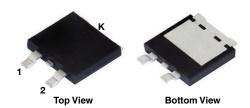
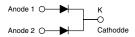


Dual High Voltage TMBS® (Trench MOS Barrier Schottky) Rectifier

eSMP® Series



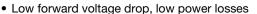
SMPD (TO-263AC)



PRIMARY CHARACTERISTICS				
I _{F(AV)}	2 x 10 A			
V _{RRM}	170 V			
I _{FSM}	150 A			
V _F at I _F = 10.0 A (T _A = 125 °C)	0.68 V			
T _J max.	175 °C			
Package	SMPD (TO-263AC)			
Circuit configurations	onfigurations Common cathode			

FEATURES





· High efficiency operation

 Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C

• AEC-Q101 qualified available



FREE

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

TYPICAL APPLICATIONS

For use in high frequency DC/DC converters, switching power supplies, freewheeling diodes, OR-ing diode, and reverse battery protection.

MECHANICAL DATA

Case: SMPD (TO-263AC)

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: As marked

MAXIMUM RATINGS (T _A = 25 °C unless otherwise noted)				
PARAMETER		SYMBOL	V20D170C	UNIT
Device marking code			V20D170C	
Maximum repetitive peak reverse voltage		V_{RRM}	170	V
Maximum average forward rectified current (fig. 1)	per device	I _{F(AV)}	20	А
	per diode		10	
Peak forward surge current 8.3 ms single half superimposed on rated load	sine-wave	I _{FSM}	150	А
Operating junction temperature range		T _J ⁽¹⁾	-40 to +175	°C
Storage temperature range		T _{STG}	-55 to +175	°C

Note

(1) The heat generated must be less than the thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$



ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage per diode	I _F = 5 A	T _A = 25 °C	V _E (1)	0.75	-	- V
	I _F = 10 A			0.83	0.9	
	I _F = 5 A	T _A = 125 °C	VF (**)	0.6	-	
	I _F = 10 A			0.68	0.76	
Reverse current at rated V _R per diode	V _R = 140 V	T _A = 25 °C	I _R ⁽²⁾	0.001	-	mA
		T _A = 125 °C		0.8	-	mA
	V 470 V	T _A = 25 °C		-	0.15	mA
	V _R = 170 V	T _A = 125 °C		1.5	5	mA
Typical junction capacitance	4.0 V, 1 MHz		CJ	520	-	pF

Notes

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 5 ms

THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL V20D170C		UNIT	
Tunical thormal registance per device	R ₀ JC (1)	1.5	°C/W	
Typical thermal resistance per device	R _{0JA} (2)(3)	58	C/VV	

Notes

- (1) Mounted on infinite heatsink
- $^{(2)}$ The heat generated must be less than the thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$ junction-to-mount
- (3) Free air, without heatsink

ORDERING INFORMATION (Example)						
PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE		
V20D170C-M3/I	0.55	I	2000/reel	13" diameter plastic tape and reel		
V20D170CHM3_B/I (1)	0.55	I	2000/reel	13" diameter plastic tape and reel		

Note

(1) AEC-Q101 qualified

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

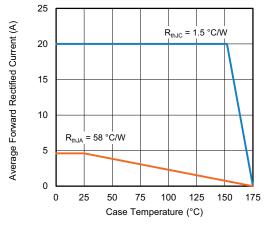


Fig. 1 - Forward Current Derating Curve

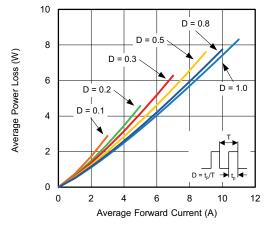


Fig. 2 - Forward Power Loss Characteristics



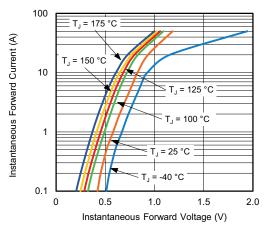


Fig. 3 - Typical Instantaneous Forward Characteristics

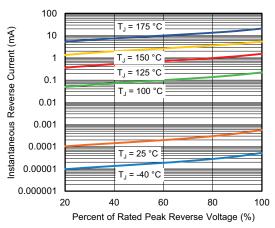


Fig. 4 - Typical Reverse Characteristics

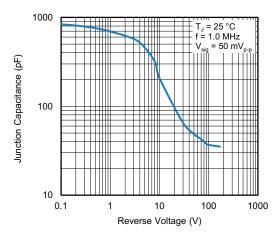


Fig. 5 - Typical Junction Capacitance

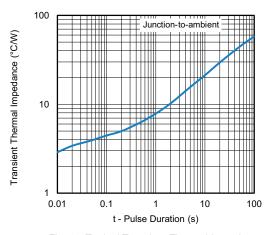


Fig. 6 - Typical Transient Thermal Impedance

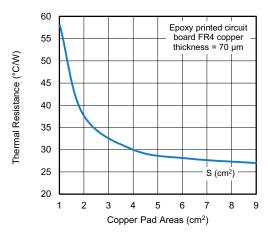
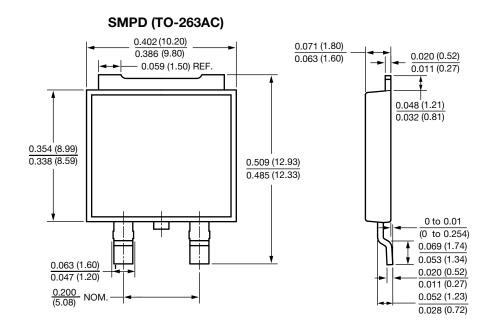
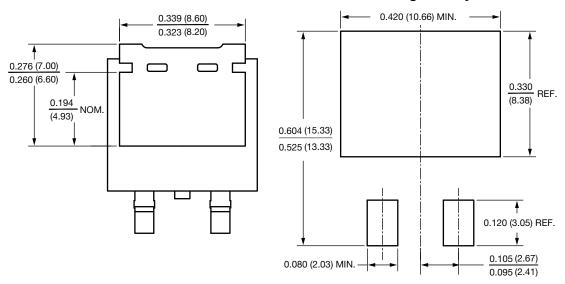


Fig. 7 - Thermal Resistance Junction-to-Ambient vs. Copper Pad Areas

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Mounting Pad Layout





Legal Disclaimer Notice

Vishay

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.

Vishay products are not designed for use in life-saving or life-sustaining applications or any application in which the failure of the Vishay product could result in personal injury or death unless specifically qualified in writing by Vishay. 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.