

# Standard Avalanche Surface Mount Rectifiers

## eSMP® Series



DO-220AA (SMP)

### PRIMARY CHARACTERISTICS

|                        |                 |
|------------------------|-----------------|
| $I_{F(AV)}$            | 1.5 A           |
| $V_{RRM}$              | 200 V to 1000 V |
| $I_{FSM}$              | 30 A            |
| $I_R$                  | 0.3 $\mu$ A     |
| $V_F$ at $I_F = 1.5$ A | 0.89 V          |
| $E_{AS}$               | 20 mJ           |
| $T_J$ max.             | 175 °C          |

### TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters, and freewheeling diodes for consumer, automotive, and telecommunication.

### FEATURES

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Controlled avalanche characteristics
- Low forward voltage drop
- Low leakage current
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- 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 definition

AUTOMOTIVE  
GRADE  
Available



RoHS  
COMPLIANT  
HALOGEN  
FREE

### MECHANICAL DATA

**Case:** DO-220AA (SMP)

Molding compound meets UL 94 V-0 flammability rating  
Base P/N-M3 - halogen-free, RoHS compliant, and commercial grade

Base P/NHM3 - halogen-free, RoHS compliant, and automotive grade

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 suffix meets JESD 201 class 1A whisker test, HM3 suffix meets JESD 201 class 2 whisker test

**Polarity:** Color band denotes cathode end

### MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)

| PARAMETER                                                                         | SYMBOL         | AS1PD         | AS1PG | AS1PJ | AS1PK | AS1PM | UNIT |
|-----------------------------------------------------------------------------------|----------------|---------------|-------|-------|-------|-------|------|
| Device marking code                                                               |                | ASD           | ASG   | ASJ   | ASK   | ASM   |      |
| Maximum repetitive peak reverse voltage                                           | $V_{RRM}$      | 200           | 400   | 600   | 800   | 1000  | V    |
| Maximum DC forward current (see fig. 1)                                           | $I_F^{(1)}$    | 1.5           |       |       |       |       | A    |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | $I_{FSM}$      | 30            |       |       |       |       | A    |
| Non-repetitive avalanche energy at $I_{AS} = 1.0$ A, $T_A = 25$ °C                | $E_{AS}$       | 20            |       |       |       |       | mJ   |
| Operating junction and storage temperature range                                  | $T_J, T_{STG}$ | - 55 to + 175 |       |       |       |       | °C   |

#### Note

<sup>(1)</sup> Mounted on 5 mm x 5 mm pad areas PCB

## AS1PD thru AS1PM

Vishay General Semiconductor



| ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                                                                          |                         |                               |      |      |      |
|----------------------------------------------------------------------------|--------------------------------------------------------------------------|-------------------------|-------------------------------|------|------|------|
| PARAMETER                                                                  | TEST CONDITIONS                                                          |                         | SYMBOL                        | TYP. | MAX. | UNIT |
| Instantaneous forward voltage                                              | I <sub>F</sub> = 1.0 A                                                   | T <sub>A</sub> = 25 °C  | V <sub>F</sub> <sup>(1)</sup> | 0.95 | -    | V    |
|                                                                            |                                                                          | T <sub>A</sub> = 125 °C |                               | 0.84 | -    |      |
|                                                                            | I <sub>F</sub> = 1.5 A                                                   | T <sub>A</sub> = 25 °C  |                               | 0.99 | 1.15 |      |
|                                                                            |                                                                          | T <sub>A</sub> = 125 °C |                               | 0.89 | 1.0  |      |
| Reverse current                                                            | Rated V <sub>R</sub>                                                     | T <sub>A</sub> = 25 °C  | I <sub>R</sub> <sup>(2)</sup> | 0.3  | 5    | μA   |
|                                                                            |                                                                          | T <sub>A</sub> = 125 °C |                               | 35   | 100  |      |
| Typical reverse recovery time                                              | I <sub>F</sub> = 0.5 A, I <sub>R</sub> = 1.0 A, I <sub>rr</sub> = 0.25 A |                         | t <sub>rr</sub>               | 1.5  | -    | μs   |
| Typical junction capacitance                                               | 4.0 V, 1 MHz                                                             |                         | C <sub>J</sub>                | 10.4 | -    | pF   |

## Notes

(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle(2) Pulse test: Pulse width  $\leq 40\text{ ms}$ 

| THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °c unless otherwise noted) |                                 |       |       |       |       |       |      |
|-------------------------------------------------------------------------|---------------------------------|-------|-------|-------|-------|-------|------|
| PARAMETER                                                               | SYMBOL                          | AS1PD | AS1PG | AS1PJ | AS1PK | AS1PM | UNIT |
| Typical thermal resistance                                              | R <sub>θJA</sub> <sup>(1)</sup> | 115   |       |       |       |       | °C/W |
|                                                                         | R <sub>θJM</sub> <sup>(1)</sup> | 15    |       |       |       |       |      |

## Note

(1) Unit mounted on PCB with 5 mm x 5 mm copper pad areas. Thermal resistance  $R_{\theta JA}$  - junction to ambient,  $R_{\theta JM}$  - junction to mount at the terminal of cathode band

| ORDERING INFORMATION (Example) |                 |                        |               |                                    |
|--------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N                  | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
| AS1PJ-M3/84A                   | 0.024           | 84A                    | 3000          | 7" diameter plastic tape and reel  |
| AS1PJ-M3/85A                   | 0.024           | 85A                    | 10 000        | 13" diameter plastic tape and reel |
| AS1PJHM3/84A <sup>(1)</sup>    | 0.024           | 84A                    | 3000          | 7" diameter plastic tape and reel  |
| AS1PJHM3/85A <sup>(1)</sup>    | 0.024           | 85A                    | 10 000        | 13" diameter plastic tape and reel |

## Note

(1) Automotive grade

## RATINGS AND CHARACTERISTICS CURVES

( $T_A = 25^\circ\text{C}$  unless otherwise noted)

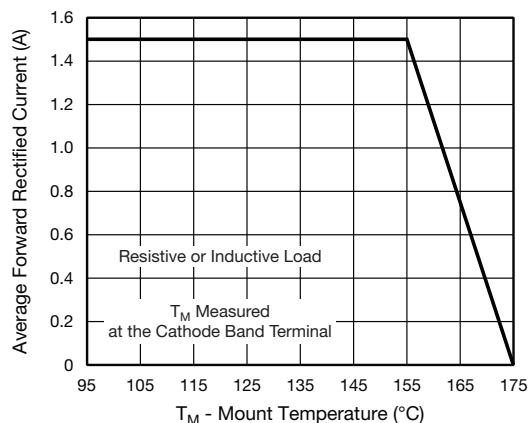


Fig. 1 - Maximum Forward Current Derating Curve

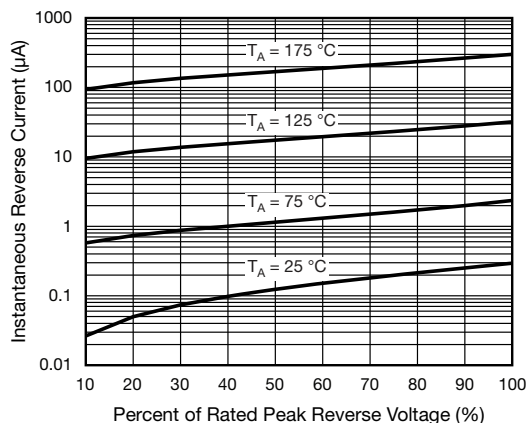


Fig. 4 - Typical Reverse Characteristics

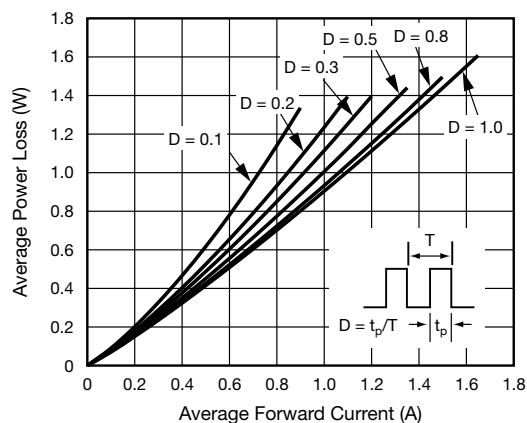


Fig. 2 - Forward Power Loss Characteristics

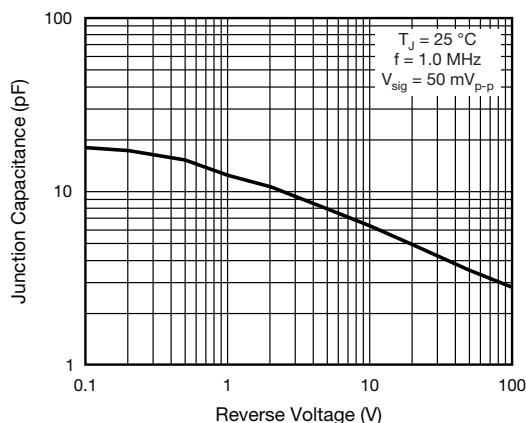


Fig. 5 - Typical Junction Capacitance

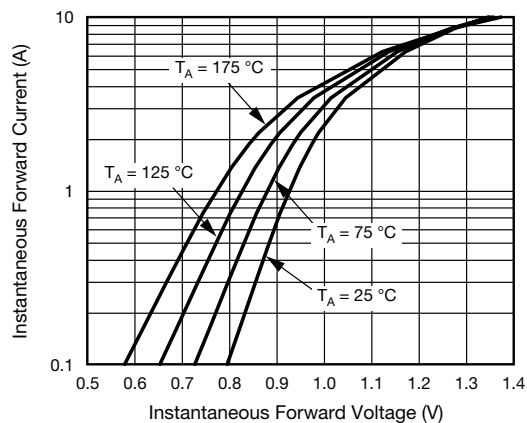


Fig. 3 - Typical Instantaneous Forward Characteristics

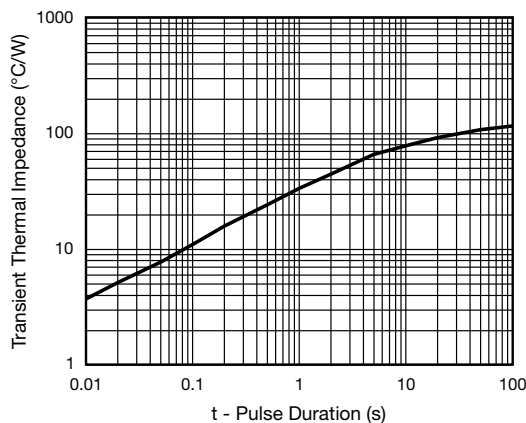
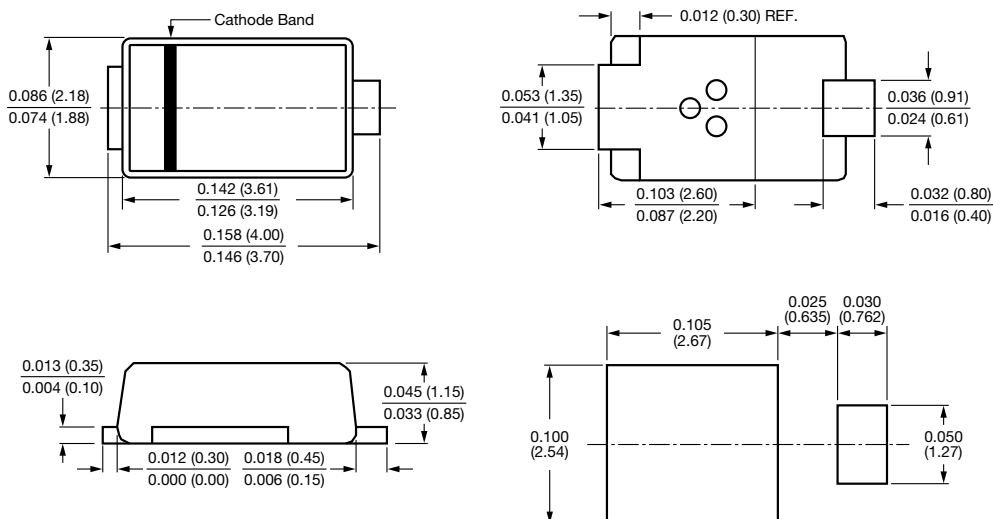


Fig. 6 - Typical Transient Thermal Impedance

**AS1PD thru AS1PM**

Vishay General Semiconductor

**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)**DO-220AA (SMP)**



## 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 and agree to fully indemnify and hold Vishay and its distributors harmless from and against any and all claims, liabilities, expenses and damages arising or resulting in connection with such use or sale, including attorneys fees, even if such claim alleges that Vishay or its distributor was negligent regarding the design or manufacture of the part. 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.**

## 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