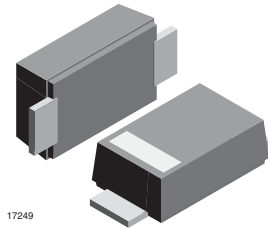
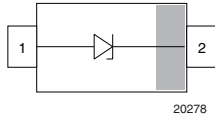
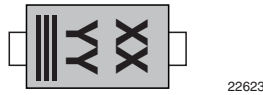


## Surface Mount ESD Protection Diodes



### MARKING (example only)



Bar = cathode marking

YY = type code (see table below)

XX = date code

### FEATURES

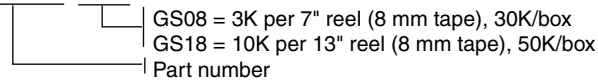
- For surface mounted applications
- Low-profile package
- Optimized for LAN protection applications
- Ideal for ESD protection of data lines in accordance with IEC 61000-4-2 (IEC 801-2)
- Ideal for EFT protection of data lines in accordance with IEC 61000-4-4 (IEC 801-4)
- ESD-protection acc. IEC 61000-4-2  
± 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

SMF5V0A-GSxx



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				



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 ( $T_{amb} = 25\text{ °C}$ , unless otherwise specified)				
PARAMETER	TEST CONDITIONS	SYMBOL	VALUE	UNIT
Peak pulse current	$t_p = 10/1000\ \mu\text{s}$ waveform acc. IEC 61000-4-5	$I_{PPM}$	see "Electrical Characteristics"	A
Peak pulse power	$t_p = 8/20\ \mu\text{s}$ waveform acc. IEC 61000-4-5	$P_{PP}$	1000	W
	$t_p = 10/1000\ \mu\text{s}$ waveform acc. IEC 61000-4-5		200	W
Peak forward surge current	8.3 ms single half sine-wave	$I_{FSM}$	20	A
ESD immunity	Contact discharge acc. IEC 61000-4-2; 10 pulses	$V_{ESD}$	$\pm 30$	kV
	Air discharge acc. IEC 61000-4-2; 10 pulses		$\pm 30$	kV
Thermal resistance	Mounted on epoxy glass PCB with 3 mm x 3 mm, Cu pads ( $\geq 40\ \mu\text{m}$ thick)	$R_{thJA}$	180	K/W
Forward clamping voltage	$I_F = 12\ \text{A}$	$V_F$	3.5	V
Operating temperature	Junction temperature	$T_J$	- 55 to + 150	°C
Storage temperature		$T_{STG}$	- 55 to + 150	°C

ELECTRICAL CHARACTERISTICS ( $T_{amb} = 25\text{ °C}$ , unless otherwise specified)								
PART NUMBER	REVERSE BREAKDOWN VOLTAGE at $I_T$ , $t_p \leq 5\ \text{ms}$	TEST CURRENT	REVERSE STAND-OFF VOLTAGE	REVERSE CURRENT at $V_{RWM}$	MAXIMUM PEAK PULSE CURRENT $t_p = 10/1000\ \mu\text{s}$	REVERSE CLAMPING VOLTAGE at $I_{PPM}$	CAPACITANCE at $V_R = 0\ \text{V}$ , $f = 1\ \text{MHz}$	PROTECTION PATHS
	$V_{BR}\ \text{MIN. (V)}$	$I_T\ \text{(mA)}$	$V_{RWM}\ \text{(V)}$	$I_R\ \text{(\mu A)}$	$I_{PPM}\ \text{(A)}$	$V_C\ \text{(V)}$	$C_D\ \text{TYP. (pF)}$	$N_{channel}$
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
SMF18A	20	1	18	1	5.8	29.2	305	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 STAND-OFF VOLTAGE	REVERSE CURRENT at $V_{RWM}$	MAXIMUM PEAK PULSE CURRENT $t_p = 10/1000\text{ }\mu\text{s}$	REVERSE CLAMPING VOLTAGE at $I_{PPM}$	CAPACITANCE at $V_R = 0\text{ V}, f = 1\text{ MHz}$	PROTECTION PATHS
	$V_{BR}\text{ MIN. (V)}$	$I_T\text{ (mA)}$	$V_{RWM}\text{ (V)}$	$I_R\text{ (}\mu\text{A)}$	$I_{PPM}\text{ (A)}$	$V_C\text{ (V)}$	$C_D\text{ TYP. (pF)}$	$N_{channel}$
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)

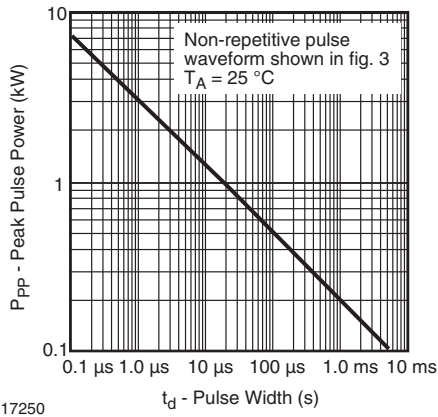


Fig. 1 - Peak Pulse Power Rating

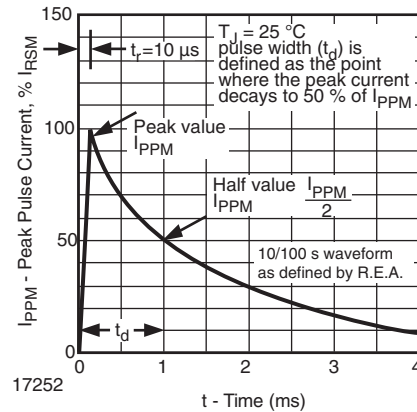


Fig. 3 - Pulse Waveform

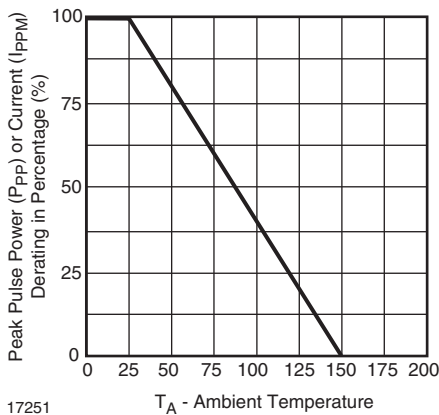
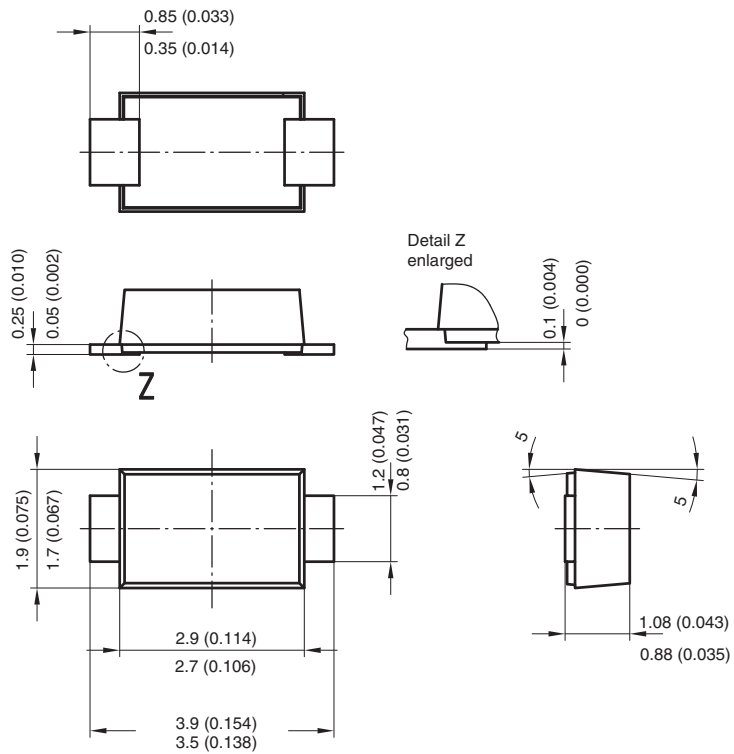


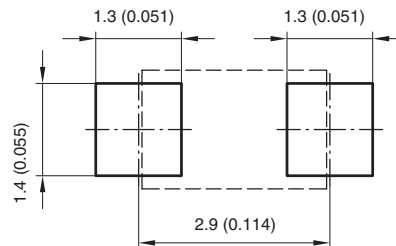
Fig. 2 - Pulse Derating Curve



## PACKAGE DIMENSIONS in millimeters (inches): SMF



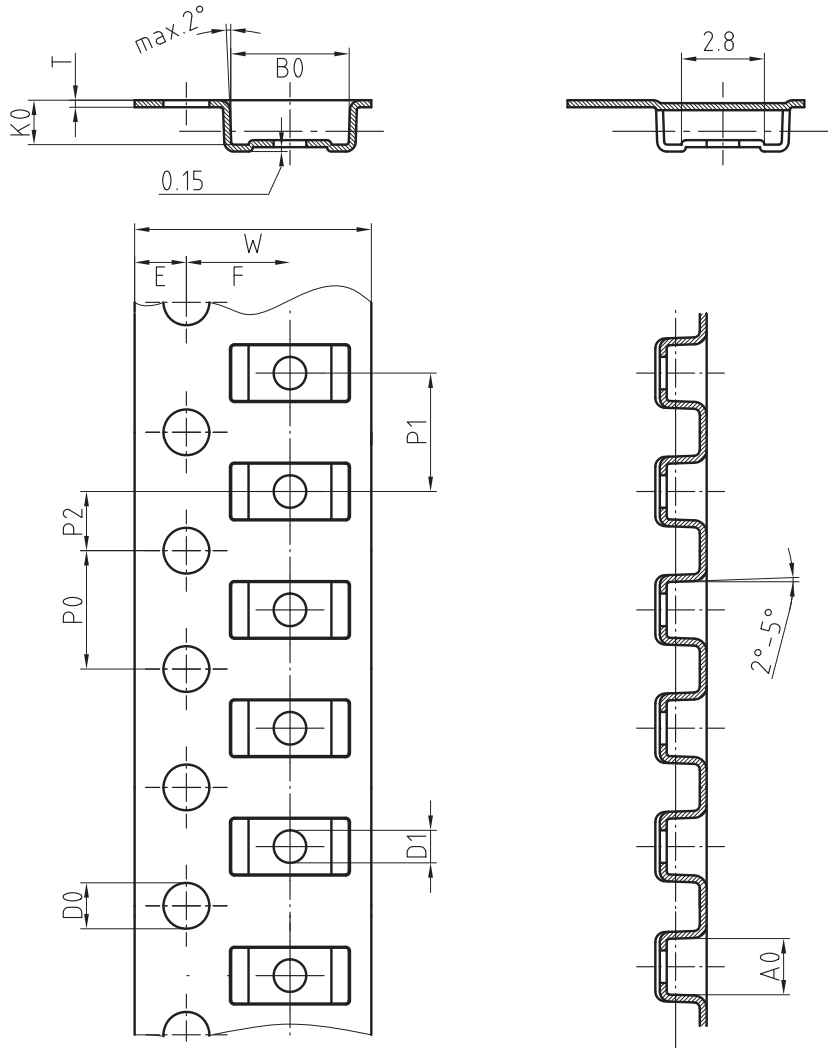
Foot print recommendation:



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



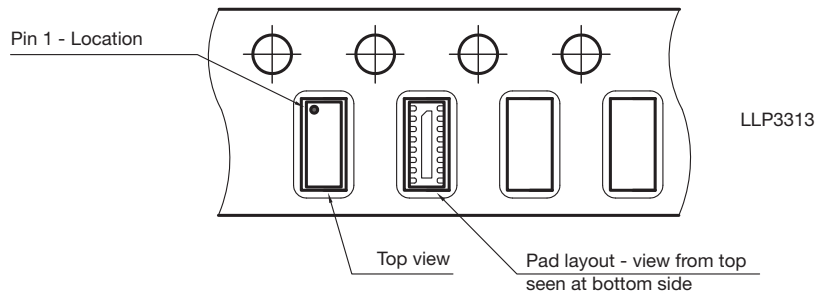
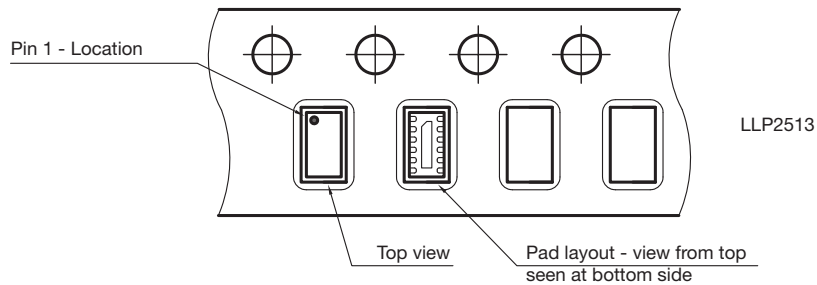
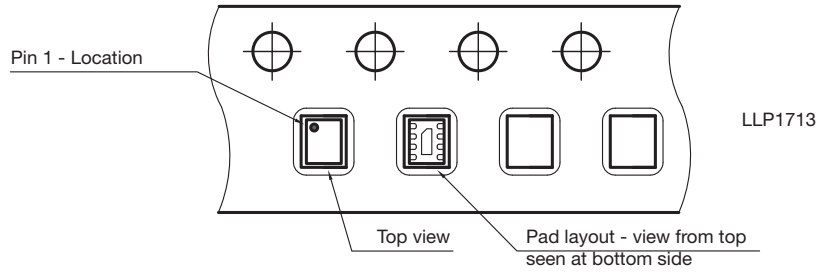
## BLISTERTAPE DIMENSIONS in millimeters (inches)



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





## Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

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 in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

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

## Material Category Policy

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.**

**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.**