Surface Mount TMBS® (Trench MOS Barrier Schottky) Rectifier



SMA (DO-214AC)

Cathode ○—▶|—○ Anode

ADDITIONAL RESOURCES

3D Models

FEATURES

AUTOMOTIVE GRADE Available

RoHS COMPLIANT HALOGEN FREE

- Low profile package
- Ideal for automated placement
- Trench MOS Schottky technology
- Low power losses, high efficiency
- Low forward voltage drop
- AEC-Q101 qualified available
  - Automotive ordering code; base P/NHM3
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

TYPICAL APPLICATIONS

For use in low voltage, high frequency inverters, freewheeling, DC/DC converters, and polarity protection applications.

MECHANICAL DATA

Case: SMA (DO-214AC)
Molding compound meets UL 94 V-0 flammability rating
Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade
Base P/NHM3_X - halogen-free, RoHS-compliant, and AEC-Q101 qualified
("_X" denotes revision code e.g. A, B,.....)

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
M3 and HM3 suffix meets JESD 201 class 2 whisker test

Polarity: color band denotes the cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	100 V
I_{FSM}	60 A
V_F at I_F = 3.0 A	0.62 V
T_J max.	150 °C
Package	SMA (DO-214AC)
Circuit configuration	Single

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

PARAMETER	SYMBOL	VSSA310S	UNIT
Device marking code		V3B	
Maximum repetitive peak reverse voltage	V_{RRM}	100	V
Maximum DC forward current	I_F (1)	3.0	A
	I_F (2)	1.7	
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	60	A
Operating junction and storage temperature range	T_J, T_{STG}	-40 to +150	°C

Notes

(1) Mounted on 10 mm x 10 mm pad areas, 1 oz. FR4 PCB
(2) Free air, mounted on recommended copper pad area

For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@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

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 1.0 mA	T_A = 25 °C	V_{BR}	100 (minimum)	-	V
Instantaneous forward voltage	I_F = 3.0 A	T_A = 25 °C	V_F (1)	0.71	0.80	V
		T_A = 125 °C		0.62	0.70	
Reverse current	V_R = 70 V	T_A = 25 °C	I_R (2)	1.0	-	µA
		T_A = 125 °C		0.95	-	mA
	V_R = 100 V	T_A = 25 °C		3.5	150	µA
		T_A = 125 °C		2.2	15	mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	175	-	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**	**VSSA310S**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	135	°C/W
	$R_{\theta JM}$ (2)	25	

Notes
(1) Free air, mounted on recommended PCB 1 oz. pad area; thermal resistance $R_{\theta JA}$ - junction to ambient
(2) Units mounted on P.C.B. with 10 mm x 10 mm copper pad areas; $R_{\theta JM}$ - junction to mount

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
VSSA310S-M3/61T	0.064	61T	1800	7" diameter plastic tape and reel
VSSA310S-M3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel
VSSA310SHM3_A/H (1)	0.064	H	1800	7" diameter plastic tape and reel
VSSA310SHM3_A/I (1)	0.064	I	7500	13" diameter plastic tape and reel

Note
(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

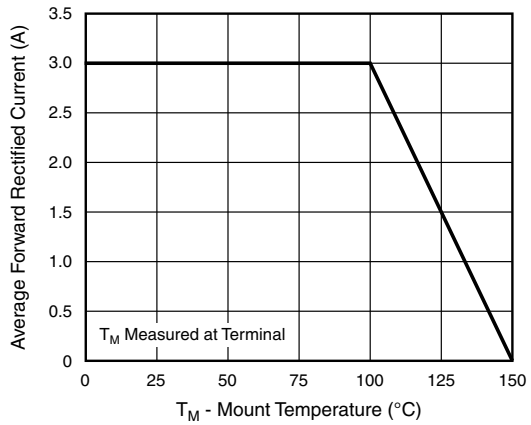


Fig. 1 - Maximum Forward Current Derating Curve

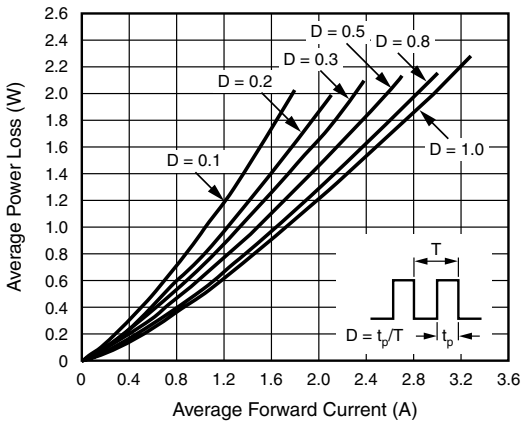


Fig. 2 - Forward Power Loss Characteristics

For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@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

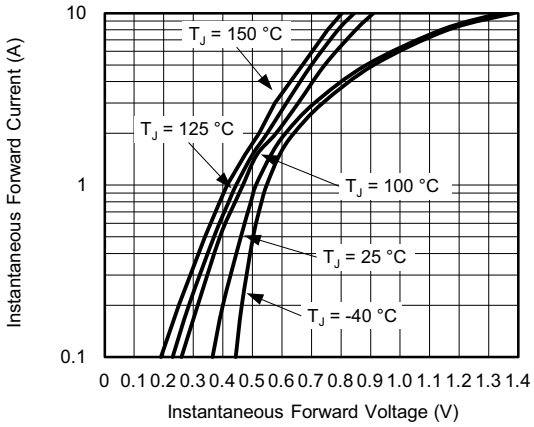


Fig. 3 - Typical Instantaneous Forward Characteristics

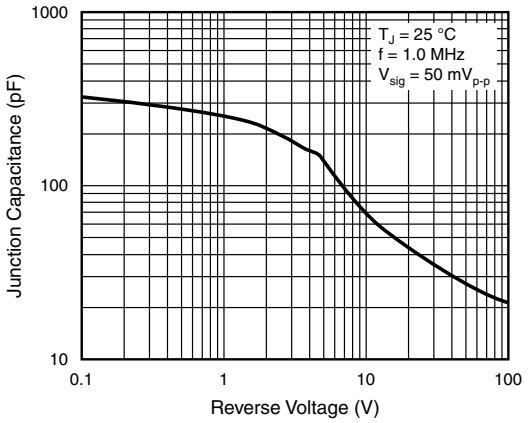


Fig. 5 - Typical Junction Capacitance

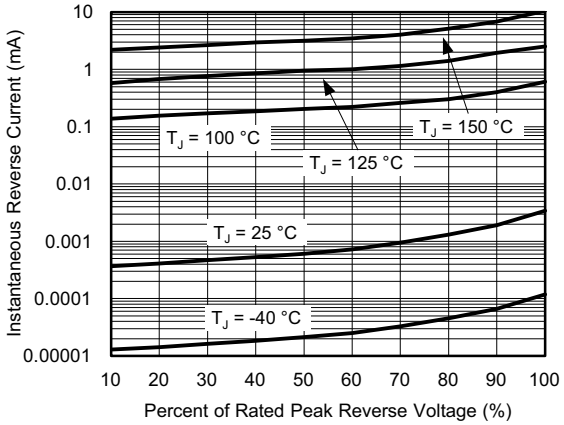


Fig. 4 - Typical Reverse Characteristics

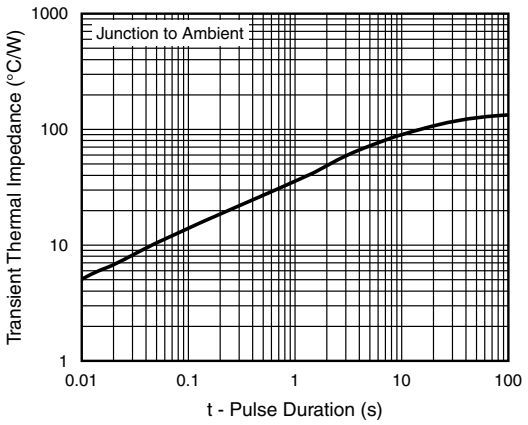
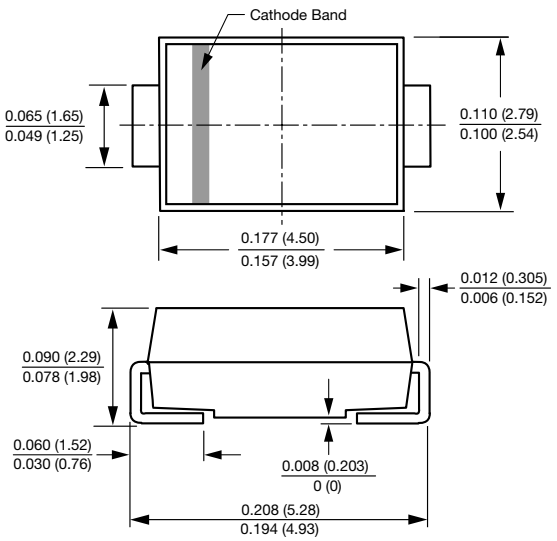


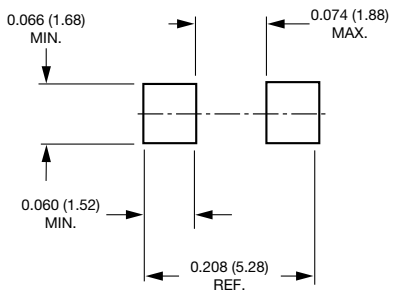
Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMA (DO-214AC)



Mounting Pad Layout



For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@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.

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.

© 2021 VISHAY INTERTECHNOLOGY, INC. ALL RIGHTS RESERVED