

StaticGuard



AVX Multilayer Ceramic Transient Voltage Suppressors ESD Protection for CMOS, Bi Polar and SiGe Based Systems

GENERAL INFORMATION

- Typical ESD failure voltage for CMOS and/or Bi Polar is $\geq 200V$.
- 15kV ESD pulse (air discharge) per IEC 1000-4-2, Level 4, generates < 20 millijoules of energy.
- Low capacitance ($< 200pF$) is required for high-speed data transmission.
- Low leakage current (I_L) is necessary for battery operated equipment.

StaticGuard

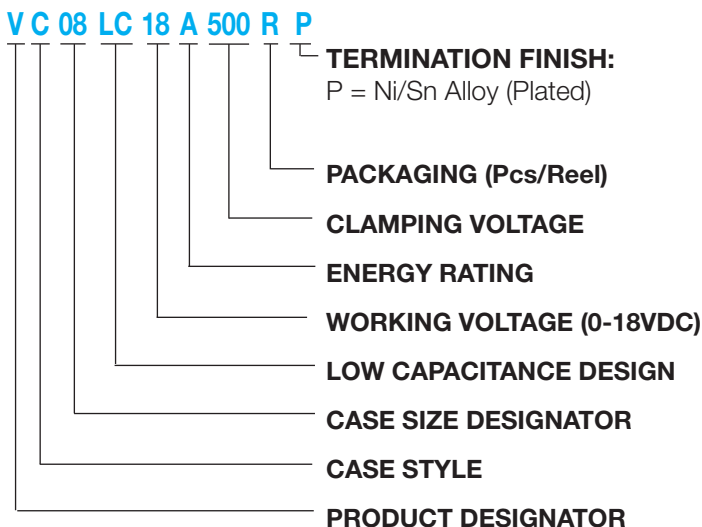
AVX Part Number	Working Voltage (DC)	Working Voltage (AC)	Clamping Voltage	Test Current For V_c	Maximum Leakage Current	Transient Energy Rating	Peak Current Rating	Typical Cap	Case Size	Elements
VC04LC18V500__	≤ 18.0	≤ 14.0	50	1	10	0.02	15	40	0402	1
VC06LC18X500__	≤ 18.0	≤ 14.0	50	1	10	0.05	30	50	0603	1
VC08LC18A500__	≤ 18.0	≤ 14.0	50	1	10	0.10	30	80	0805	1
VC12LC18A500__	≤ 18.0	≤ 14.0	50	1	10	0.10	30	200	1206	1
VA10LC18A500__	≤ 18.0	≤ 14.0	50	1	10	0.10	30	200	Axial	1

Termination/Lead Finish Code
Packaging Code

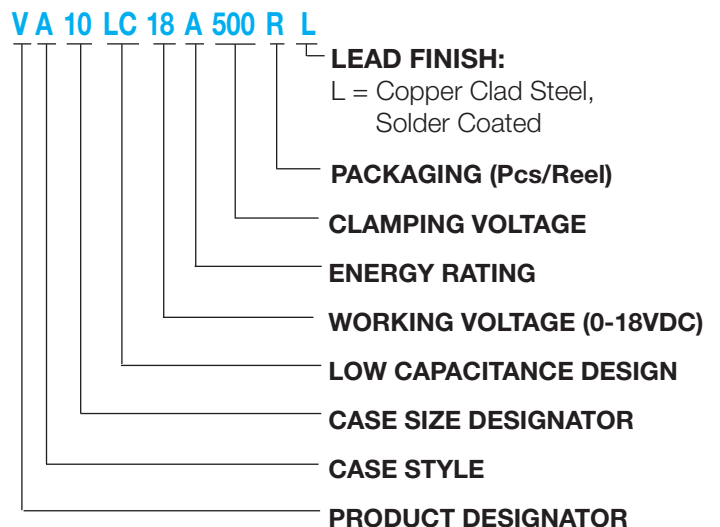
- V_w (DC) DC Working Voltage (V)
 V_w (AC) AC Working Voltage (V)
 V_c Clamping Voltage (V @ I_{vc})
 I_{vc} Test Current for V_c (A, $8 \times 20\mu S$)
 I_L Maximum Leakage Current at the Working Voltage (μA)
 E_T Transient Energy Rating (J, $10 \times 1000\mu S$)
 I_p Peak Current Rating (A, $8 \times 20\mu S$)
 Cap Typical Capacitance (pF) @ frequency specified and 0.5 V

PART NUMBER IDENTIFICATION

Chips

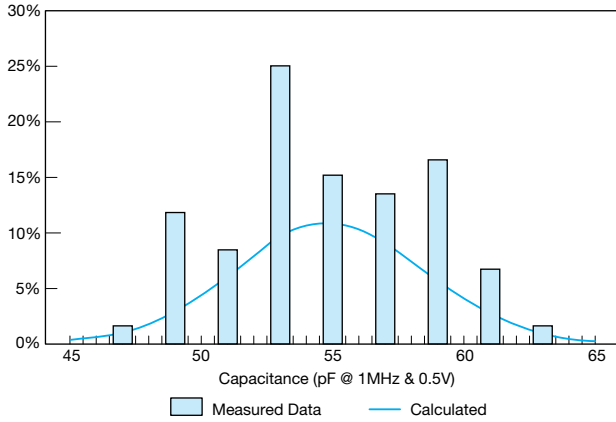


Axials

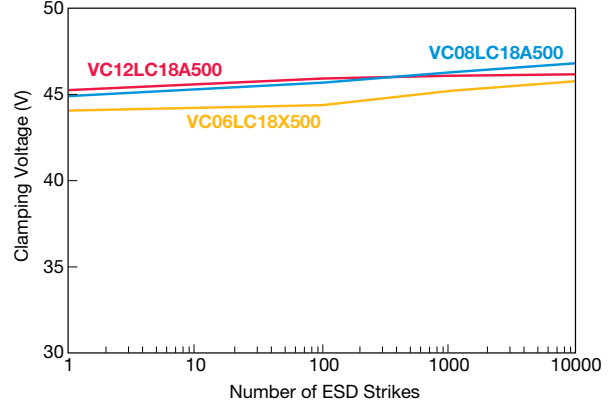


TYPICAL PERFORMANCE DATA

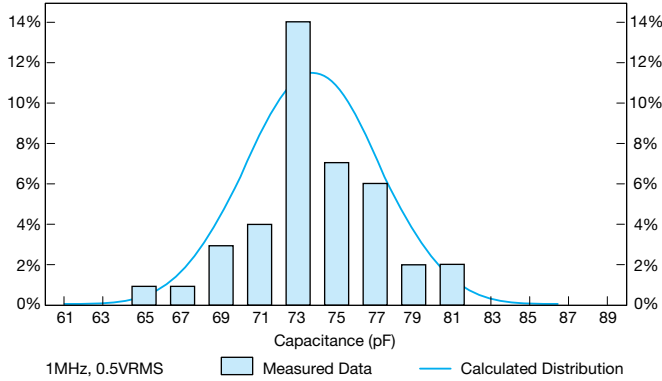
VC06LC18X500 Capacitance Histogram



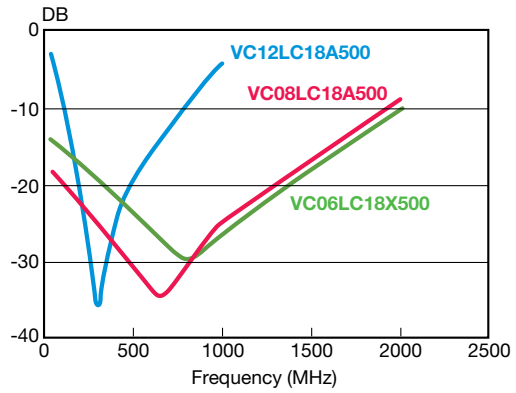
StaticGuard ESD RESPONSE
IEC 1000-4-2 (8 Kv Contact Discharge)



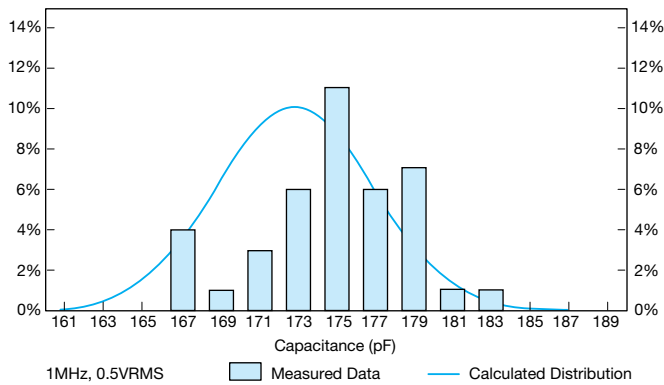
VC08LC18A500 Capacitance Histogram



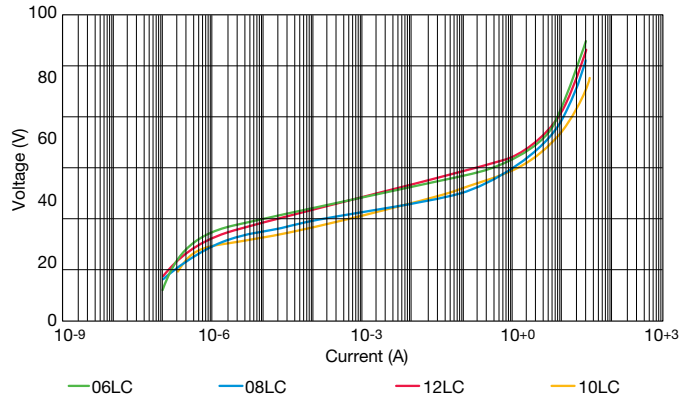
StaticGuard S21



VC12LC18A500 Capacitance Histogram



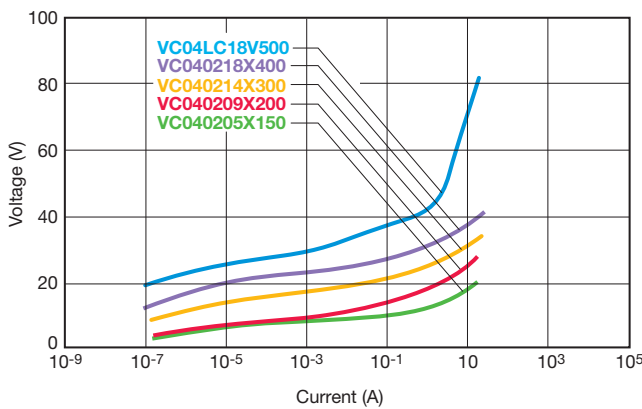
VI Curves - StaticGuard Products



TYPICAL PERFORMANCE CURVES (0402 CHIP SIZE)

VOLTAGE/CURRENT CHARACTERISTICS

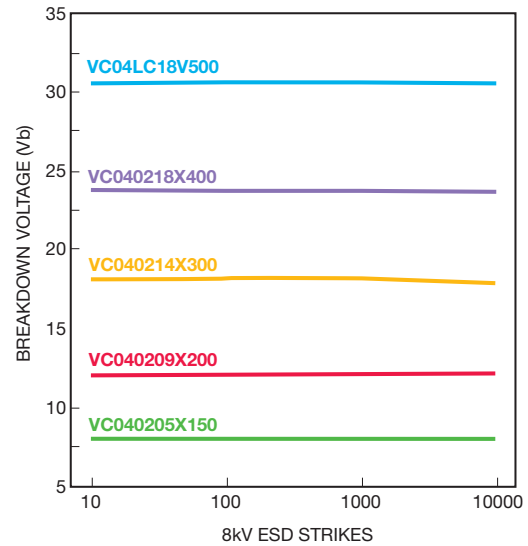
Multilayer construction and improved grain structure result in excellent transient clamping characteristics up to 20 amps peak current, while maintaining very low leakage currents under DC operating conditions. The VI curves below show the voltage/current characteristics for the 5.6V, 9V, 14V, 18V and low capacitance StaticGuard parts with currents ranging from parts of a micro amp to tens of amps.



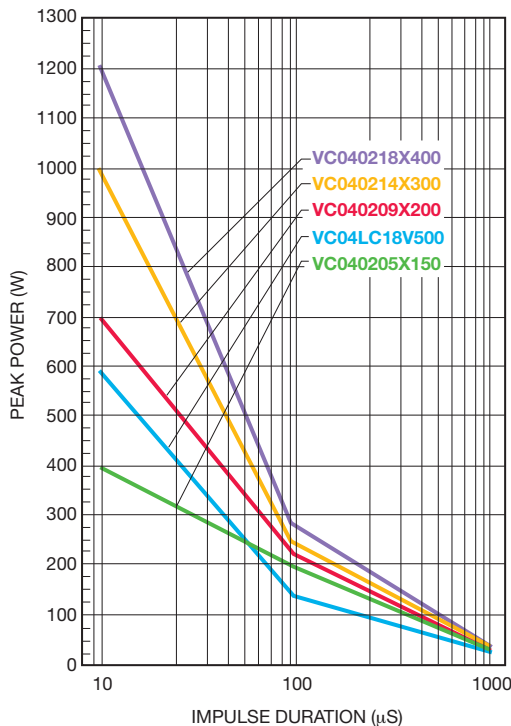
PULSE DEGRADATION

Traditionally varistors have suffered degradation of electrical performance with repeated high current pulses resulting in decreased breakdown voltage and increased leakage current. It has been suggested that irregular intergranular boundaries and bulk material result in restricted current paths and other non-Schottky barrier paralleled conduction paths in the ceramic. Repeated pulsing of TransGuard® transient voltage suppressors with 150Amp peak $8 \times 20\mu\text{S}$ waveforms shows negligible degradation in breakdown voltage and minimal increases in leakage current. This does not mean that TransGuard® suppressors do not suffer degradation, but it occurs at much higher current.

ESD TEST OF 0402 PARTS



PEAK POWER VS PULSE DURATION



INSERTION LOSS CHARACTERISTICS

