

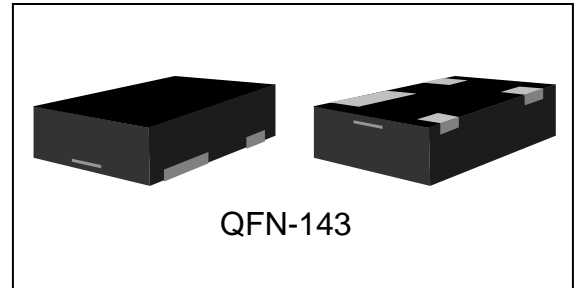
**500W, Bi-directional TVS array**
**Main product characteristics**

$V_{WM}$	3.3V – 24.0V
$V_{BR(min)} / V_{BR(max)}$	4.0V / 26.7V
$C_{MAX}$	3pF
$P_{PP}$	500W

**RoHS**  
COMPLIANT

HALOGEN  
**FREE**

**NON**  
MAGNETIC  
FOR MRI


**Description and applications**

This Transient Voltage Suppressor (TVS) is assembled in a QFN143 package which is compatible (pin for pin) with the SOT-143 package. The configuration gives protection to 1 bi-directional 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 ( $\pm 30kV$ ), electrical fast transients (EFT) per IEC 61000-4-4 ( $\pm 8kV$ ) and effects of secondary lightning.

These TVS arrays have a peak power rating of 500 watts for an 8/20  $\mu s$  pulse (figure 1). This array is suitable for protection of sensitive circuitry consisting of TTL, CMOS, DRAMs, SRAMs, HCMOS, HSIC microprocessors, UNIVERSAL SERIAL BUS (USB) and I/O transceivers. The USBQNM504xxC product provides board level protection from static electricity and other induced voltage surges that can damage or upset sensitive circuitry. This particular device is aimed specifically at MRI application due to the absence of ferrous elements in the metal lead frame.

**Features**

- Protects 1 bi-directional line
- Surge protection per IEC 61000-4-2 & IEC 61000-4-4
- Ultralow capacitance (3pF per line pair)
- Ultralow leakage
- Use of C7025 non-magnetic alloy

**Applications**

- EIA RS485 data rates : 5Mbps
- 10 Base-T ethernet
- USB data rate 900Mbps
- MRI applications

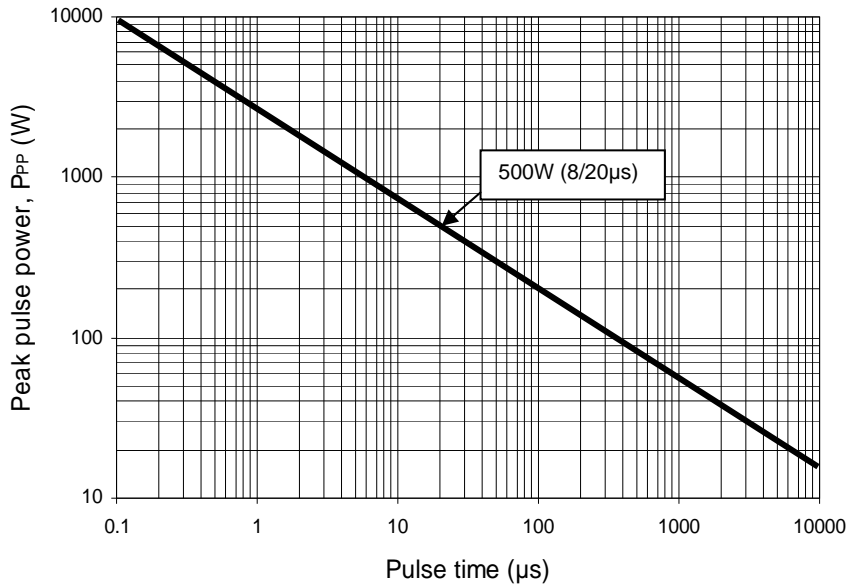
**Electrical characteristics**

PART NUMBER	DEVICE MARKING	STAND OFF VOLTAGE, $V_{WM}$ (V)	BREAKDOWN VOLTAGE, $V_{BR}$ (V) @ 1mA	CLAMPING VOLTAGE, $V_{CL}$ (V) @ 1A (see figure 2)	CLAMPING VOLTAGE, $V_{CL}$ (V) @ 5A (see figure 2)	STANDBY CURRENT, $I_D$ ( $\mu A$ ) @ $V_{WM}$	CAPACITANCE, C (pF) @ 0V & 1MHz	TEMPERATURE COEFFICIENT of $V_{BR}, \alpha_{VBR}$ (mV/°C)
		Max	Min	Max	Max	Max	Max	Max
<b>USBQNM50403Ce3</b>	N03C	3.3	4.0	8.0	11	200	3	-5
<b>USBQNM50405Ce3</b>	N05C	5.0	6.0	10.8	12	40	3	1
<b>USBQNM50412Ce3</b>	N12C	12.0	13.3	19.0	26	1	3	8
<b>USBQNM50415Ce3</b>	N15C	15.0	16.7	24.0	32	1	3	11
<b>USBQNM50424Ce3</b>	N24C	24.0	26.7	43.0	57	1	3	28

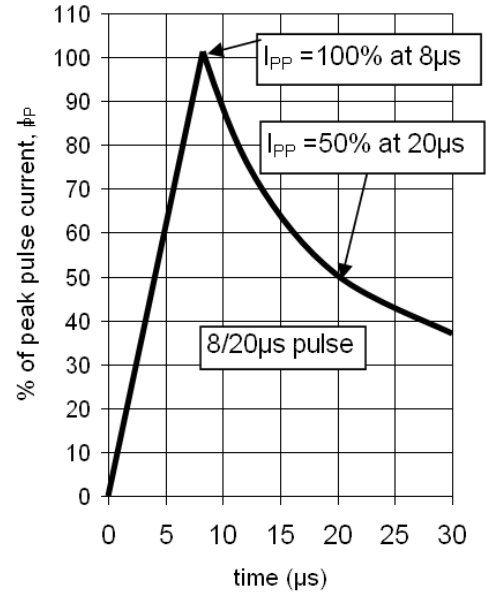
**Absolute maximum ratings<sup>(1)</sup>**

Symbol	Parameter	Value	Unit
$T_{STG}$	Storage temperature	-55 to +150	°C
$T_J$	Junction temperature	-55 to +125	°C
$P_{PP}$	Peak Pulse Power (using 8/20 $\mu s$ pulse)	500	W
$P_{RR}$	Pulse repetition rate	0.01	%

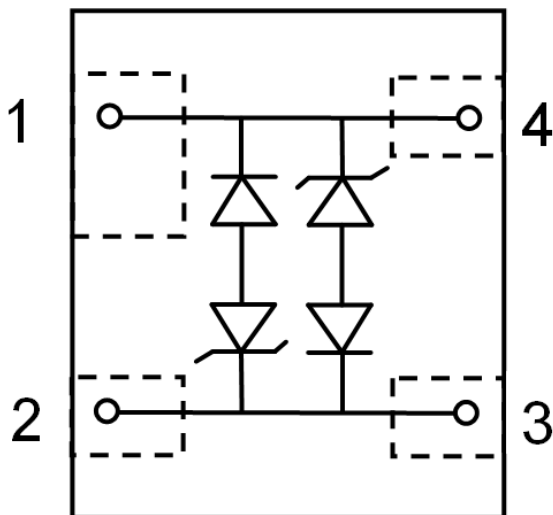
<sup>(1)</sup> All ratings at 25°C unless specified otherwise

**500W, Bi-directional TVS array**


**Figure 1** Graph of peak pulse power vs pulse time



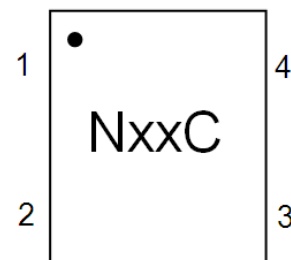
**Figure 2** 8/20μs pulse curve

**Circuit schematic**


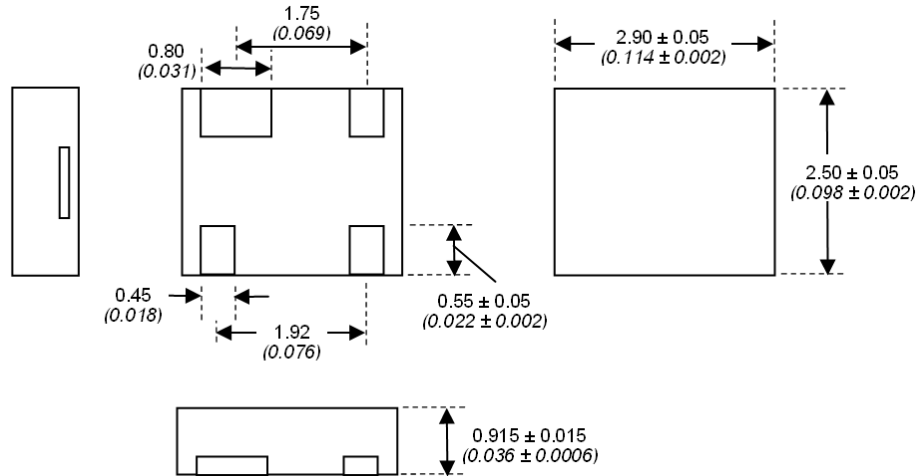
Seen from above

**Marking and packaging information**

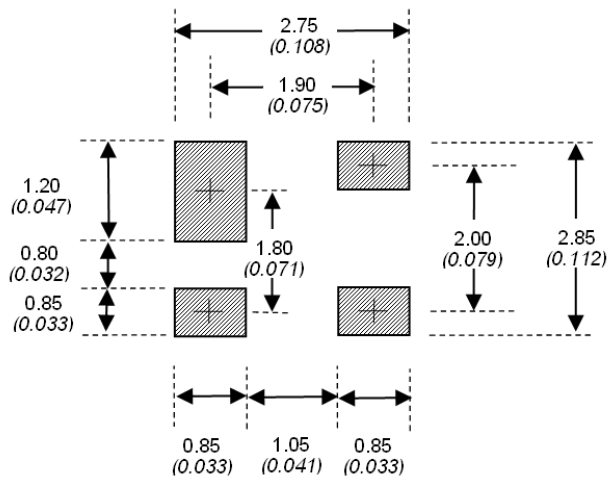
**Case :** Epoxy meets UL94V-0  
**Electrode finish :** Matte Sn plating - fully RoHS compliant  
**Leadframe material :** C7025 non-magnetic Cu alloy  
**Marking Specification :**



The dot in the corner is over pin 1

**Package dimensions**


Measurements in mm (inches)

**Footprint dimensions**

**Ordering information**

Product order code	Marking	Package	Base qty	Delivery mode
USBQNM504xxCe3/TR7	NxxC	QFN143	3000	Tape and reel

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Microsemi Corporation

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Please refer to [www.microsemi.com](http://www.microsemi.com) for the terms and conditions of purchase