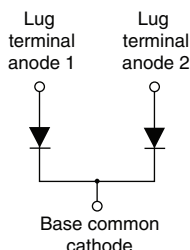


Gen 2 High Performance Schottky Rectifier Not Insulated TO-244 Power Module 200 V, 400 A


TO-244


FEATURES

- Max. $T_J = 175\text{ }^{\circ}\text{C}$
- Trench MOS Barrier Schottky technology
- Ultra low forward voltage drop
- Easy to use and parallel
- Optimized for power conversion: welding and industrial SMPS applications
- Designed for industrial level
- UL approved file E222165 
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT

PRIMARY CHARACTERISTICS

$I_{F(AV)}$, module - $T_C = 128\text{ }^{\circ}\text{C}$	400 A
V_R	200 V
Q_{rr} (typical)	540 nC
t_{rr}	132 ns
Type	Modules - diode, Schottky
Package	TO-244
Circuit configuration	Two diodes common cathode

BENEFITS

- Reduced RFI and EMI
- Higher frequency operation
- Reduced snubbing
- Reduced parts count

DESCRIPTION / APPLICATIONS

The VS-402CNQ200PBF not insulated modules integrate two state of the art Trench MOS barrier Schottky technology rectifiers in the compact industry standard TO244 package.

These devices are thus intended for high frequency converters and switching power supplies.

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	MAX.	UNITS
Cathode to anode voltage	V_R		200	V
Continuous forward current per diode	$I_{F(DC)}$	$T_C = 25\text{ }^{\circ}\text{C}$	551	A
		$T_C = 85\text{ }^{\circ}\text{C}$	397	
		$T_C = 143\text{ }^{\circ}\text{C}$	200	
Single pulse forward current per diode	I_{FSM}	$T_C = 175\text{ }^{\circ}\text{C}$, $t = 6\text{ ms}$, square	2100	
Maximum power dissipation	P_D	$T_C = 25\text{ }^{\circ}\text{C}$	789	W
		$T_C = 85\text{ }^{\circ}\text{C}$	474	
Operating junction temperatures	T_J		-40 to +175	$^{\circ}\text{C}$
Storage temperatures	T_{Stg}		-40 to +150	$^{\circ}\text{C}$

ELECTRICAL SPECIFICATIONS PER LEG ($T_J = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Breakdown voltage	V_{BR}	$I_R = 2\text{ mA}$	200	-	-	
Forward voltage	V_{FM}	$I_F = 200\text{ A}$	-	0.845	1.045	V
		$I_F = 400\text{ A}$	-	0.958	1.358	
		$I_F = 200\text{ A}$, $T_J = 125\text{ }^{\circ}\text{C}$	-	0.715	-	
		$I_F = 400\text{ A}$, $T_J = 125\text{ }^{\circ}\text{C}$	-	0.850	-	
Reverse leakage current	I_{RM}	$T_J = 25\text{ }^{\circ}\text{C}$, $V_R = 200\text{ V}$	-	50	200	μA
	I_{RM}	$T_J = 175\text{ }^{\circ}\text{C}$, $V_R = 200\text{ V}$	-	198	500	mA
Maximum junction capacitance per leg	C_T	$V_{DC} = 5\text{ V}$, $f = 1\text{ MHz}$, $25\text{ }^{\circ}\text{C}$	-	-	20	nF
Series inductance	L_S	From top of terminal hole to mounting plane	-	5	-	nH

**DYNAMIC RECOVERY CHARACTERISTICS** ($T_J = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Reverse recovery time	t_{rr}	$T_J = 25\text{ }^{\circ}\text{C}$	-	132	-	ns
		$T_J = 125\text{ }^{\circ}\text{C}$	-	155	-	
Peak recovery current	I_{RRM}	$T_J = 25\text{ }^{\circ}\text{C}$	-	6	-	A
		$T_J = 125\text{ }^{\circ}\text{C}$	-	8	-	
Reverse recovery charge	Q_{rr}	$T_J = 25\text{ }^{\circ}\text{C}$	-	540	-	nC
		$T_J = 125\text{ }^{\circ}\text{C}$	-	840	-	

THERMAL - MECHANICAL SPECIFICATIONS

MECHANICAL ME					
--	--	--	--	--	--

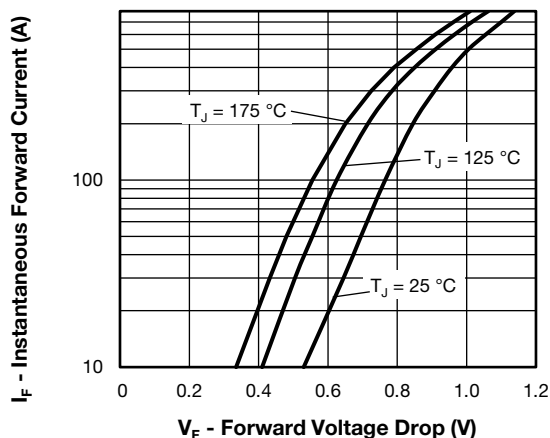


Fig. 1 - Typical Forward Voltage Drop vs. Instantaneous Forward Current (Per Diode)

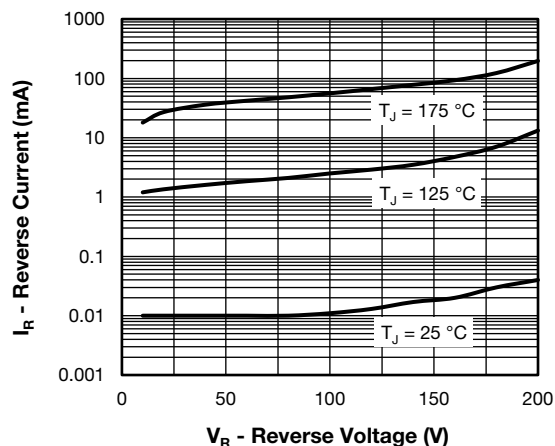


Fig. 2 - Typical Reverse Current vs. Reverse Voltage (Per Diode)

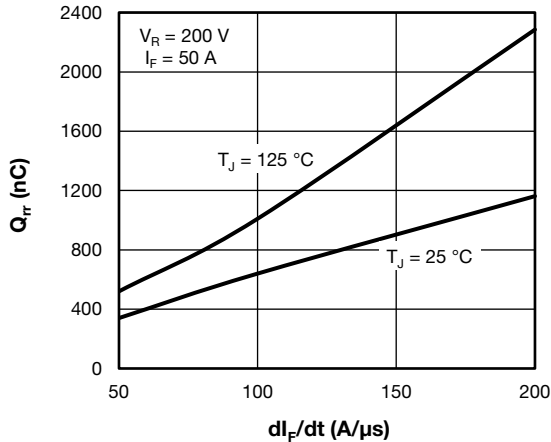


Fig. 3 - Typical Reverse Recovery Charge vs. dI_F/dt (Per Diode)

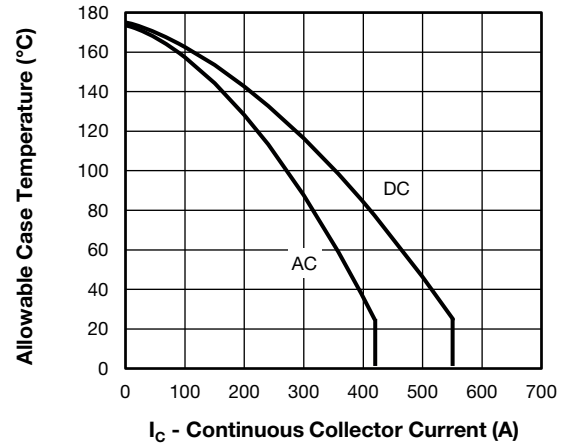


Fig. 6 - Maximum Continuous Forward Current vs. Case Temperature

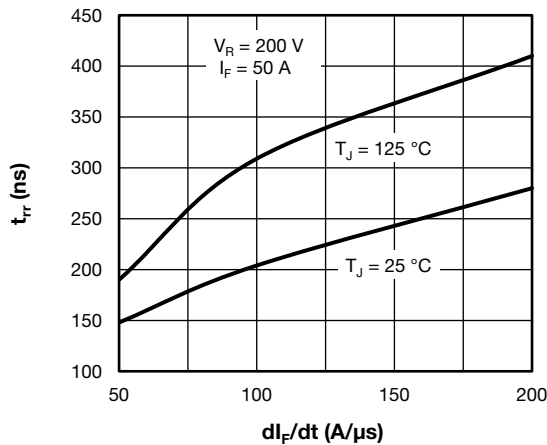


Fig. 4 - Typical Reverse Recovery Time vs dI_F/dt (Per Diode)

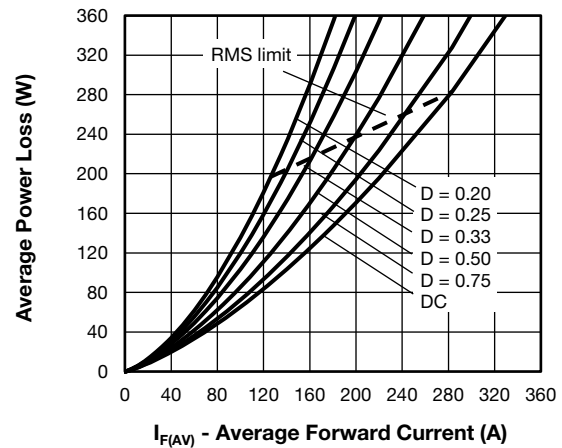


Fig. 7 - Average Power Loss vs Average Forward Current (Forward Power Loss Characteristics)

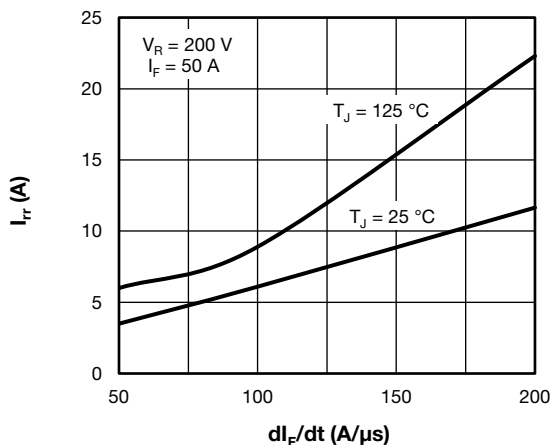


Fig. 5 - Typical Reverse Recovery Current vs. dI_F/dt (Per Diode)

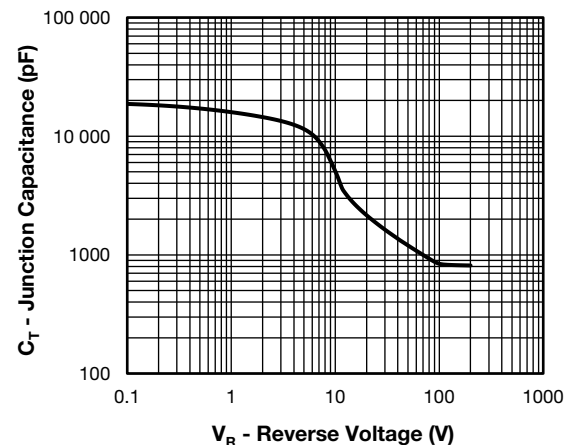


Fig. 8 - Typical Junction Capacitance vs. Reverse Voltage

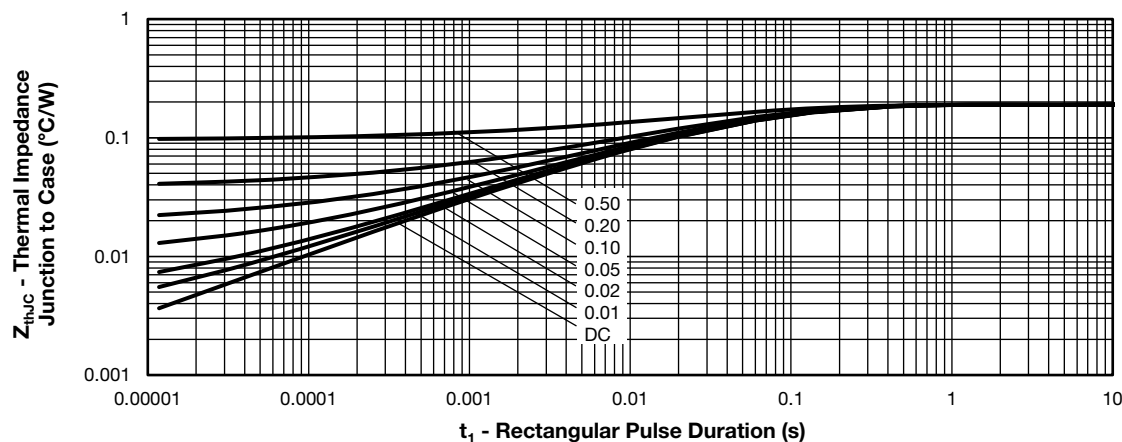


Fig. 9 - $Z_{th,JC}$ Maximum Thermal Impedance Junction to Case vs. t_1 Rectangular Pulse Duration

ORDERING INFORMATION TABLE

Device code	VS-	40	2	C	N	Q	200	PbF
	1	2	3	4	5	6	7	8

- 1 - Vishay Semiconductors product
- 2 - Average current rating (x 10)
- 3 - Product silicon identification
- 4 - Circuit configuration:
C = two diodes common cathode
- 5 - N = not isolated
- 6 - Q = Schottky rectifier diode
- 7 - 200 = 200 V
- 8 - PbF = lead (Pb)-free

Circuit Configuration		
Circuit	Circuit Configuration Code	Circuit Drawing
Two diodes common cathode	C	

LINKS TO RELATED DOCUMENTS

Dimensions	www.vishay.com/doc?95021
------------	--



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.