AVX STATICGUARD PERFORMANCE COMPARISON TO SOT-23 SMT DIODES

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Abstract:

AVX StaticGuard is designed to provide transient protection for MSI to VLSI CMOS circuitry. This article presents performance characteristics of low energy MLV transient voltage suppressors relative to low energy silicon diodes. All major parameters are described, including leakage current, clamping voltage, capacitance, peak current and repetitive strike performance. AVX StaticGuard is shown to have superior performance to SOT 23 diodes in transient suppression applications.
AVX StaticGuard offers significant performance advantages over all SOT-23 package type TVS devices.

Among the advantages are:

**Electrical**
- StaticGuard meets IEC 801-2, Level 4 and IEC801-4, Level 4.
- StaticGuard has the fastest response time in the industry <<1ns.
- StaticGuard can withstand repetitive ESD and high current strikes without performance degradation.
- StaticGuard exhibits a capacitance which can be used as an EMI/RFI filter.
- High in rush current capability up to 30A.

**Physical**
- StaticGuard is the smallest surface mount TVS suppressor in the industry and can be placed at the entry point of a transient.
- StaticGuard is easily picked and placed with standard equipment.

### Specification Comparison

<table>
<thead>
<tr>
<th>AVX StaticGuard 0805 0.1J</th>
<th>SOT-23 Unidirectional Bidirectional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steady state power:</td>
<td>500MW</td>
</tr>
<tr>
<td>Repetitive strike:</td>
<td>&gt;50000 ESD</td>
</tr>
<tr>
<td>Voltage range:</td>
<td>≤ 18V, 5V - 69V</td>
</tr>
<tr>
<td>Peak current capability (8x20μs):</td>
<td>30A N/S</td>
</tr>
<tr>
<td>Vc</td>
<td>&lt;50V, 11 - 85V</td>
</tr>
<tr>
<td>Capacitance:</td>
<td>&lt;100pF, 60 - 550pF</td>
</tr>
<tr>
<td>Leakage current:</td>
<td>&lt;10μA @ Vwm, &lt;100μA @ Vwm</td>
</tr>
</tbody>
</table>
TURN ON TIME COMPARISON
STATICGUARD vs SOT-23

1. Static Guard Turn on Time: 400 ps
2. Si TVS Turn on Time: >1.2 ns
3. Unprotected energy due to Si TVS delay

PEAK PULSE POWER vs PULSE DURATION
STATICGUARD vs SOT 23

8 Kv CONTACT REPETITIVE STRIKE
ESD TEST
STATICGUARD vs SOT 23

PULSES TO FAILURE: 850
TEST STOPPED AT 80000 PULSES
NO FAILURES FOUND

Energy (J)

PEAK PULSE POWER (Kw)

REPETITIVE STRIKE
8 x 20us 150a TEST
STATICGUARD vs SOT 23

Energy (J)
<table>
<thead>
<tr>
<th><strong>USA</strong></th>
<th><strong>EUROPE</strong></th>
<th><strong>ASIA-PACIFIC</strong></th>
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