USB50803C-A thru USB50824C-A, e3

Bidirectional Low Capacitance TVSarray ™

Microsemi
SCOTTSDALE DIVISION

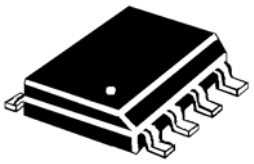
DESCRIPTION

This Transient Voltage Suppressor (TVS) array is packaged in an SO-8 configuration giving protection to 2 Bidirectional 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 1 & 2 are tied together for the first protected line, and pins 7 & 8 are tied together to ground. The same would occur for a second protected line where pins 3 & 4 tied together and pins 5 & 6 tied together to the ground. These may also be switched in polarity connections since the electrical features are the same in each antiparallel (opposite facing) leg when the pins are tied together in this manner for bidirectional protection. This device with an "A" suffix is opposite in polarity for each pin-to-pin leg to the USB50803C series (see schematic). This provides no functional difference for bidirectional TVS protection with the noted pins tied together as described above.

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 USB508XXC 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 bidirectional 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: 260°C 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*	STANDOFF 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
USB50803C-A	U3CA	3.3	4	8	11	200	3	-5
USB50805C-A	U5CA	5.0	6.0	10.8	13	40	3	1
USB50812C-A	U12CA	12.0	13.3	19	26	1	3	8
USB50815C-A	U15CA	15.0	16.7	24	32	1	3	11
USB50824C-A	U24CA	24.0	26.7	43	57	1	3	28

***Device marking has an e3 suffix added for the RoHS Compliant option, e.g. U3CAe3, U5CAe3, U12CAe3, U15CAe3, and U24CAe3.

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SYMBOLS & DEFINITIONS

Symbol	Definition
V_{WM}	Standoff 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

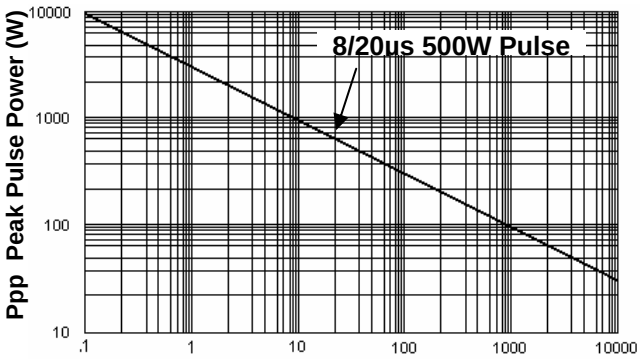


Figure 1
Peak Pulse Power Vs Pulse Time t = µsec

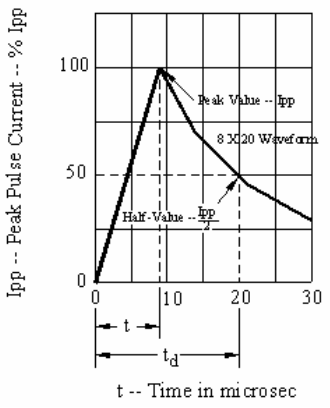
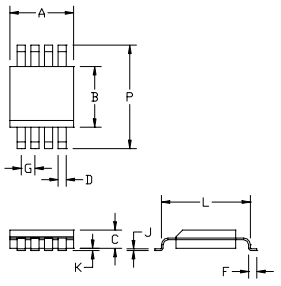


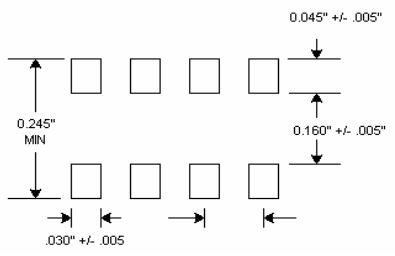
Figure 2
Pulse Wave Form

OUTLINE AND SCHEMATIC

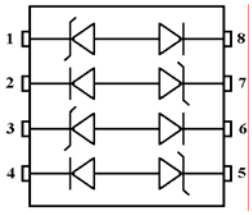


DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.188	0.197	4.77	5.00
B	0.150	0.158	3.81	4.01
C	0.053	0.069	1.35	1.75
D	0.011	0.021	0.28	0.53
F	0.0160	0.050	0.41	1.27
G	0.050 BSC		1.27 BSC	
J	0.006	0.010	0.15	0.25
K	0.004	0.008	0.10	0.20
L	0.189	0.206	4.80	5.23
P	0.228	0.244	5.79	6.19

OUTLINE



PAD LAYOUT



SCHEMATIC

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