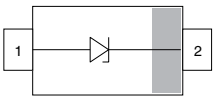
Surface Mount ESD Protection Diodes



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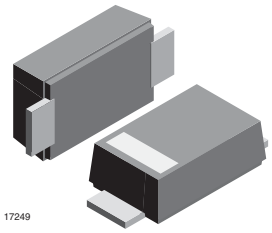

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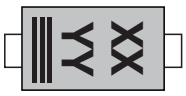
FEATURES

- 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 µs 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
- Halogen-free according to IEC 61249-2-21 definiton

RoHS COMPLIANT

HALOGEN FREE

MARKING (example only)



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Bar = cathode marking
YY = type code (see table below)
XX = date code

ORDERING INFORMATION

SMF5V0A-M-xx

- 08 = 3K per 7" reel (8 mm tape), 30K/box
- 18 = 10K per 13" reel (8 mm tape), 50K/box
- Environmental suffix -M- defines halogen-free
- Part number

PACKAGE DATA						
DEVICE NAME	PACKAGE NAME	TYPE CODE	WEIGHT	MOLDING COMPOUND FLAMMABILITY RATING	MOISTURE SENSITIVITY LEVEL	SOLDERING CONDITIONS
SMF5V0A-M	SMF	NE	15 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	260 °C/10 s at terminals
SMF6V5A-M		NK				
SMF7V0A-M		NM				
SMF7V5A-M		NP				
SMF8V0A-M		NR				
SMF8V5A-M		NT				
SMF9V0A-M		NV				
SMF10A-M		NX				
SMF11A-M		NZ				
SMF12A-M		OE				
SMF13A-M		OG				
SMF14A-M		OK				
SMF15A-M		OM				
SMF16A-M		OP				
SMF17A-M		OR				
SMF18A-M		OT				
SMF20A-M		OV				
SMF22A-M		OX				
SMF24A-M		OZ				

For technical questions, contact: ESDprotection@vishay.com

PACKAGE DATA						
DEVICE NAME	PACKAGE NAME	TYPE CODE	WEIGHT	MOLDING COMPOUND FLAMMABILITY RATING	MOISTURE SENSITIVITY LEVEL	SOLDERING CONDITIONS
SMF26A-M	SMF	PE	15 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	260 °C/10 s at terminals
SMF28A-M		PG				
SMF30A-M		PK				
SMF33A-M		PM				
SMF36A-M		PP				
SMF40A-M		PR				
SMF43A-M		PT				
SMF45A-M		PV				
SMF48A-M		PX				
SMF51A-M		PZ				

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)				
PARAMETER	TEST CONDITIONS	SYMBOL	VALUE	UNIT
Peak pulse current	t_p = 10/1000 µs waveform acc. IEC 61000-4-5	I_{PPM}	see "Electrical Characteristics"	A
Peak pulse power	t_p = 8/20 µs waveform acc. IEC 61000-4-5	P_{PP}	1000	W
	t_p = 10/1000 µs 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}	± 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_{thJA}	180	K/W
Forward clamping voltage	I_F = 12 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 °C, unless otherwise specified)								
PART NUMBER	REVERSE BREAKDOWN VOLTAGE at I_T, $t_p \le 5$ ms	TEST CURRENT	REVERSE WORKING VOLTAGE	REVERSE CURRENT at V_{RWM}	MAXIMUM PEAK PULSE CURRENT t_p = 10/1000 µs	REVERSE CLAMPING VOLTAGE at I_{PPM}	CAPACITANCE at V_R = 0 V, f = 1 MHz	PROTECTION PATHS
	V_{BR} MIN. (V)	I_T (mA)	V_{RWM} (V)	I_R (µA)	I_{PPM} (A)	V_C (V)	C_D TYP. (pF)	$N_{channel}$
SMF5V0A-M	6.40	10	5	400	21.7	9.2	1030	1
SMF6V0A-M	6.67	10	6	400	19.4	10.3	1010	1
SMF6V5A-M	7.22	10	6.5	250	17.9	11.2	850	1
SMF7V0A-M	7.78	10	7	100	16.7	12	750	1
SMF7V5A-M	8.33	1	7.5	50	15.5	12.9	730	1
SMF8V0A-M	8.89	1	8	25	14.7	13.6	670	1
SMF8V5A-M	9.44	1	8.5	10	13.9	14.4	660	1
SMF9V0A-M	10	1	9	5	13.5	15.4	620	1
SMF10A-M	11.1	1	10	2.5	11.8	17	570	1
SMF11A-M	12.2	1	11	2.5	11	18.2	460	1
SMF12A-M	13.3	1	12	2.5	10.1	19.9	440	1
SMF13A-M	14.4	1	13	1	9.3	21.5	420	1
SMF14A-M	15.6	1	14	1	8.6	23.2	370	1
SMF15A-M	16.7	1	15	1	8.2	24.4	350	1
SMF16A-M	17.8	1	16	1	7.7	26	340	1
SMF17A-M	18.9	1	17	1	7.2	27.6	310	1
SMF18A-M	20	1	18	1	5.8	29.2	305	1

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

TYPICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

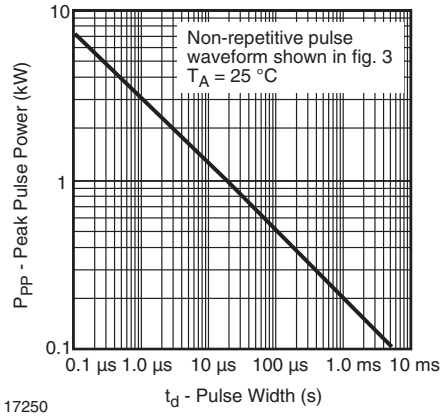


Fig. 1 - Peak Pulse Power Rating

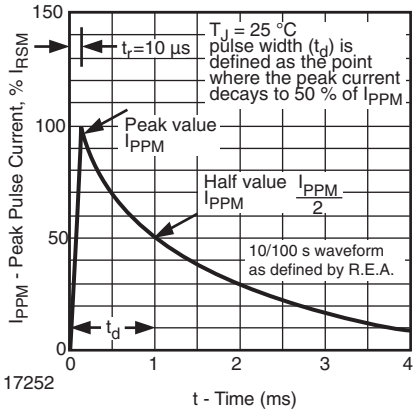


Fig. 3 - Pulse Waveform

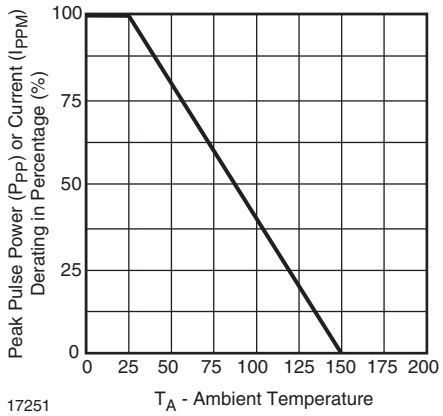
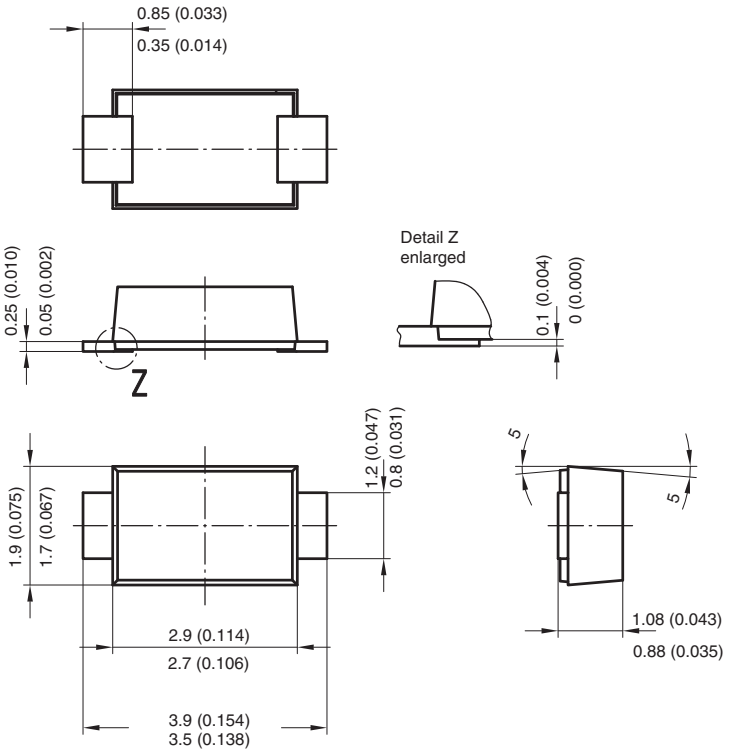
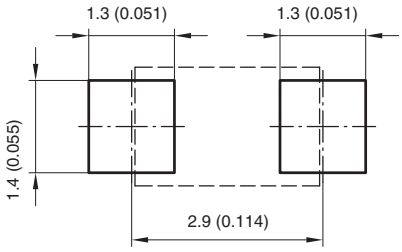


Fig. 2 - Pulse Derating Curve

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)
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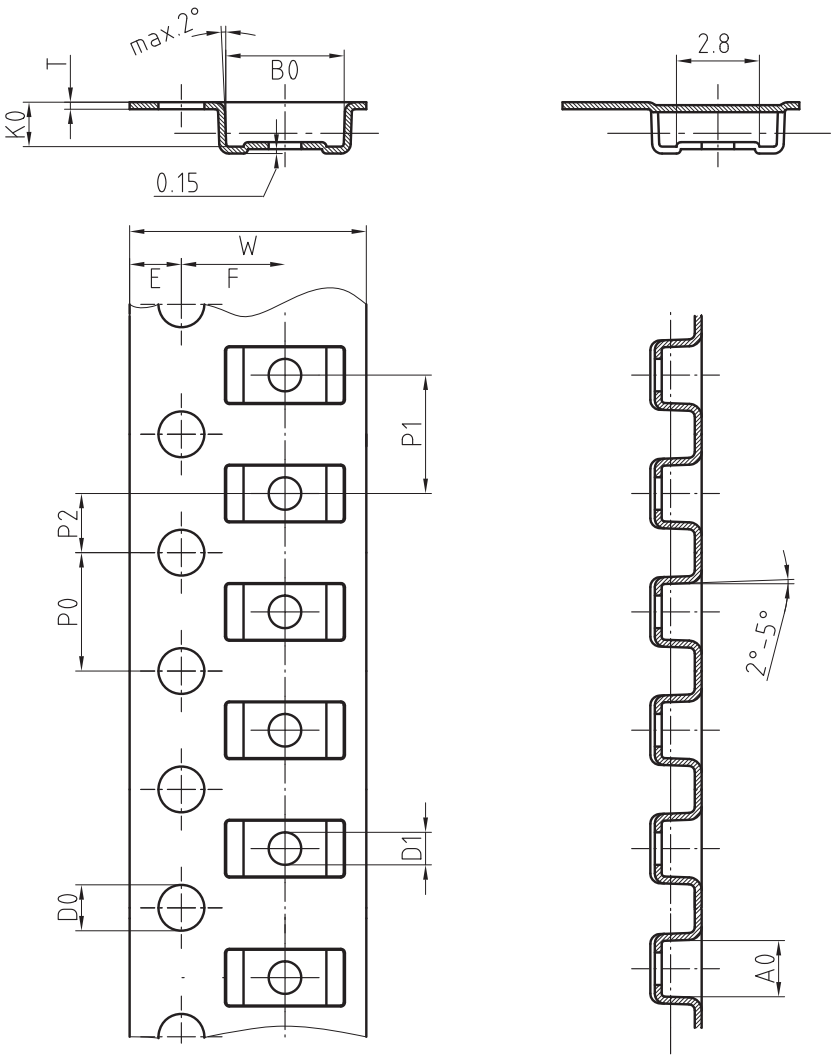
BLISTERTAPE DIMENSIONS in millimeters (inches)



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)

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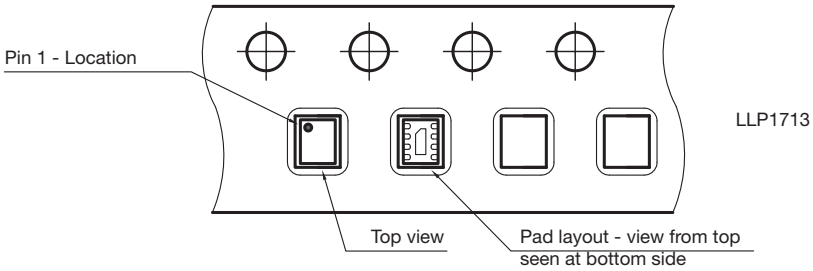

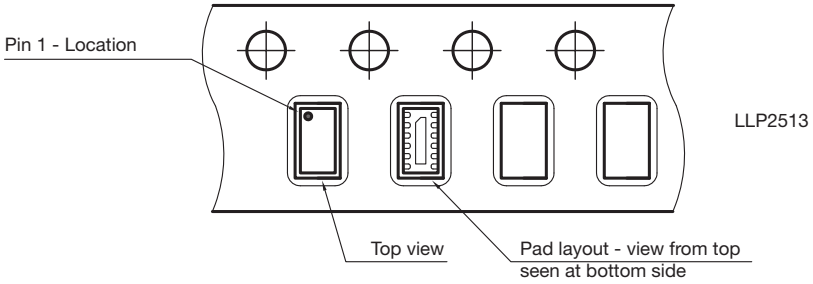

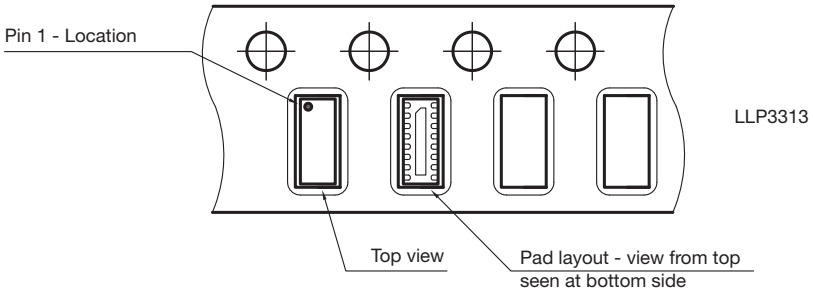

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