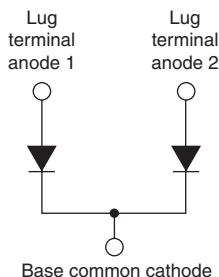


Schottky Rectifier, 200 A



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
- Lead (Pb)-free
- Designed and qualified for industrial level


RoHS
COMPLIANT

DESCRIPTION

The 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.

PRODUCT SUMMARY

$I_{F(AV)}$	200 A
V_R	135/150 V

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 Apk, $T_J = 125^\circ C$ (per leg)	0.71	V
T_J	Range	- 55 to 175	°C

VOLTAGE RATINGS

PARAMETER	SYMBOL	209CNQ135PbF	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 See fig. 5	$I_{F(AV)}$	50 % duty cycle at $T_C = 131\text{ }^{\circ}\text{C}$, rectangular waveform		100	A
per leg 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}	$T_J = 25\text{ }^{\circ}\text{C}$, $I_{AS} = 5.5\text{ A}$, $L = 1\text{ mH}$		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 °C	1.06	V
		200 A		1.33	
		100 A	T _J = 125 °C	0.74	
		200 A		0.88	
Maximum reverse leakage current per leg See fig. 2	I _{RM} ⁽¹⁾	T _J = 25 °C	V _R = Rated V _R	3	mA
		T _J = 125 °C		45	
Maximum junction capacitance per leg	C _T	V _R = 5 V _{DC} (test signal range 100 kHz to 1 MHz) 25 °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/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	$^{\circ}\text{C}$
Thermal resistance, junction to case — per leg per module	R_{thJC}	-	-	0.38	$^{\circ}\text{C/W}$
		-	-	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	

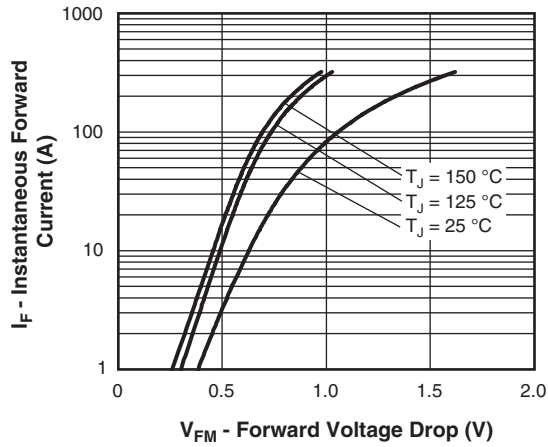


Fig. 1 - Maximum Forward Voltage Drop Characteristics

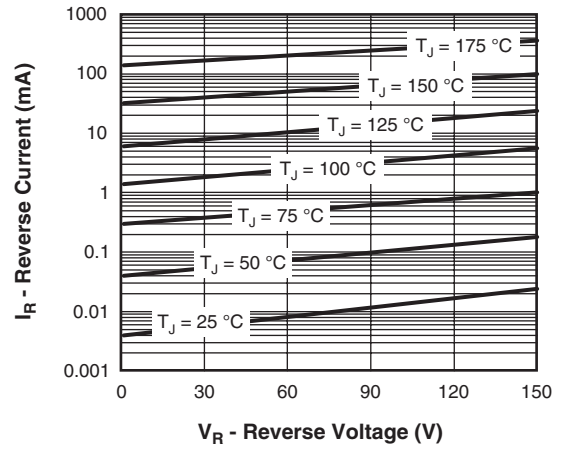


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

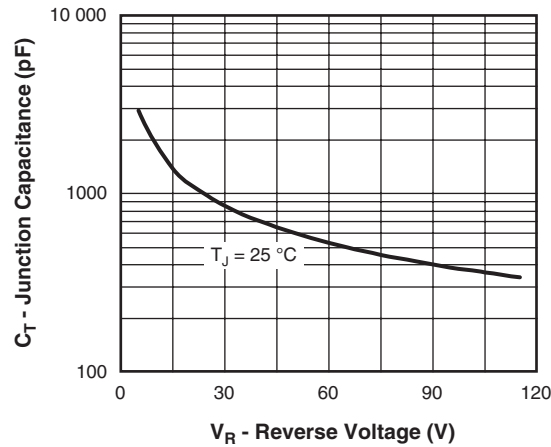
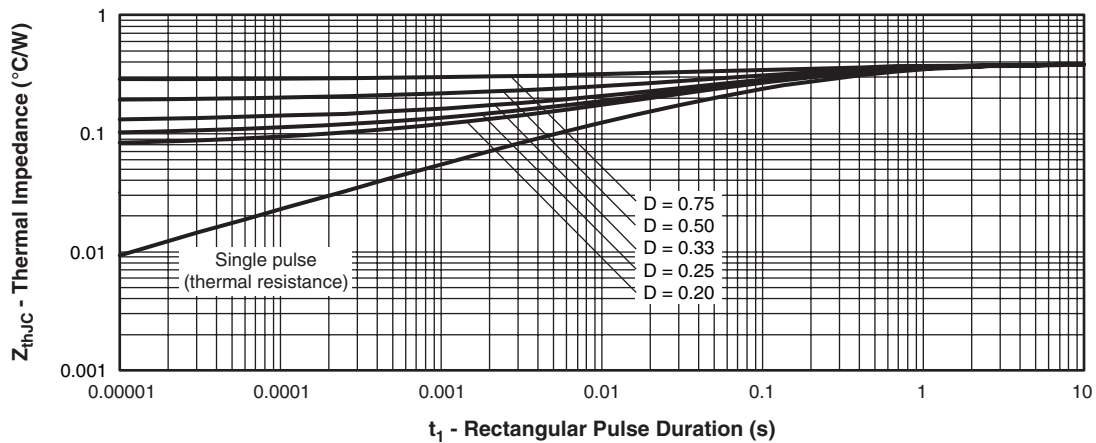


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage


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

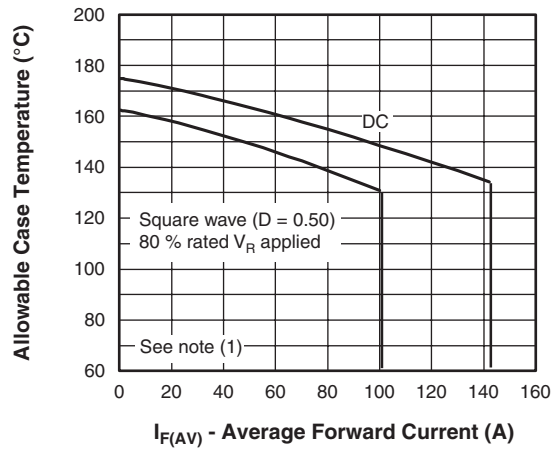


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

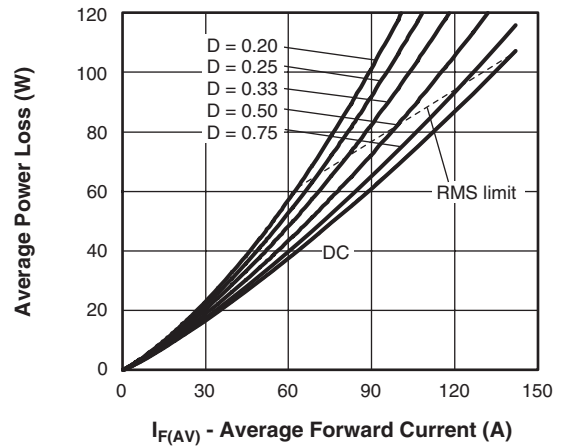


Fig. 6 - Forward Power Loss Characteristics

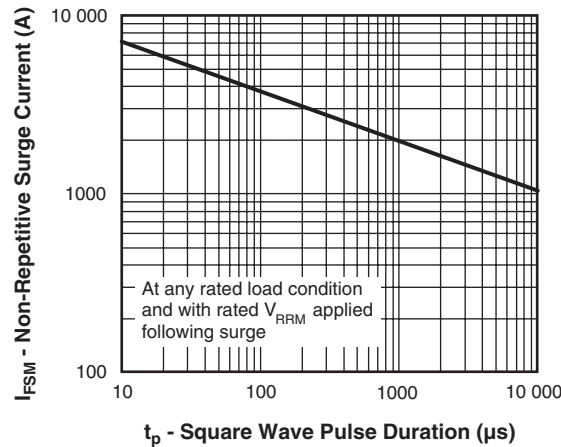


Fig. 7 - Maximum Non-Repetitive Surge Current

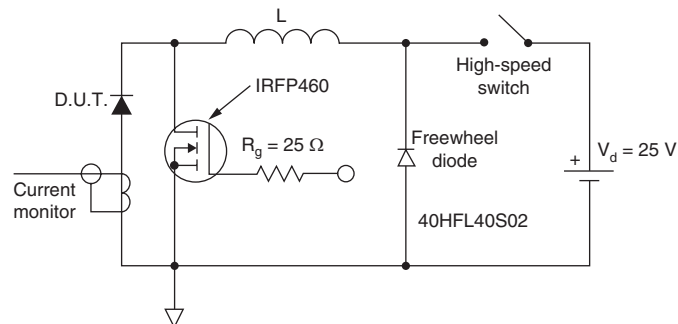


Fig. 8 - Unclamped Inductive Test Circuit

Note

- (1) Formula used: $T_C = T_J - (P_d + P_{dREV}) \times R_{thJC}$;
 P_d = Forward power loss = $I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6);
 P_{dREV} = Inverse power loss = $V_{R1} \times I_R (1 - D)$; I_R at $V_{R1} = 80\%$ rated V_R



ORDERING INFORMATION TABLE

Device code	20	9	C	N	Q	150	PbF
	1	2	3	4	5	6	7

- | | | |
|---|---|--------------------------------|
| 1 | - | Average current rating (x 10) |
| 2 | - | Product silicon identification |
| 3 | - | C = Circuit configuration |
| 4 | - | N = Not isolated |
| 5 | - | Q = Schottky rectifier diode |
| 6 | - | Voltage ratings |
| 7 | - | Lead (Pb)-free |
- 135 = 135 V
150 = 150 V

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



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