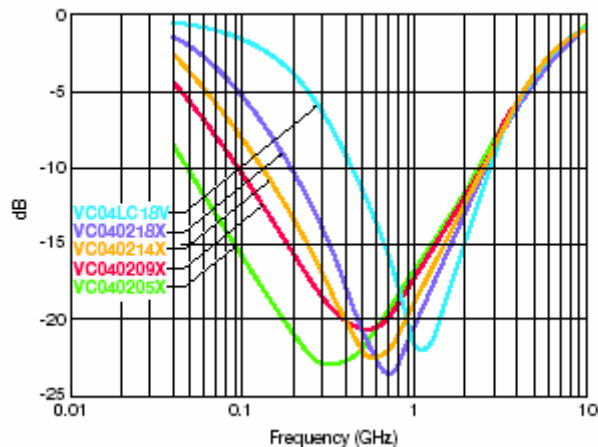
Electrical advantages include their EMI filter response, fast “turn on” time and repetitive strike capability. A single MLV takes the place of a back-to-back diode, plus an EMC capacitor thereby saving up to 90% of the board space that zener & capacitor solutions demand. An equivalent circuit model and the S21 filter response of the 0402 products are shown below. In its “off” state, the network acts like an EMI filter. In its “on” state the MLV works like back-to-back zener diodes. MLV capacitance ranges from 3 pf to 4.7 nf.

Discrete MLV Model



Where: R_v = Voltage Variable resistance (per VI curve)
 $R_p \geq 10^{12} \Omega$
 C = defined by voltage rating and energy level
 R_{on} = turn on resistance
 L_p = parallel body inductance

INSERTION LOSS CHARACTERISTICS



Please contact your local AVX Sales representative to receive a free MLV Transient Suppression sample kit or to receive further information on AVX MLVs.