



## Features

- Maximum Peak Power Dissipation: 6600 watts
- Meets ISO7637-2 / ISO16750-2 Surge specification (varies by test condition)
- RoHS compliant\*
- AEC-Q101 compliant\*\*

## Applications

- High peak power applications (up to rated limits)
- High temperature applications (up to rated limits)
- Clamping diode
- Load switching and lighting

# SM8S-Q Transient Voltage Suppressor Diode Series

## General Information

Bourns offers Transient Voltage Suppressor Diodes for surge and ESD protection applications, in compact chip package DO-218 size format. The Transient Voltage Suppressor series offers a choice of Working Peak Reverse Voltage from 16 V up to 43 V. Typical fast response times are less than 1.0 picosecond from 0 V to Breakdown Voltage.

## Absolute Maximum Ratings (@ $T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

Parameter	Symbol	Value	Unit
Maximum Peak Pulse Power Dissipation (10/1000 $\mu\text{s}$ )	$P_{PK}$	6600	W
Maximum Peak Pulse Power Dissipation (10/10000 $\mu\text{s}$ )	$P_{PK}$	5200	W
Power Dissipation with Infinite Heatsink ( $T_C = 25^\circ\text{C}$ )	$P_D$	8	W
Operating Temperature Range	$T_J$	-55 to +175	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-55 to +175	$^\circ\text{C}$

## Electrical Characteristics (@ $T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

Unidirectional Device	Bidirectional Device	Breakdown Voltage $V_{BR}$ (Volts)			Working Peak Reverse Voltage	Maximum Reverse Leakage @ $V_{RWM}$	Maximum Reverse Voltage @ $I_{RSM}$	Maximum Reverse Surge Current
Part No.	Part No.	Min.	Max.	@ $I_T$ (mA)	$V_{RWM}$ (V)	$I_R$ ( $\mu\text{A}$ )	$V_{RSM}$ (V)	$I_{RSM}$ (A)
SM8S16A	SM8S16CA	17.80	19.70	5	16.0	10	26.0	254.0
SM8S17A	SM8S17CA	18.90	20.90	5	17.0	10	27.6	239.0
SM8S18A	SM8S18CA	20.00	22.10	5	18.0	10	29.2	226.0
SM8S20A	SM8S20CA	22.20	24.50	5	20.0	10	32.4	204.0
SM8S22A	SM8S22CA	24.40	26.90	5	22.0	10	35.5	186.0
SM8S24A	SM8S24CA	26.70	29.50	5	24.0	10	38.9	170.0
SM8S26A	SM8S26CA	28.90	31.90	5	26.0	10	42.1	157.0
SM8S28A	SM8S28CA	31.10	34.40	5	28.0	10	45.4	145.0
SM8S30A	SM8S30CA	33.30	36.80	5	30.0	10	48.4	136.0
SM8S33A	SM8S33CA	36.70	40.60	5	33.0	10	53.3	124.0
SM8S36A	SM8S36CA	40.00	44.20	5	36.0	10	58.1	114.0
SM8S40A	SM8S40CA	44.40	49.10	5	40.0	10	64.5	102.0
SM8S43A	SM8S43CA	47.80	52.80	5	43.0	10	69.4	95.0

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[www.bourns.com](http://www.bourns.com)



**WARNING Cancer and Reproductive Harm - [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)**

\*RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011.

\*\*"Q" part number suffix for automotive and other applications requiring appropriate AEC-Q101 compliance.

Specifications are subject to change without notice.

Users should verify actual device performance in their specific applications.

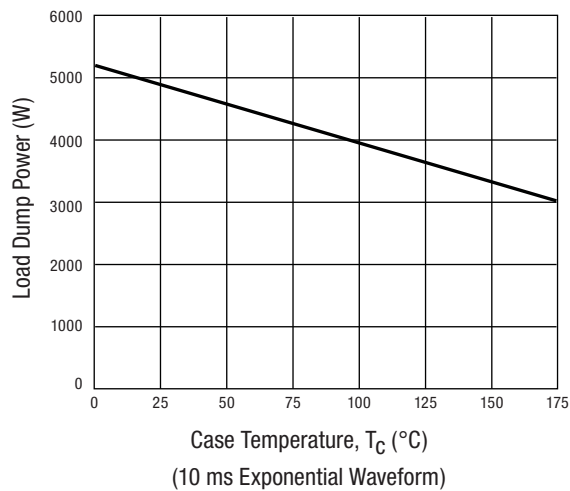
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# SM8S-Q Transient Voltage Suppressor Diode Series

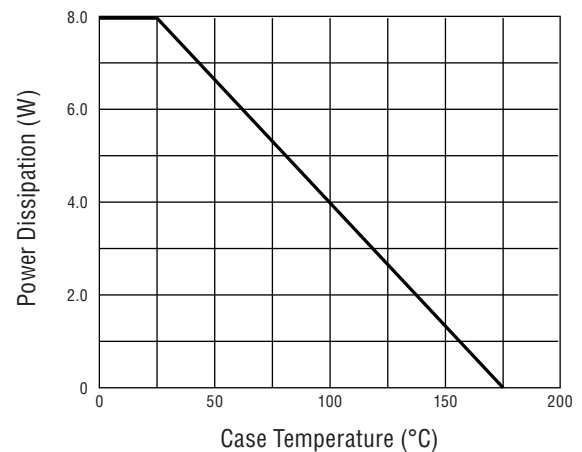
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## Performance Graphs

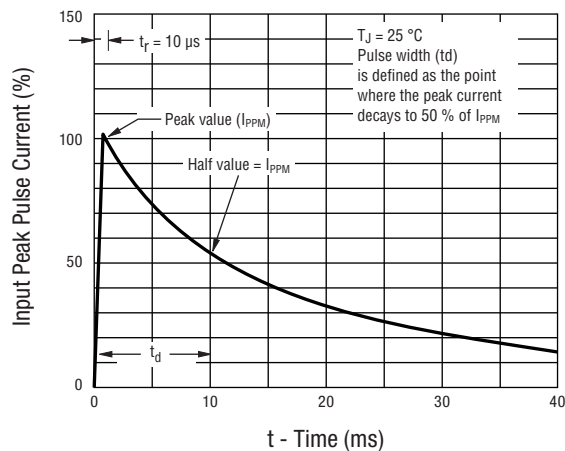
### Load Dump Power Characteristics



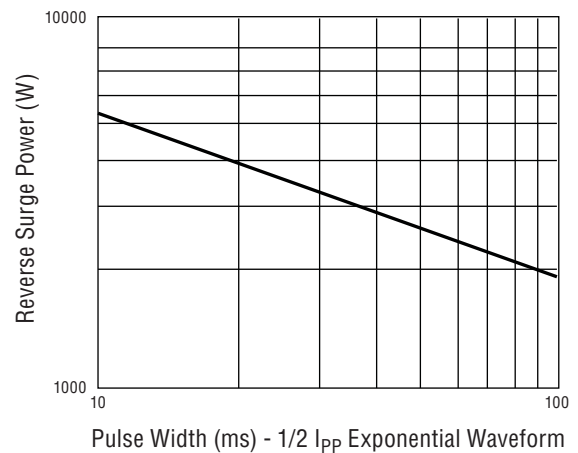
### Steady State Power Dissipation



### Pulse Waveform



### Maximum Non-Repetitive Surge Current



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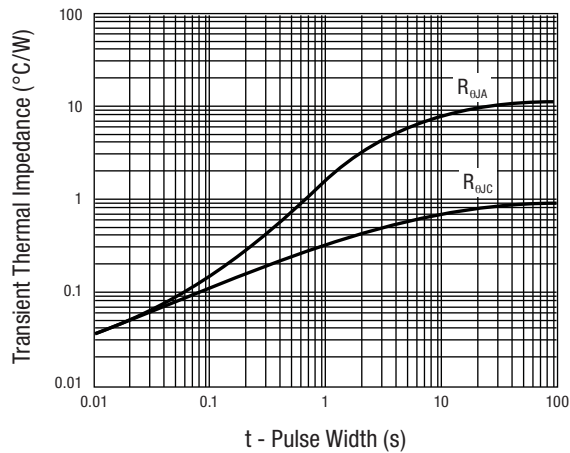
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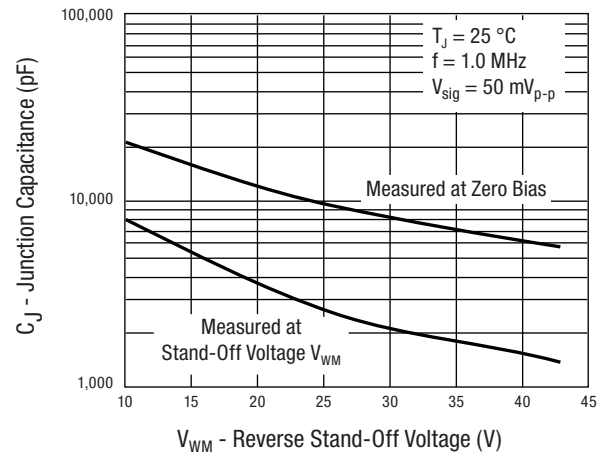
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## Performance Graphs

### Typical Transient Thermal Impedance



### Typical Junction Capacitance



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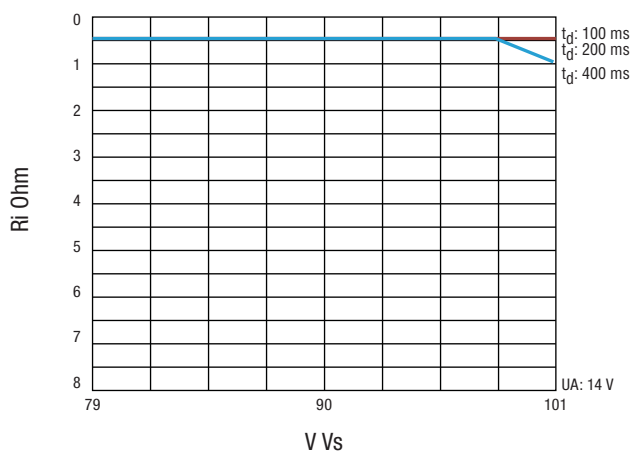
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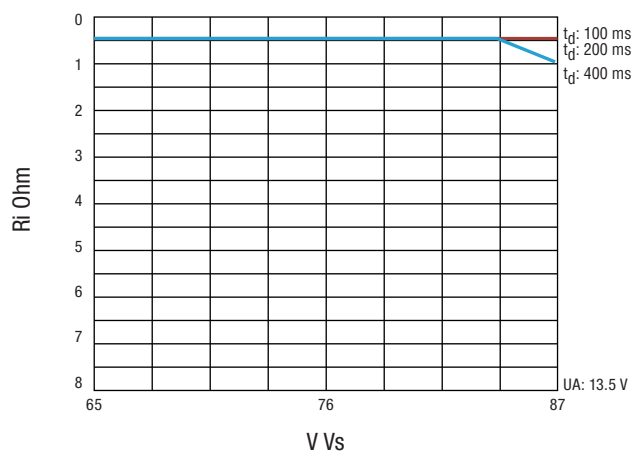
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## Performance Graphs

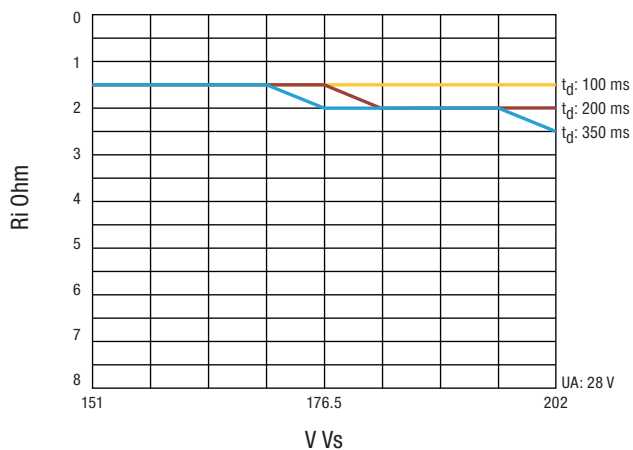
ISO 16750-2 Test A (10 Pulse) - SM8S24A



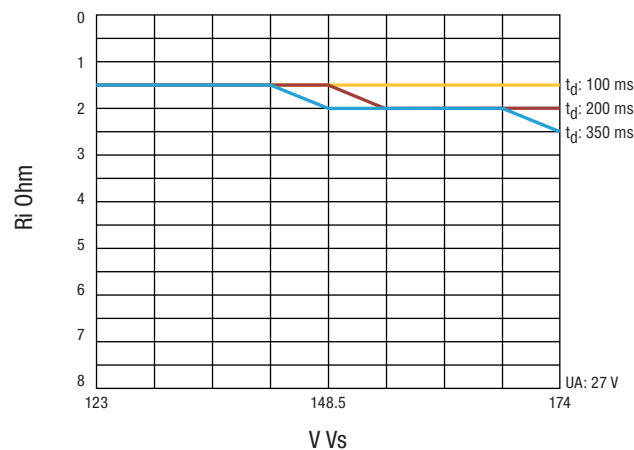
ISO 7637-2 5a (1 Pulse) - SM8S24A



ISO 16750-2 Test A (10 Pulse) - SM8S36A



ISO 7637-2 5a (1 Pulse) - SM8S36A



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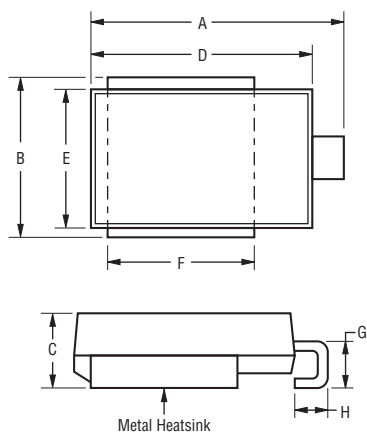
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## SM8S-Q Transient Voltage Suppressor Diode Series

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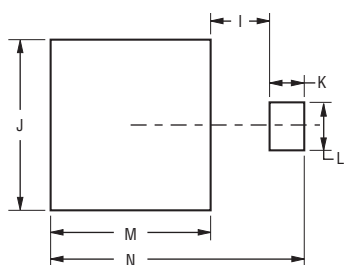
### Product Dimensions



Dimension	Value
A	$15.5 \pm 0.5$ (0.610 ± 0.02)
B	$10.0 \pm 0.5$ (0.394 ± 0.02)
C	$4.85 \pm 0.15$ (0.191 ± 0.006)
D	$13.5 \pm 0.2$ (0.531 ± 0.008)
E	$8.5 \pm 0.2$ (0.335 ± 0.008)
F	$9.0 \pm 0.3$ (0.354 ± 0.012)
G	$3.0 \pm 0.5$ (0.118 ± 0.02)
H	$2.0 \pm 0.5$ (0.079 ± 0.02)

DIMENSIONS:  $\frac{\text{MM}}{(\text{INCHES})}$

### Recommended Footprint



Dimension	Value
I	$3.5 \pm 0.3$ (0.138 ± 0.012)
J	$10.0 \pm 0.5$ (0.394 ± 0.02)
K	$2.0 \pm 0.3$ (0.079 ± 0.012)
L	$2.7 \pm 0.3$ (0.106 ± 0.012)
M	$9.0 \pm 0.3$ (0.354 ± 0.012)
N	$14.5 \pm 0.4$ (0.571 ± 0.016)

DIMENSIONS:  $\frac{\text{MM}}{(\text{INCHES})}$

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## SM8S-Q Transient Voltage Suppressor Diode Series

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### Physical Specifications

Case ..... Molded plastic per UL Class 94V-0  
Polarity ..... Cathode band indicates unidirectional device  
No cathode band indicates bidirectional device

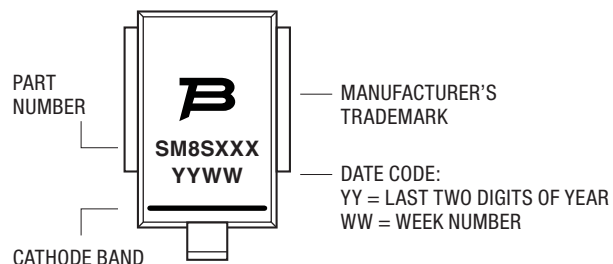
### How to Order

Package ..... **SM8S** ..... **18** ..... **CA - Q**  
SM8S = DO-218 Package  
Working Peak Reverse Voltage .....  
18 = 18 V<sub>RWM</sub> (Volts)  
Suffix .....  
A = 5 % Tolerance Unidirectional Device  
CA = 5 % Tolerance Bidirectional Device  
AEC-Q101 Suffix .....  
Q = AEC-Q101 Compliant

### Environmental Specifications

Moisture Sensitivity Level ..... 1  
ESD Classification (HBM) ..... 3B

### Typical Part Marking



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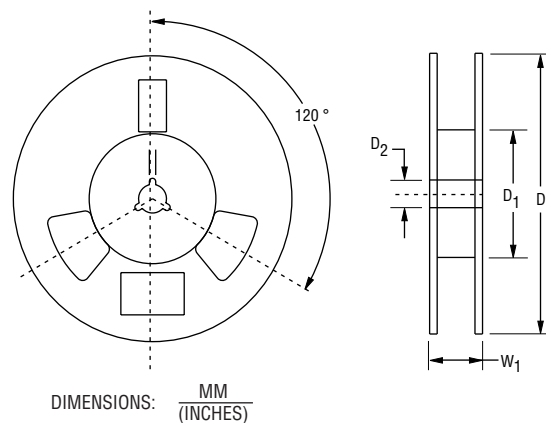
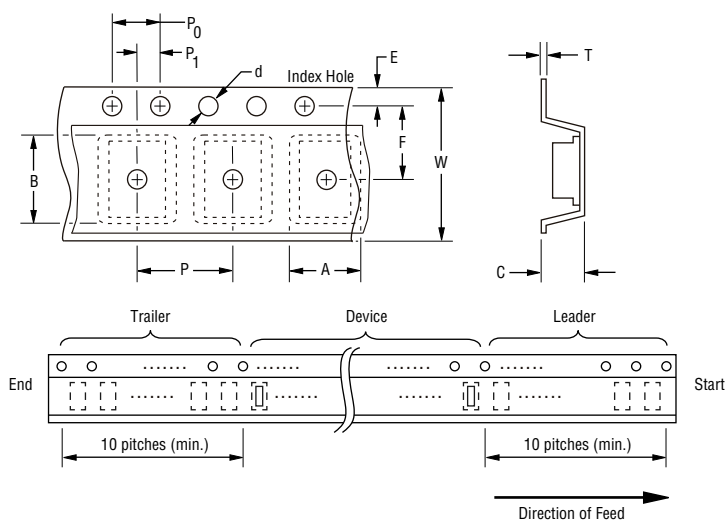
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# SM8S-Q Transient Voltage Suppressor Diode Series

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## Packaging Information

The product will be dispensed in tape and reel format (see diagram below).



Devices are packed in accordance with EIA 481 standard specifications shown here.

Item	Symbol	SM8S-Q Series
Carrier Width	A	$\frac{10.77 \pm 0.20}{(0.424 \pm 0.008)}$
Carrier Length	B	$\frac{16.33 \pm 0.20}{(0.643 \pm 0.008)}$
Carrier Depth	C	$\frac{6.02 \pm 0.20}{(0.237 \pm 0.008)}$
Sprocket Hole	d	$\frac{1.50 + 0.10 / - 0.00}{(0.059 + 0.004 / - 0.00)}$
Reel Outside Diameter	D	$\frac{330 \pm 2.0}{(12.992 \pm 0.079)}$
Reel Inner Diameter	D <sub>1</sub>	$\frac{60.0}{(2.362)} \text{ MIN.}$
Feed Hole Diameter	D <sub>2</sub>	$\frac{13.0 + 0.50 / - 0.20}{(0.512 + 0.020 / - 0.008)}$
Sprocket Hole Position	E	$\frac{1.75 \pm 0.10}{(0.069 \pm 0.004)}$
Punch Hole Position	F	$\frac{11.5 \pm 0.10}{(0.453 \pm 0.004)}$
Punch Hole Pitch	P	$\frac{16.0 \pm 0.10}{(0.63 \pm 0.004)}$
Sprocket Hole Pitch	P <sub>0</sub>	$\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$
Embossment Center	P <sub>1</sub>	$\frac{2.00 \pm 0.10}{(0.079 \pm 0.004)}$
Overall Tape Thickness	T	$\frac{12}{(0.472)} \text{ MAX.}$
Tape Width	W	$\frac{24.0 \pm 0.30}{(0.945 \pm 0.012)}$
Reel Width	W <sub>1</sub>	$\frac{30.4}{(1.197)} \text{ MAX.}$
Quantity per Reel	--	750

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