

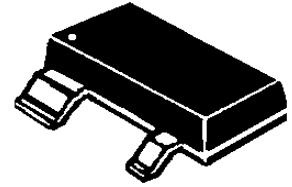
**DESCRIPTION**

This TRANSIENT VOLTAGE SUPPRESSOR (TVS) is packaged in an SOT-143 configuration giving protection to 1 Bidirectional data or interface line. It is designed for use in applications where protection is required at the board level from voltage transients caused by electrostatic discharge (ESD) as defined in IEC 61000-4-2, electrical fast transients (EFT) per IEC 61000-4-4 and effects of secondary lightning. It is also available with either Tin-Lead plated terminations or as RoHS Compliant with annealed matte-Tin finish by adding an "e3" suffix to the part number\*.

These TVS arrays have a peak power rating of 500 watts for an 8/20 μsec pulse. This array is suitable for protection of sensitive circuitry consisting of TTL, CMOS DRAM's, SRAM's, HCMOS, HSIC microprocessors, **UNIVERSAL SERIAL BUS (USB)** and I/O transceivers. The USB504xxC product provides board level protection from static electricity and other induced voltage surges that can damage or upset sensitive circuitry.

**IMPORTANT:** For the most current data, consult MICROSEMI's website: <http://www.microsemi.com>

**APPEARANCE**



**SOT-143**

**FEATURES**

- Protects 1 bidirectional line
- Surge protection per IEC 61000-4-2, IEC 61000-4-4
- Provides electrically isolated protection
- UL 94V-0 Flamability Classification
- RoHS Compliant devices available by adding e3 suffix
- **ULTRA LOW CAPACITANCE 3 pF per line pair**
- **ULTRA LOW LEAKAGE**

**APPLICATIONS / BENEFITS**

- EIA-RS485 data rates:  
5 Mbs
- 10 Base T Ethernet
- USB data rate: 900 Mbs
- Tape & Reel per EIA Standard 481-1-A
- 7 inch reel; 3,000 pieces per reel

**MAXIMUM RATINGS**

- Operating Temperature: -55°C to +150°C
- Storage Temperature: -55°C to +150°C
- Peak Pulse Power: 500 watts (8/20 μs, Figure 1)
- Pulse Repetition Rate: < .01%

**MECHANICAL AND PACKAGING**

- Molded SOT-143 Surface Mount
- Weight: 0.035 grams (approximate)
- Body marked with device marking code\* (see below)
- Pin #1 defined by dot on top of package

**ELECTRICAL CHARACTERISTICS**

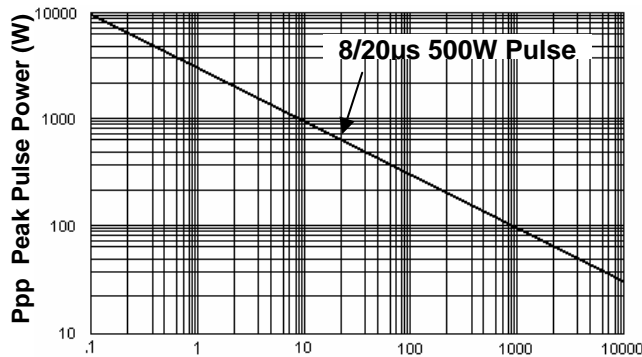
PART NUMBER	DEVICE MARKING*	STAND OFF VOLTAGE V <sub>WM</sub>	BREAKDOWN VOLTAGE V <sub>BR</sub> @1 mA	CLAMPING VOLTAGE V <sub>C</sub> @ 1 Amp (Figure 2)	CLAMPING VOLTAGE V <sub>C</sub> @ 5 Amp (Figure 2)	STANDBY CURRENT I <sub>D</sub> @ V <sub>WM</sub>	CAPACITANCE (f=1 MHz) C @0V	TEMPERATURE COEFFICIENT OF V <sub>BR</sub> α <sub>VBR</sub>
		VOLTS	VOLTS	VOLTS	VOLTS	μA	pF	mV/°C
		MAX	MIN	MAX	MAX	MAX	MAX	MAX
USB50403C	53	3.3	4	8	11	200	3	-5
USB50405C	55	5.0	6.0	10.8	13	40	3	1
USB50412C	512	12.0	13.3	19	26	1	3	8
USB50415C	515	15.0	16.7	24	32	1	3	11
USB50424C	524	24.0	26.7	43	57	1	3	28

\*Device marking has an e3 suffix added for the RoHS Compliant option, e.g. 53e3, 55e3, 512e3, 515e3, and 524e3.

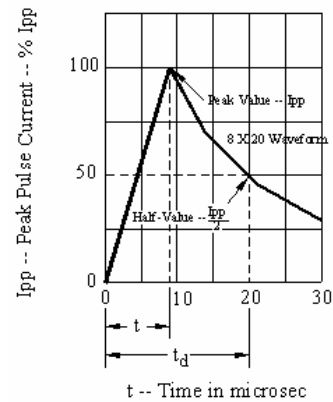
**SYMBOLS & DEFINITIONS**

Symbol	Definition
$V_{WM}$	Stand Off Voltage: Maximum dc voltage that can be applied over the operating temperature range. $V_{WM}$ must be selected to be equal or be greater than the operating voltage of the line to be protected.
$V_{BR}$	Minimum Breakdown Voltage: The minimum voltage the device will exhibit at a specified current
$V_C$	Clamping Voltage: Maximum clamping voltage across the TVS device when subjected to a given current at a pulse time of 20 $\mu s$ .
$I_D$	Standby Current: Leakage current at $V_{WM}$ .
C	Capacitance: Capacitance of the TVS as defined @ 0 volts at a frequency of 1 MHz and stated in picofarads.

**GRAPHS**

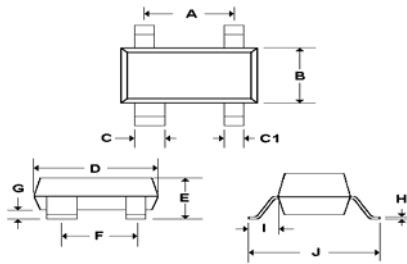


**Figure 1**  
Peak Pulse Power Vs Pulse Time  $t = \mu sec$



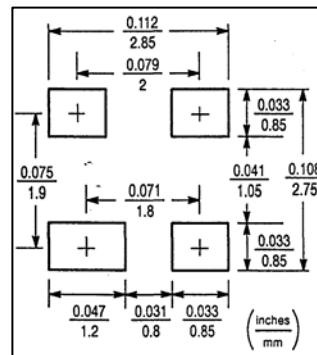
**Figure 2**  
Pulse Wave Form

**OUTLINE AND SCHEMATIC**

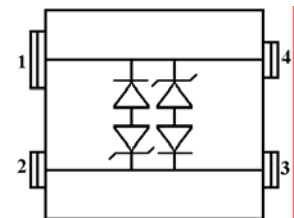


DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.070	0.080	1.78	2.03
B	0.047	0.053	1.20	1.40
C	0.027	0.033	0.69	0.84
C1	0.012	0.018	0.30	0.46
D	0.107	0.113	2.72	2.87
E	0.042	0.045	1.07	1.14
F	0.067	0.079	1.70	2.01
G	0.002	0.008	0.051	0.20
H	0.003	0.009	0.076	0.23
I	0.018	0.023	0.46	0.58
J	0.083	0.093	2.11	2.36

**OUTLINE**



**PAD LAYOUT**



**SCHEMATIC**