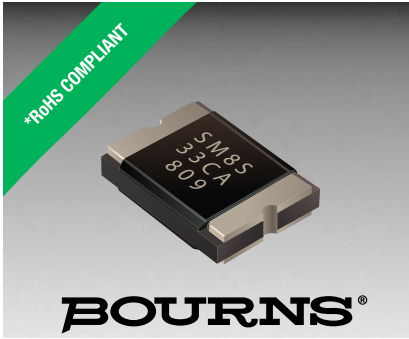




**THE DATASHEET OF  
SM8SF33A-Q**





## Features

- Maximum Peak Power Dissipation: 7000 watts
- Meets ISO7637-2 / ISO16750-2 Surge specification (varies by test condition)
- RoHS compliant\*
- AEC-Q101 compliant\*\* and manufactured at an IATF 16949:2016 certified factory

## Applications

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

# SM8SF-Q Transient Voltage Suppressor Diode Series

### General Information

The Model SM8SF-Q Series TVS diodes are designed to provide overvoltage protection for sensitive electronics, meeting ISO7637-2 and ISO16750-2 requirements (varies by test condition).

The Model SM8SF-Q Series offers a choice of Working Peak Reverse Voltages from 24 V to 36 V and Breakdown Voltage up to 40 V. The SM8SF-Q is available in a compact DFN package of 8.1 mm x 10.5 mm, with a low profile of just 1.3 mm, facilitating layout in today's compact PCB designs.

### Additional Information

Click these links for more information:



### Absolute Maximum Ratings (@ T<sub>A</sub> = 25 °C Unless Otherwise Noted)

Parameter	Symbol	Value	Unit
Maximum Peak Pulse Power Dissipation (10/1000 μs)	P <sub>PK</sub>	7000	W
Power Dissipation with Infinite Heatsink (T <sub>C</sub> = 25 °C)	P <sub>D</sub>	5	W
Operating Temperature Range	T <sub>J</sub>	-55 to +175	°C
Storage Temperature Range	T <sub>STG</sub>	-55 to +175	°C

### Electrical Characteristics (@ T<sub>A</sub> = 25 °C Unless Otherwise Noted)

Unidirectional Device		Bidirectional Device		Breakdown Voltage V <sub>BR</sub> (Volts)			Working Peak Reverse Voltage	Maximum Reverse Leakage @ V <sub>RWM</sub>	Maximum Reverse Voltage @ I <sub>RSM</sub>	Maximum Reverse Surge Current
Part No.	Marking	Part No.	Marking	Min.	Max.	@ I <sub>T</sub> (mA)	V <sub>RWM</sub> (V)	I <sub>R</sub> (μA)	V <sub>RSM</sub> (V)	I <sub>RSM</sub> (A)
SM8SF24A-Q	24A	SM8SF24CA-Q	24CA	26.7	29.5	5	24	10	38.9	180
SM8SF28A-Q	28A	SM8SF28CA-Q	28CA	31.1	34.4	5	28	10	45.4	154
SM8SF30A-Q	30A	SM8SF30CA-Q	30CA	33.3	36.8	5	30	10	48.4	145
SM8SF33A-Q	33A	SM8SF33CA-Q	33CA	36.7	40.6	5	33	10	53.3	131
SM8SF36A-Q	36A	SM8SF36CA-Q	36CA	40.0	44.2	5	36	10	58.1	120



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

\*RoHS Directive 2015/863, Mar 31, 2015 and Annex.

\*\*"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.

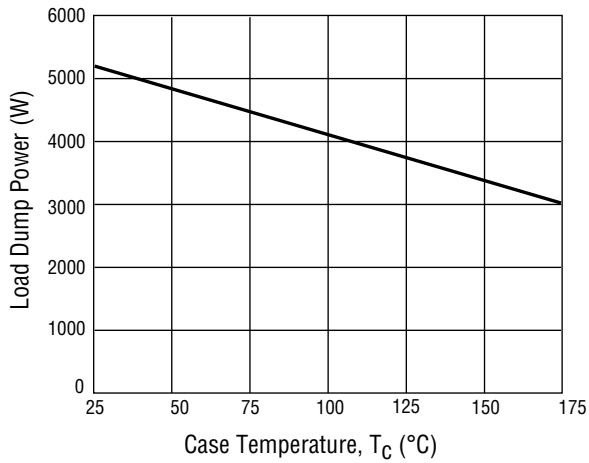
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# SM8SF-Q Transient Voltage Suppressor Diode Series

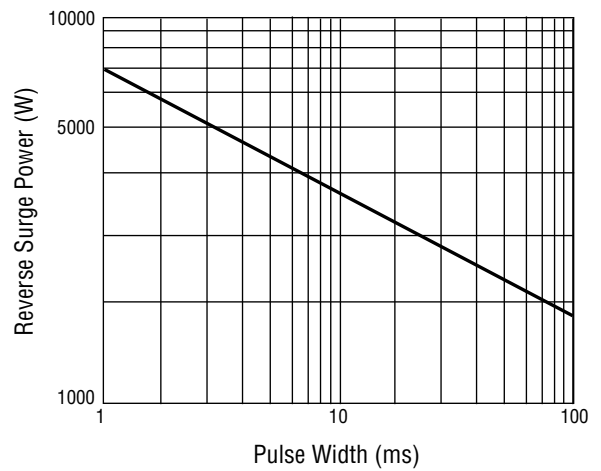


## Performance Graphs

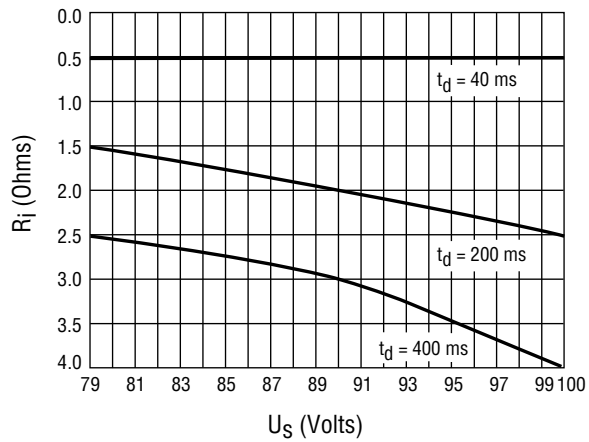
### Load Dump Power Characteristics



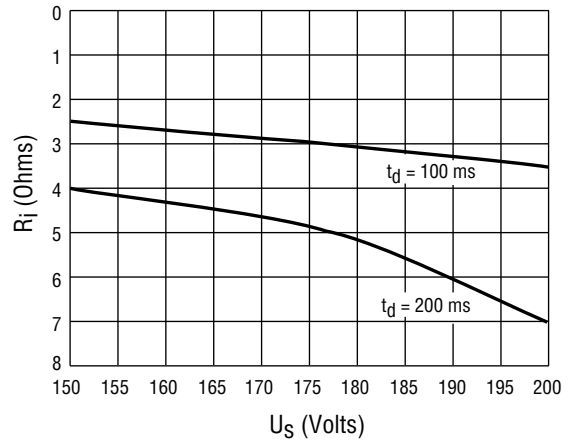
### Peak Pulse Power Derating Curve



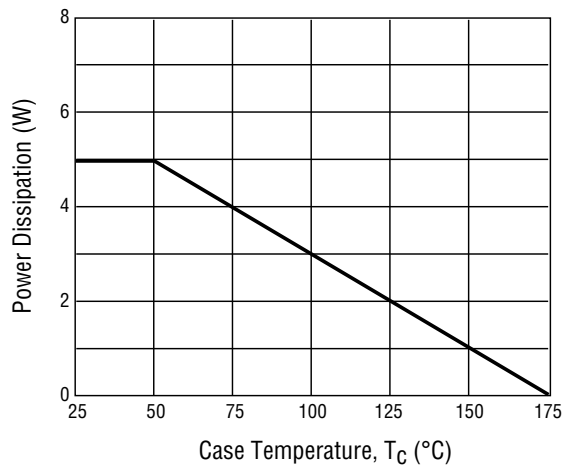
### ISO 7637-2: Pulse 5a, Single Pulse: SM8SF-24A-Q



### ISO 7637-2: Pulse 5a, Single Pulse: SM8SF-33A-Q



### Power Dissipation

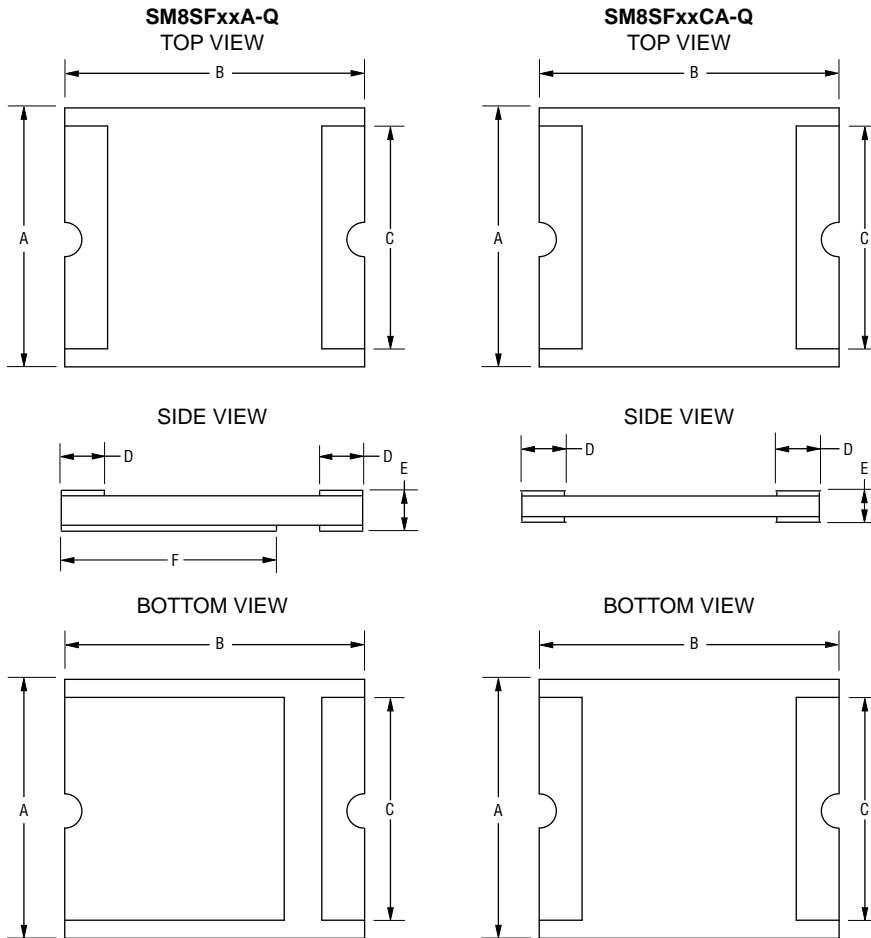


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# SM8SF-Q Transient Voltage Suppressor Diode Series

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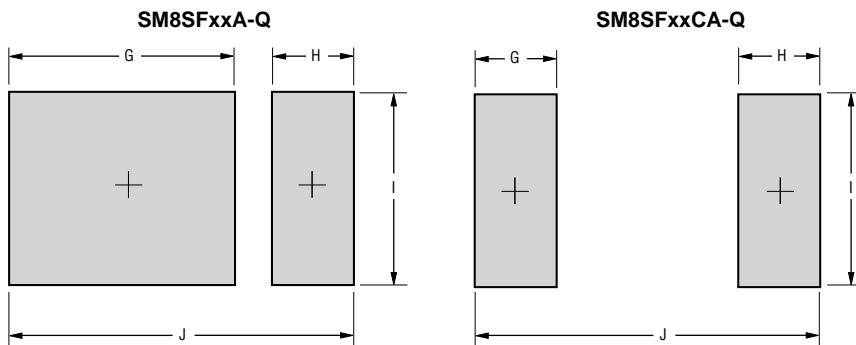
## Product Dimensions



Dimension	Value
A	$8.1 \pm 0.15$ ( $0.319 \pm 0.006$ )
B	$10.5 \pm 0.20$ ( $0.413 \pm 0.008$ )
C	$7.0 \pm 0.15$ ( $0.276 \pm 0.006$ )
D	$1.5 \pm 0.15$ ( $0.059 \pm 0.006$ )
E	$1.3 \pm 0.20$ ( $0.051 \pm 0.008$ )
F	$7.5 \pm 0.15$ ( $0.295 \pm 0.006$ )

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

## Recommended Footprint



Dim.	SM8SFxxA-Q	SM8SFxxCA-Q
G	$9.5$	$3.5$
(Min.)	( $0.374$ )	( $0.138$ )
H	$3.5$	$3.5$
(Min.)	( $0.138$ )	( $0.138$ )
I	$8.0$	$8.0$
(Min.)	( $0.315$ )	( $0.315$ )
J	$14.5$	$14.5$
(Ref.)	( $0.571$ )	( $0.571$ )

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

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# SM8SF-Q Transient Voltage Suppressor Diode Series



## 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

**SM8SF 33 CA - Q**

Package .....  
 SM8SF = 0.41 inch x 0.32 inch size

Working Peak Reverse Voltage .....  
 33 = 33 V<sub>RWM</sub> (Volts)

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

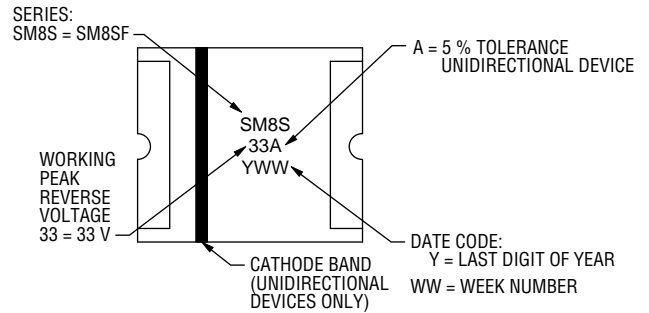
AEC-Q101 Suffix .....  
 Q = AEC-Q101 Compliant

## Environmental Specifications

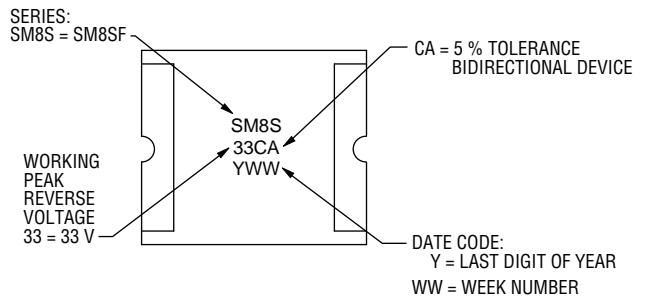
Moisture Sensitivity Level ..... 1  
 ESD Classification (HBM).....3B

## Typical Part Marking

### SM8SFxxA-Q



### SM8SFxxCA-Q



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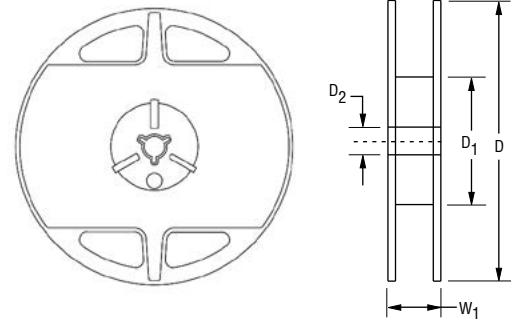
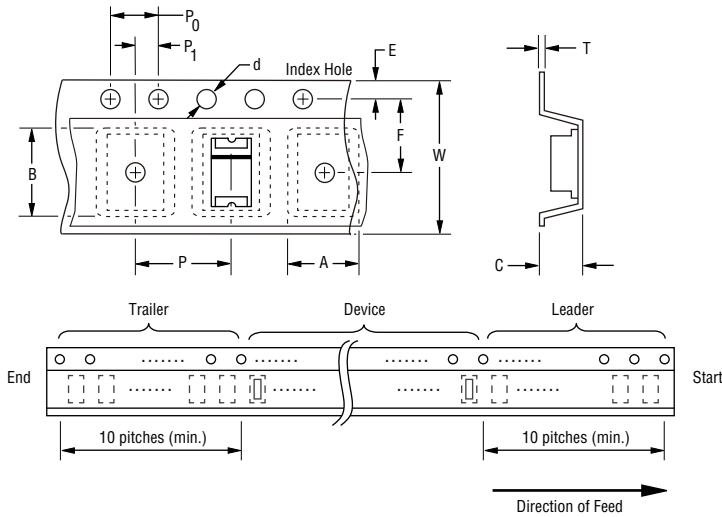
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# SM8SF-Q Transient Voltage Suppressor Diode Series

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## Packaging Information

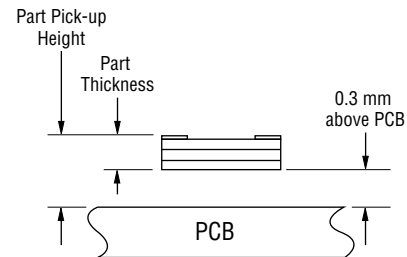
The product will be dispensed in tape and reel format (see diagram below).



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

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

Item	Symbol	SM8SF Series
Carrier Width	A	$\frac{8.35 \pm 0.10}{(0.329 \pm 0.004)}$
Carrier Length	B	$\frac{10.75 \pm 0.10}{(0.423 \pm 0.004)}$
Carrier Depth	C	$\frac{1.65 \pm 0.10}{(0.065 \pm 0.004)}$
Sprocket Hole	d	$\frac{1.55 \pm 0.05}{(0.061 \pm 0.002)}$
Reel Outside Diameter	D	$\frac{178 \pm 1.0}{(7.008 \pm 0.039)}$
Reel Inner Diameter	D <sub>1</sub>	$\frac{60 \pm 1.0}{(2.362 \pm 0.039)}$
Feed Hole Diameter	D <sub>2</sub>	$\frac{13.5 \pm 0.50}{(0.531 \pm 0.02)}$
Sprocket Hole Position	E	$\frac{1.75 \pm 0.10}{(0.069 \pm 0.004)}$
Punch Hole Position	F	$\frac{5.50 \pm 0.10}{(0.217 \pm 0.004)}$
Punch Hole Pitch	P	$\frac{12.00 \pm 0.10}{(0.472 \pm 0.004)}$
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	$\frac{0.40}{(0.016)}$ MAX.
Tape Width	W	$\frac{16.00 \pm 0.30}{(0.630 \pm 0.012)}$
Reel Width	W <sub>1</sub>	$\frac{18.1 \pm 1.2}{(0.713 \pm 0.047)}$
Quantity per Reel	--	750



Recommended pick-up height: The bottom of the device should be 0.3 mm above the PCB.

09/19

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-  Alternative Solution
-  Excess Inventory Management