Microsemi
SCOTTSDALE DIVISION

USB50803 thru USB50824, e3

Unidirectional Low Capacitance TVSarray ™

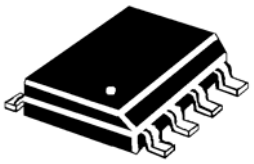
DESCRIPTION

This TRANSIENT VOLTAGE SUPPRESSOR (TVS) array is packaged in an SO-8 configuration' giving protection to 2 Unidirectional data or interface lines. It is designed for use in applications where very low capacitance 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*.

Using the schematic on the second page, pins 7 & 8 are tied together for the first protected positive line, and pins 1 & 2 are tied together to the ground. The same would then occur where pins 5 & 6 are tied together for a second protected positive line and pins 2 & 3 are tied together to the ground. If protecting a negative line with respect to ground, these may be switched in polarity connections where the pins are tied together in this manner for Unidirectional protection.

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 USB508XX product provides board level protection from static electricity and other induced voltage surges that can damage or upset sensitive circuitry.

APPEARANCE



SO–8

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

FEATURES

- Protects up to 2 unidirectional lines
- 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 date rate: 900 Mbs
- Tape & Reel per EIA Standard 481
- 13 inch reel; 2,500 pieces (OPTIONAL)
- Carrier tubes; 95 pcs (STANDARD)

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%
- Solder Temperatures: 260ºC for 10 s (maximum)

MECHANICAL AND PACKAGING

- Molded SO-8 Surface Mount
- Weight 0.066 grams (approximate)
- Marking: Logo, device marking code*, date code
- Pin #1 defined by dot on top of package

ELECTRICAL CHARACTERISTICS

PART NUMBER	DEVICE MARKING*	STAND OFF VOLTAGE V_{WM} VOLTS	BREAKDOWN VOLTAGE V_{BR} @1 mA VOLTS	CLAMPING VOLTAGE V_C @ 1 Amp (Figure 2) VOLTS	CLAMPING VOLTAGE V_C @ 5 Amp (Figure 2) VOLTS	STANDBY CURRENT I_D @ V_{WM} μA	CAPACITANCE (f=1 MHz) C @0V pF	TEMPERATURE COEFFICIENT OF V_{BR} α_{VBR} mV/°C
		MAX	MIN	MAX	MAX	MAX	MAX	MAX
USB50803	AF	3.3	4	8	11	200	3	-5
USB50805	AG	5.0	6.0	10.8	13	20	3	1
USB50812	AH	12.0	13.3	19	26	1	3	8
USB50815	AJ	15.0	16.7	24	32	1	3	11
USB50824	AK	24.0	26.7	43	57	1	3	28

***** Device marking has an e3 suffix added for the RoHS Compliant option, e.g. AFe3, AGe3, AHe3, AJe3, and AKe3.

Microsemi
Scottsdale Division
8700 E. Thomas Rd. PO Box 1390, Scottsdale, AZ 85252 USA, (480) 941-6300, Fax: (480) 947-1503

SYMBOLS & DEFINITIONS

Symbol	Definition
V_{WM}	Stand Off Voltage: Maximum dc voltage that can be applied over the operating temperature range. Vwm 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

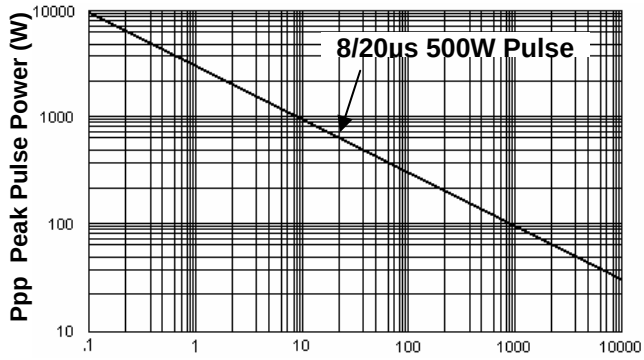


Figure 1
Peak Pulse Power Vs Pulse Time t = µsec

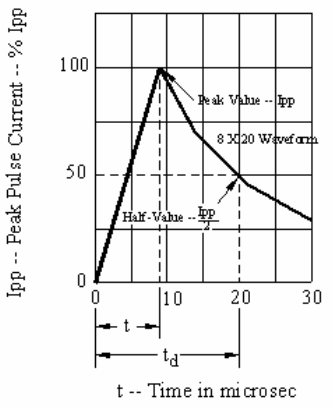
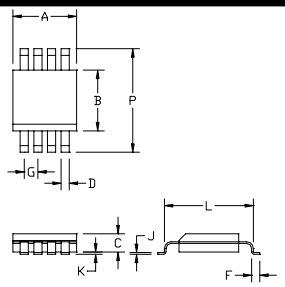


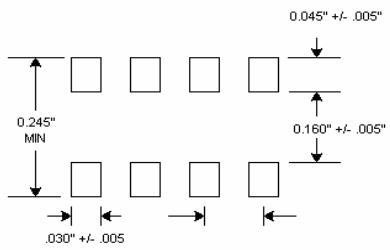
Figure 2
Pulse Wave Form

OUTLINE AND SCHEMATIC

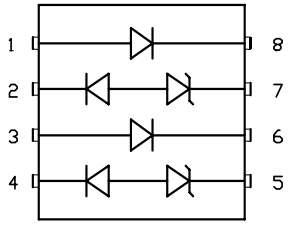


DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.188	0.197	4.77	5.00
B	0.150	0.158	3.81	4.01
C	0.053	0.069	1.35	1.75
D	0.011	0.021	0.28	0.53
F	0.0160	0.050	0.41	1.27
G	0.050 BSC		1.27 BSC	
J	0.006	0.010	0.15	0.25
K	0.004	0.008	0.10	0.20
L	0.189	0.206	4.80	5.23
P	0.228	0.244	5.79	6.19

OUTLINE



PAD LAYOUT



SCHEMATIC