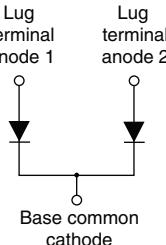


High Performance Schottky Rectifier, 200 A


TO-244


FEATURES

- 175 °C T_J operation
- Center tap module
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- UL approved file E222165 
- Designed and qualified for industrial level
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


**RoHS
COMPLIANT**

DESCRIPTION / APPLICATIONS

The VS-209CNQ center tap Schottky rectifier module series has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 175 °C junction temperature. Typical applications are in high current switching power supplies, plating power supplies, UPS systems, converters, freewheeling diodes, welding, and reverse battery protection.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	200 A
V_R	135 V, 150 V
Package	TO-244
Circuit configuration	Two diodes common cathode

MAJOR RATINGS AND CHARACTERISTICS					
SYMBOL	CHARACTERISTICS			VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform			200	A
V_{RRM}	Range			135/150	V
I_{FSM}	$t_p = 5 \mu s$ sine			10 000	A
V_F	$100 A_{pk}$, $T_J = 125^\circ C$ (per leg)			0.71	V
T_J	Range			-55 to +175	°C

VOLTAGE RATINGS				
PARAMETER	SYMBOL	VS-209CNQ135PbF	VS-209CNQ150PbF	UNITS
Maximum DC reverse voltage	V_R	135	150	V
Maximum working peak reverse voltage	V_{RWM}			

ABSOLUTE MAXIMUM RATINGS						
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum average forward current per leg See fig. 5	$I_{F(AV)}$	50 % duty cycle at $T_C = 131^\circ C$, rectangular waveform		100	A	
per device				200		
Maximum peak one cycle non-repetitive surge current per leg See fig. 7	I_{FSM}	5 μs sine or 3 μs rect. pulse	Following any rated load condition and with rated V_{RRM} applied	10 000		
		10 ms sine or 6 ms rect. pulse		1200		
Non-repetitive avalanche energy per leg	E_{AS}	$T_J = 25^\circ C$, $I_{AS} = 5.5 A$, $L = 1 mH$		15	mJ	
Repetitive avalanche current per leg	I_{AR}	Current decaying linearly to zero in 1 μs Frequency limited by T_J maximum $V_A = 1.5 \times V_R$ typical		1	A	

ELECTRICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum forward voltage drop per leg See fig. 1	$V_{FM}^{(1)}$	100 A	$T_J = 25^\circ C$	1.06	V	
		200 A		1.33		
		100 A	$T_J = 125^\circ C$	0.74		
		200 A		0.88		
Maximum reverse leakage current per leg See fig. 2	$I_{RM}^{(1)}$	$T_J = 25^\circ C$	$V_R = \text{Rated } V_R$	3	mA	
		$T_J = 125^\circ C$		45		
Maximum junction capacitance per leg	C_T	$V_R = 5 V_{DC}$ (test signal range 100 kHz to 1 MHz) $25^\circ C$		3000	pF	
Typical series inductance per leg	L_S	From top of terminal hole to mounting plane		7.0	nH	
Maximum voltage rate of change	dV/dt	Rated V_R		10 000	V/ μ s	

Note

(1) Pulse width < 300 μ s, duty cycle < 2 %

THERMAL - MECHANICAL SPECIFICATIONS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS
Maximum junction and storage temperature range	T_J, T_{Stg}	-55	-	175	°C
Thermal resistance, junction to case per leg	R_{thJC}	-	-	0.38	°C/W
per module		-	-	0.19	
Thermal resistance, case to heatsink	R_{thCS}	-	0.10	-	
Weight		-	68	-	g
		-	2.4	-	oz.
Mounting torque		35.4 (4)	-	53.1 (6)	lbf · in (N · m)
Mounting torque center hole		30 (3.4)	-	40 (4.6)	
Terminal torque		30 (3.4)	-	44.2 (5)	
Vertical pull		-	-	80	lbf · in
2" lever pull		-	-	35	

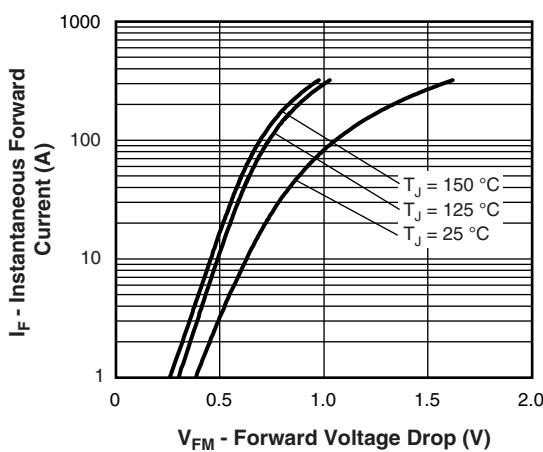


Fig. 1 - Maximum Forward Voltage Drop Characteristics

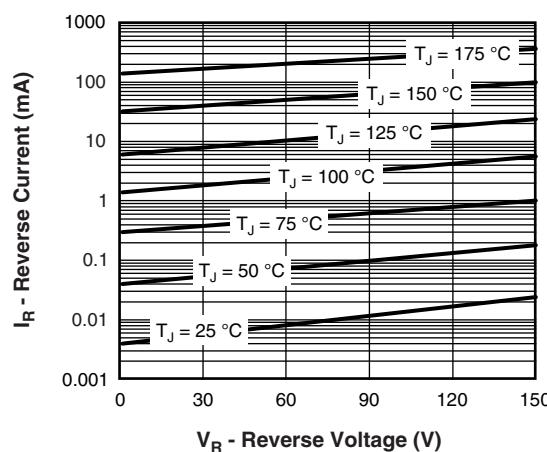


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

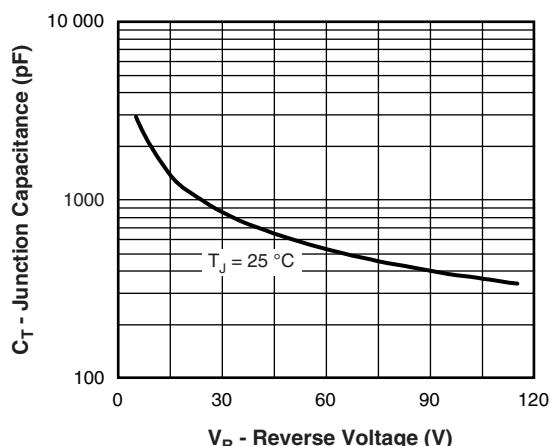


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

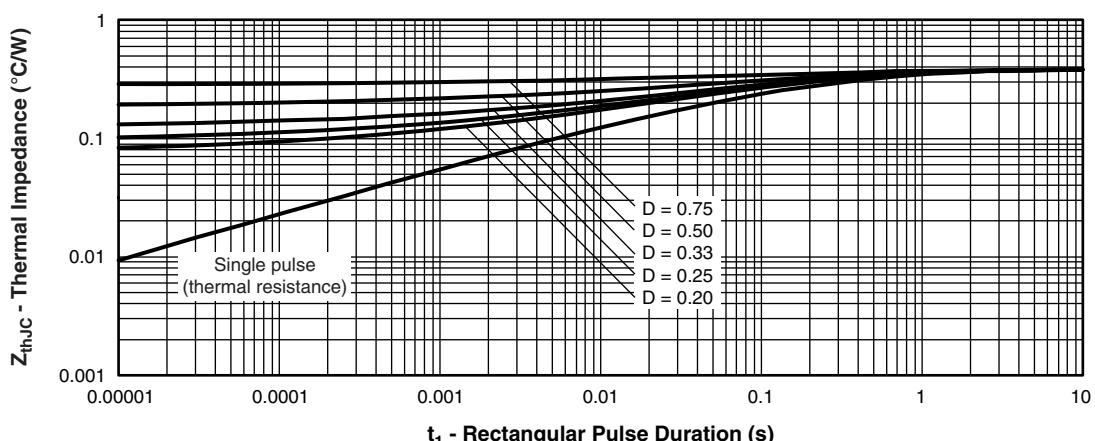


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

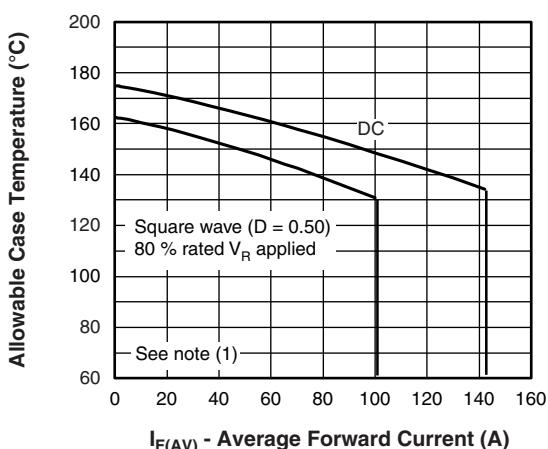


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

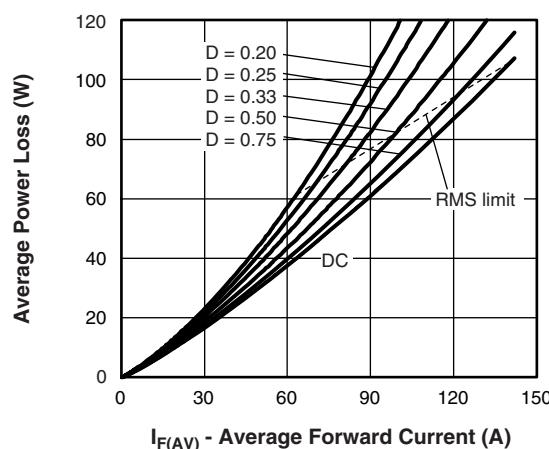


Fig. 6 - Forward Power Loss Characteristics

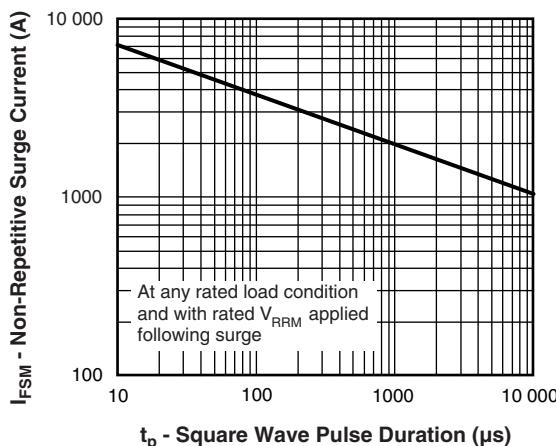


Fig. 7 - Maximum Non-Repetitive Surge Current

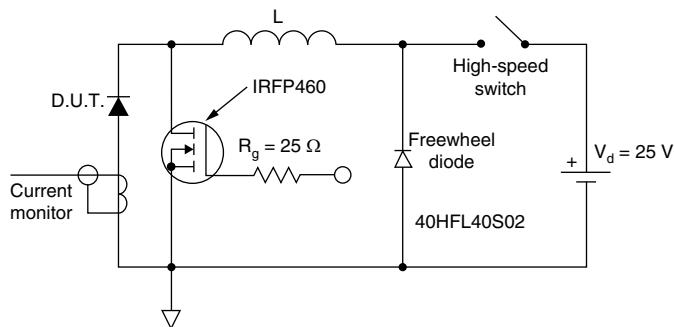


Fig. 8 - Unclamped Inductive Test Circuit

Note

(1) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
 $Pd = \text{forward power loss} = I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6);
 $Pd_{REV} = \text{inverse power loss} = V_{R1} \times I_R (1 - D)$; I_R at $V_{R1} = 80\%$ rated V_R

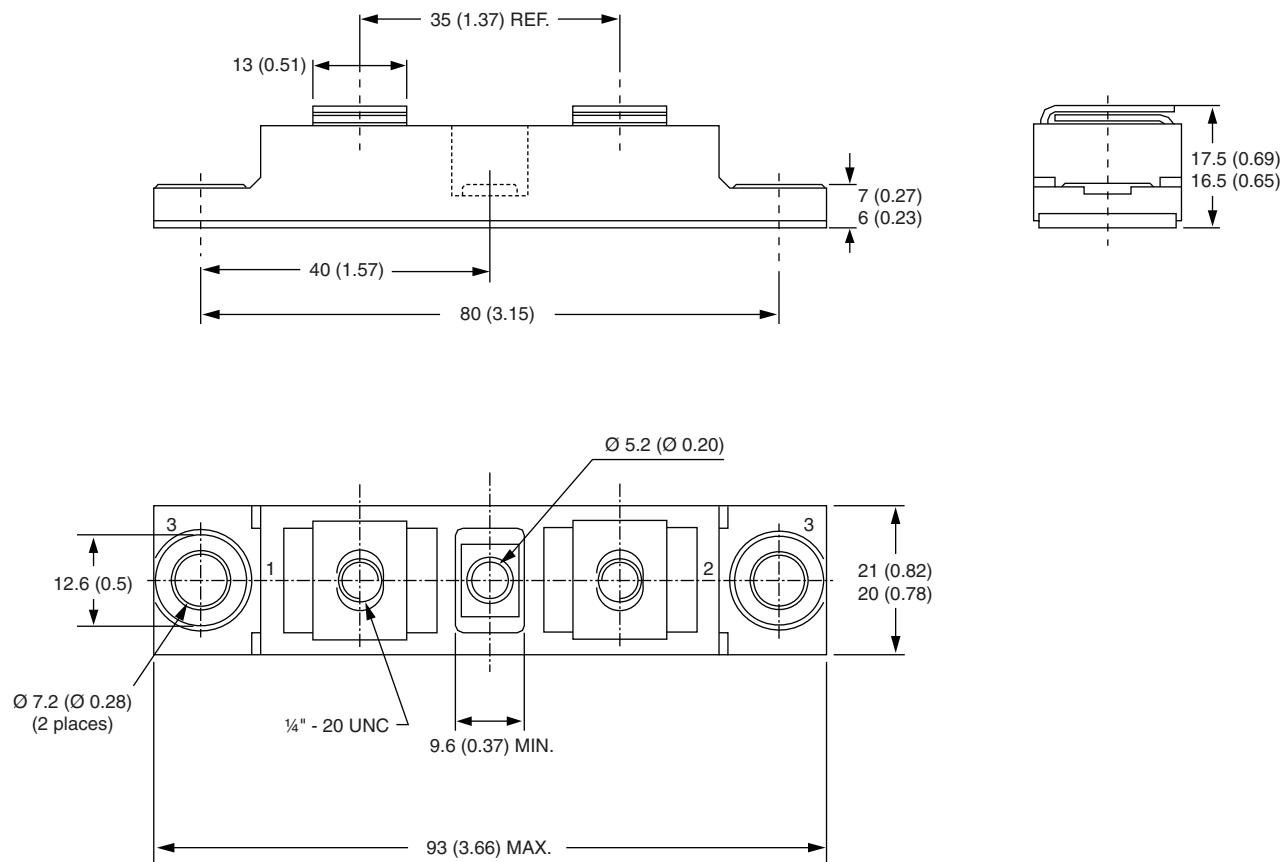
ORDERING INFORMATION TABLE

Device code	VS-	20	9	C	N	Q	150	PbF
	1	2	3	4	5	6	7	8
	1 <ul style="list-style-type: none"> - Vishay Semiconductors product 	2 <ul style="list-style-type: none"> - Average current rating (x 10) 	3 <ul style="list-style-type: none"> - Product silicon identification 	4 <ul style="list-style-type: none"> - C = circuit configuration 	5 <ul style="list-style-type: none"> - N = not isolated 	6 <ul style="list-style-type: none"> - Q = Schottky rectifier diode 	7 <ul style="list-style-type: none"> - Voltage ratings _____ 	8 <ul style="list-style-type: none"> - Lead (Pb)-free

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95021

TO-244

DIMENSIONS in millimeters (inches)



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