



**THE DATASHEET OF
SM8S33CA-Q**





Features

- Maximum Peak Power Dissipation: 6600 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

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.

Additional Information

Click these links for more information:



Absolute Maximum Ratings (@ T_A = 25 °C Unless Otherwise Noted)

Parameter	Symbol	Value	Unit
Maximum Peak Pulse Power Dissipation (10/1000 μs)	P _{PK}	6600	W
Maximum Peak Pulse Power Dissipation (10/10000 μs)	P _{PK}	5200	W
Power Dissipation with Infinite Heatsink (T _C = 25 °C)	P _D	8	W
Operating Temperature Range	T _J	-55 to +175	°C
Storage Temperature Range	T _{STG}	-55 to +175	°C

Electrical Characteristics (@ T_A = 25 °C Unless Otherwise Noted)

Unidirectional Device Part No.	Bidirectional Device Part No.	Breakdown Voltage V _{BR} (Volts)			Working Peak Reverse Voltage V _{RWM} (V)	Maximum Reverse Leakage @ V _{RWM} I _R (μA)	Maximum Reverse Voltage @ I _{RSM} V _{RSM} (V)	Maximum Reverse Surge Current I _{RSM} (A)
		Min.	Max.	@ I _T (mA)				
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



WARNING Cancer and Reproductive Harm - 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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SM8S-Q Transient Voltage Suppressor Diode Series

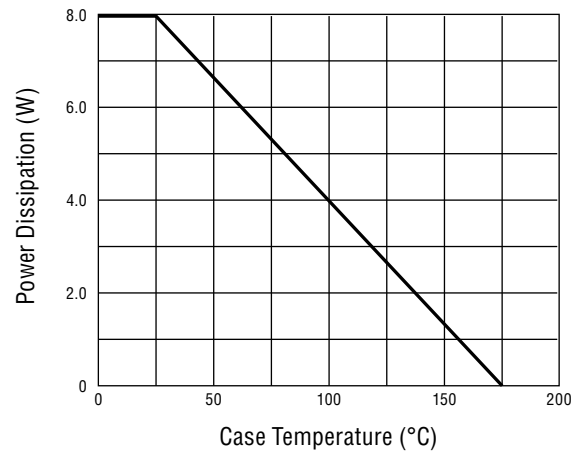


Performance Graphs

Load Dump Power Characteristics



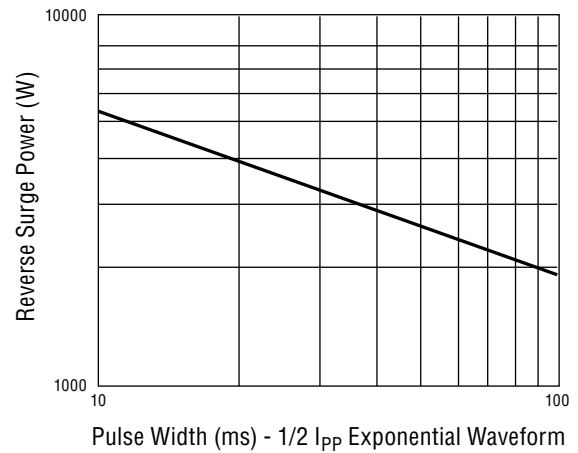
Steady State Power Dissipation



Pulse Waveform



Maximum Non-Repetitive Surge Current



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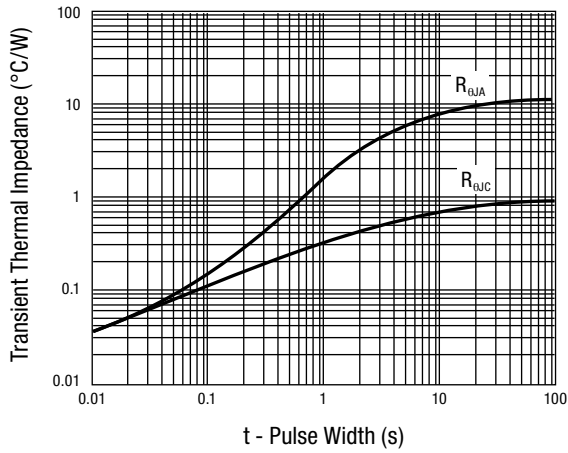
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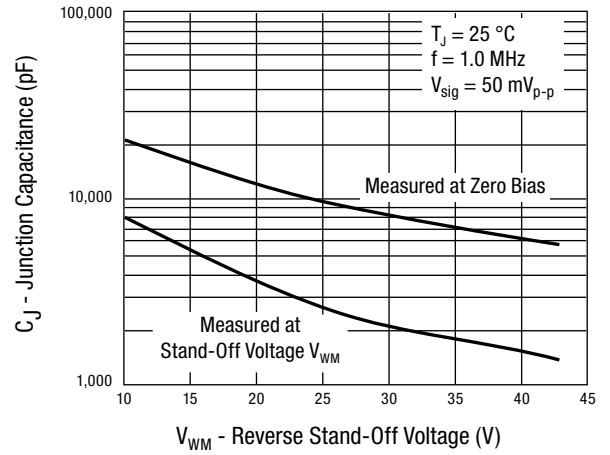


Performance Graphs

Typical Transient Thermal Impedance



Typical Junction Capacitance



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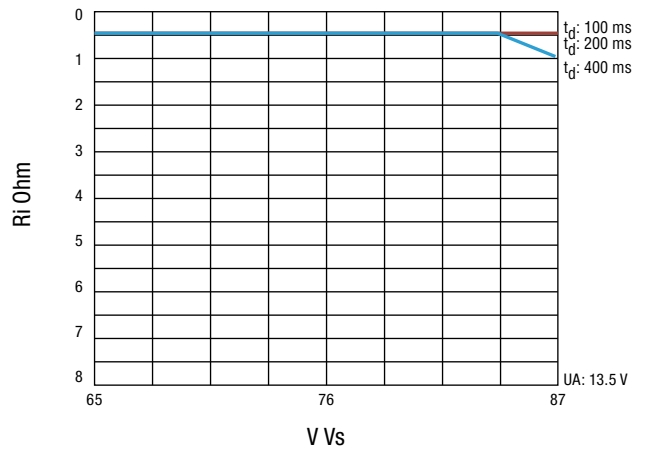


Performance Graphs

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



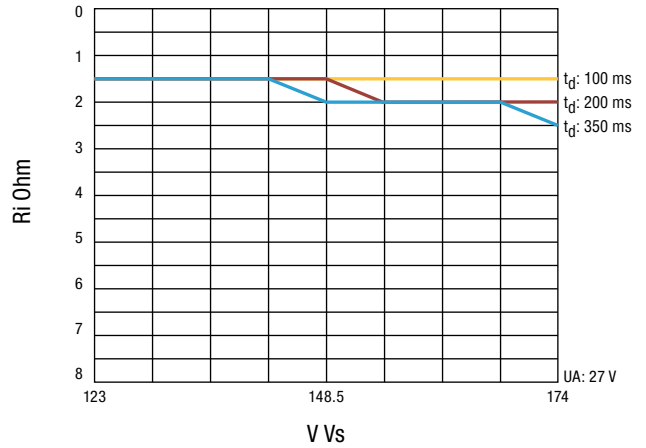
ISO 7637-2 5a (1 Pulse) - SM8S24A



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



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



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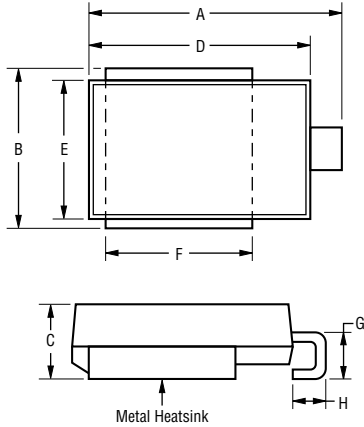
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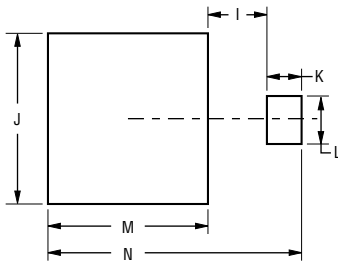
Product Dimensions



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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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

Typical Part Marking



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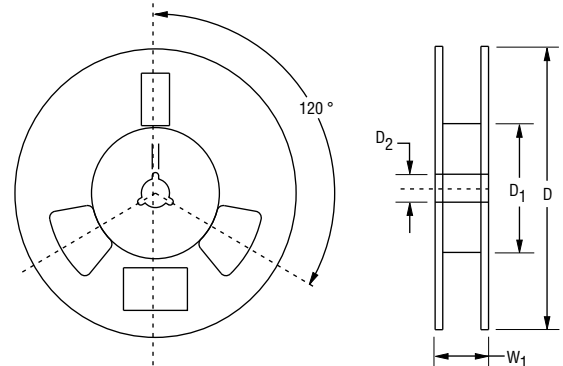
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Packaging Information

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	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 ₁	$\frac{60.0}{(2.362)}$ MIN.
Feed Hole Diameter	D ₂	$\frac{13.0 + 0.50 / - 0.20}{(0.512 + 0.020 / - 0.008)}$
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 ₀	$\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$
Embossment Center	P ₁	$\frac{2.00 \pm 0.10}{(0.079 \pm 0.004)}$
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 ₁	$\frac{30.4}{(1.197)}$ MAX.
Quantity per Reel	--	750

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