



## 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 $V_{RWM}$ (V)	Maximum Reverse Leakage @ $V_{RWM}$ $I_R$ ( $\mu\text{A}$ )	Maximum Reverse Voltage @ $I_{RSM}$ $V_{RSM}$ (V)	Maximum Reverse Surge Current $I_{RSM}$ (A)
		Min.	Max.	@ $I_T$ (mA)				
Part No.	Part No.							
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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**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.

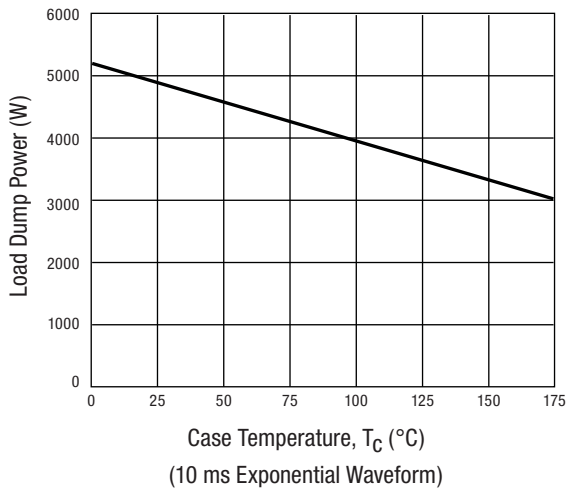
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# SM8S-Q Transient Voltage Suppressor Diode Series

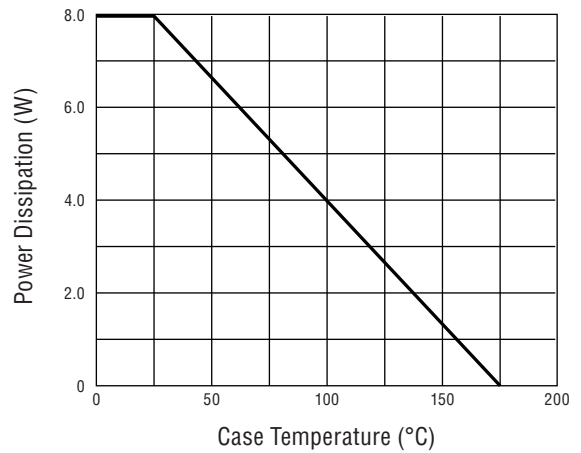


## Performance Graphs

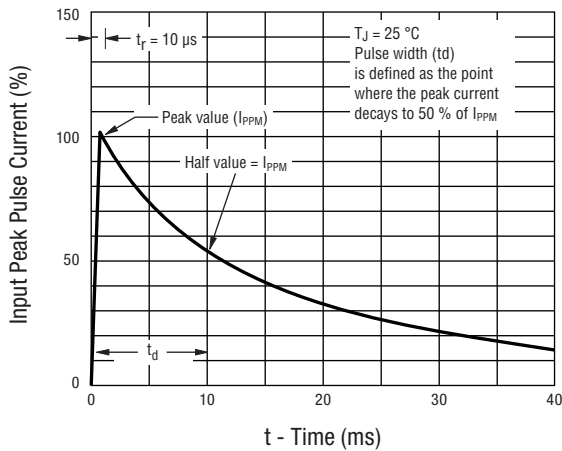
### Load Dump Power Characteristics



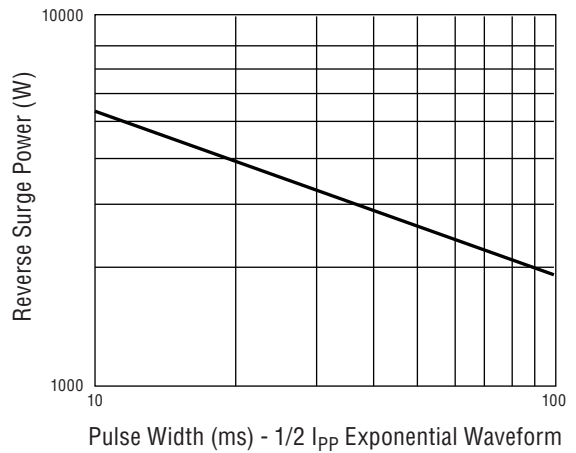
### Steady State Power Dissipation



### Pulse Waveform



### Maximum Non-Repetitive Surge Current



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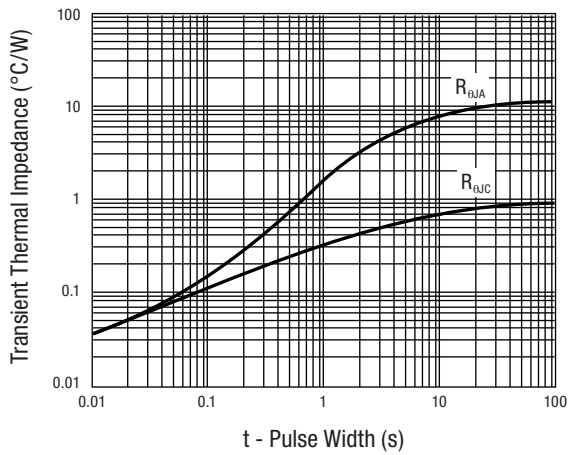
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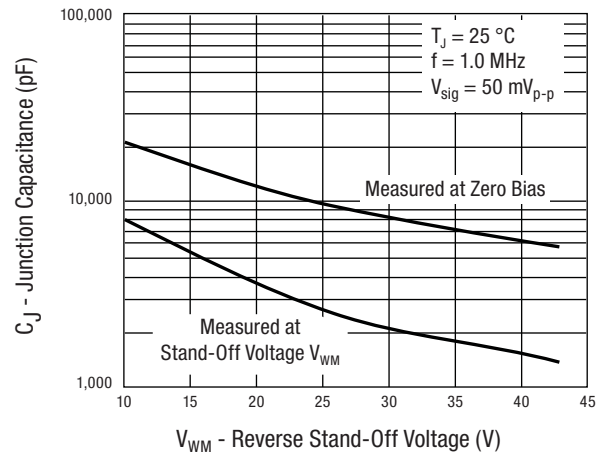
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## Performance Graphs

### Typical Transient Thermal Impedance



### Typical Junction Capacitance



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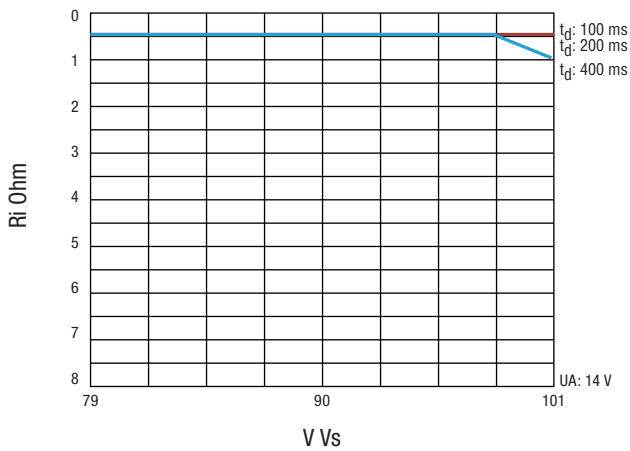
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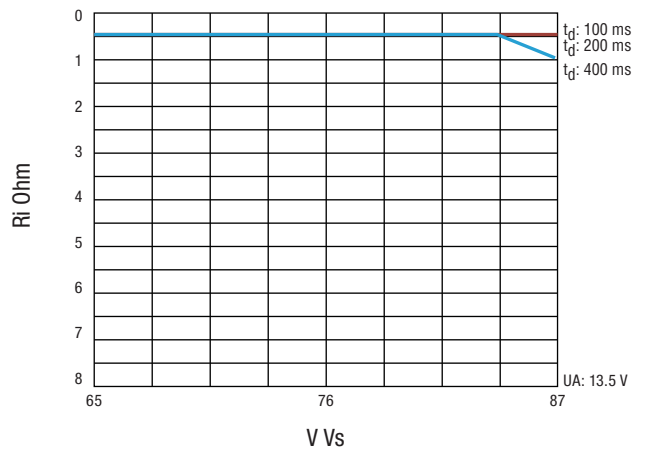


## Performance Graphs

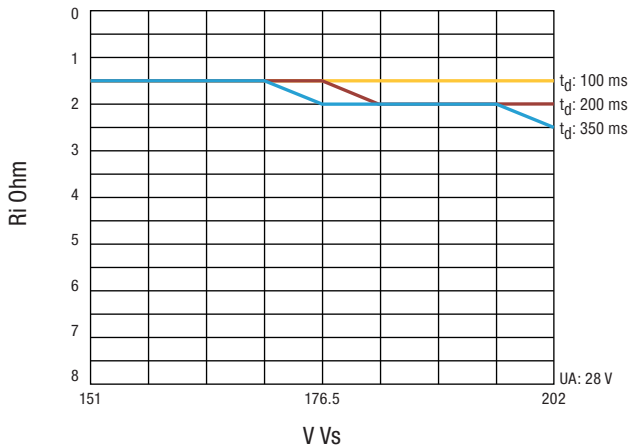
ISO 16750-2 Test A (10 Pulse) - SM8S24A



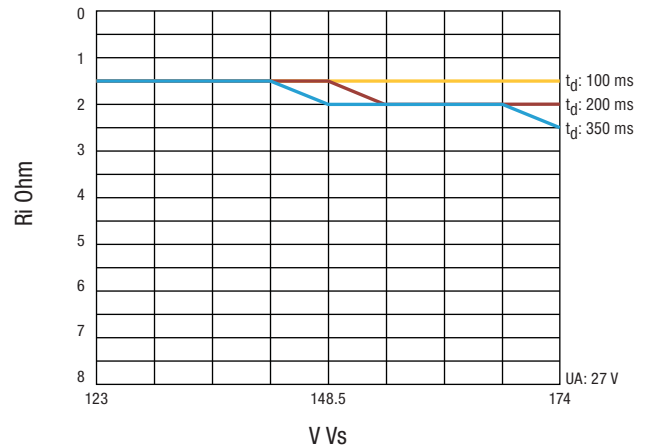
ISO 7637-2 5a (1 Pulse) - SM8S24A



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



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



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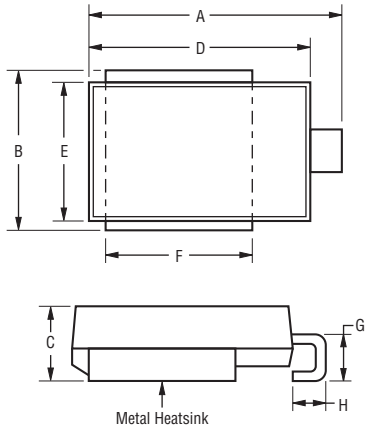
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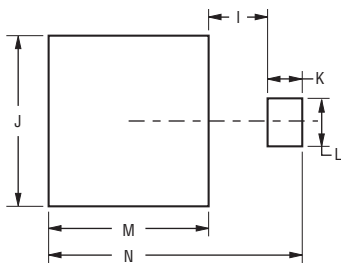
## Product Dimensions



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

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

## Recommended Footprint



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

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

**SM8S 18 CA - Q**

Package .....  
SM8S = DO-218 Package

Working Peak Reverse Voltage .....  
18 = 18  $V_{RWM}$  (Volts)

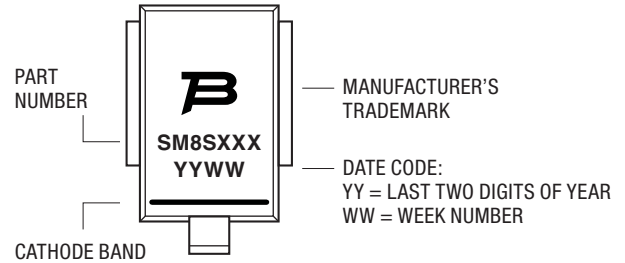
Suffix .....  
A = 5 % Tolerance Unidirectional Device  
CA = 5 % Tolerance Bidirectional Device

AEC-Q101 Suffix .....  
Q = AEC-Q101 Compliant

## Environmental Specifications

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

## Typical Part Marking



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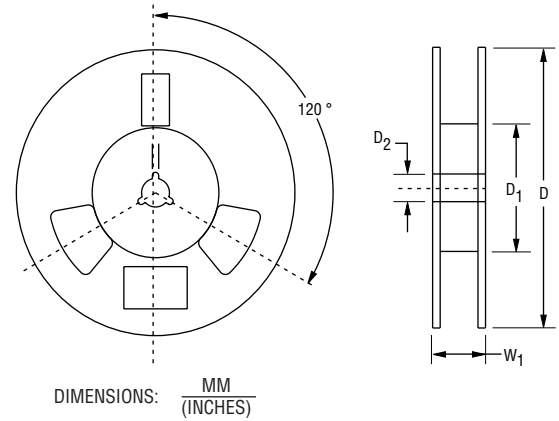
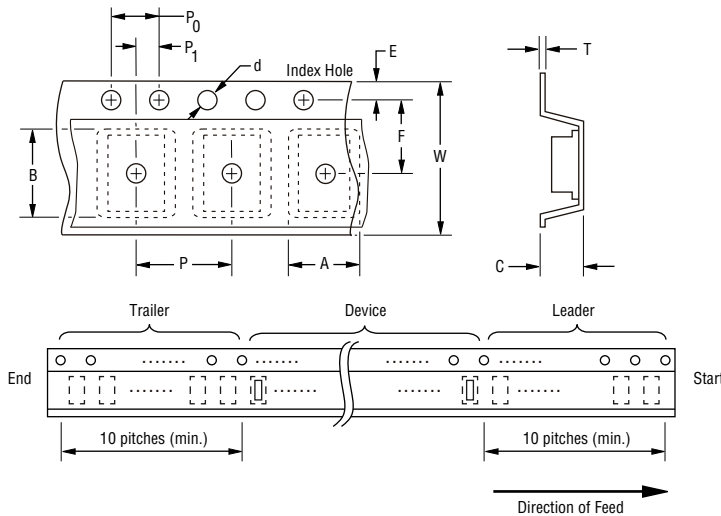
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# SM8S-Q Transient Voltage Suppressor Diode Series

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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>	$\frac{60.0}{(2.362)}$ 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	$\frac{12}{(0.472)}$ MAX.
Tape Width	W	$\frac{24.0 \pm 0.30}{(0.945 \pm 0.012)}$
Reel Width	W <sub>1</sub>	$\frac{30.4}{(1.197)}$ MAX.
Quantity per Reel	--	750

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