

USBQ50403Ce3 – USBQ50424Ce3

-					
2	RoHS				
Available					

500 W, Bidirectional Low Capacitance TVS Array

DESCRIPTION

This Transient Voltage Suppressor (TVS) is assembled in a QFN-143 package which has the same pinout and footprint as the SOT-143 package. The configuration gives protection to 1 bidirectional data or interface line. It is designed for use in applications where 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 the secondary effects of lightning. These TVS arrays have a peak power rating of 500 watts for an 8/20 µs pulse (figure 1). With a capacitance of only 3 pF, this part can provide protection to very fast data lines including USB at 900 Mbits/sec.

Important: For the latest information, visit our website http://www.microsemi.com.

FEATURES

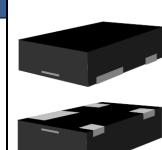
- Protects 1 bidirectional line
- Surge protection per IEC 61000-4-2 and IEC 61000-4-4
- Ultra low capacitance (3 pF per line pair, see schematic for the line pair)
- Low profile surface mount package
- RoHS compliant versions are available

APPLICATIONS / BENEFITS

- EIA RS485 data rates: 5 Mbps
- 10 Base-T Ethernet
- USB data rate 900 Mbps

MAXIMUM RATINGS @ 25 °C unless otherwise noted

Parameters/Test Conditions	Symbol	Value	Unit
Storage Temperature	T _{STG}	-55 to +150	°C
Junction Temperature	TJ	-55 to +125	°C
Peak Pulse Power Dissipation with a 10/1000µs waveform (with a duty factor of 0.01%)	P _{PP}	500	W
Solder Temperature @ 10 s		260	°C



HALOGEN

FREE



Also available:

Unidirectional				
Z	(QFN-143) <u>USBQ50403e3 –</u> USBQ50424e3			
	00000000			

MSC – Lawrence

6 Lake Street, Lawrence, MA 01841 1-800-446-1158 or (978) 620-2600 Fax: (978) 689-0803

MSC – Ireland

Gort Road Business Park, Ennis, Co. Clare, Ireland Tel: +353 (0) 65 6840044 Fax: +353 (0) 65 6822298

Website:

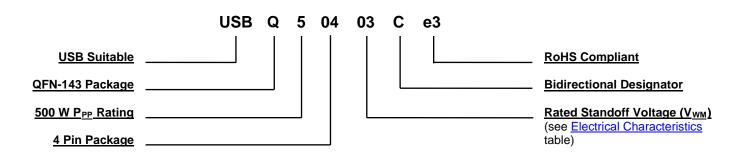
www.microsemi.com



MECHANICAL and PACKAGING

- CASE: Void-free transfer molded thermosetting epoxy body meeting UL94V-0
- TERMINALS: RoHS compliant annealed matte-tin plating. Readily solderable per MIL-STD-750, method 2026.
- MARKING: Body marked with part number code (QxxC)
- POLARITY: Dot in corner indicates pin 1
- TAPE-AND-REEL: Standard per EIA-481-B (add "TR" suffix to part number). Consult factory for quantities.
- WEIGHT: Approximately 16.53 milligrams
- See Package Dimensions on last page.

PART NOMENCLATURE



SYMBOLS & DEFINITIONS				
Symbol	Definition			
α _{V(BR)}	Temperature Coefficient of Breakdown Voltage: The change in breakdown voltage divided by the change in temperature that caused it expressed in %/°C or mV/°C.			
I _(BR)	Breakdown Current: The current used for measuring Breakdown Voltage V(BR).			
Ι _D	Standby Current: The current through the device at rated stand-off voltage.			
I _{PP}	Peak Impulse Current: The maximum rated random recurring peak impulse current or nonrepetitive peak impulse current that may be applied to a device. A random recurring or nonrepetitive transient current is usually due to an external cause, and it is assumed that its effect will have completely disappeared before the next transient arrives.			
V _(BR)	Breakdown Voltage: The voltage across the device at a specified current I(BR) in the breakdown region.			
Vc	Clamping Voltage: The voltage across the device in a region of low differential resistance during the application of an impulse current (I _{PP}) for a specified waveform.			
V _{WM}	Working Standoff Voltage: The maximum-rated value of dc or repetitive peak positive cathode-to-anode voltage that may be continuously applied over the standard operating temperature.			

ELECTRICAL CHARACTERISTICS @ 25 °C unless otherwise stated

PART NUMBER	DEVICE MARKING	STAND- OFF VOLTAGE V _{WM} Volts	BREAKDOWN VOLTAGE V _{BR} @ 1 mA Volts	CLAMPING VOLTAGE Vc @ 1 Amp (Figure 2) Volts	CLAMPING VOLTAGE Vc @ 5 Amp (Figure 2) Volts	STANDBY CURRENT I _D @ V _{WM} µA	CAPACITANCE (f= 1 MHz) C @ 0 V pF	TEMPERATURE COEFFICIENT OF V _{BR} α _{VBR} mV/°C
		MAX	MIN	MAX	MAX	MAX	MAX	MAX
USBQ50403Ce3	Q03C	3.3	4.0	8.0	11	200	3	-5
USBQ50405Ce3	Q05C	5.0	6.0	10.8	12	40	3	1
USBQ50412Ce3	Q12C	12.0	13.3	19.0	26	1	3	8
USBQ50415Ce3	Q15C	15.0	16.7	24.0	32	1	3	11
USBQ50424Ce3	Q24C	24.0	26.7	43.0	57	1	3	28

RF01086-2, Rev A (9/30/13)



GRAPHS

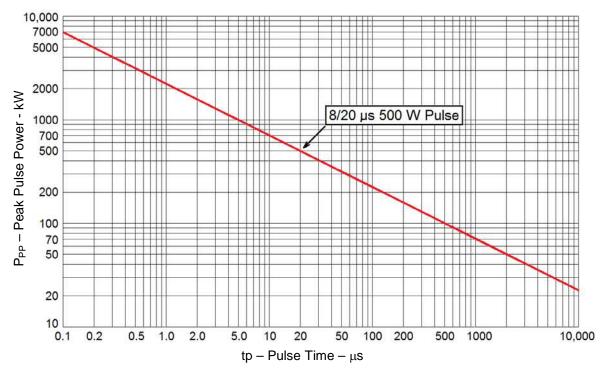
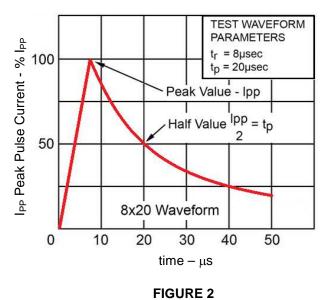


FIGURE 1 Peak Pulse Power vs. Pulse Time

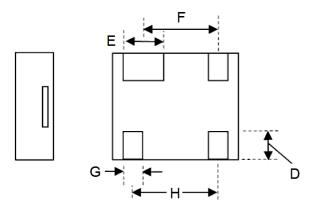


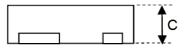
Pulse Waveform

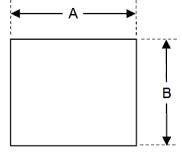


USBQ50403Ce3 – USBQ50424Ce3

PACKAGE DIMENSIONS

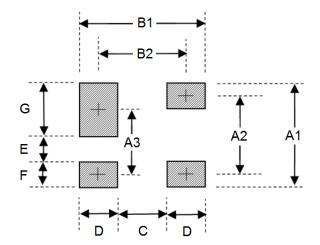






	Dimensions			
Ref.	Inch		Millin	neters
	Min	Max	Min	Max
Α	0.112	0.116	2.85	2.95
В	0.096	0.100	2.45	2.55
С	0.0354	0.0366	0.900	0.930
D	0.020	0.024	0.50	0.60
E	0.031 NOM		0.80	NOM
F	0.069 NOM		1.75	NOM
G	0.018 NOM		0.45	NOM
Н	0.076 NOM		1.92	NOM

PAD LAYOUT



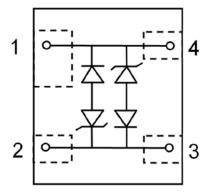
	Dimensions		
Ref.	Inch	Millimeters	
	Nominal	Nominal	
A1	0.112	2.85	
A2	0.079	2.00	
A3	0.071	1.80	
B1	0.108	2.75	
B2	0.075	1.90	
С	0.041	1.05	
D	0.033	0.85	
E	0.032	0.80	
F	0.033	0.85	
G	0.047	1.20	

See schematic on next page





SCHEMATIC



Seen from above