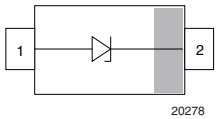
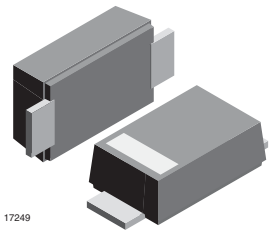
THE DATASHEET OF

SMF12A-E3-08

Surface Mount ESD Protection Diodes



20278


17249

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
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

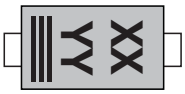
AUTOMOTIVE GRADE Available

RoHS COMPLIANT

HALOGEN FREE Available

MARKING

(example only)



22623

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

DESIGN SUPPORT TOOLS click logo to get started

3D Models Available

ORDERING INFORMATION

PART NUMBER (EXAMPLE)	ENVIRONMENTAL AND QUALITY CODE				PACKAGING CODE		ORDERING CODE (EXAMPLE)
	AEC-Q101 QUALIFIED	RoHS-COMPLIANT + LEAD (Pb)-FREE TERMINATIONS		TIN PLATED	3K PER 7" REEL (8 mm TAPE), 30K/BOX = MOQ	10K PER 13" REEL (8 mm TAPE), 50K/BOX = MOQ	
		STANDARD	HALOGEN-FREE				
SMF5V0A-		E		3	-08		SMF5V0A-E3-08
SMF5V0A-			M	3	-08		SMF5V0A-M3-08
SMF5V0A-	H	E		3	-08		SMF5V0A-HE3-08
SMF5V0A-	H		M	3	-08		SMF5V0A-HM3-08
SMF5V0A-		E		3		-18	SMF5V0A-E3-18
SMF5V0A-			M	3		-18	SMF5V0A-M3-18
SMF5V0A-	H	E		3		-18	SMF5V0A-HE3-18
SMF5V0A-	H		M	3		-18	SMF5V0A-HM3-18

PACKAGE DATA

PACKAGE NAME	MOLDING COMPOUND	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)	Standard	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
	Halogen-free								

For technical questions, contact: ESDprotection@vishay.com

THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

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	TYPE 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
	STD.	HALOGEN-FREE	V_{BR} MIN. (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	NE	6.40	10	5	5	21.7	9.2	1120	1
SMF6V0A	AG	NG	6.67	10	6	26	19.4	10.3	1063	1
SMF6V5A	AK	NK	7.22	10	6.5	20	17.9	11.2	938	1
SMF7V0A	AM	NM	7.78	10	7	3	16.7	12	843	1
SMF7V5A	AP	NP	8.33	1	7.5	0.1	15.5	12.9	773	1
SMF8V0A	AR	NR	8.89	1	8	0.1	14.7	13.6	706	1
SMF8V5A	AT	NT	9.44	1	8.5	0.1	13.9	14.4	674	1
SMF9V0A	AV	NV	10	1	9	0.1	13.5	15.4	640	1
SMF10A	AX	NX	11.1	1	10	0.1	11.8	17	562	1
SMF11A	AZ	NZ	12.2	1	11	0.1	11	18.2	509	1
SMF12A	BE	OE	13.3	1	12	0.1	10.1	19.9	483	1
SMF13A	BG	OG	14.4	1	13	0.1	9.3	21.5	423	1
SMF14A	BK	OK	15.6	1	14	0.1	8.6	23.2	392	1
SMF15A	BM	OM	16.7	1	15	0.1	8.2	24.4	367	1
SMF16A	BP	OP	17.8	1	16	0.1	7.7	26	343	1
SMF17A	BR	OR	18.9	1	17	0.1	7.2	27.6	324	1
SMF18A	BT	OT	20	1	18	0.1	6.8	29.2	320	1
SMF20A	BV	OV	22.2	1	20	0.1	6.2	32.4	283	1
SMF22A	BX	OX	24.4	1	22	0.1	5.6	35.5	271	1
SMF24A	BZ	OZ	26.7	1	24	0.1	5.1	38.9	244	1
SMF26A	CE	PE	28.9	1	26	0.1	4.8	42.1	230	1
SMF28A	CG	PG	31.1	1	28	0.1	4.4	45.4	227	1
SMF30A	CK	PK	33.3	1	30	0.1	4.1	48.4	207	1
SMF33A	CM	PM	36.7	1	33	0.1	3.8	53.3	198	1
SMF36A	CP	PP	40	1	36	0.1	3.4	58.1	178	1
SMF40A	CR	PR	44.4	1	40	0.1	3.1	64.5	172	1
SMF43A	CT	PT	47.8	1	43	0.1	2.9	69.4	165	1
SMF45A	CV	PV	50	1	45	0.1	2.8	72.7	162	1
SMF48A	CX	PX	53.3	1	48	0.1	2.6	77.4	161	1
SMF51A	CZ	PZ	56.7	1	51	0.1	2.4	82.4	151	1
SMF54A	CA	PA	60	1	54	0.1	2.25	88	148	1
SMF58A	CC	PC	64.4	1	58	0.1	2.1	95	144	1

For technical questions, contact: ESDprotection@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

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

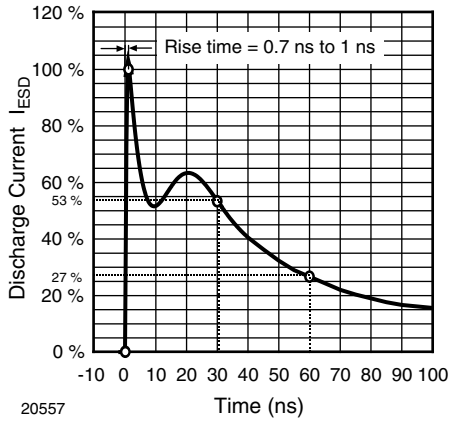


Fig. 1 - ESD Discharge Current Wave Form acc. IEC 61000-4-2 (330 Ω/150pF)

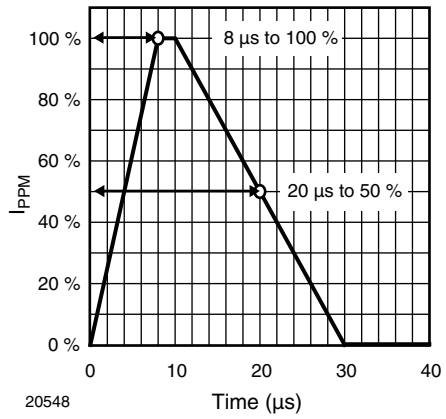


Fig. 2 - 8/20 µs Peak Pulse Current Wave Form acc. IEC 61000-4-5

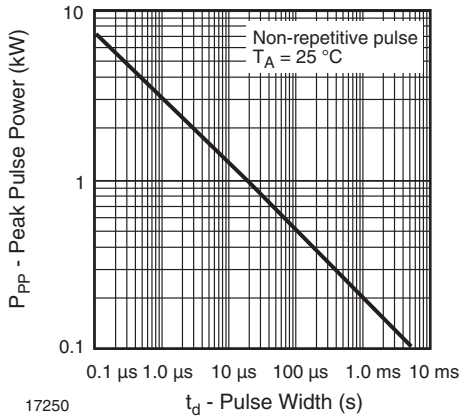


Fig. 3 - Peak Pulse Power Rating

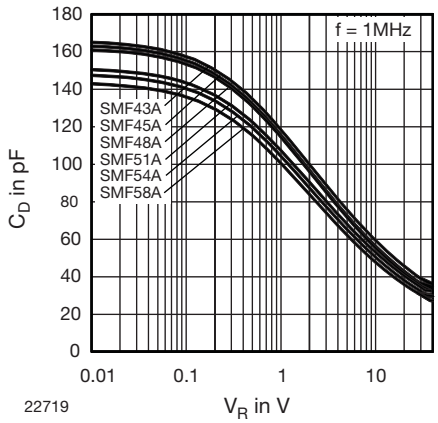


Fig. 4 - Pulse Waveform

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

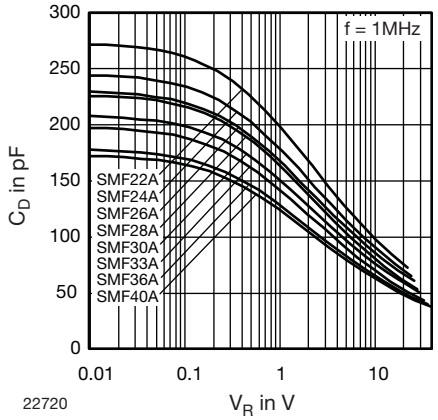


Fig. 6 - Typical Capacitance C_D vs. Reverse Voltage V_R

For technical questions, contact: ESDprotection@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

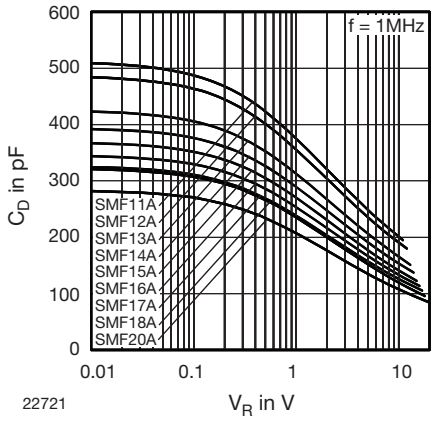


Fig. 7 - Typical Capacitance C_D vs. Reverse Voltage V_R

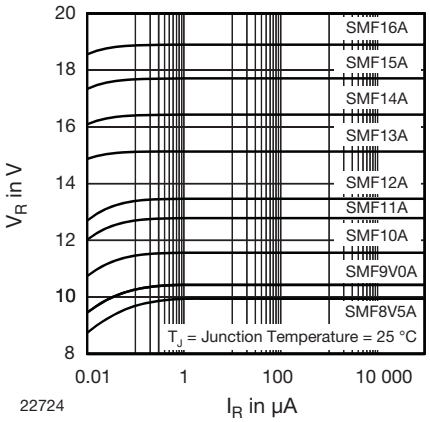


Fig. 10 - Typical Reverse Voltage V_R vs. Reverse Current I_R

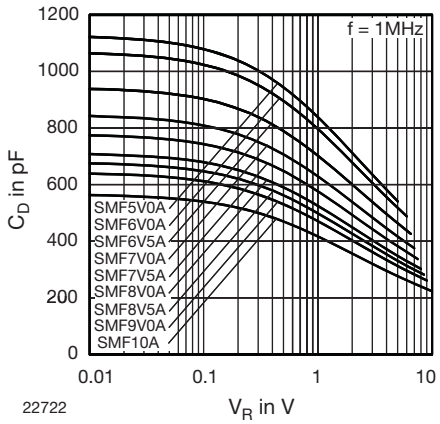


Fig. 8 - Typical Capacitance C_D vs. Reverse Voltage V_R

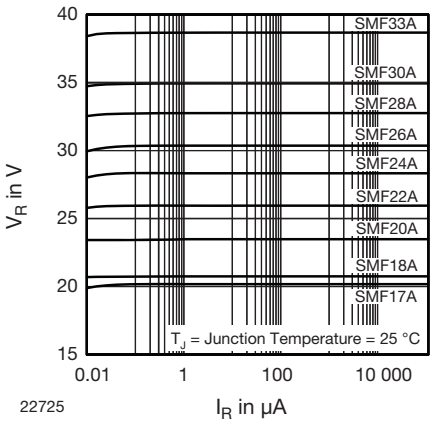


Fig. 11 - Typical Reverse Voltage V_R vs. Reverse Current I_R

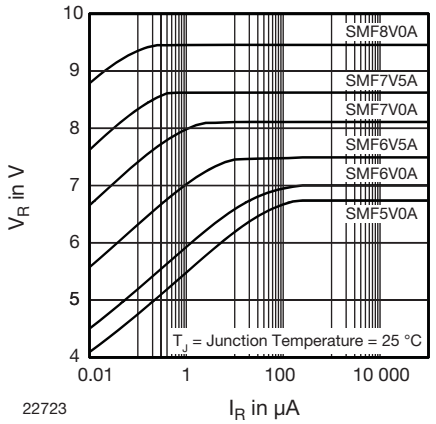


Fig. 9 - Typical Reverse Voltage V_R vs. Reverse Current I_R

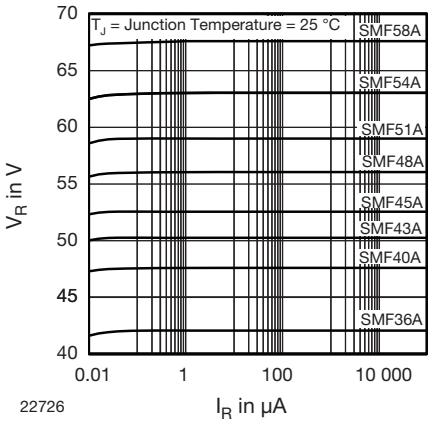
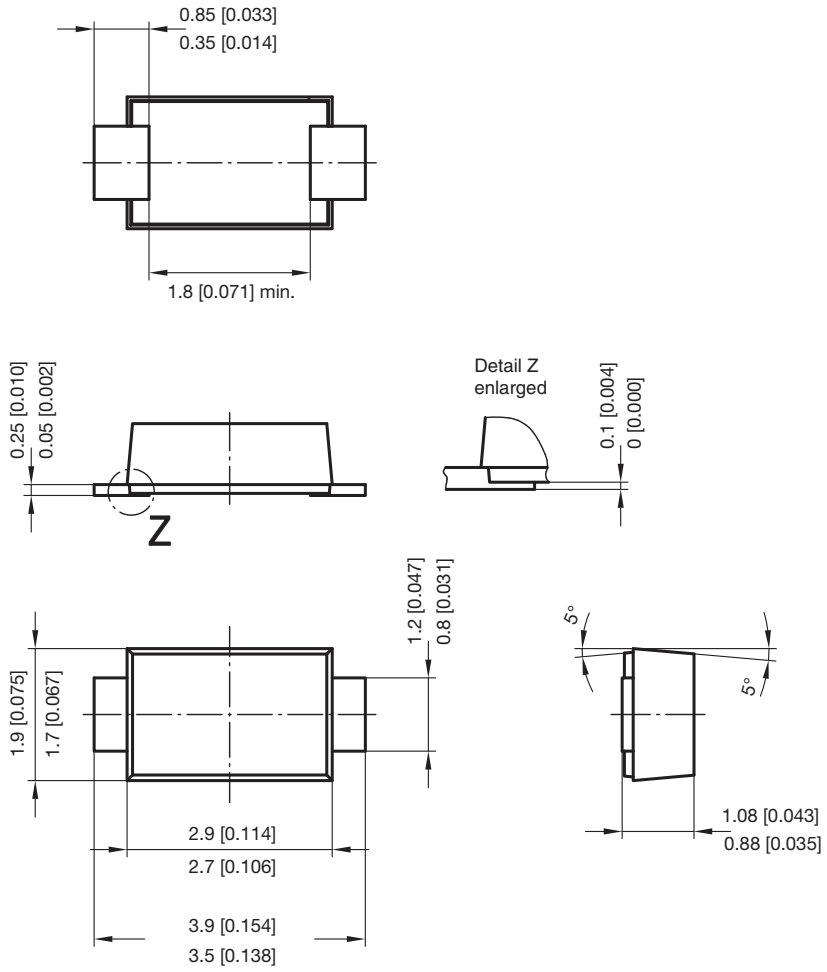


Fig. 12 - Typical Reverse Voltage V_R vs. Reverse Current I_R

For technical questions, contact: ESDprotection@vishay.com

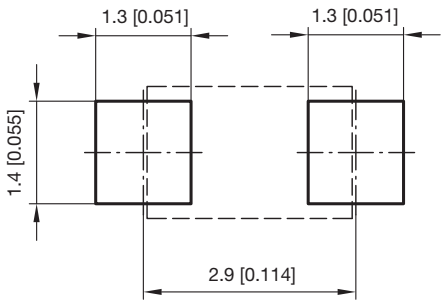
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

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



foot print recommendation:

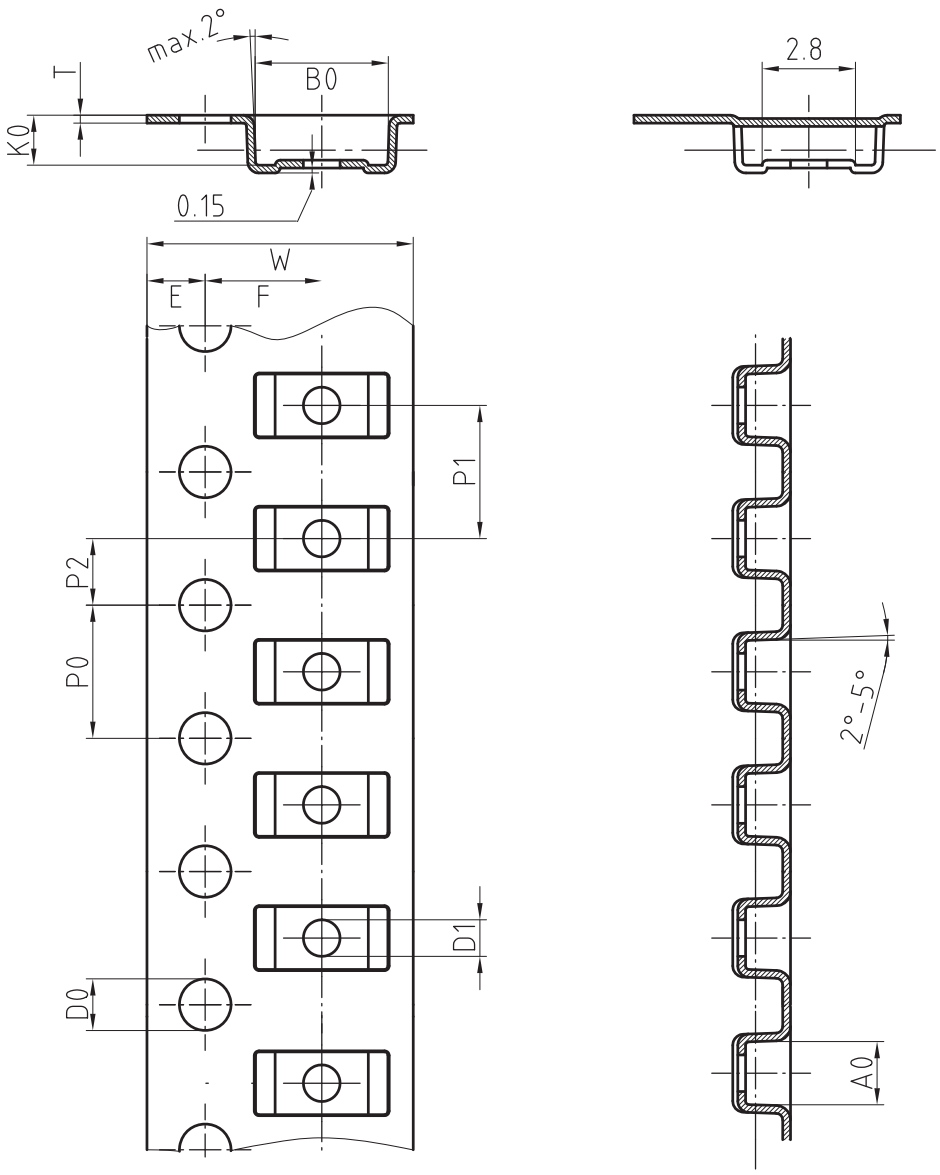
Reflow soldering



Created - Date: 15. February 2005
Rev. 5 - Date: 09. Oct. 2017
Document no.: S8-V-3915.01-001 (4)
22989

For technical questions, contact: ESDprotection@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

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

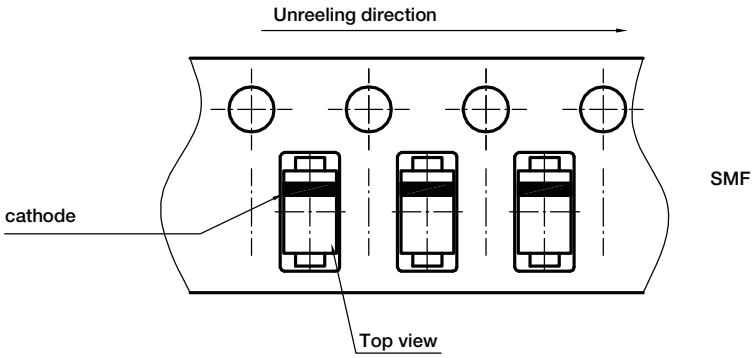
Document-No.: S8-V-3717.02-001 (3)

18513

For technical questions, contact: ESDprotection@vishay.com

THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

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



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

For technical questions, contact: ESDprotection@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

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.

© 2017 VISHAY INTERTECHNOLOGY, INC. ALL RIGHTS RESERVED

Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

- View SMF12A-E3-08 on WIN SOURCE
- Vishay Information

Optimize Your Supply Chain with WIN SOURCE Solutions

- Global Sourcing Solution
- Obsolete Management
- Cost Control Management
- Shortage Management
- Alternative Solution
- Excess Inventory Management