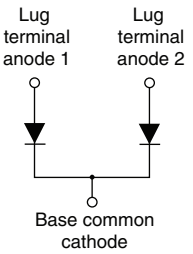
Gen 2 High Performance Schottky Rectifier Not Insulated TO-244 Power Module 200 V, 400 A

TO-244



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$, module - T_C = 128 °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

FEATURES

- Max. T_J = 175 °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

BENEFITS

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

DESCRIPTION / APPLICATIONS

The VS-402CNQ20OPBF 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 °C	551	A
		T_C = 85 °C	397	
		T_C = 143 °C	200	
Single pulse forward current per diode	I_{FSM}	T_C = 175 °C, t = 6 ms, square	2100	
Maximum power dissipation	P_D	T_C = 25 °C	789	W
		T_C = 85 °C	474	
Operating junction temperatures	T_J		-40 to +175	°C
Storage temperatures	T_{Stg}		-40 to +150	°C

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

DYNAMIC RECOVERY CHARACTERISTICS (T_J = 25 °C unless otherwise specified)							
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNITS
Reverse recovery time	t_{rr}	T_J = 25 °C	I_F = 50 A, dI_F/dt = 100 A/µs, V_R = 100 V	-	132	-	ns
		T_J = 125 °C		-	155	-	
Peak recovery current	I_{RRM}	T_J = 25 °C		-	6	-	A
		T_J = 125 °C		-	8	-	
Reverse recovery charge	Q_{rr}	T_J = 25 °C		-	540	-	nC
		T_J = 125 °C		-	840	-	

THERMAL - MECHANICAL SPECIFICATIONS						
PARAMETER		SYMBOL	MIN.	TYP.	MAX.	UNITS
Thermal resistance, junction to case	per leg	R_{thJC}	-	-	0.19	°C/W
	per module		-	-	0.095	
Thermal resistance, case to heatsink		R_{thCS}	-	0.10	-	
Weight			-	68	-	g
			-	2.4	-	oz.
Mounting torque			30 (3.4)	-	40 (4.6)	lbf · in (N · m)
Mounting torque center hole			12 (1.4)	-	18 (2.1)	
Terminal torque			30 (3.4)	-	40 (4.6)	
Vertical pull			-	-	80	lbf · in
2" lever pull			-	-	35	
Case style			TO-244			

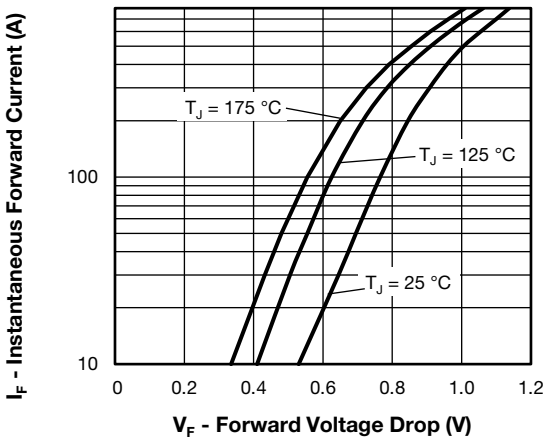


Fig. 1 - Typical Forward Voltage Drop vs. Instantaneous Forward Current (Per Diode)

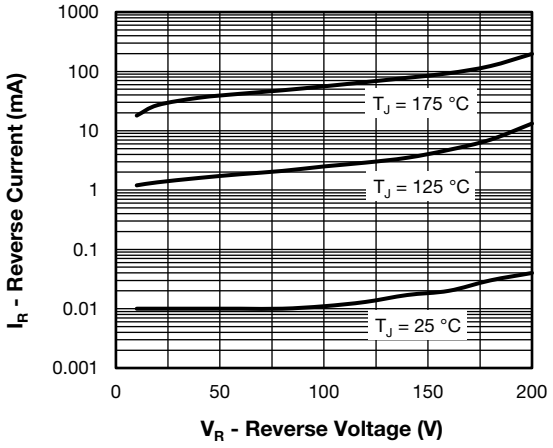


Fig. 2 - Typical Reverse Current vs. Reverse Voltage (Per Diode)

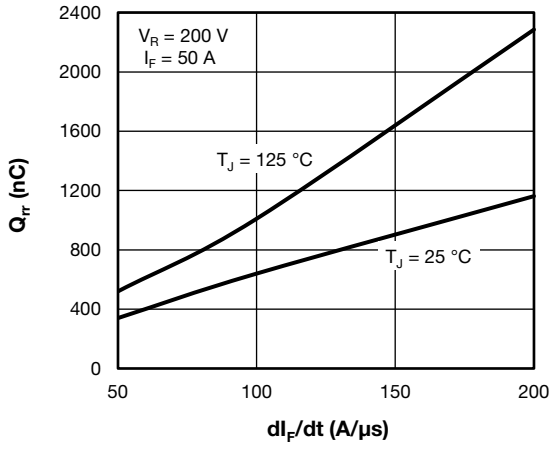


Fig. 3 - Typical Reverse Recovery Charge vs. dIFdt
(Per Diode)

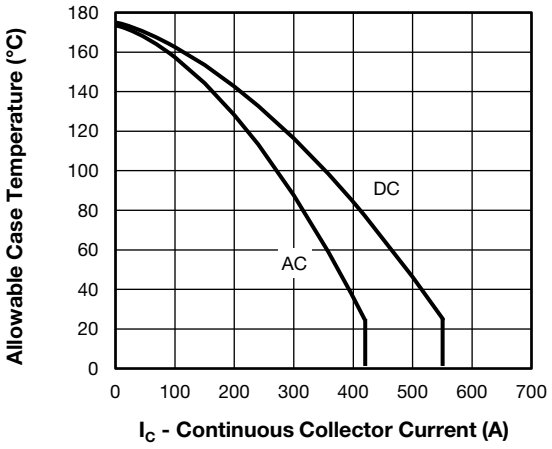


Fig. 6 - Maximum Continuous Forward Current vs.
Case Temperature

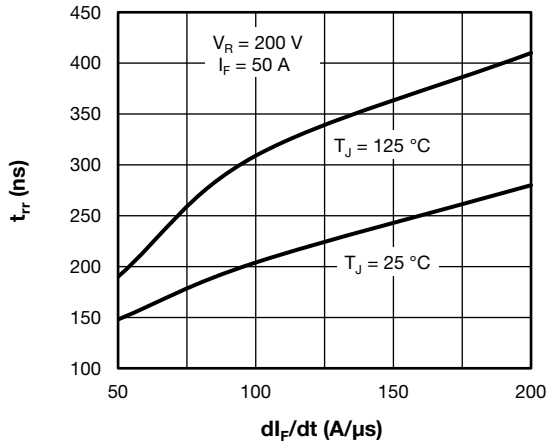


Fig. 4 - Typical Reverse Recovery Time vs $dI_F dt$
(Per Diode)

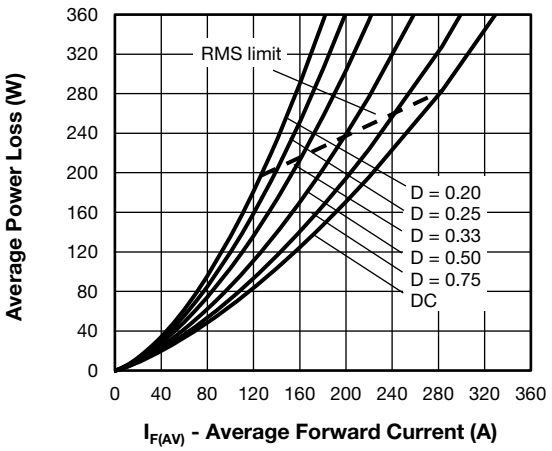


Fig. 7 - Average Power Loss vs Average Forward Current
(Forward Power Loss Characteristics)

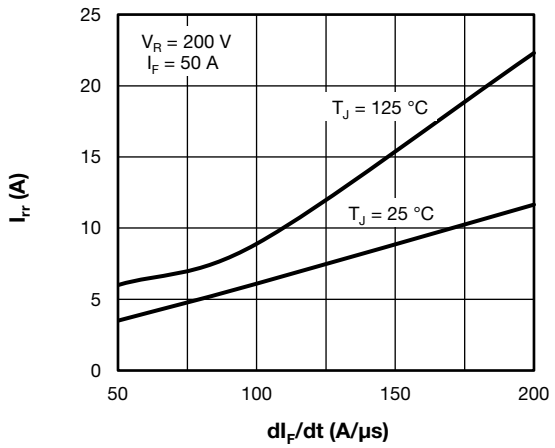


Fig. 5 - Typical Reverse Recovery Current vs. $dI_F dt$
(Per Diode)

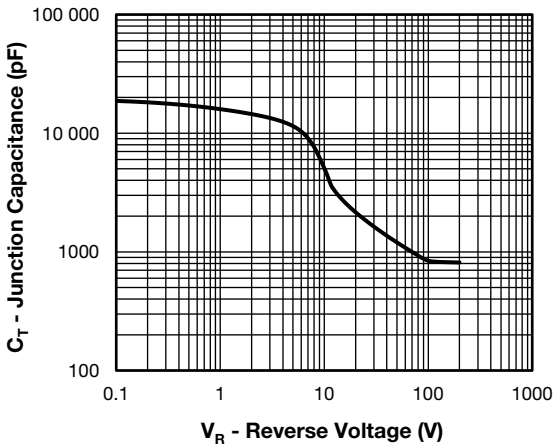


Fig. 8 - Typical Junction Capacitance vs. Reverse Voltage

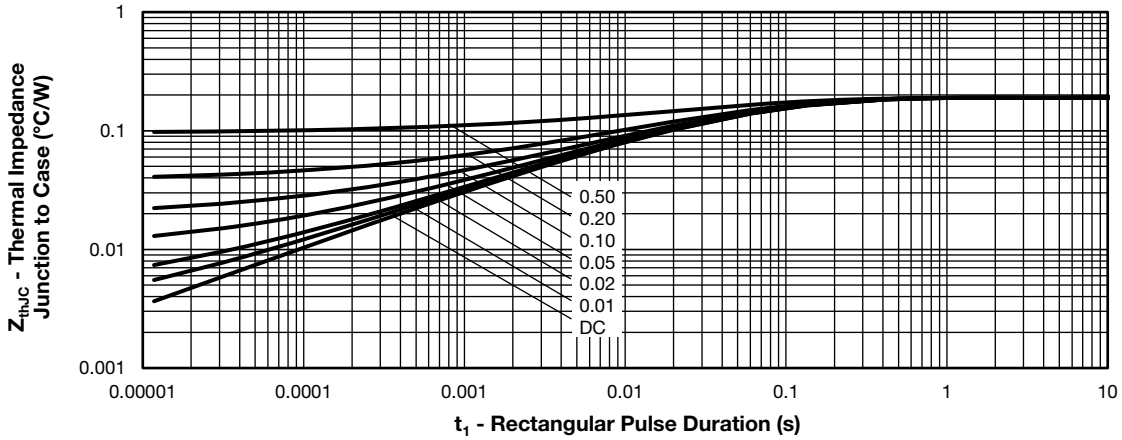


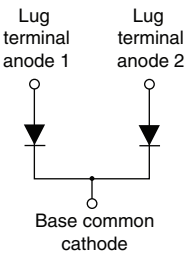
Fig. 9 - Z_{thJC} Maximum Thermal Impedance Junction to Case vs. t_1 Rectangular Pulse Duration

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

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