

# TECHNICAL PAPER

## AVX Staticguard Performance Comparison to SOT-23 SMT Diodes

**Ron Demcko**

*Application Engineering Manager  
KYOCERA AVX Components Corporation  
Raleigh, NC*

---

### **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 PERFORMANCE COMPARISON TO SOT-23 SMT DIODES

AVX StaticGuard offers significant performance advantages over all SOT-23 package type TVS devices.

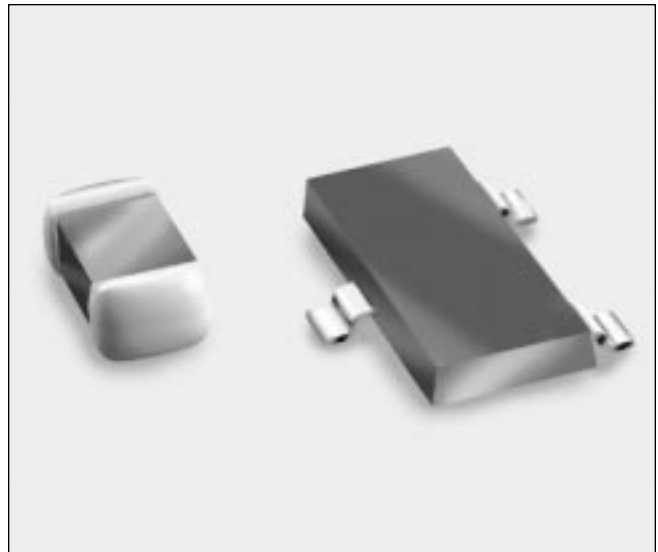
Among the advantages are:

## Electrical

- StaticGuard meets IEC 801-2, Level 4 and IEC801-4, Level 4.
- StaticGuard has the fastest response time in the industry  $\ll 1\text{ns}$ .
- 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

### AVX StaticGuard 0805 0.1J

### SOT-23

Bidirectional

Unidirectional  
Bidirectional

Steady state power: 500MW

500MW

Repetitive strike:  $>50000$  ESD

$<100$  unidirectional  
 $<1000$  bidirectional

Voltage range:  $\leq 18\text{V}$

5V - 69V

Peak current capability (8x20 $\mu\text{s}$ ): 30A

N/S

Vc  $<50\text{V}$

11 - 85V

Capacitance:  $<100\text{pF}$

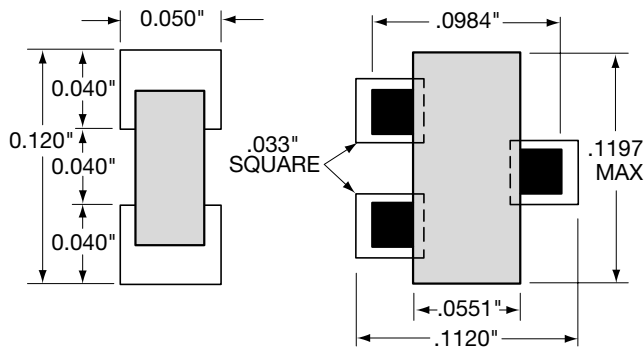
60 - 550pF

Leakage current:  $<10\mu\text{A}$  @  $V_{wm}$

$<100\mu\text{A}$  @  $V_{wm}$

### 0805 STATICGUARD

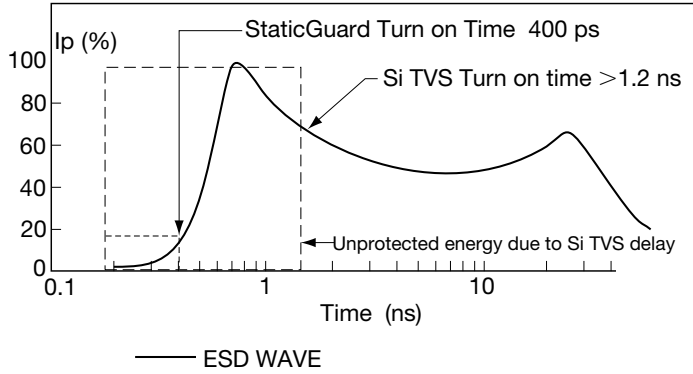
### SOT 23 DIODE



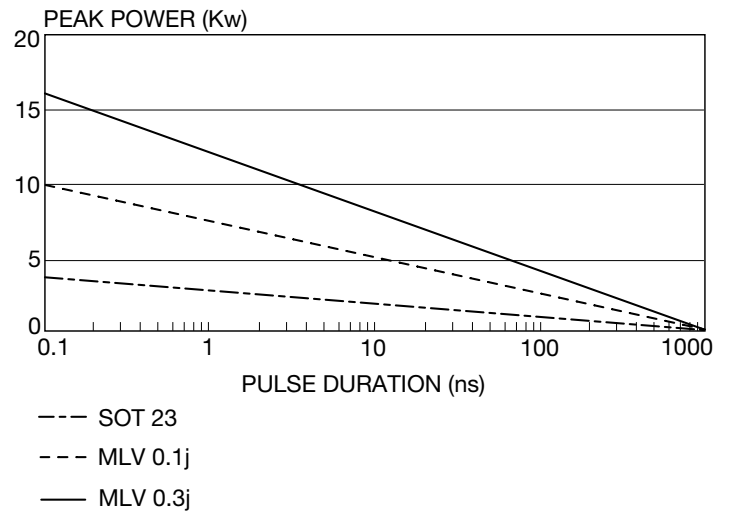
TOTAL AREA USED  
0.006 SQ. IN.

TOTAL AREA USED  
0.0134 SQ. IN.

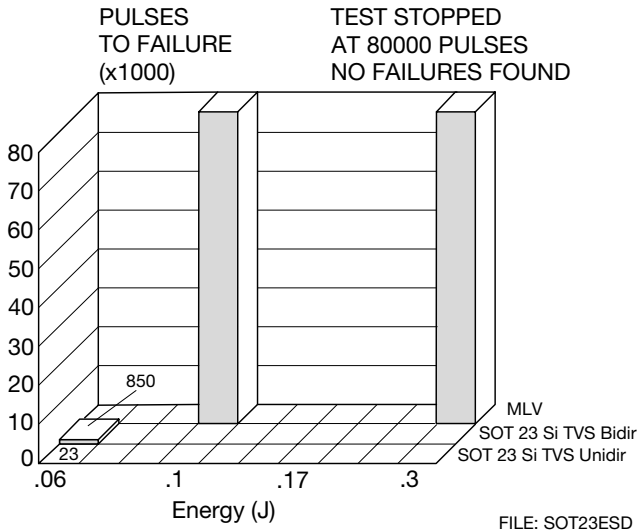
## TURN ON TIME COMPARISON STATICGUARD vs SOT-23



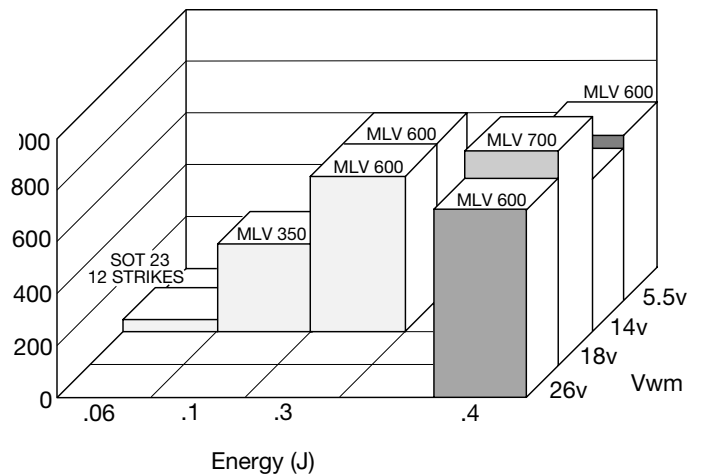
## PEAK PULSE POWER vs PULSE DURATION STATICGUARD vs SOT 23



## 8 Kv CONTACT REPETITIVE STRIKE ESD TEST STATICGUARD vs SOT 23



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





**NORTH AMERICA**  
Tel: +1 864-967-2150

**ASIA**  
Tel: +65 6286-7555

**CENTRAL AMERICA**  
Tel: +55 11-46881960

**EUROPE**  
Tel: +44 1276-697000

**JAPAN**  
Tel: +81 740-321250

**NOTICE:** Specifications are subject to change without notice. Contact your nearest KYOCERA AVX Sales Office for the latest specifications. All statements, information and data given herein are believed to be accurate and reliable, but are presented without guarantee, warranty, or responsibility of any kind, expressed or implied. Statements or suggestions concerning possible use of our products are made without representation or warranty that any such use is free of patent infringement and are not recommendations to infringe any patent. The user should not assume that all safety measures are indicated or that other measures may not be required. Specifications are typical and may not apply to all applications.

  
[WWW.KYOCERA-AVX.COM](http://WWW.KYOCERA-AVX.COM)