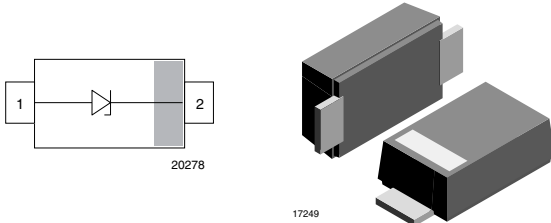


## Surface Mount ESD Protection Diodes



### MARKING (example only)



Bar = cathode marking  
 Y = type code (see table below)  
 X = date code

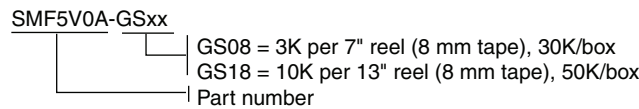
### FEATURES

- 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)
- ESD-protection acc. IEC 61000-4-2  
 ± 30 kV contact discharge  
 ± 30 kV air discharge
- 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
- e3 - Sn
- AEC-Q101 qualified
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC



**RoHS**  
COMPLIANT

### ORDERING INFORMATION



PACKAGE DATA						
DEVICE NAME	PACKAGE NAME	TYPE CODE	WEIGHT	MOLDING COMPOUND FLAMMABILITY RATING	MOISTURE SENSITIVITY LEVEL	SOLDERING CONDITIONS
SMF5V0A	SMF	AE	15 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	260 °C/10 s at terminals
SMF6V5A		AK				
SMF7V0A		AM				
SMF7V5A		AP				
SMF8V0A		AR				
SMF8V5A		AT				
SMF9V0A		AV				
SMF10A		AX				
SMF11A		AZ				
SMF12A		BE				
SMF13A		BG				
SMF14A		BK				
SMF15A		BM				
SMF16A		BP				
SMF17A		BR				
SMF18A		BT				
SMF20A		BV				
SMF22A		BX				
SMF24A		BZ				

# SMF5V0A to SMF51A



Vishay Semiconductors

Surface Mount ESD Protection  
Diodes

PACKAGE DATA						
DEVICE NAME	PACKAGE NAME	TYPE CODE	WEIGHT	MOLDING COMPOUND FLAMMABILITY RATING	MOISTURE SENSITIVITY LEVEL	SOLDERING CONDITIONS
SMF26A	SMF	CE	15 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	260 °C/10 s at terminals
SMF28A		CG				
SMF30A		CK				
SMF33A		CM				
SMF36A		CP				
SMF40A		CR				
SMF43A		CT				
SMF45A		CV				
SMF48A		CX				
SMF51A		CZ				

ABSOLUTE MAXIMUM RATINGS (T <sub>amb</sub> = 25 °C, unless otherwise specified)				
PARAMETER	TEST CONDITIONS	SYMBOL	VALUE	UNIT
Peak pulse current	t <sub>p</sub> = 10/1000 μs waveform acc. IEC 61000-4-5	I <sub>PPM</sub>	see "Electrical Characteristics"	A
Peak pulse power	t <sub>p</sub> = 10/1000 μs waveform acc. IEC 61000-4-5	P <sub>PP</sub>	200	W
	t <sub>p</sub> = 8/20 μs waveform acc. IEC 61000-4-5		1000	W
Peak forward surge current	8.3 ms single half sine-wave	I <sub>FSM</sub>	20	A
ESD immunity	Contact discharge acc. IEC 61000-4-2; 10 pulses	V <sub>ESD</sub>	± 30	kV
	Air discharge acc. IEC 61000-4-2; 10 pulses		± 30	kV
Thermal resistance	Mounted on epoxy glass PCB with 3 mm x 3 mm, Cu pads (≥ 40 μm thick)	R <sub>thJA</sub>	180	K/W
Forward clamping voltage	I <sub>F</sub> = 12 A	V <sub>F</sub>	3.5	V
Operating temperature	Junction temperature	T <sub>J</sub>	- 55 to + 150	°C
Storage temperature		T <sub>STG</sub>	- 55 to + 150	°C

ELECTRICAL CHARACTERISTICS (T <sub>amb</sub> = 25 °C, unless otherwise specified)								
PART NUMBER	REVERSE BREAKDOWN VOLTAGE at I <sub>T</sub> , t <sub>p</sub> ≤ 5 ms	TEST CURRENT	REVERSE WORKING VOLTAGE	REVERSE CURRENT at V <sub>RWM</sub>	MAXIMUM PULSE CURRENT at t <sub>p</sub> = 10/1000 s	REVERSE CLAMPING VOLTAGE at I <sub>PPM</sub>	CAPACITANCE at V <sub>R</sub> = 0 V, f = 1 MHz	PROTECTION PATHS
	V <sub>BR</sub> MIN. (V)	I <sub>T</sub> (mA)	V <sub>RWM</sub> (V)	I <sub>R</sub> (μA)	I <sub>PPM</sub> (A)	V <sub>C</sub> (V)	C <sub>D</sub> TYP. (pF)	N <sub>channel</sub>
SMF5V0A	6.40	10	5	400	21.7	9.2	1030	1
SMF6V0A	6.67	10	6	400	19.4	10.3	1010	1
SMF6V5A	7.22	10	6.5	250	17.9	11.2	850	1
SMF7V0A	7.78	10	7	100	16.7	12	750	1
SMF7V5A	8.33	1	7.5	50	15.5	12.9	730	1
SMF8V0A	8.89	1	8	25	14.7	13.6	670	1
SMF8V5A	9.44	1	8.5	10	13.9	14.4	660	1
SMF9V0A	10	1	9	5	13.5	15.4	620	1
SMF10A	11.1	1	10	2.5	11.8	17	570	1
SMF11A	12.2	1	11	2.5	11	18.2	460	1
SMF12A	13.3	1	12	2.5	10.1	19.9	440	1
SMF13A	14.4	1	13	1	9.3	21.5	420	1
SMF14A	15.6	1	14	1	8.6	23.2	370	1
SMF15A	16.7	1	15	1	8.2	24.4	350	1
SMF16A	17.8	1	16	1	7.7	26	340	1
SMF17A	18.9	1	17	1	7.2	27.6	310	1

ELECTRICAL CHARACTERISTICS ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)								
PART NUMBER	REVERSE BREAKDOWN VOLTAGE at $I_T$ , $t_p \leq 5\text{ ms}$	TEST CURRENT	REVERSE WORKING VOLTAGE	REVERSE CURRENT at $V_{RWM}$	MAXIMUM PEAK PULSE CURRENT $t_p = 10/1000\text{ s}$	REVERSE CLAMPING VOLTAGE at $I_{PPM}$	CAPACITANCE at $V_R = 0\text{ V}$ , $f = 1\text{ MHz}$	PROTECTION PATHS
	$V_{BR}\text{ MIN. (V)}$	$I_T\text{ (mA)}$	$V_{RWM}\text{ (V)}$	$I_R\text{ (}\mu\text{A)}$	$I_{PPM}\text{ (A)}$	$V_C\text{ (V)}$	$C_D\text{ TYP. (pF)}$	$N_{channel}$
SMF18A	20	1	18	1	5.8	29.2	305	1
SMF20A	22.2	1	20	1	6.2	32.4	207	1
SMF22A	24.4	1	22	1	5.6	35.5	265	1
SMF24A	26.7	1	24	1	5.1	38.9	240	1
SMF26A	28.9	1	26	1	4.8	42.1	225	1
SMF28A	31.1	1	28	1	4.4	45.4	210	1
SMF30A	33.3	1	30	1	4.1	48.4	205	1
SMF33A	36.7	1	33	1	3.8	53.3	190	1
SMF36A	40	1	36	1	3.4	58.1	180	1
SMF40A	44.4	1	40	1	3.1	64.5	165	1
SMF43A	47.8	1	43	1	2.9	69.4	160	1
SMF45A	50	1	45	1	2.8	72.7	155	1
SMF48A	53.3	1	48	1	2.6	77.4	150	1
SMF51A	56.7	1	51	1	2.4	82.4	145	1

**TYPICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

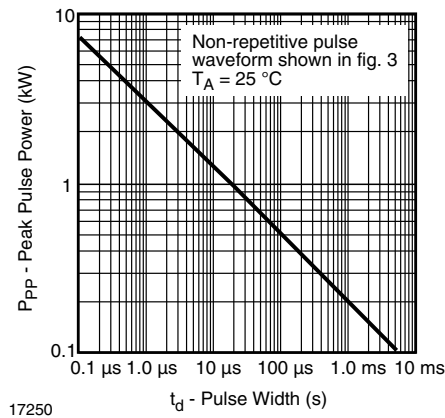


Fig. 1 - Peak Pulse Power Rating

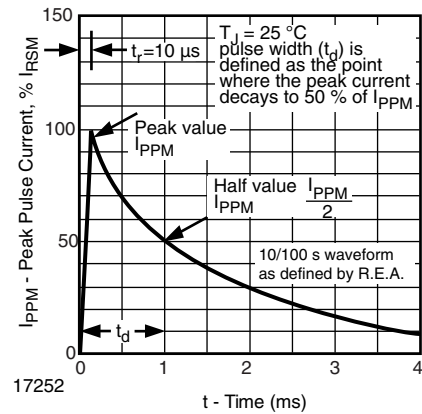


Fig. 3 - Pulse Waveform

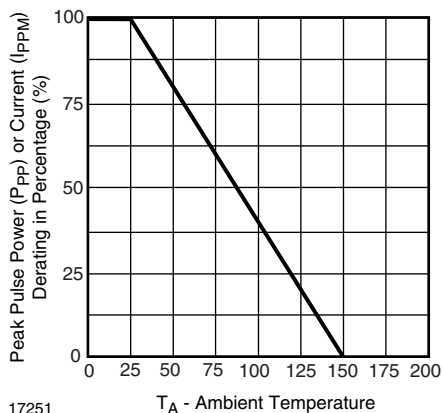


Fig. 2 - Pulse Derating Curve

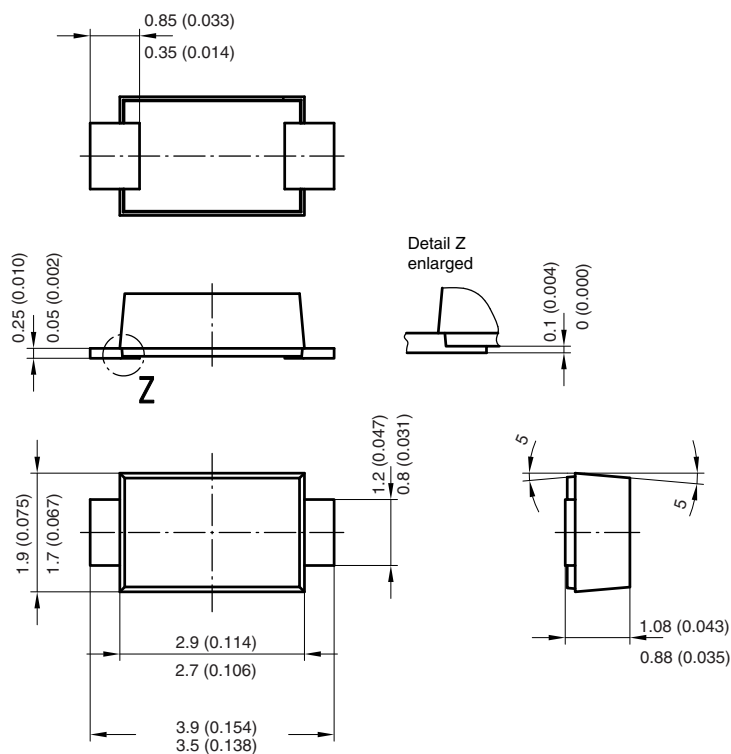
# SMF5V0A to SMF51A

Vishay Semiconductors

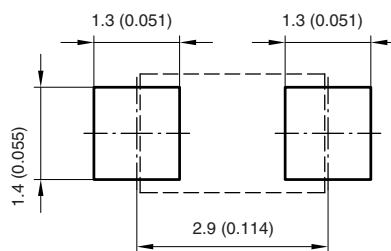
Surface Mount ESD Protection  
Diodes



## PACKAGE DIMENSIONS in millimeters (inches): **SMF**

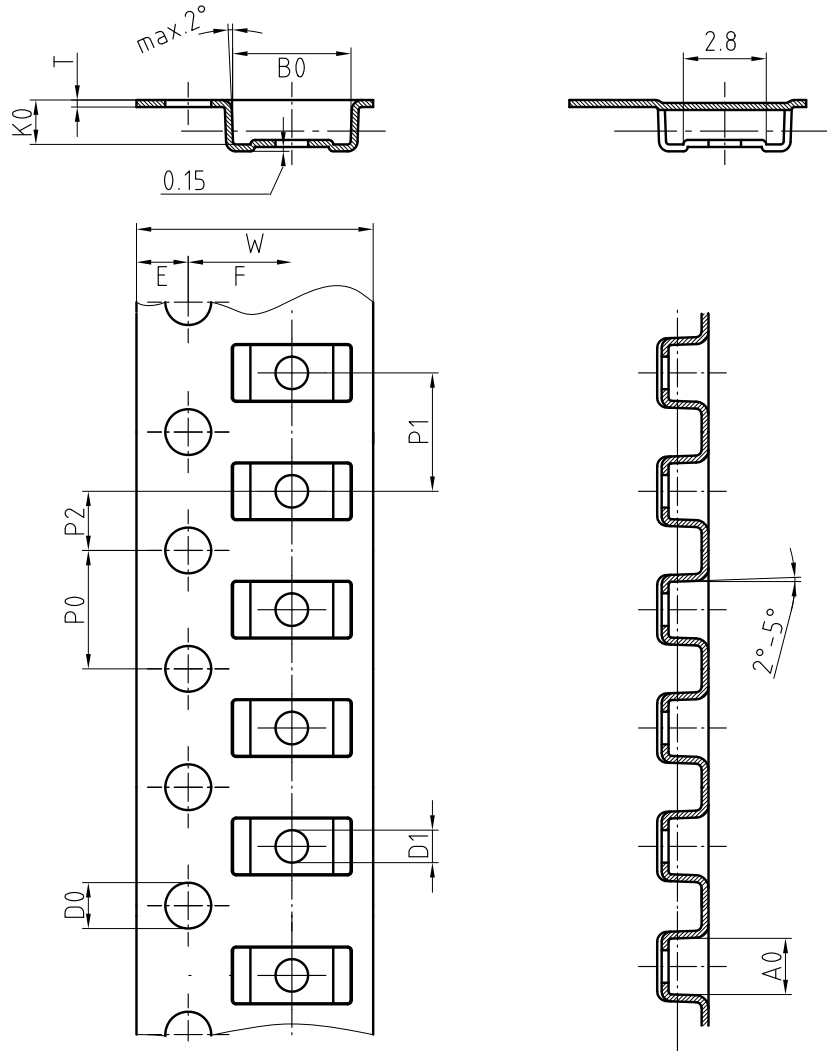


Foot print recommendation:



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

### BLISTERTAPE DIMENSIONS in millimeters (inches)



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

Document-No.: S8-V-3717.02-001 (3)

18513



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