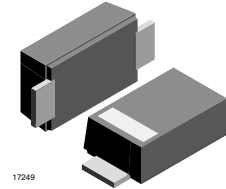


## Surface Mount ESD Protection Diodes

### Features

- For surface mounted applications
- Low-profile package
- Optimized for LAN protection applications
- Ideal for ESD protection of data lines in accordance with IEC 61000-4-2 (IEC 801-2)
- Ideal for EFT protection of data lines in accordance with IEC 61000-4-4 (IEC 801-4)
- IEC 61000-4-2 (ESD) 15 kV (air) 8 kV (contact)
- 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 s at terminals
- AEC Q101 qualified
- Lead (Pb)-free component
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21



### Mechanical Data

**Case:** JEDEC DO-219AB (SMF<sup>®</sup>) plastic case

**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. 15 mg

### Ordering Information/Packaging Codes

SMF5V0A-GSxx  
 GS08 = 3K per 7" reel (8 mm tape)  
 GS18 = 10K per 13" reel (8 mm tape)  
 Part number

SMF5V0A-M-xx  
 08 = 3K per 7" reel (8 mm tape)  
 18 = 10K per 13" reel (8 mm tape)  
 Environmental suffix -M- defines halogen-free  
 Part number

### Absolute Maximum Ratings

$T_{amb} = 25\text{ °C}$ , unless otherwise specified

Parameter	Test conditions	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

#### Note

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

# SMF5V0A to SMF51A



Vishay Semiconductors

## Thermal Characteristics

$T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified

Parameter	Test conditions	Symbol	Value	Unit
Thermal resistance <sup>1)</sup>		$R_{thJA}$	180	K/W
Operating junction and storage temperature range		$T_{stg}, T_J$	- 55 to + 150	$^{\circ}\text{C}$

### Note

<sup>1)</sup> Mounted on epoxy glass PCB with 3 x 3 mm, Cu pads ( $\geq 40\text{ }\mu\text{m}$  thick)

## Electrical Characteristics

Ratings at  $25\text{ }^{\circ}\text{C}$ , ambient temperature unless otherwise specified.  $V_F = 3.5\text{ V}$  at  $I_F = 12\text{ A}$

Partnumber	Marking code	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	Junction capacitance
		$V_{(BR)}$	at $I_T$	$V_{WM}$	at $V_{WM}$ $I_D$	$I_{PPM}$	at $I_{PPM}$ $V_C$	$C_j$ at $V_R = 0\text{ V}$ , $f = 1\text{ MHz}$
		V	mA	V	$\mu\text{A}$	A	V	pF
		min.						typ.
SMF5V0A	AE	6.40	10	5.0	400	21.7	9.2	1030
SMF6V0A	AG	6.67	10	6.0	400	19.4	10.3	1010
SMF6V5A	AK	7.22	10	6.5	250	17.9	11.2	850
SMF7V0A	AM	7.78	10	7.0	100	16.7	12.0	750
SMF7V5A	AP	8.33	1.0	7.5	50	15.5	12.9	730
SMF8V0A	AR	8.89	1.0	8.0	25	14.7	13.6	670
SMF8V5A	AT	9.44	1.0	8.5	10	13.9	14.4	660
SMF9V0A	AV	10.0	1.0	9.0	5.0	13.5	15.4	620
SMF10A	AX	11.1	1.0	10	2.5	11.8	17.0	570
SMF11A	AZ	12.2	1.0	11	2.5	11.0	18.2	460
SMF12A	BE	13.3	1.0	12	2.5	10.1	19.9	440
SMF13A	BG	14.4	1.0	13	1.0	9.3	21.5	420
SMF14A	BK	15.6	1.0	14	1.0	8.6	23.2	370
SMF15A	BM	16.7	1.0	15	1.0	8.2	24.4	350
SMF16A	BP	17.8	1.0	16	1.0	7.7	26.0	340
SMF17A	BR	18.9	1.0	17	1.0	7.2	27.6	310
SMF18A	BT	20.0	1.0	18	1.0	5.8	29.2	305
SMF20A	BV	22.2	1.0	20	1.0	6.2	32.4	207
SMF22A	BX	24.4	1.0	22	1.0	5.6	35.5	265
SMF24A	BZ	26.7	1.0	24	1.0	5.1	38.9	240
SMF26A	CE	28.9	1.0	26	1.0	4.8	42.1	225
SMF28A	CG	31.1	1.0	28	1.0	4.4	45.4	210
SMF30A	CK	33.3	1.0	30	1.0	4.1	48.4	205
SMF33A	CM	36.7	1.0	33	1.0	3.8	53.3	190
SMF36A	CP	40.0	1.0	36	1.0	3.4	58.1	180
SMF40A	CR	44.4	1.0	40	1.0	3.1	64.5	165
SMF43A	CT	47.8	1.0	43	1.0	2.9	69.4	160
SMF45A	CV	50.0	1.0	45	1.0	2.8	72.7	155
SMF48A	CX	53.3	1.0	48	1.0	2.6	77.4	150
SMF51A	CZ	56.7	1.0	51	1.0	2.4	82.4	145

### Notes

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

<sup>2)</sup> Surge current waveform 10/1000  $\mu\text{s}$

<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

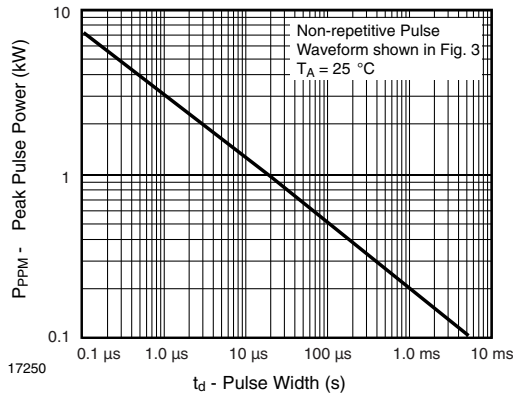


Figure 1. Peak Pulse Power Rating

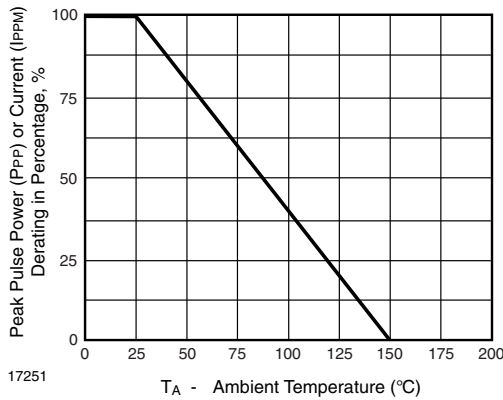


Figure 2. Pulse Derating Curve

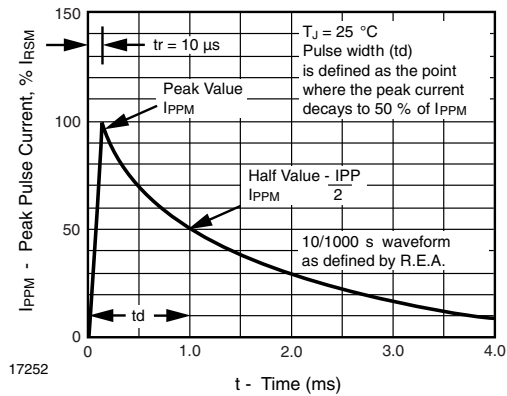


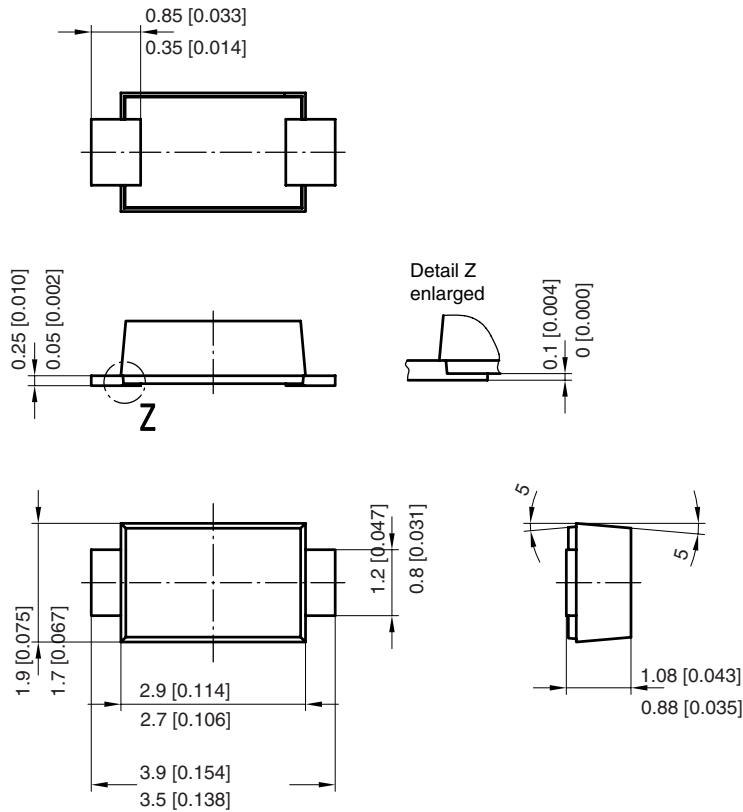
Figure 3. Pulse Waveform

# SMF5V0A to SMF51A

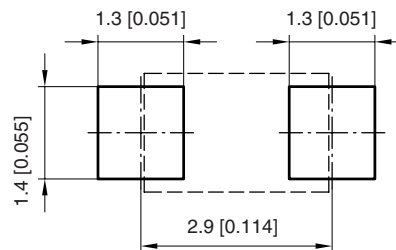


Vishay Semiconductors

Package Dimensions in millimeters (inches):

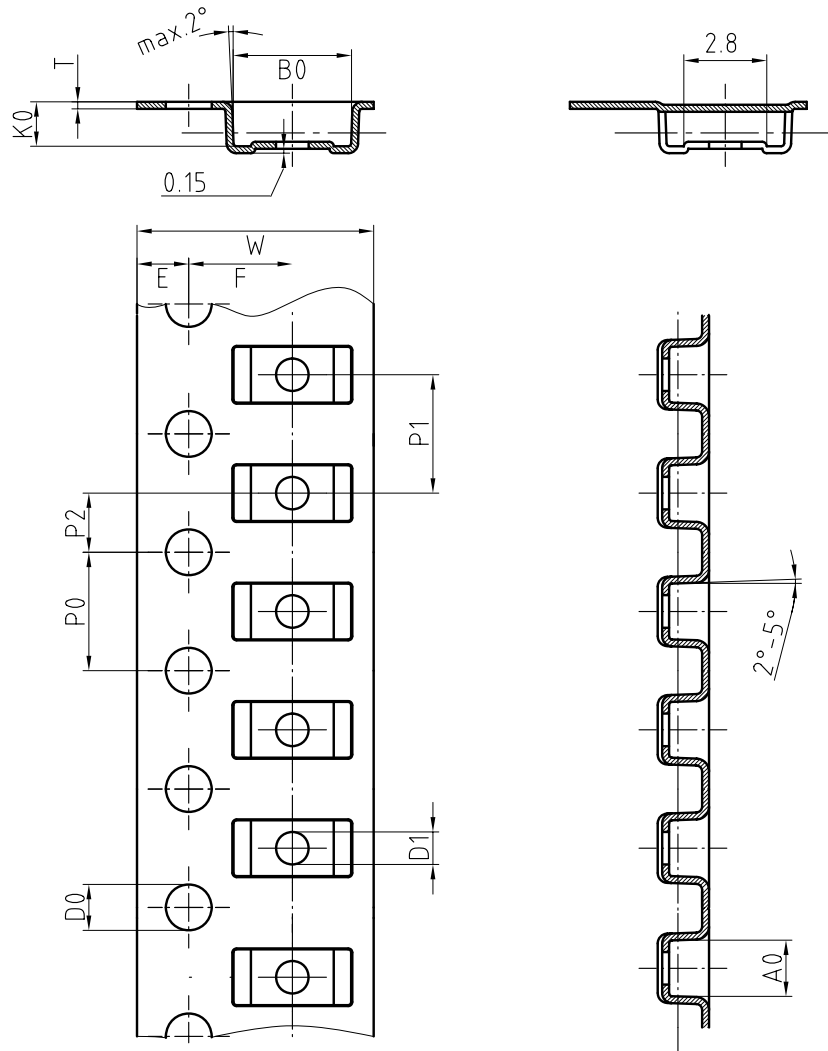


foot print recommendation:



Created - Date: 15. February 2005  
Rev. 3 - Date: 13. March 2007  
Document no.:S8-V-3915.01-001 (4)  
17247

## Blisertape Dimensions in millimeters:



Mat:	A0	B0	K0	W	T	P0	P2	P1	D0	D1	E	F
PS	1.9	4.0	1.5	8.0	0.235	4.0	2.0	4.0	1.5	1	1.75	3.5

18513

### 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.

Vishay Semiconductor GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany



## Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.