

GENERAL DESCRIPTION

The StaticGuard Series are low capacitance versions of the TransGuard and are designed for general ESD protection of CMOS, Bi-Polar, and SiGe based systems. The low capacitance makes these products suitable for use in high speed data transmission lines.

GENERAL CHARACTERISTICS

- Operating Temperature: -55°C to 125°C
- Working Voltage: $\leq 18\text{Vdc}$
- Case Size: 0402, 0603, 0805, 1206

FEATURES

- Typical ESD failure voltage for CMOS and/or Bi Polar is $\geq 200\text{V}$
- Low capacitance ($<200\text{pF}$) is required for high-speed data transmission.
- Low leakage current (IL) is necessary for battery operated equipment.
- 15kV ESD pulse (air discharge) per IEC 61000-4-2, Level 4, generates < 20 millijoules of energy.

APPLICATIONS

- Sensors
- CMOS
- SiGe based systems
- Higher speeded data lines
- Capacitance sensitive applications and more

HOW TO ORDER

VC

Varistor Chip

06

Case Size
04 = 0402
06 = 0603
08 = 0805
12 = 1206

LC

Low Cap Design

18

Working Voltage
18 = 18.0VDC

X

Energy Rating
A = 0.10 Joules
V = 0.02 Joules
X = 0.05 Joules

500

Clamping Voltage
500 = 50V

X

Packaging (PCS/REEL)
D = 1,000*
R = 4,000*
T = 10,000*
W = 10,000**

P

Termination
P = Ni/Sn

*Not available for 0402
**Only available for 0402

ELECTRIAL CHARACTERISTICS

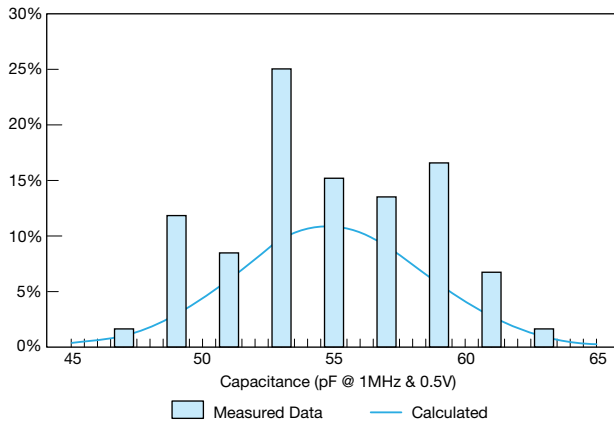
Part Number	V _w (DC)	V _w (AC)	V _B	V _C	I _{VC}	I _L	E _T	I _P	Cap	Freq	Size
VC04LC18V500	≤ 18.0	≤ 14.0	25-40	50	1	10	0.02	15	40	M	0402
VC06LC18X500	≤ 18.0	≤ 14.0	25-40	50	1	10	0.05	30	50	M	0603
VC08LC18A500	≤ 18.0	≤ 14.0	25-40	50	1	10	0.1	30	80	M	0805
VC12LC18A500	≤ 18.0	≤ 14.0	25-40	50	1	10	0.1	30	200	K	1206

V_w(DC) DC Working Voltage [V]
V_w(AC) AC Working Voltage [V]
V_B Typical Breakdown Voltage (Min-Max) [V @ 1mA_{DC}, 25°C]
V_C Clamping Voltage [V @ I_{VC}]
I_{VC} Test Current for V_C [A, 8x20μs]

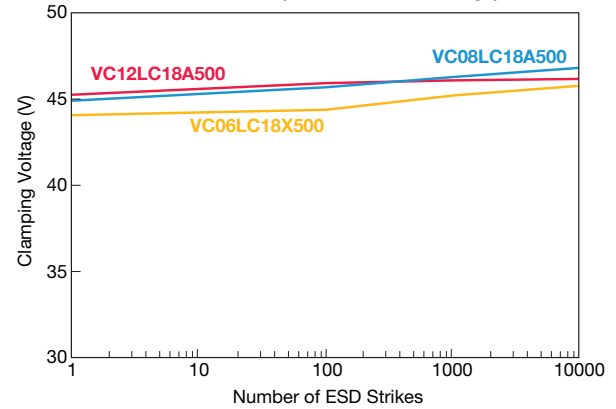
I_L Maximum leakage current at the working voltage, 25°C [μA]
E_T Transient Energy Rating [J, 10x1000μs]
I_P Peak Current Rating [A, 8x20μs]
Cap Typical capacitance [pF] @ frequency specified and 0.5V_{RMS}, 25°C, K = 1kHz, M = 1MHz

TYPICAL PERFORMANCE DATA

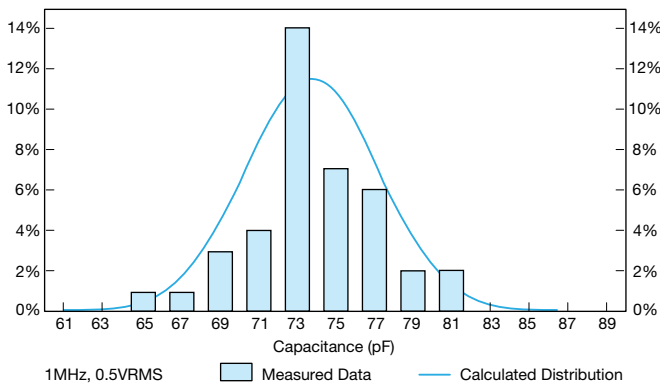
VC06LC18X500 Capacitance Histogram



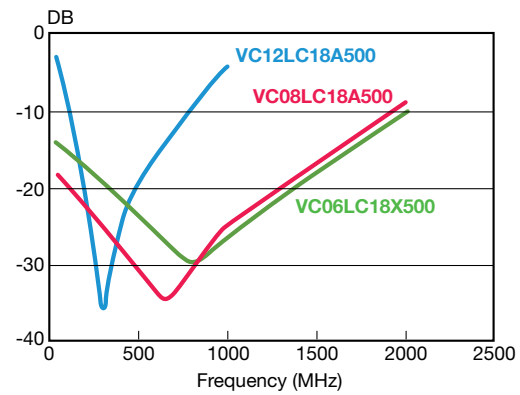
StaticGuard ESD RESPONSE
IEC 61000-4-2 (8 Kv Contact Discharge)



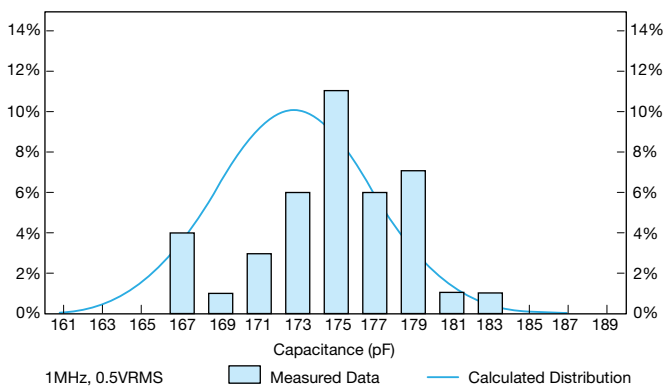
VC08LC18A500 Capacitance Histogram



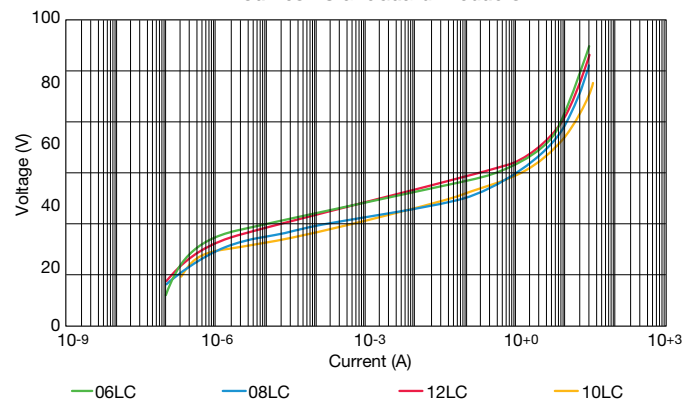
StaticGuard S21



VC12LC18A500 Capacitance Histogram



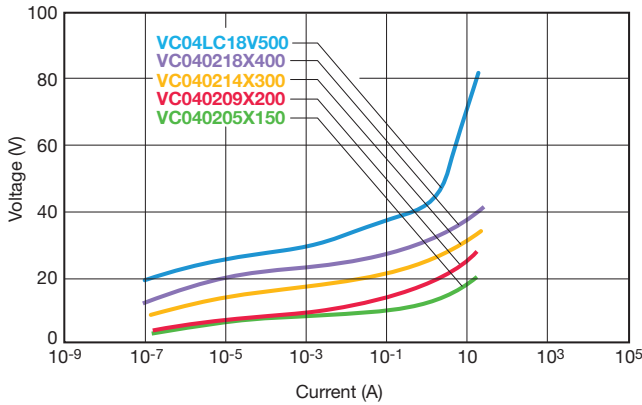
VI Curves - StaticGuard Products



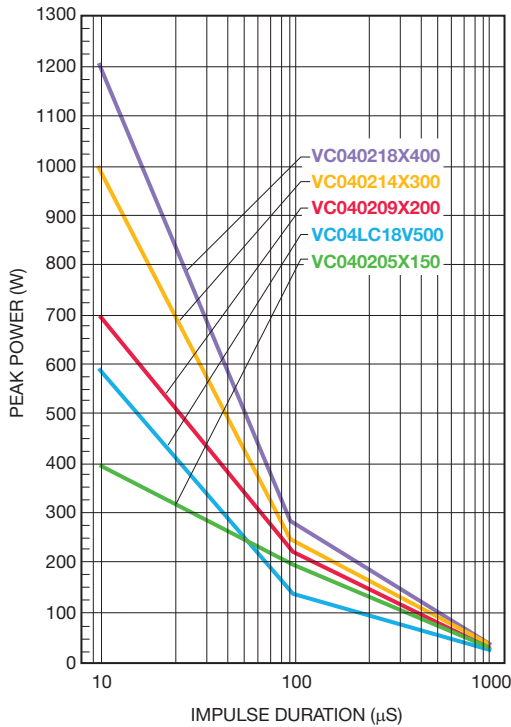
TYPICAL PERFORMANCE CURVES (0402 CHIP SIZE)

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.



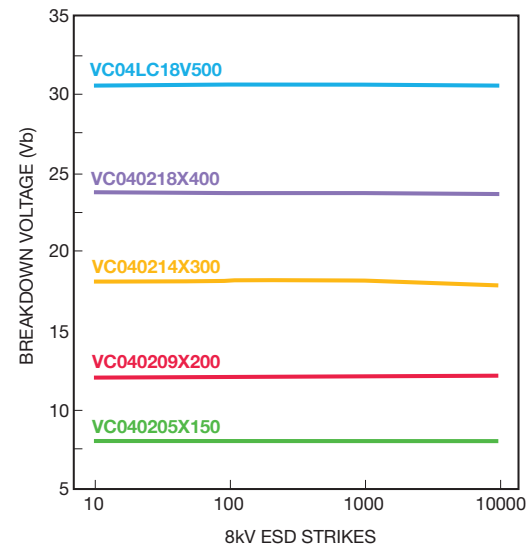
PEAK POWER VS PULSE DURATION



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 x 20μs waveforms shows negligible degradation in breakdown voltage and minimal increases in leakage current.

ESD TEST OF 0402 PARTS



INSERTION LOSS CHARACTERISTICS

