StaticGuard

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





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: ≤ 18Vdc
- Case Size: 0402, 0603, 0805, 1206

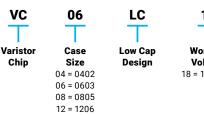
FEATURES

- Typical ESD failure voltage for CMOS and/or Bi Polar is ≥ 200V
- Low capacitance (<200pF) is required for highspeed 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.

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- Sensors . .
- CMOS
- SIGe based systems Higher speeed data lines
- Capacitance sensitive applications and more

HOW TO ORDER



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Working	Ene
Voltage	A =
8 = 18.0VDC	V =
	X =

ergy Rating 0.10 Joules 0.02 Joules 0.05 Joules

X

500 X Clamping Packaging (PCS/REEL) Voltage 500 = 50V D = 1,000* R = 4,000*



W = 10,000** *Not available for 0402 **Only available for 0402

T = 10,000*

ELECTRIAL CHARACTERISTICS

 V_{c}

Part Number	V _w (DC)	V _w (AC)	V _B	V _c	I _{vc}	I,	E _T	I _P	Сар	Freq	Size
VC04LC18V500	≤18.0	≤14.0	25-40	50	1	10	0.02	15	40	М	0402
VC06LC18X500	≤18.0	≤14.0	25-40	50	1	10	0.05	30	50	М	0603
VC08LC18A500	≤18.0	≤14.0	25-40	50	1	10	0.1	30	80	М	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]

 $V_{\rm B}$ Typical Breakdown Votage (Min-Max) [V @ 1mA_{DC}, 25°C]

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Clamping Voltage [V @ I_{VC}] Test Current for V_c [A, 8x20µs]

I_{vc}

Maximum leakage current at the working voltage, 25°C [µA]

E, Transient Energy Rating [J, 10x1000µS]

Peak Current Rating [A, 8x20µS]

Typical capacitance [pF] @ frequency specified Cap and 0.5V_{RMS}, 25°C, K = 1kHz, M = 1MHz

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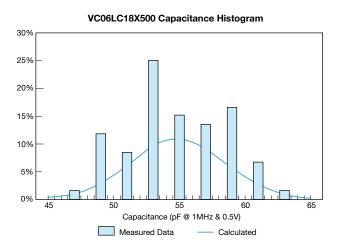
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StaticGuard

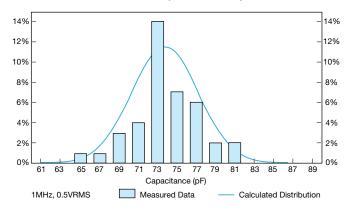
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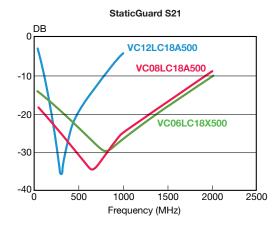
TYPICAL PERFORMANCE DATA

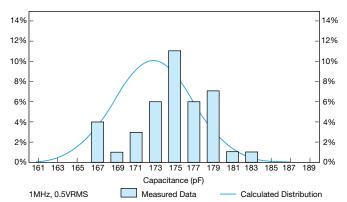


VC08LC18A500 Capacitance Histogram

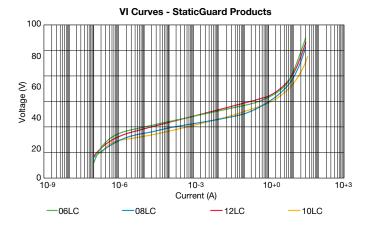


StaticGuard ESD RESPONSE IEC 61000-4-2 (8 Kv Contact Discharge) 50 VC08LC18A500 VC12LC18A500 45 Clamping Voltage (V) VC06LC18X500 40 35 30 10 100 1000 10000 Number of ESD Strikes









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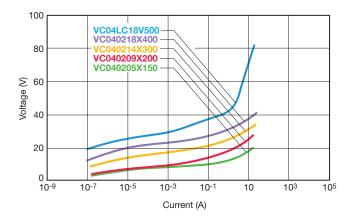
StaticGuard Multilayer Ceramic Transient Voltage Suppressors



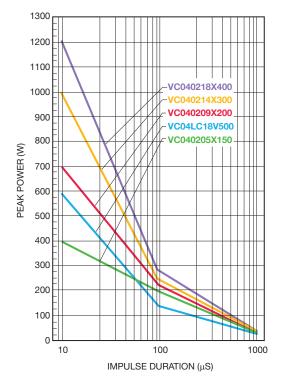
TYPICAL PERFORMANCE CURVES (0402 CHIP SIZE)

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.



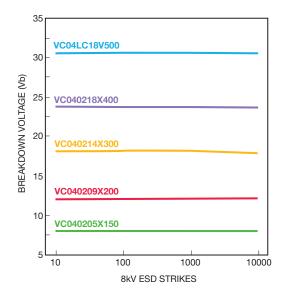
PEAK POWER VS PULSE DURATION



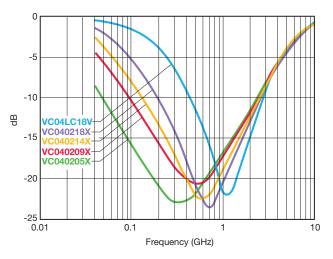
PULSE DEGRADATION

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



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