

High Current Density Standard Avalanche Surface Mount Rectifiers



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	4.0 A
V_{RRM}	200 V to 1000 V
I_{FSM}	100 A
E_{AS}	20 mJ
V_F at $I_F = 4$ A	0.92 V
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.

MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted)							
PARAMETER	SYMBOL	AS4PD	AS4PG	AS4PJ	AS4PK	AS4PM	UNIT
Device marking code		AS4D	AS4G	AS4J	AS4K	AS4M	
Maximum repetitive peak reverse voltage	V_{RRM}	200	400	600	800	1000	V
Maximum DC forward current (fig. 1)	$I_F^{(1)}$	4.0					A
	$I_F^{(2)}$	2.4					
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	100					A
Non-repetitive avalanche energy at $T_J = 25$ °C	$I_{AS} = 2.5$ A max.	20					mJ
	$I_{AS} = 1.0$ A typical	30					
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 175					°C

Notes

(1) Mounted on 20 mm x 20 mm pad areas, 1 oz. FR4 PCB

(2) Free air, mounted on recommended copper pad area

FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Glass passivated chip junction
- Controlled avalanche characteristics
- Low leakage current
- High forward surge capability
- AEC-Q101 qualified
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Not recommended for PCB bottom side wave mounting
- 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: TO-277A (SMPC)

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

AS4PD thru AS4PM

Vishay General Semiconductor



ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	I _F = 2.0 A	T _A = 25 °C	V _F ⁽¹⁾	0.962	-	V
	I _F = 4.0 A			1.044	1.10	
	I _F = 2.0 A	T _A = 125 °C		0.822	-	
	I _F = 4.0 A			0.922	0.98	
Reverse current	rated V _R	T _A = 25 °C	I _R ⁽²⁾	0.35	10	μA
		T _A = 125 °C		75	150	
Typical junction capacitance per diode	4.0 V, 1 MHz		C _J	60	-	pF

Notes⁽¹⁾ Pulse test: 300 μs pulse width, 1 % duty cycle⁽²⁾ Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)								
PARAMETER	SYMBOL	AS4PD	AS4PG	AS4PJ	AS4PK	AS4PM	UNIT	
Typical thermal resistance	R _{θJA} ⁽¹⁾	80						°C/W
	R _{θJM} ⁽²⁾	5						

Notes⁽¹⁾ Free air, mounted on recommended PCB 1 oz. pad area; thermal resistance R_{θJA} - junction-to-ambient⁽²⁾ Units mounted on PCB with 20 mm x 20 mm copper pad areas, 1 oz. FR4 PCB; R_{θJM} - junction-to-mount

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
AS4PJ-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
AS4PJ-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
AS4PJHM3/86A ⁽¹⁾	0.10	86A	1500	7" diameter plastic tape and reel
AS4PJHM3/87A ⁽¹⁾	0.10	87A	6500	13" diameter plastic tape and reel

Note⁽¹⁾ AEC-Q101 qualified



RATINGS AND CHARACTERISTICS CURVES

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

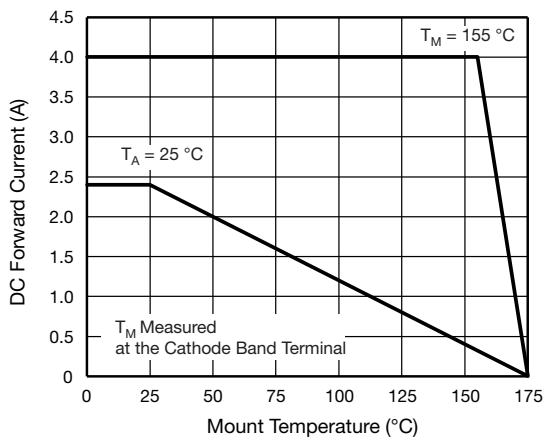


Figure 1. Maximum Forward Current Derating Curve

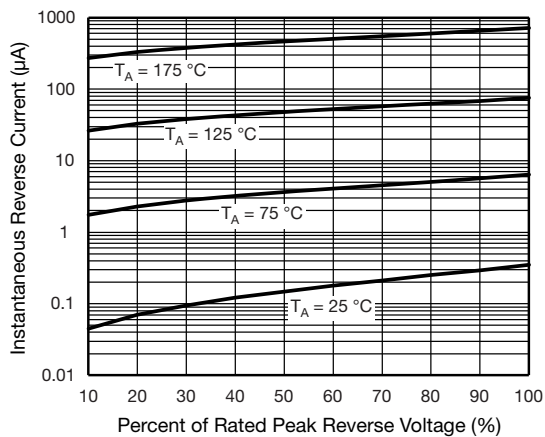


Figure 4. Typical Reverse Leakage Characteristics

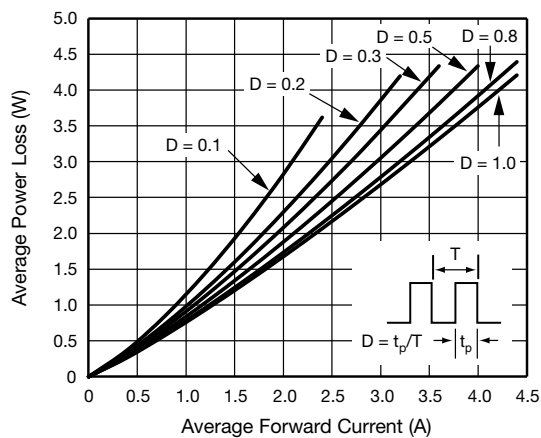


Figure 2. Forward Power Loss Characteristics

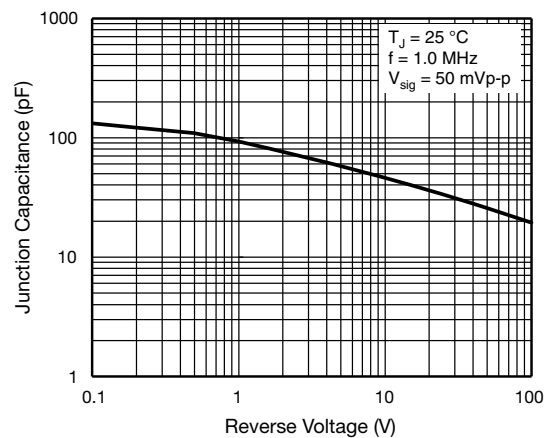


Figure 5. Typical Junction Capacitance

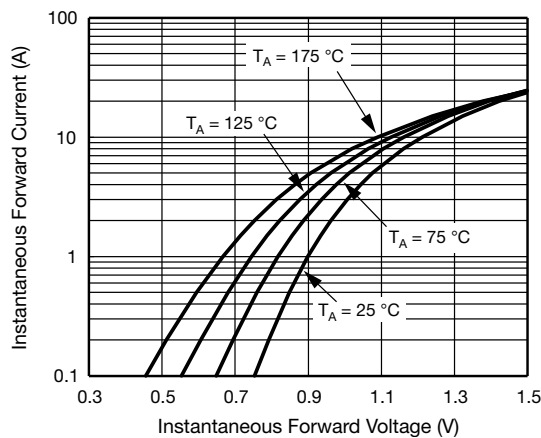


Figure 3. Typical Instantaneous Forward Characteristics

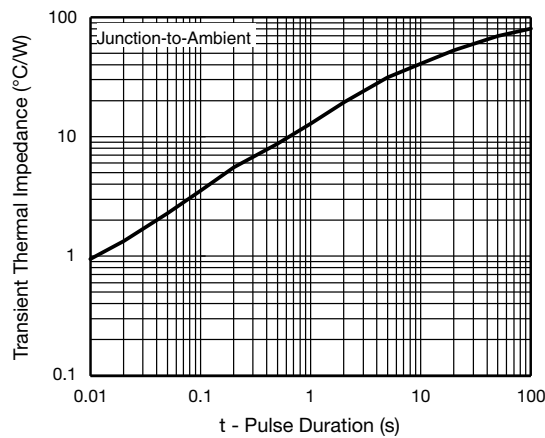


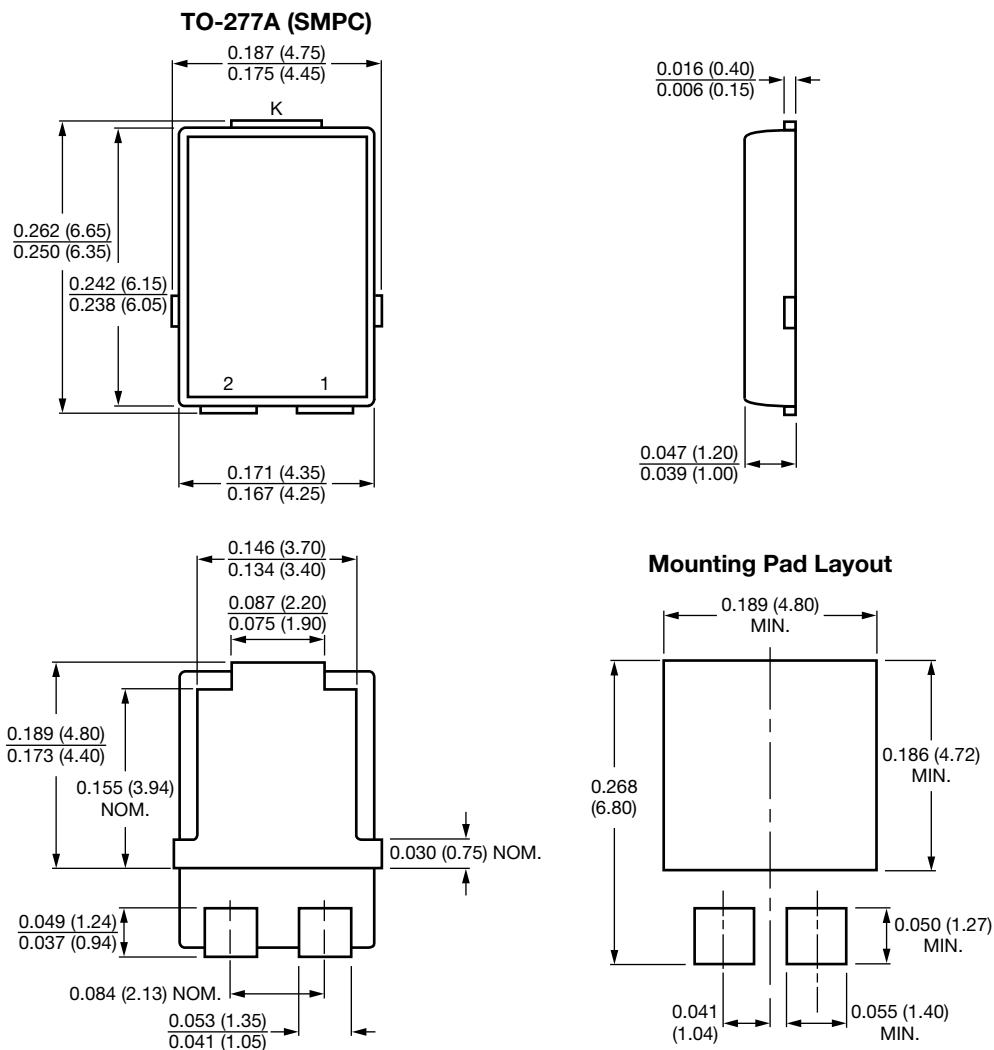
Figure 6. Typical Transient Thermal Impedance

AS4PD thru AS4PM

Vishay General Semiconductor



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Conform to JEDEC TO-277A



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.