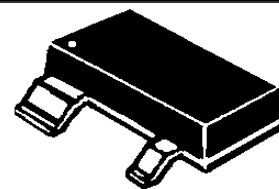


DESCRIPTION

This TRANSIENT VOLTAGE SUPPRESSOR (TVS) is packaged in an SOT-143 configuration giving protection to 1 Unidirectional 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 μ sec 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 USB504xx 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 unidirectional 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 Mbps
- 10 Base T Ethernet
- USB data rate: 900 Mbps
- 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 μ s, 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* in table below
- Pin #1 defined by dot on top of package

ELECTRICAL CHARACTERISTICS

PART NUMBER	DEVICE MARKING*	STAND OFF VOLTAGE V_{WM}	BREAKDOWN VOLTAGE V_{BR} @1 mA	CLAMPING VOLTAGE V_C @ 1 Amp (Figure 2)	CLAMPING VOLTAGE V_C @ 5 Amp (Figure 2)	STANDBY CURRENT I_D @ V_{WM}	CAPACITANCE (f=1 MHz) C @0V	TEMPERATURE COEFFICIENT OF V_{BR} α_{VBR}
		VOLTS	VOLTS	VOLTS	VOLTS	μ A	pF	mV/°C
		MAX	MIN	MAX	MAX	MAX	MAX	MAX
USB50403	AA	3.3	4	8	11	200	3	-5
USB50405	AB	5.0	6.0	10.8	13	20	3	1
USB50412	AC	12.0	13.3	19	26	1	3	8
USB50415	AD	15.0	16.7	24	32	1	3	11
USB50424	AE	24.0	26.7	43	57	1	3	28

* Device marking has an e3 suffix added for the RoHS Compliant option, e.g. AAe3, ABe3, ACe3, ADe3, and AEe3.

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 μs .
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

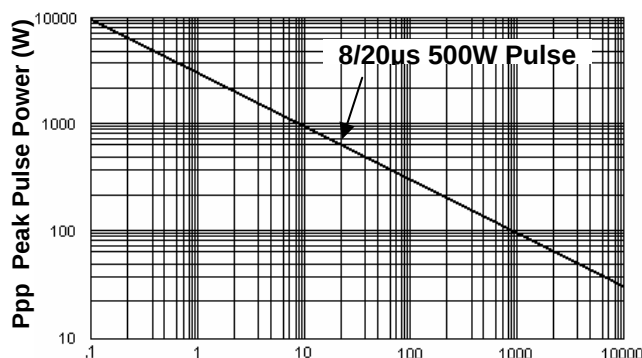


Figure 1
Peak Pulse Power Vs Pulse Time $t = \mu sec$

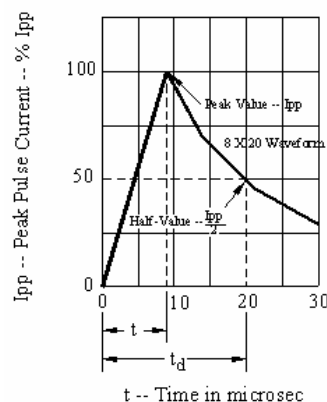
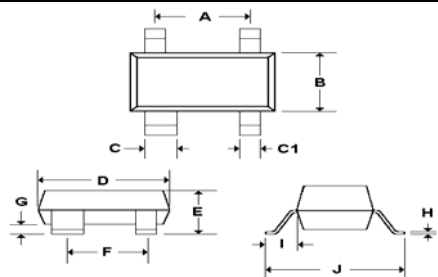


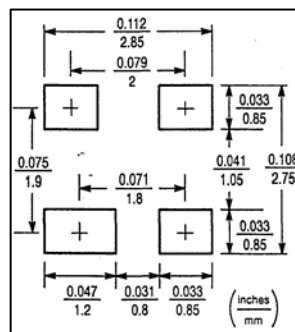
Figure 2
Pulse Wave Form

OUTLINE AND SCHEMATIC

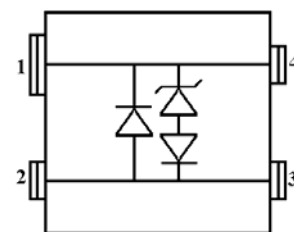


DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.070	0.080	1.78	2.03
B	0.047	0.053	1.20	1.40
C	0.027	0.033	0.69	0.84
C1	0.012	0.018	0.30	0.46
D	0.107	0.113	2.72	2.87
E	0.042	0.045	1.07	1.14
F	0.067	0.079	1.70	2.01
G	0.002	0.008	0.051	0.20
H	0.003	0.009	0.076	0.23
I	0.018	0.023	0.46	0.58
J	0.083	0.093	2.11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

OUTLINE



PAD LAYOUT



SCHEMATIC