



New Product

SM5S Series

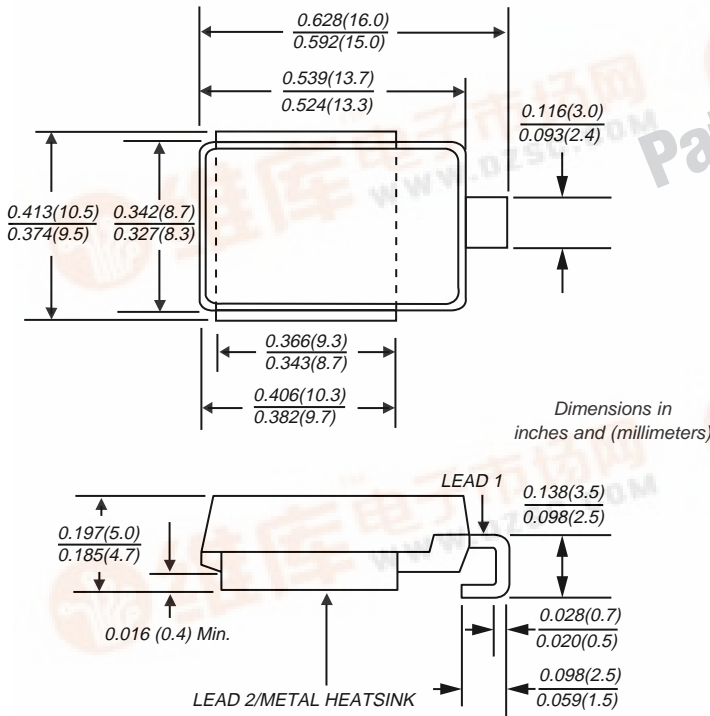
Vishay Semiconductors  
formerly General Semiconductor



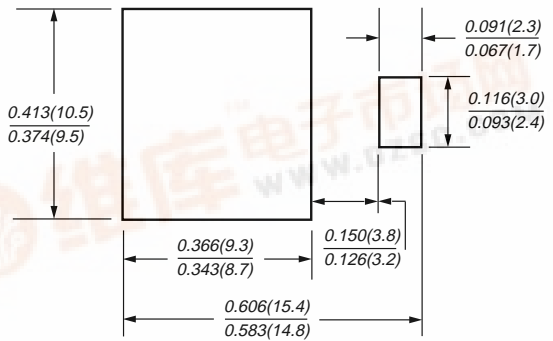
## Surface Mount Automotive Transient Voltage Suppressors

**Stand-off Voltage** 10 to 36V  
**Peak Pulse Power** 3600W (10/1000μs)  
2800W (10/10,000μs)

DO-218AB



Mounting Pad Layout



\*Patent #s:  
4,980,315  
5,166,769  
5,278,095

### Mechanical Data

**Case:** Molded plastic body, surface mount with heatsink integrally mounted in the encapsulation

**Terminals:** Plated, solderable per MIL-STD-750, Method 2026

**Polarity:** Heatsink is anode

**Mounting Position:** Any

**Weight:** 0.091 oz., 2.58 g

**Packaging codes/options:**

2D/750 per 13" Reel (16mm Tape),  
anode towards sprocket hole, 4.5K/box

2E/750 per 13" Reel (16mm Tape),  
cathode towards sprocket hole, 4.5K/box

### Features

- Ideally suited for load dump protection
- Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- High temperature stability due to unique oxide passivation and patented PAR<sup>®</sup> construction
- Integrally molded heatsink provides a very low thermal resistance for maximum heat dissipation
- Low leakage current at T<sub>J</sub> = 175°C
- High temperature soldering guaranteed: 260°C for 10 seconds at terminals
- Meets ISO7637-2 surge spec.
- Low forward voltage drop

### Maximum Ratings and Thermal Characteristics (T<sub>C</sub> = 25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak pulse power dissipation with 10/1000μs waveform 10/10,000μs waveform	P <sub>PPM</sub>	3600 2800	W
Steady state power dissipation	P <sub>D</sub>	5.0	W
Peak pulse current with a 10/1000μs waveform <sup>(1)</sup>	I <sub>PPM</sub>	See Table 1	A
Peak forward surge current, 8.3ms single half sine-wave	I <sub>FSM</sub>	500	A
Typical thermal resistance junction to case	R <sub>θJC</sub>	1.0	°C/W
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +175	°C

Notes: (1) Non-repetitive current pulse derated above T<sub>A</sub> = 25°C

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## Electrical Characteristics (T<sub>c</sub> = 25°C unless otherwise noted)

Device Type	Breakdown Voltage V <sub>(BR)</sub> (V)		Test Current I <sub>T</sub> (mA)	Stand-off Voltage V <sub>WM</sub> (V)	Maximum Reverse Leakage at V <sub>WM</sub> I <sub>D</sub> (μA)	Maximum Reverse Leakage at V <sub>WM</sub> T <sub>c</sub> = 175°C I <sub>D</sub> (μA)	Max. Peak Pulse Current at 10/1000μs Waveform (A)	Maximum Clamping Voltage at I <sub>PPM</sub> V <sub>c</sub> (V)
	Min.	Max.						
SM5S10	11.1	13.6	5.0	10.0	15	250	191	18.8
SM5S10A	11.1	12.3	5.0	10.0	15	250	212	17.0
SM5S11	12.2	14.9	5.0	11.0	10	150	179	20.1
SM5S11A	12.2	13.5	5.0	11.0	10	150	198	18.2
SM5S12	13.3	16.3	5.0	12.0	10	150	164	22.0
SM5S12A	13.3	14.7	5.0	12.0	10	150	181	19.9
SM5S13	14.4	17.6	5.0	13.0	10	150	151	23.8
SM5S13A	14.4	15.9	5.0	13.0	10	150	167	21.5
SM5S14	15.6	19.1	5.0	14.0	10	150	140	25.8
SM5S14A	15.6	17.2	5.0	14.0	10	150	155	23.2
SM5S15	16.7	20.4	5.0	15.0	10	150	134	26.9
SM5S15A	16.7	18.5	5.0	15.0	10	150	148	24.4
SM5S16	17.8	21.8	5.0	16.0	10	150	125	28.8
SM5S16A	17.8	19.7	5.0	16.0	10	150	138	26.0
SM5S17	18.9	23.1	5.0	17.0	10	150	118	30.5
SM5S17A	18.9	20.9	5.0	17.0	10	150	130	27.6
SM5S18	20.0	24.4	5.0	18.0	10	150	112	32.2
SM5S18A	20.0	22.1	5.0	18.0	10	150	123	29.2
SM5S20	22.2	27.1	5.0	20.0	10	150	101	35.8
SM5S20A	22.2	24.5	5.0	20.0	10	150	111	32.4
SM5S22	24.4	29.8	5.0	22.0	10	150	91	39.4
SM5S22A	24.4	26.9	5.0	22.0	10	150	101	35.5
SM5S24	26.7	32.6	5.0	24.0	10	150	84	43.0
SM5S24A	26.7	29.5	5.0	24.0	10	150	93	38.9
SM5S26	28.9	35.3	5.0	26.0	10	150	77	46.6
SM5S26A	28.9	31.9	5.0	26.0	10	150	86	42.1
SM5S28	31.1	38.0	5.0	28.0	10	150	72	50.1
SM5S28A	31.1	34.4	5.0	28.0	10	150	79	45.4
SM5S30	33.3	40.7	5.0	30.0	10	150	67	53.5
SM5S30A	33.3	36.8	5.0	30.0	10	150	74	48.4
SM5S33	36.7	44.9	5.0	33.0	10	150	61	59.0
SM5S33A	36.7	40.6	5.0	33.0	10	150	68	53.3
SM5S36	40.0	48.9	5.0	36.0	10	150	56	64.3
SM5S36A	40.0	44.2	5.0	36.0	10	150	62	58.1

**Note:** For all types maximum V<sub>F</sub> = 2.0V at I<sub>F</sub> = 100A measured on 8.3ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum

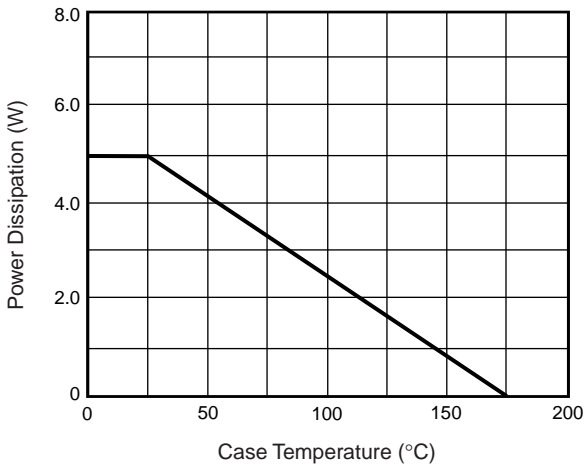


# SM5S Series

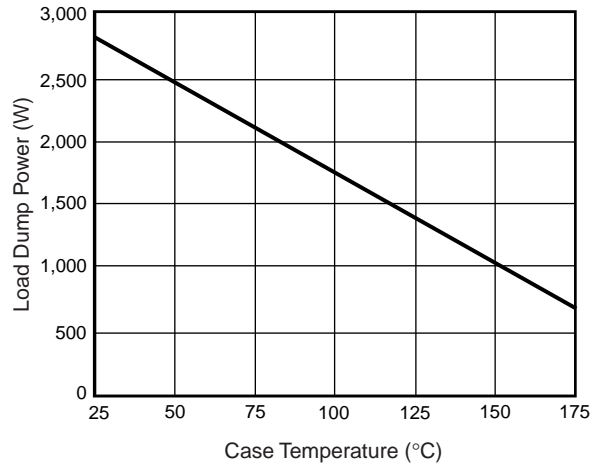
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## Ratings and Characteristic Curves ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

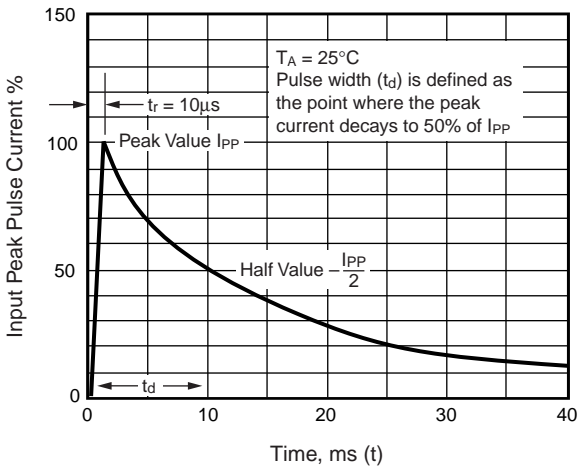
**Power Derating Curve**



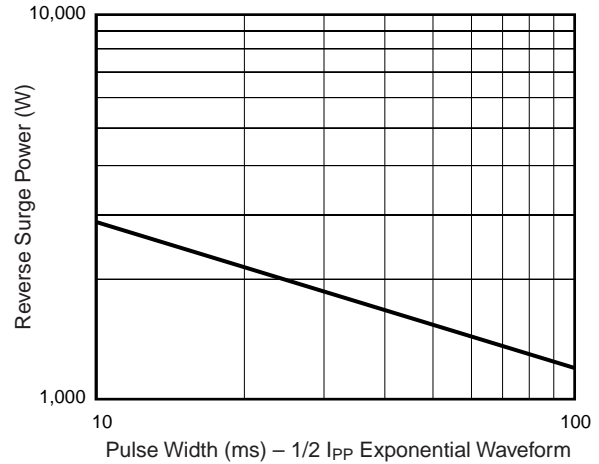
**Load Dump Power Characteristics (10ms Exponential Waveform)**



**Pulse Waveform**



**Reverse Power Capability**



**Typical Transient Thermal Impedance**

