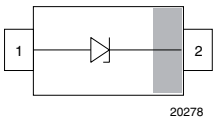
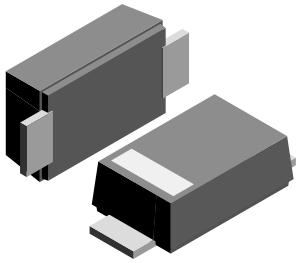
Surface-Mount ESD Protection Diodes



eSMP® Series



SMF (DO-219AB)

FEATURES

- 200 W peak pulse power capability with a 10/1000 µs waveform, repetition rate (duty cycle): 0.01 %
- Low profile package
- Wave and reflow solderable
- ESD immunity acc. IEC 61000-4-2
  ± 30 kV contact discharge
  ± 30 kV air discharge
- ESD capability according to AEC-Q101:
  human body model: class H3B: > 8 kV
- Low incremental surge resistance, excellent clamping capability
- "Low Noise" technology - very fast response time
- AEC-Q101 qualified available
- Compatible to SOD-123W package case outline or SOD-123F and SOD-123FL
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

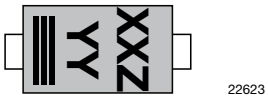
AUTOMOTIVE GRADE Available

Pb

e3

RoHS COMPLIANT

MARKING (example only)



22623

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

LINKS TO ADDITIONAL RESOURCES

3D Models | Simulation Tools | SPICE Models

ORDERING INFORMATION

PART NUMBER (EXAMPLE)	ENVIRONMENTAL AND QUALITY CODE			REVISION CODE	PACKAGING CODE		ORDERING CODE (EXAMPLE)
	AEC-Q101 QUALIFIED	RoHS-COMPLIANT + LEAD (Pb)-FREE TERMINATIONS	TIN PLATED		3K PER 7" REEL (8 mm TAPE), MOQ = 30K	10K PER 13" REEL (8 mm TAPE), MOQ = 50K	
SMF5V0A-		E	3	-	08		SMF5V0A-E3-08
SMF5V0A-	H	E	3	_A	08		SMF5V0A-HE3_A08
SMF5V0A-		E	3	-		18	SMF5V0A-E3-18
SMF5V0A-	H	E	3	_A		18	SMF5V0A-HE3_A18

PACKAGE DATA

PACKAGE NAME	WEIGHT (mg)	HEIGHT MAX. (mm)	LENGTH MAX. (mm)	WIDTH MAX. (mm)	MOLDING COMPOUND FLAMMABILITY RATING	MOISTURE SENSITIVITY LEVEL	WHISKER TEST ACC. JESD 201	SOLDERING CONDITIONS
SMF (DO-219AB)	15	1.08	3.9	1.9	UL 94 V-0	MSL level 1 (acc. J-STD-020)	Class 2	Peak temperature max. 260 °C

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	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		200	W
Peak forward surge current	8.3 ms single half sine-wave	I_{FSM}	50	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 = 50A, t_p = 400 µs	V_F	2.5	V
Junction temperature		T_J	175	°C
Storage temperature range		T_{stg}	-65 to +175	°C
Operating temperature range		T_{op}	-65 to +175	°C

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

PART NUMBER	MARKING CODE	REVERSE BREAKDOWN VOLTAGE at I_T, t_p = 5 ms		TEST CURRENT	STAND-OFF VOLTAGE	MAXIMUM REVERSE CURRENT at V_{RWM}	MAXIMUM PEAK PULSE CURRENT t_p = 10/1000 µs	MAXIMUM REVERSE CLAMPING VOLTAGE at I_{PPM}	TYPICAL CAP. at V_R = 0 V, f = 1 MHz	PROTECTION PATHS
		V_{BR} MIN. (V)	V_{BR} MAX. (V)	I_T (mA)	V_{RWM} (V)	I_R (µA)	I_{PPM} (A)	V_C MAX. (V)	C_D TYP. (pF)	$N_{channel}$
SMF5V0A	AE	6.40	7.1	10	5	5	21.7	9.2	1120	1
SMF6V0A	AG	6.67	7.4	10	6	26	19.4	10.3	1063	1
SMF6V5A	AK	7.22	8	10	6.5	20	17.9	11.2	938	1
SMF7V0A	AM	7.78	8.6	10	7	3	16.7	12	843	1
SMF7V5A	AP	8.33	9.3	1	7.5	0.1	15.5	12.9	773	1
SMF8V0A	AR	8.89	9.9	1	8	0.1	14.7	13.6	706	1
SMF8V5A	AT	9.44	10.5	1	8.5	0.1	13.9	14.4	674	1
SMF9V0A	AV	10	11.2	1	9	0.1	13.5	15.4	640	1
SMF10A	AX	11.1	12.3	1	10	0.1	11.8	17	562	1
SMF11A	AZ	12.2	13.5	1	11	0.1	11	18.2	509	1
SMF12A	BE	13.3	14.7	1	12	0.1	10.1	19.9	483	1
SMF13A	BG	14.4	16	1	13	0.1	9.3	21.5	423	1
SMF14A	BK	15.6	17.3	1	14	0.1	8.6	23.2	392	1
SMF15A	BM	16.7	18.5	1	15	0.1	8.2	24.4	367	1
SMF16A	BP	17.8	19.7	1	16	0.1	7.7	26	343	1
SMF17A	BR	18.9	20.9	1	17	0.1	7.2	27.6	324	1
SMF18A	BT	20	22.3	1	18	0.1	6.8	29.2	320	1
SMF20A	BV	22.2	24.6	1	20	0.1	6.2	32.4	283	1
SMF22A	BX	24.4	27	1	22	0.1	5.6	35.5	271	1
SMF24A	BZ	26.7	29.6	1	24	0.1	5.1	38.9	244	1
SMF26A	CE	28.9	32	1	26	0.1	4.8	42.1	230	1
SMF28A	CG	31.1	34.4	1	28	0.1	4.4	45.4	227	1
SMF30A	CK	33.3	36.9	1	30	0.1	4.1	48.4	207	1
SMF33A	CM	36.7	40.6	1	33	0.1	3.8	53.3	198	1
SMF36A	CP	40	44.3	1	36	0.1	3.4	58.1	178	1
SMF40A	CR	44.4	49.1	1	40	0.1	3.1	64.5	172	1
SMF43A	CT	47.8	52.9	1	43	0.1	2.9	69.4	165	1
SMF45A	CV	50	55.3	1	45	0.1	2.8	72.7	162	1
SMF48A	CX	53.3	59	1	48	0.1	2.6	77.4	161	1
SMF51A	CZ	56.7	62.7	1	51	0.1	2.4	82.4	151	1
SMF54A	CA	60	66	1	54	0.1	2.25	88	148	1
SMF58A	CC	64.4	70.8	1	58	0.1	2.1	95	144	1

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

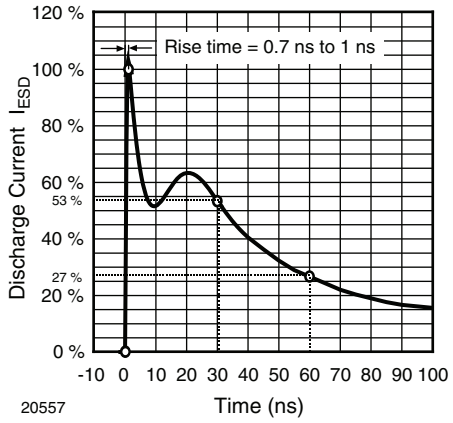


Fig. 1 - ESD Discharge Current Wave Form acc. IEC 61000-4-2 (330 Ω/150pF)

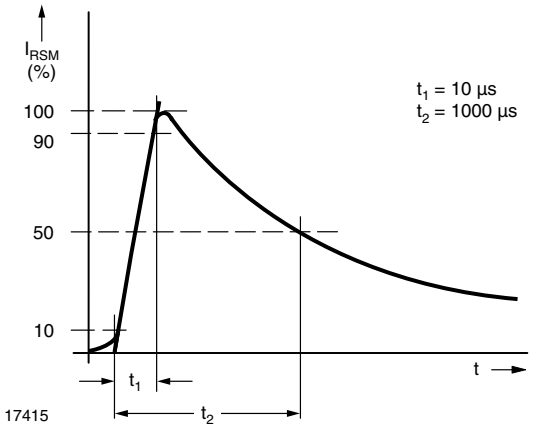


Fig. 4 - Pulse Waveform

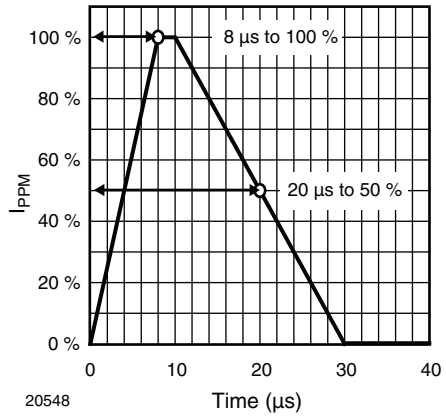


Fig. 2 - 8/20 µs Peak Pulse Current Wave Form acc. IEC 61000-4-5

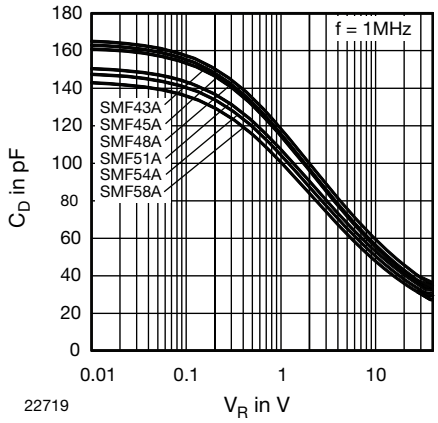


Fig. 5 - Typical Capacitance C_D vs. Reverse Voltage V_R

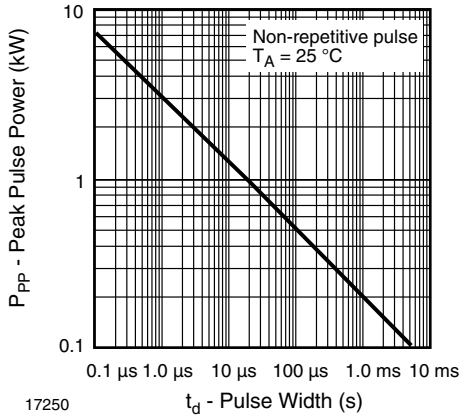


Fig. 3 - Peak Pulse Power Rating

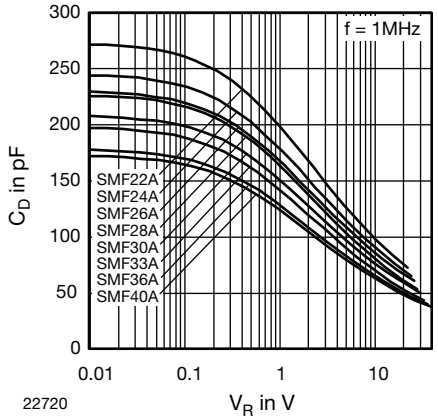


Fig. 6 - Typical Capacitance C_D vs. Reverse Voltage V_R

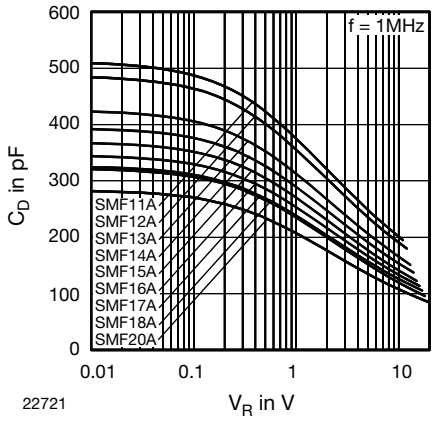


Fig. 7 - Typical Capacitance C_D vs. Reverse Voltage V_R

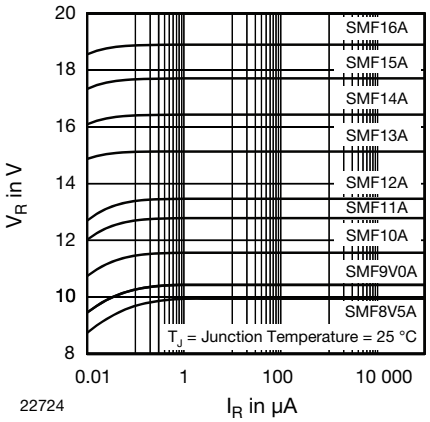


Fig. 10 - Typical Reverse Voltage V_R vs. Reverse Current I_R

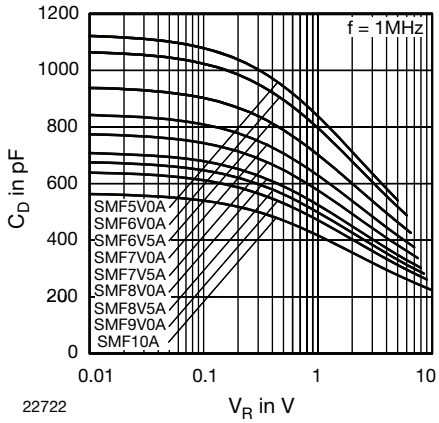


Fig. 8 - Typical Capacitance C_D vs. Reverse Voltage V_R

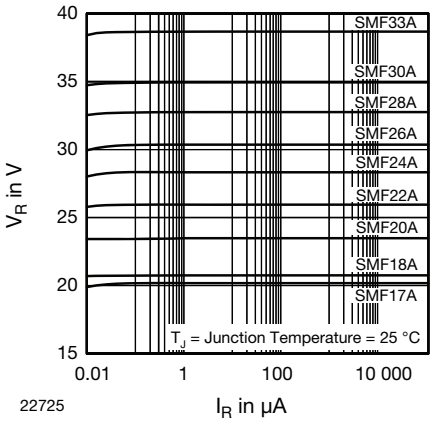


Fig. 11 - Typical Reverse Voltage V_R vs. Reverse Current I_R

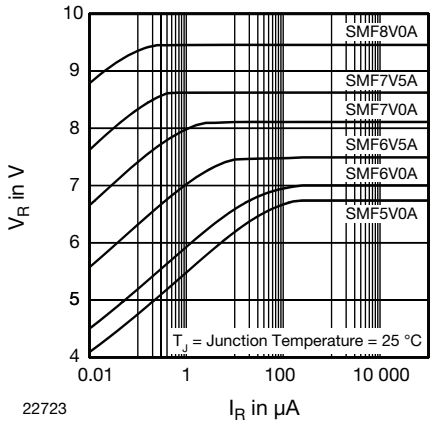


Fig. 9 - Typical Reverse Voltage V_R vs. Reverse Current I_R

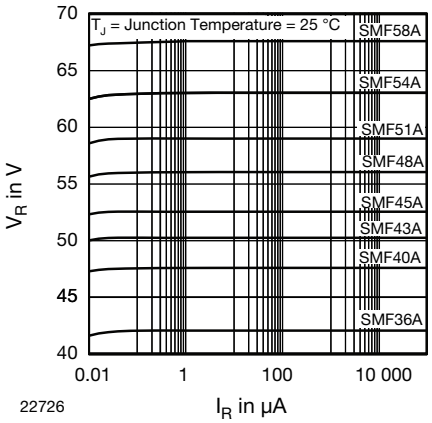
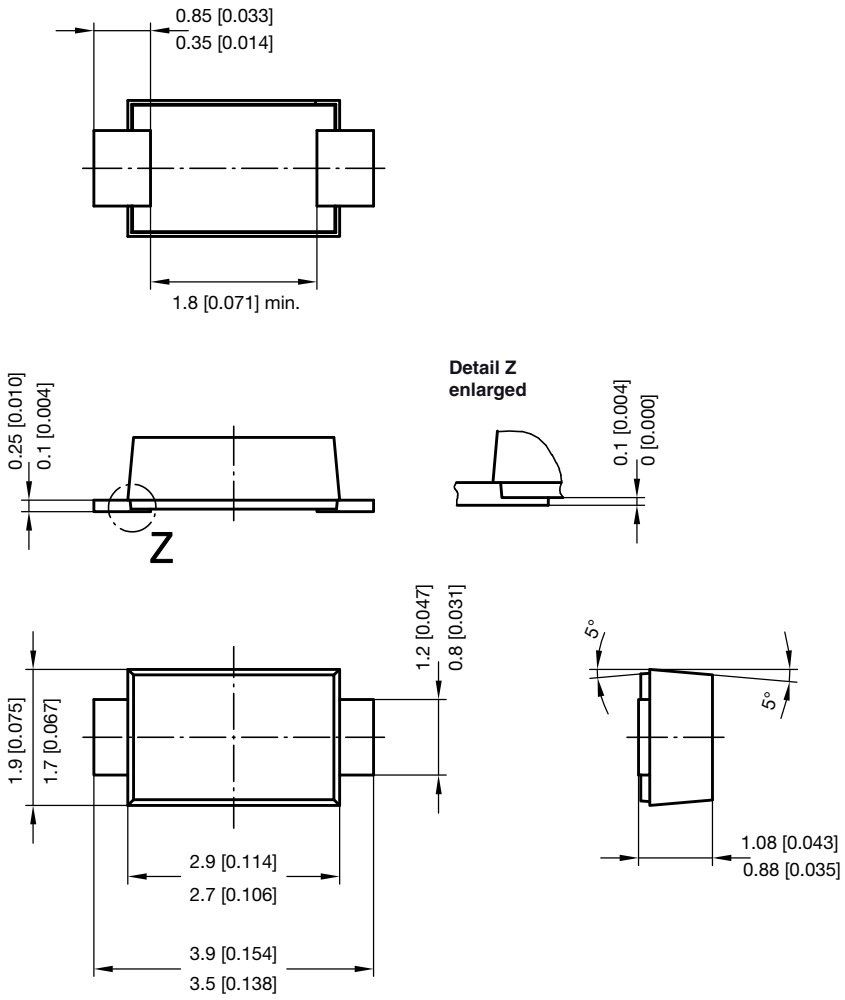


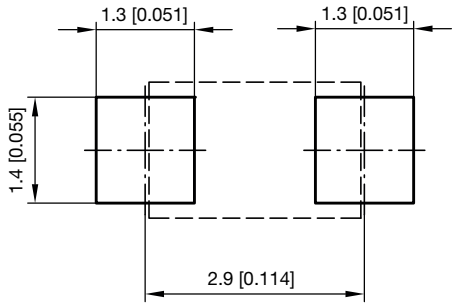
Fig. 12 - Typical Reverse Voltage V_R vs. Reverse Current I_R

PACKAGE DIMENSIONS in millimeters (inches): **SMF (DO-219AB)**



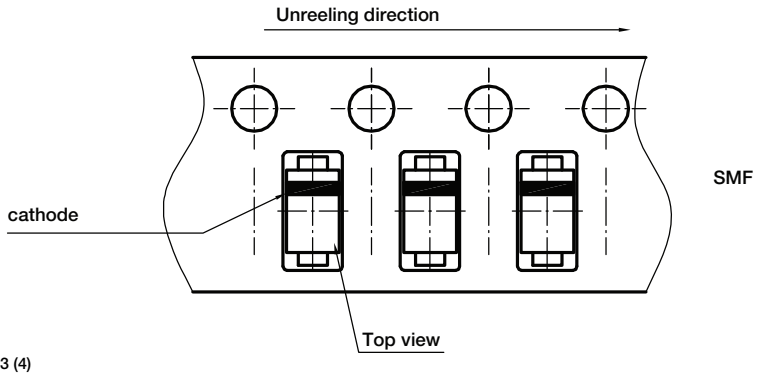
foot print recommendation:

Reflow soldering



Created - Date: 15. February 2005
Rev. 6 - Date: 24.Feb.2021
Document no.: S8-V-3915.01-001 (4)
22989

ORIENTATION IN CARRIER TAPE - SMF (DO-219AB)



Document no.: S8-V-3717.02-003 (4)
Created - Date: 09. Feb. 2010
22670

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.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

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.