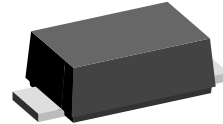


## Surface Mount ESD Protection Diodes

### Features

- For surface mounted applications
- Low-profile package
- Optimized for LAN protection applications
- Ideal for ESD protection of data lines in accordance with IEC 1000-4-2 (IEC801-2)
- Ideal for EFT protection of data lines in accordance with IEC 1000-4-4 (IEC801-4)
- IEC 1000-4-2 (ESD) 15 kV (air) 8 kV (contact)  
IEC 1000-4-4 (EFT) 40 A ( $t_p = 5/50$  ns)  
IEC 1000-4-5 (Lightning) 24 A ( $t_p = 8/20$   $\mu$ s)
- Low incremental surge resistance, excellent clamping capability
- 200 W peak pulse power capability with a 10/1000  $\mu$ s waveform, repetition rate (duty cycle): 0.01 %
- Very fast response time
- High temperature soldering guaranteed: 260 °C/ 10 seconds at terminals



17249

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

**Polarity:** The band denotes the cathode, which is positive with respect to the anode under normal TVS operation

**Mounting Position:** Any

**Weight:** approx. 0.00035 oz, 0.01g

**Packaging Codes/Options:**

G1/10 K per 13 " reel (8 mm tape), 50 K/box

G2/3 K per 7 " reel (8 mm tape), 30 K/box

### Mechanical Data

**Case:** JEDEC DO-219-AB (SMF) Plastic case

### Absolute Maximum Ratings

Ratings at 25 °C, ambient temperature unless otherwise specified

Parameter	Test condition	Symbol	Value	Unit
Peak pulse power dissipation	10/1000 $\mu$ s waveform <sup>1)</sup>	$P_{PPM}$	200	W
	8/20 $\mu$ s waveform <sup>1)</sup>	$P_{PPM}$	1000	W
Peak pulse current	10/1000 $\mu$ s waveform <sup>1)</sup>	$I_{PPM}$	next Table	A
Peak forward surge current	8.3 ms single half sine-wave	$I_{FSM}$	20	A

<sup>1)</sup> Non-repetitive current pulse and derated above  $T_A = 25$  °C

### Maximum Thermal Resistance

Ratings at 25 °C, ambient temperature unless otherwise specified

Parameter	Symbol	Value	Unit
Thermal resistance <sup>2)</sup>	$R_{thJA}$	180	K/W
Operation junction and storage temperature range	$T_{stg}, T_J$	- 55 to + 150	°C

<sup>2)</sup> Mounted on epoxy substrate with 3 x 3 mm, cu pads ( $\geq 40$   $\mu$ m thick)

# SMF5.0A to SMF51A

Vishay Semiconductors



## Electrical Characteristics

Ratings at 25 °C ambient temperature unless otherwise specified.  $V_F = 3.5$  V at  $I_F = 12$  A (uni-directional only)

Partnumber	Marking Code UNI	Breakdown Voltage <sup>1)</sup>	Test Current	Stand-off Voltage	Maximum Reverse Leakage	Maximum Peak Pulse Surge Current <sup>2,3)</sup>	Maximum Clamping Voltage
		$V_{(BR)}$	@ $I_T$	$V_{WM}$	@ $V_{WM}$ $I_D$	$I_{PPM}$	@ $I_{PPM}$ $V_C$
		V	mA	V	μA	A	V
		min					
SMF5.0A	AE	6.40	10	5.0	400	21.7	9.2
SMF6.0A	AG	6.67	10	6.0	400	19.4	10.3
SMF6.5A	AK	7.22	10	6.5	250	17.9	11.2
SMF7.0A	AM	7.78	10	7.0	100	16.7	12.0
SMF7.5A	AP	8.33	1.0	7.5	50	15.5	12.9
SMF8.0A	AR	8.89	1.0	8.0	25	14.7	13.6
SMF8.5A	AT	9.44	1.0	8.5	10	13.9	14.4
SMF9.0A	AV	10.0	1.0	9.0	5.0	13.5	15.4
SMF10A	AX	11.1	1.0	10	2.5	11.8	17.0
SMF11A	AZ	12.2	1.0	11	2.5	11.0	18.2
SMF12A	BE	13.3	1.0	12	2.5	10.1	19.9
SMF13A	BG	14.4	1.0	13	1.0	9.3	21.5
SMF14A	BK	15.6	1.0	14	1.0	8.6	23.2
SMF15A	BM	16.7	1.0	15	1.0	8.2	24.4
SMF16A	BP	17.8	1.0	16	1.0	7.7	26.0
SMF17A	BR	18.9	1.0	17	1.0	7.2	27.6
SMF18A	BT	20.0	1.0	18	1.0	5.8	29.2
SMF20A	BV	22.2	1.0	20	1.0	6.2	32.4
SMF22A	BX	24.4	1.0	22	1.0	5.6	35.5
SMF24A	BZ	26.7	1.0	24	1.0	5.1	38.9
SMF26A	CE	28.9	1.0	26	1.0	4.8	42.1
SMF28A	CG	31.1	1.0	28	1.0	4.4	45.4
SMF30A	CK	33.3	1.0	30	1.0	4.1	48.4
SMF33A	CM	36.7	1.0	33	1.0	3.8	53.3
SMF36A	CP	40.0	1.0	36	1.0	3.4	58.1
SMF40A	CR	44.4	1.0	40	1.0	3.1	64.5
SMF43A	CT	47.8	1.0	43	1.0	2.9	69.4
SMF45A	CV	50.0	1.0	45	1.0	2.8	72.7
SMF48A	CX	53.3	1.0	48	1.0	2.6	77.4
SMF51A	CZ	56.7	1.0	51	1.0	2.4	82.4

<sup>1)</sup> Pulse test  $t_p \leq 5.0$  ms

<sup>2)</sup> Surge current waveform 10/1000 μs

<sup>3)</sup> All terms and symbols are consistent with ANSI/IEEE C62.35

## Typical Characteristics ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)

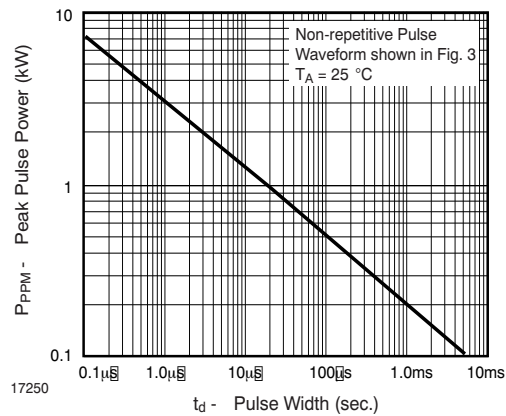


Figure 1. Peak Pulse Power Rating

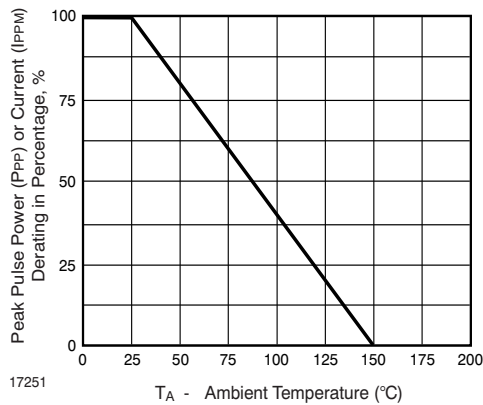


Figure 2. Pulse Derating Curve

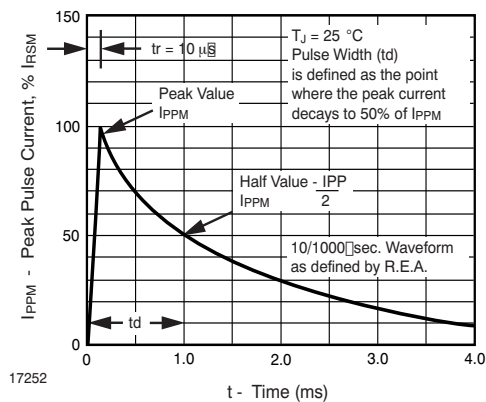


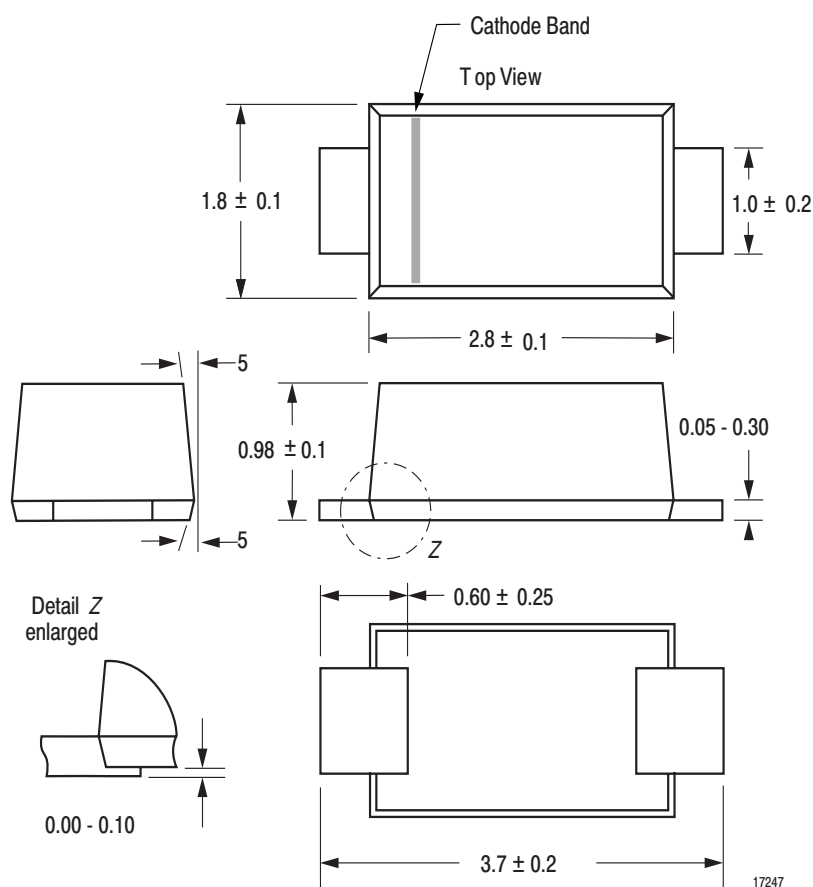
Figure 3. Pulse Waveform

# SMF5.0A to SMF51A

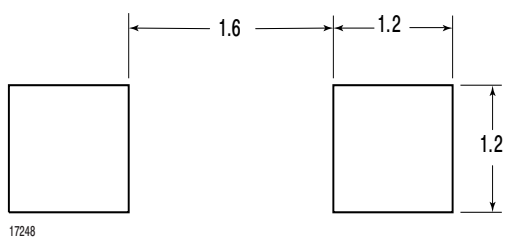
Vishay Semiconductors



## Package Dimensions in mm



## Mounting Pad Layout





## Ozone Depleting Substances Policy Statement

It is the policy of **Vishay Semiconductor GmbH** to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

**Vishay Semiconductor GmbH** has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

**Vishay Semiconductor GmbH** can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

### **We reserve the right to make changes to improve technical design and may do so without further notice.**

Parameters can vary in different applications. All operating parameters must be validated for each customer application by the customer. Should the buyer use Vishay Semiconductors products for any unintended or unauthorized application, the buyer shall indemnify Vishay Semiconductors against all claims, costs, damages, and expenses, arising out of, directly or indirectly, any claim of personal damage, injury or death associated with such unintended or unauthorized use.

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