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 high-speed data transmission.
- Low leakage current (I₀) 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 speed data lines
- Capacitance sensitive applications and more

HOW TO ORDER

<table>
<thead>
<tr>
<th>DC Working Voltage [V]</th>
<th>AC Working Voltage [V]</th>
<th>Typical Breakdown Voltage Min-Max [V @ 1mA, 25°C]</th>
<th>Clamping Voltage [V @ I₀]</th>
<th>Test Current for Iₘ [A, 8x20μs]</th>
<th>Maximum leakage current at the working voltage, 25°C [μA]</th>
<th>Peak Current Rating [A, 8x20μs]</th>
<th>Typical capacitance [pF] @ frequency specified and 0.05Vrms, 25°C</th>
<th>K = 1 MHz, M = 1 MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>VW(DC)</td>
<td>VW(AC)</td>
<td>VC</td>
<td>Iₐ</td>
<td>I₀</td>
<td>Eₚ</td>
<td>Iₚ</td>
<td>Cap</td>
<td>Size</td>
</tr>
<tr>
<td>VC04LC180500</td>
<td>≤18.0</td>
<td>≤14.0</td>
<td>25-40</td>
<td>50</td>
<td>1</td>
<td>10</td>
<td>10.02</td>
<td>15</td>
</tr>
<tr>
<td>VC05LC18A500</td>
<td>≤18.0</td>
<td>≤14.0</td>
<td>25-40</td>
<td>50</td>
<td>1</td>
<td>10</td>
<td>0.05</td>
<td>30</td>
</tr>
<tr>
<td>VC08LC18A500</td>
<td>≤18.0</td>
<td>≤14.0</td>
<td>25-40</td>
<td>50</td>
<td>1</td>
<td>10</td>
<td>0.1</td>
<td>30</td>
</tr>
<tr>
<td>VC12LC18A500</td>
<td>≤18.0</td>
<td>≤14.0</td>
<td>25-40</td>
<td>50</td>
<td>1</td>
<td>10</td>
<td>0.1</td>
<td>30</td>
</tr>
</tbody>
</table>

ELECTRICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>AVX PN</th>
<th>V₃₀(DC)</th>
<th>V₃₀(AC)</th>
<th>V₅₀</th>
<th>V₃₀</th>
<th>Iₐ</th>
<th>Eₚ</th>
<th>Iₚ</th>
<th>Cap</th>
<th>Freq</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VC04LC180500</td>
<td>≤18.0</td>
<td>≤14.0</td>
<td>25-40</td>
<td>50</td>
<td>1</td>
<td>10</td>
<td>10</td>
<td>0.02</td>
<td>15</td>
<td>40</td>
</tr>
<tr>
<td>VC05LC18A500</td>
<td>≤18.0</td>
<td>≤14.0</td>
<td>25-40</td>
<td>50</td>
<td>1</td>
<td>10</td>
<td>0.05</td>
<td>30</td>
<td>50</td>
<td>M</td>
</tr>
<tr>
<td>VC08LC18A500</td>
<td>≤18.0</td>
<td>≤14.0</td>
<td>25-40</td>
<td>50</td>
<td>1</td>
<td>10</td>
<td>0.1</td>
<td>30</td>
<td>80</td>
<td>M</td>
</tr>
<tr>
<td>VC12LC18A500</td>
<td>≤18.0</td>
<td>≤14.0</td>
<td>25-40</td>
<td>50</td>
<td>1</td>
<td>10</td>
<td>0.1</td>
<td>30</td>
<td>200</td>
<td>K</td>
</tr>
</tbody>
</table>

*Not available for 0402
**Only available for 0402
**StaticGuard**
AVX Multilayer Ceramic Transient Voltage Suppressors
ESD Protection for CMOS, Bi Polar and SiGe Based Systems

**TYPICAL PERFORMANCE DATA**

**VC06LC18X500 Capacitance Histogram**

- Measured Data
- Calculated Distribution

**VC08LC18A500 Capacitance Histogram**

1 MHz, 0.5 VRMS

**VC12LC18A500 Capacitance Histogram**

1 MHz, 0.5 VRMS

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

**StaticGuard S21**

**VI Curves - StaticGuard Products**

06LC, 08LC, 12LC, 10LC
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.

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.

**TYPICAL PERFORMANCE CURVES (0402 CHIP SIZE)**

**VOLTAGE/CURRENT CHARACTERISTICS**

**PULSE DEGRADATION**

**ESD TEST OF 0402 PARTS**

**INSERTION LOSS CHARACTERISTICS**