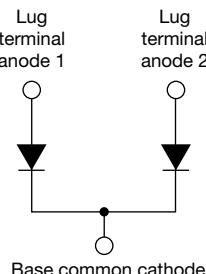


High Performance Schottky Rectifier, 200 A


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**

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	200 A
V_R	45 V
Package	TO-244
Circuit configuration	Two diodes common cathode

DESCRIPTION / APPLICATIONS

The VS-201CNQ045PbF center tap Schottky rectifier module 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, converters, freewheeling diodes, welding, and reverse battery protection.

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	200	A
V_{RRM}		45	V
I_{FSM}	$t_p = 5 \mu s$ sine	16 000	A
V_F	$100 A_{pk}$, $T_J = 125^\circ C$ (per leg)	0.58	V
T_J	Range	-55 to +175	°C

VOLTAGE RATINGS			
PARAMETER	SYMBOL	VS-201CNQ045PbF	UNITS
Maximum DC reverse voltage	V_R	45	V
Maximum working peak reverse voltage	V_{RWM}		

ABSOLUTE MAXIMUM RATINGS						
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum average forward current per device See fig. 5	$I_{F(AV)}$	50 % duty cycle at $T_C = 146^\circ C$, rectangular waveform		200	A	
per leg				100		
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	16 000	A	
		10 ms sine or 6 ms rect. pulse		2000		
Non-repetitive avalanche energy per leg	E_{AS}	$T_J = 25^\circ C$, $I_{AS} = 17 A$, $L = 1 mH$		145	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		20	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 °C	0.67	V	
		200 A		0.81		
		100 A	T _J = 125 °C	0.58		
		200 A		0.71		
Maximum reverse leakage current per leg See fig. 2	I _{RM} ⁽¹⁾	T _J = 25 °C	V _R = Rated V _R	10	mA	
		T _J = 125 °C		90		
Maximum junction capacitance per leg	C _T	V _R = 5 V _{DC} (test signal range 100 kHz to 1 MHz) 25 °C		5200	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/μs	

Note

⁽¹⁾ Pulse width < 300 μs, 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	
2" lever pull		-	-	35	lbf · in

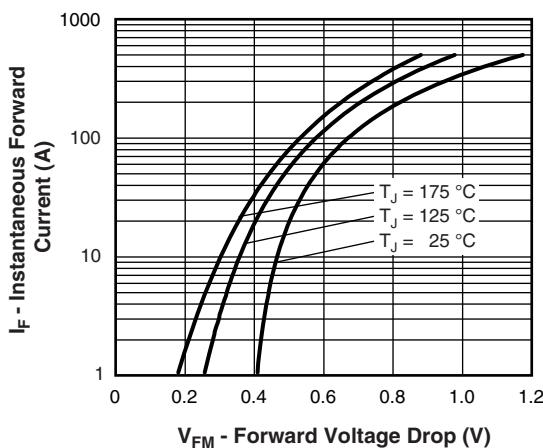


Fig. 1 - Maximum Forward Voltage Drop Characteristics
(Per Leg)

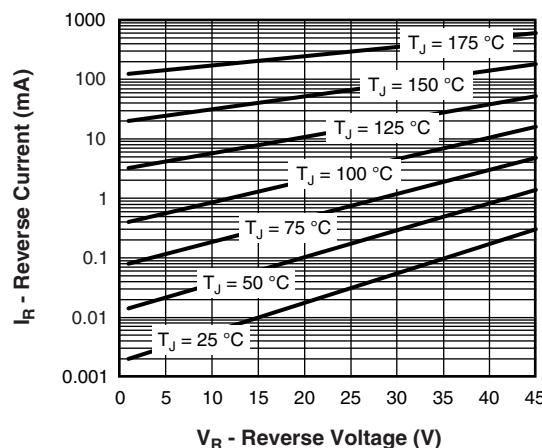


Fig. 2 - Typical Values of Reverse Current vs.
Reverse Voltage (Per Leg)

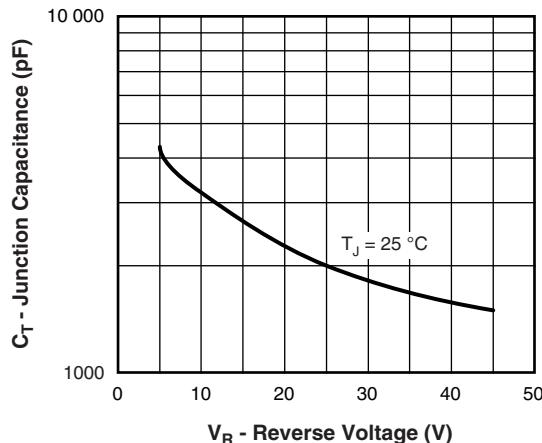


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

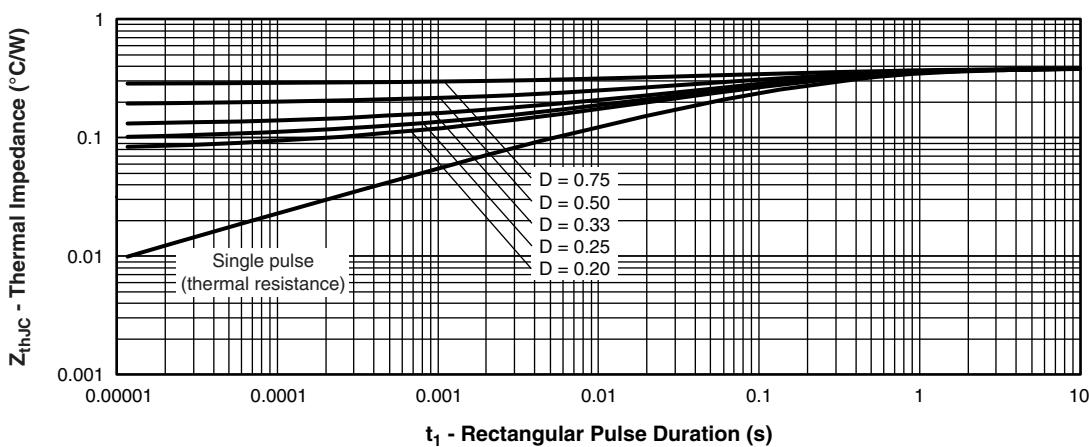


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

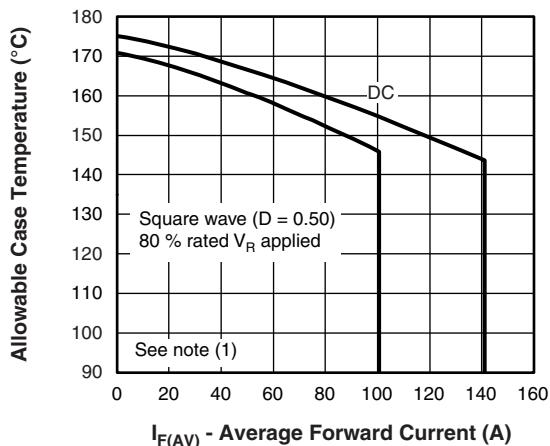


Fig. 5 - Maximum Allowable Case Temperature vs.
Average Forward Current (Per Leg)

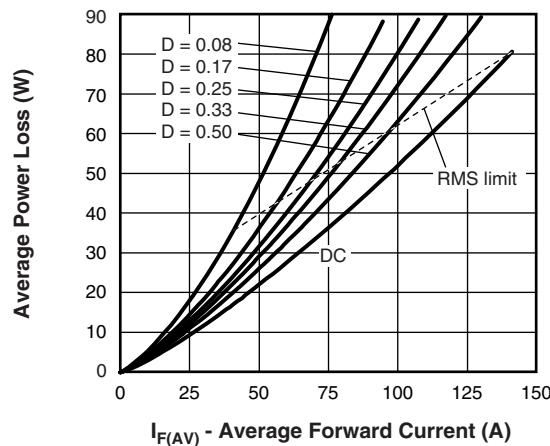


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

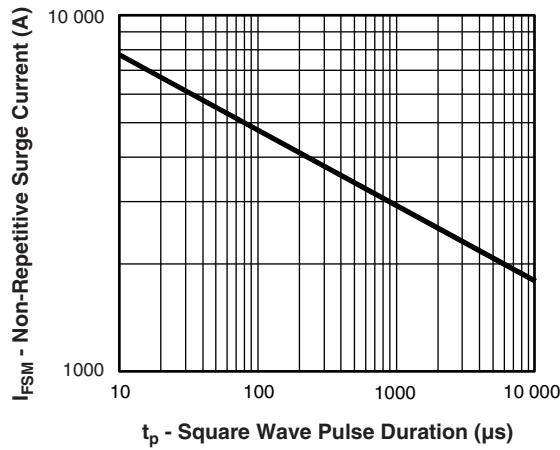


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

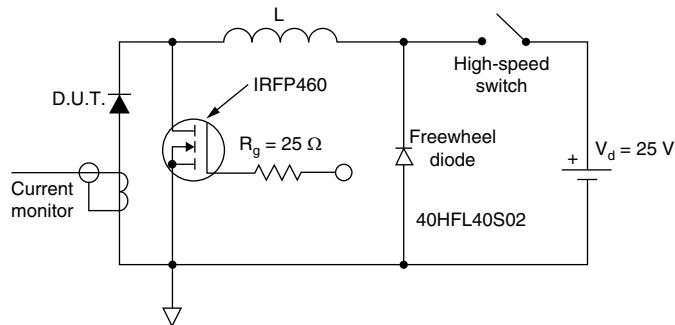


Fig. 8 - Unclamped Inductive Test Circuit

Note

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

ORDERING INFORMATION TABLE

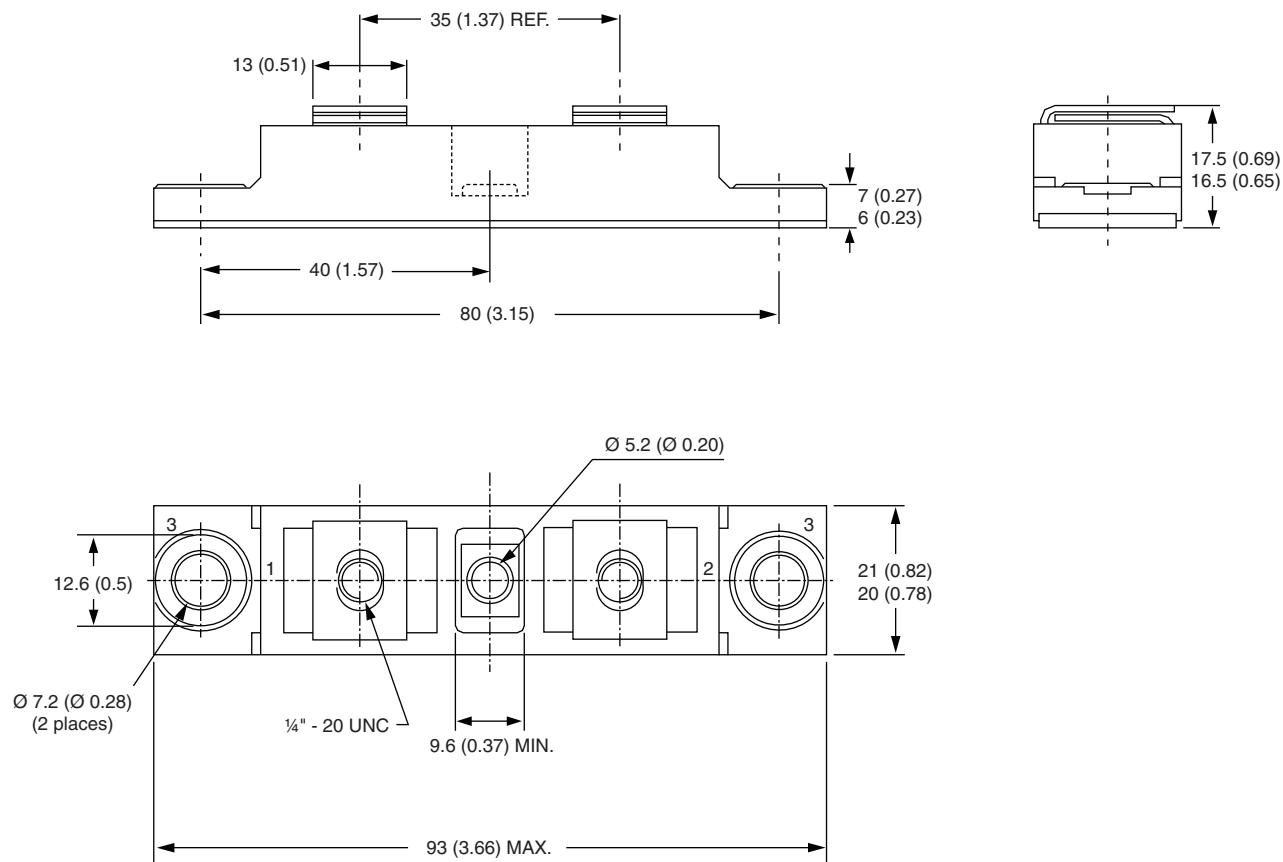
Device code	VS-	20	1	C	N	Q	045	PbF
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	1	- Vishay Semiconductors product						
	2	- Average current rating (x 10)						
	3	- Product silicon identification						
	4	- C = circuit configuration						
	5	- N = not isolated						
	6	- Q = Schottky rectifier diode						
	7	- Voltage rating (045 = 45 V)						
	8	- Lead (Pb)-free						

LINKS TO RELATED DOCUMENTS

Dimensions	www.vishay.com/doc?95021
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TO-244

DIMENSIONS in millimeters (inches)



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