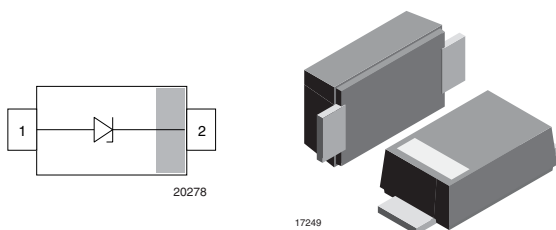
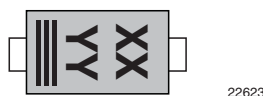




## Surface Mount ESD Protection Diodes



## MARKING (example only)



Bar = cathode marking

YY = type code (see table below)

XX = date code

## FEATURES

- 200 W peak pulse power capability with a 10/1000  $\mu$ s waveform, repetition rate (duty cycle): 0.01 %
- Low-profile package
- Wave and reflow solderable
- ESD-protection acc. IEC 61000-4-2  $\pm 30$  kV contact discharge  $\pm 30$  kV air discharge
- Low incremental surge resistance, excellent clamping capability
- “Low-Noise” technology - very fast response time
- AEC-Q101 qualified
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

AUTOMOTIVE  
GRADE  
AvailableRoHS  
COMPLIANT  
HALOGEN  
FREE  
Available

## ORDERING INFORMATION

| PART<br>NUMBER<br>(EXAMPLE) | ENVIRONMENTAL AND QUALITY CODE |                                                 |              |               | PACKAGING CODE                                  |                                                   | ORDERING CODE<br>(EXAMPLE) |
|-----------------------------|--------------------------------|-------------------------------------------------|--------------|---------------|-------------------------------------------------|---------------------------------------------------|----------------------------|
|                             | AEC-Q101<br>QUALIFIED          | RoHS-COMPLIANT +<br>LEAD (Pb)-FREE TERMINATIONS |              | TIN<br>PLATED | 3K PER 7" REEL<br>(8 mm TAPE),<br>30K/BOX = MOQ | 10K PER 13" REEL<br>(8 mm TAPE),<br>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<br>NAME   | MOLDING<br>COMPOUND | WEIGHT<br>(mg) | HEIGHT<br>MAX.<br>(mm) | LENGTH<br>MAX.<br>(mm) | WIDTH<br>MAX.<br>(mm) | MOLDING<br>COMPOUND<br>FLAMMABILITY<br>RATING | MOISTURE<br>SENSITIVITY<br>LEVEL | WHISKER TEST<br>ACC. JESD 201 | SOLDERING<br>CONDITIONS            |
|-------------------|---------------------|----------------|------------------------|------------------------|-----------------------|-----------------------------------------------|----------------------------------|-------------------------------|------------------------------------|
| SMF<br>(DO-219AB) | Standard            | 15             | 1.08                   | 3.9                    | 1.9                   | UL 94 V-0                                     | MSL level 1<br>(acc. J-STD-020)  | class 2                       | Peak<br>temperature<br>max. 260 °C |
|                   | Halogen-free        |                |                        |                        |                       |                                               |                                  |                               |                                    |

**ABSOLUTE MAXIMUM RATINGS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

| PARAMETER                   | TEST CONDITIONS                                                                            | SYMBOL     | VALUE                            | UNIT               |
|-----------------------------|--------------------------------------------------------------------------------------------|------------|----------------------------------|--------------------|
| Peak pulse current          | $t_p = 10/1000\text{ }\mu\text{s}$ waveform                                                | $I_{PPM}$  | see "Electrical Characteristics" | A                  |
| Peak pulse power            | $t_p = 8/20\text{ }\mu\text{s}$ waveform acc. IEC 61000-4-5                                | $P_{PP}$   | 1000                             | W                  |
|                             | $t_p = 10/1000\text{ }\mu\text{s}$ 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                                            | $V_{ESD}$  | $\pm 30$                         | 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 ( $\geq 40\text{ }\mu\text{m}$ thick) | $R_{thJA}$ | 180                              | K/W                |
| Forward clamping voltage    | $I_F = 50\text{ A}$ , $t_p = 400\text{ }\mu\text{s}$                                       | $V_F$      | 2.5                              | V                  |
| Junction temperature        |                                                                                            | $T_J$      | 175                              | $^{\circ}\text{C}$ |
| Storage temperature range   |                                                                                            | $T_{stg}$  | -65 to +175                      | $^{\circ}\text{C}$ |
| Operating temperature range |                                                                                            | $T_{op}$   | -65 to +175                      | $^{\circ}\text{C}$ |

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

| PART NUMBER | TYPE CODE |              | REVERSE BREAKDOWN VOLTAGE at $I_T$ , $t_p = 5\text{ ms}$ | TEST CURRENT | REVERSE WORKING VOLTAGE | REVERSE CURRENT at $V_{RWM}$ | 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 |
|-------------|-----------|--------------|----------------------------------------------------------|--------------|-------------------------|------------------------------|-------------------------------------------------------|---------------------------------------|--------------------------------------------------------|------------------|
|             | STD.      | HALOGEN-FREE | $V_{BR\text{ MIN.}}$ (V)                                 | $I_T$ (mA)   | $V_{RWM}$ (V)           | $I_R$ ( $\mu\text{A}$ )      | $I_{PPM}$ (A)                                         | $V_C\text{ MAX.}$ (V)                 | $C_D\text{ TYP.}$ (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                |



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

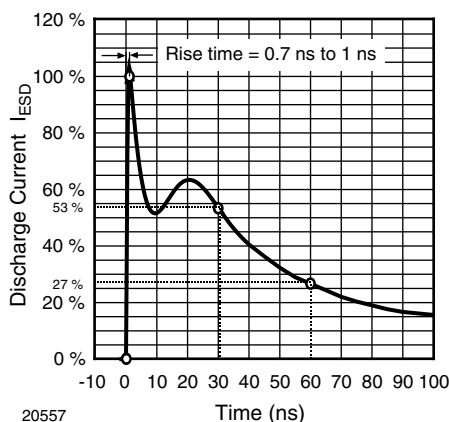


Fig. 1 - ESD Discharge Current Wave Form acc. IEC 61000-4-2 (330  $\Omega$ /150pF)

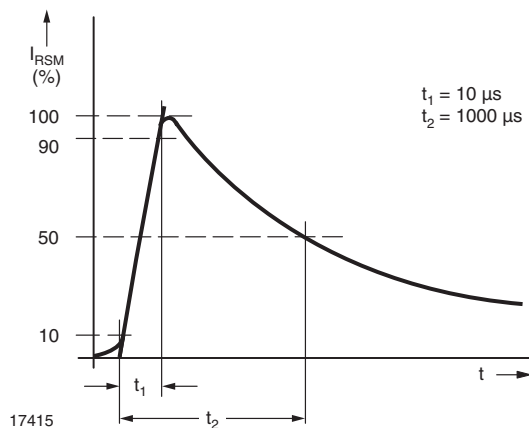


Fig. 4 - Pulse Waveform

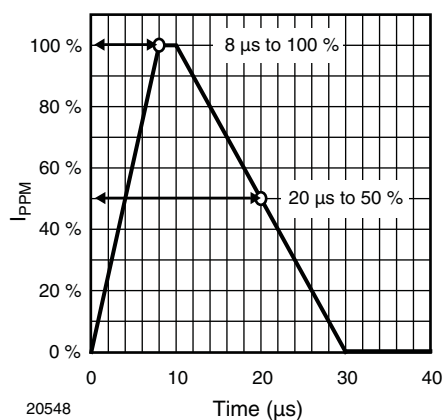


Fig. 2 - 8/20  $\mu\text{s}$  Peak Pulse Current Wave Form acc. IEC 61000-4-5

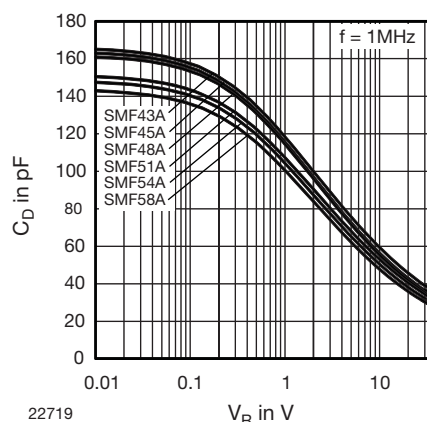


Fig. 5 - Typical Capacitance  $C_D$  vs. Reverse Voltage  $V_R$

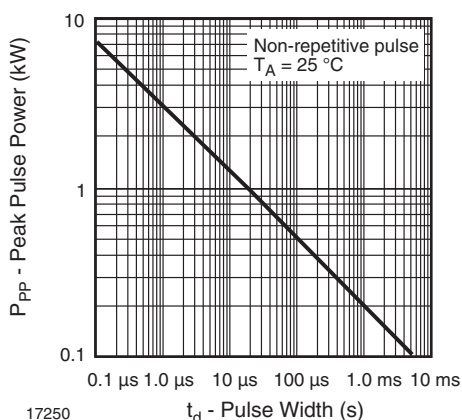


Fig. 3 - Peak Pulse Power Rating

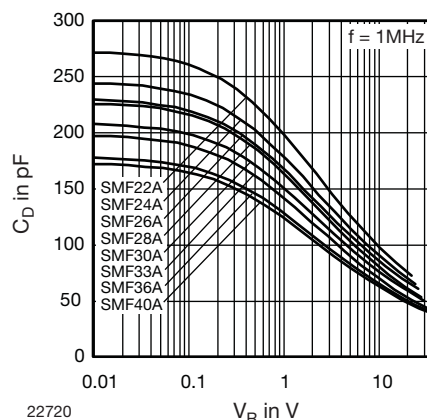


Fig. 6 - Typical Capacitance  $C_D$  vs. Reverse Voltage  $V_R$

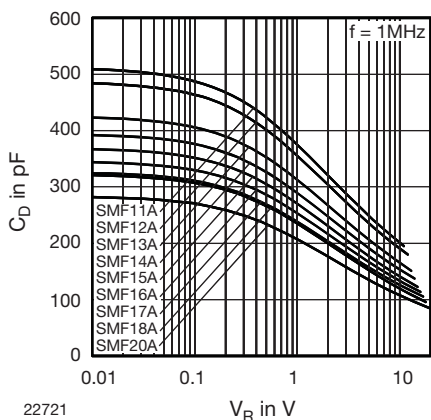


Fig. 7 - Typical Capacitance  $C_D$  vs. Reverse Voltage  $V_R$

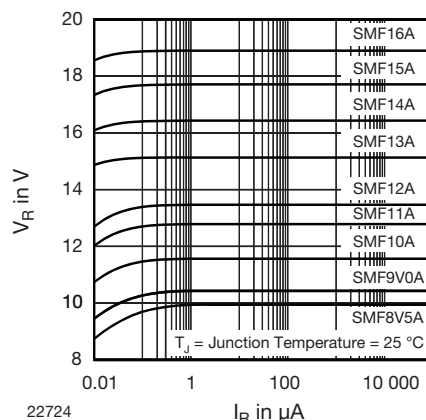


Fig. 10 - Typical Reverse Voltage  $V_R$  vs. Reverse Current  $I_R$

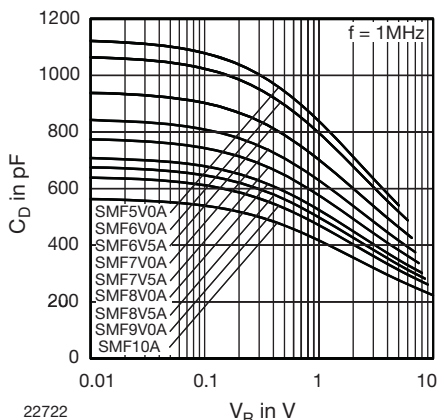


Fig. 8 - Typical Capacitance  $C_D$  vs. Reverse Voltage  $V_R$

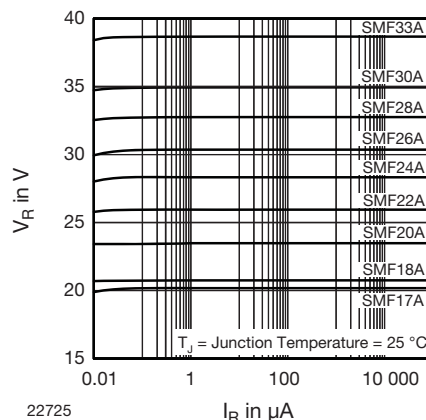


Fig. 11 - Typical Reverse Voltage  $V_R$  vs. Reverse Current  $I_R$

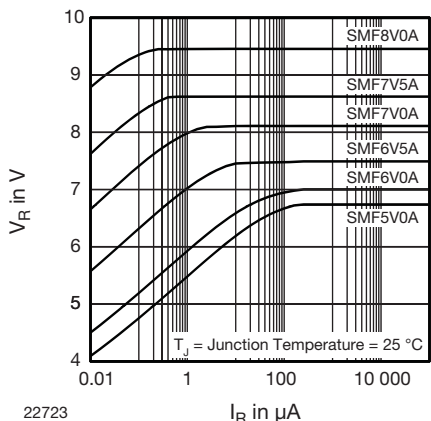


Fig. 9 - Typical Reverse Voltage  $V_R$  vs. Reverse Current  $I_R$

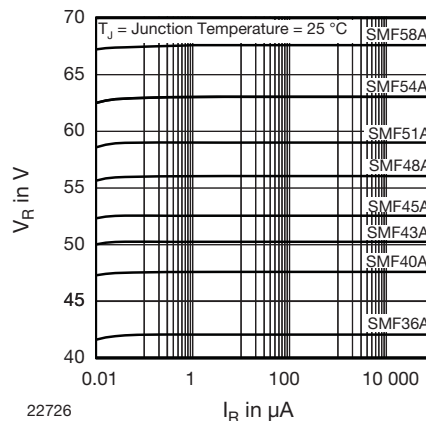
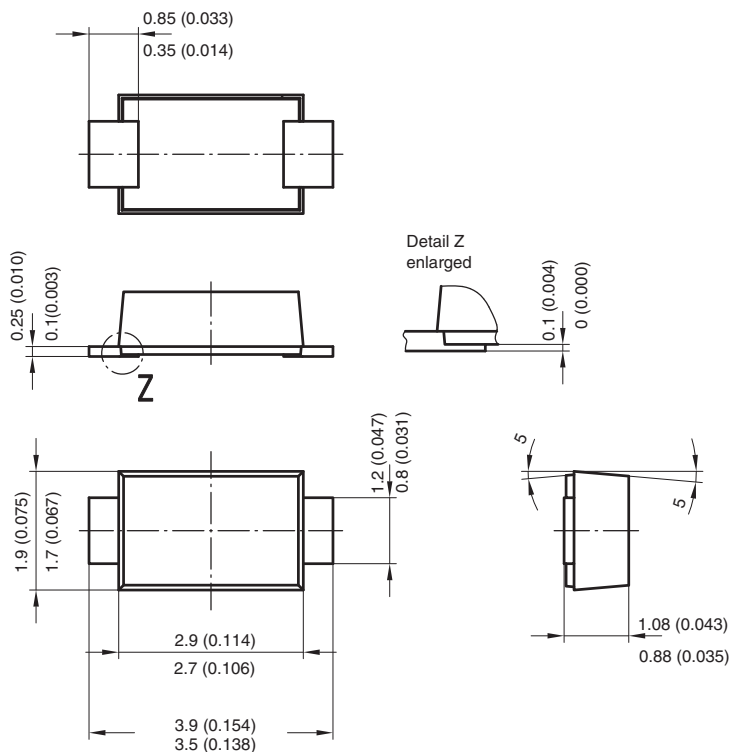


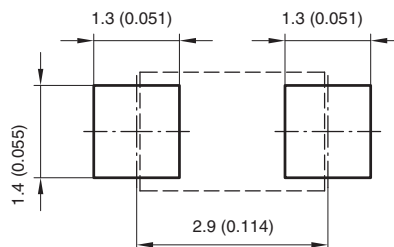
Fig. 12 - Typical Reverse Voltage  $V_R$  vs. Reverse Current  $I_R$



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



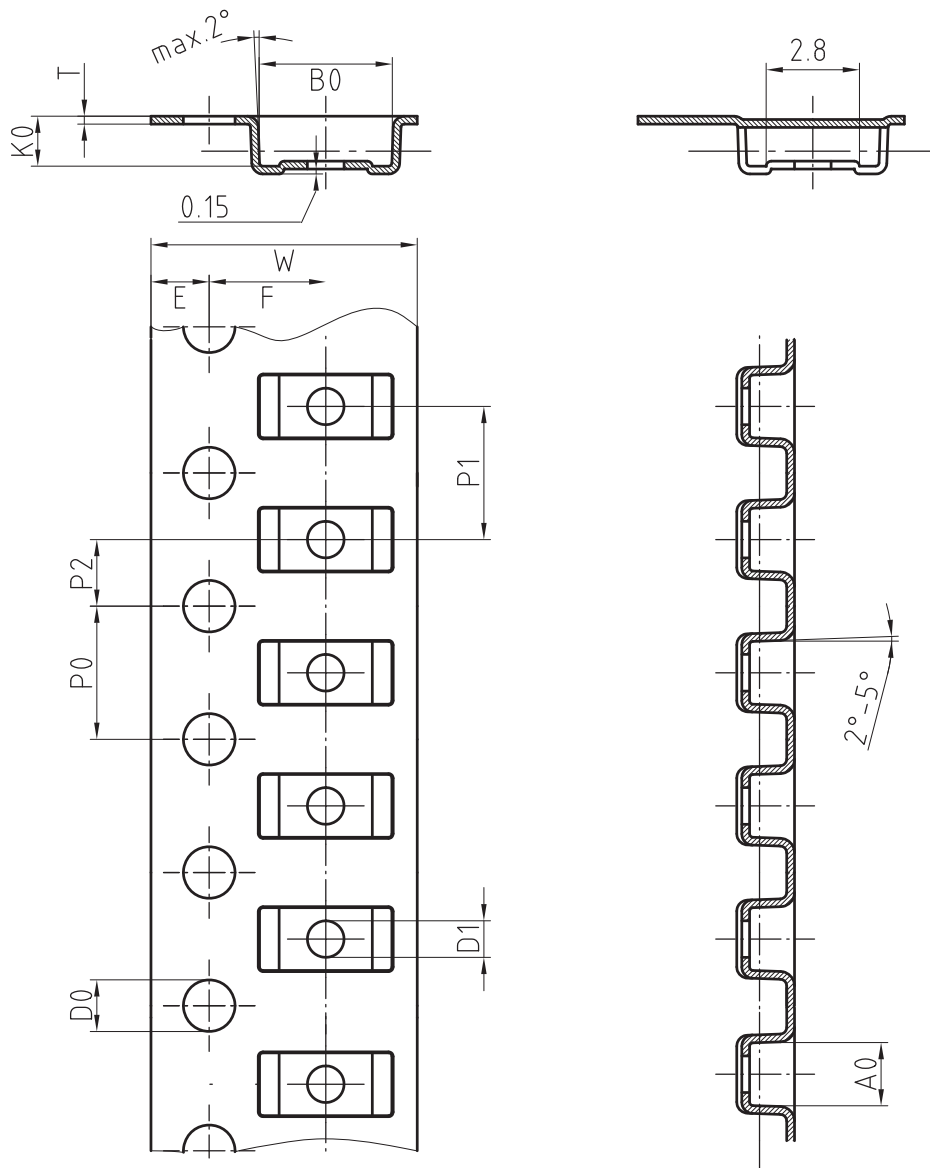
Foot print recommendation:



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)

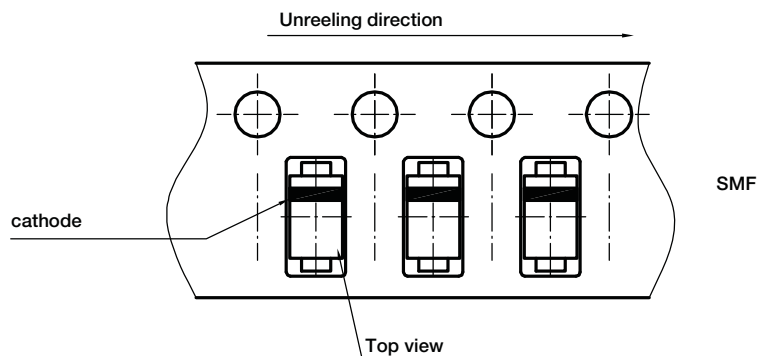


Document-No.: S8-V-3717.02-001 (3)

18513



**ORIENTATION IN CARRIER TAPE - SMF**



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.

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.**



## Данный компонент на территории Российской Федерации

**Вы можете приобрести в компании MosChip.**

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

### Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: [info@moschip.ru](mailto:info@moschip.ru)

Skype отдела продаж:

moschip.ru

moschip.ru\_4

moschip.ru\_6

moschip.ru\_9