

Vishay High Power Products

Schottky Rectifier, 180 A





HALF-PAK (D-67)

anode Base cathode

Lug terminal

PRODUCT SUMMARY			
I _{F(AV)}	180 A		
V-	100 V		

FEATURES

- 175 °C T_J operation
- · 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

DESCRIPTION

The 183NQ.. high current 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.

MAJOR RATINGS AND CHARACTERISTICS					
SYMBOL	CHARACTERISTICS	VALUES	UNITS		
I _{F(AV)}	Rectangular waveform	180	A		
V_{RRM}		100	V		
I _{FSM}	$t_p = 5 \mu s sine$	22 000	Α		
V _F	180 Apk, T _J = 125 °C	0.73	V		
T _J	Range	- 55 to 175	°C		

VOLTAGE RATINGS				
PARAMETER	SYMBOL	183NQ100PbF	UNITS	
Maximum DC reverse voltage	V _R	100	V	
Maximum working peak reverse voltage	V _{RWM}	100	V	

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 = 128 °C, rectangular waveform		240	
Maximum peak one cycle non-repetitive surge current	1	5 μs sine or 3 μs rect. pulse	Following any rated load condition and with	22 000	Α
See fig. 7	IFSM	10 ms sine or 6 ms rect. pulse	rated V _{RRM} applied	2500	
Non-repetitive avalanche energy	E _{AS}	$T_J = 25 ^{\circ}\text{C}, I_{AS} = 5.5 \text{A}, L = 1 \text{mH}$		15	mJ
Repetitive avalanche current	I _{AR}	Current decaying linearly to zero in 1 μ s Frequency limited by T _J maximum V _A = 1.5 x V _R typical		1	А

183NQ100PbF

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ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop See fig. 1		180 A	T _J = 25 °C	0.91	V
	V _{FM} ⁽¹⁾	360 A		1.23	
	V FM (')	180 A	T _J = 125 °C	0.73	
		360 A		0.9	
Maximum reverse leakage current	I _{RM} ⁽¹⁾	T _J = 25 °C	V _R = Rated V _R	4.5	mA
See fig. 2	IRM (1)	T _J = 125 °C		60	IIIA
Maximum junction capacitance	C _T	$V_R = 5 V_{DC}$ (test signal range 100 kHz to 1 MHz) 25 °C		4150	pF
Typical series inductance	L _S	From top of terminal hole to mounting plane		6.0	nΗ
Maximum voltage rate of change	dV/dt	Rated V _R		10 000	V/µs

Note

 $^{^{(1)}}$ Pulse width = 500 μs

THERMAL - MECHANICAL SPECIFICATIONS						
PARAMETER		SYMBOL	TEST CONDITIONS	VALUES	UNITS	
Maximum junction and storage temperature range		T _J , T _{Stg}		- 55 to 175	°C	
Maximum thermal resistance, junction to case		R_{thJC}	DC operation See fig. 4	0.28		
Typical thermal resistance, case to heatsink		R _{thCS}	Mounting surface, smooth and greased	0.05	°C/W	
Approximate weight				30	g	
Approximate weight				1.06	OZ.	
Mounting torque	minimum		Non-lubricated threads	3 (26.5)		
Wounting torque	maximum			4 (35.4)	$N\cdotm$	
Torminal targue	minimum			3.4 (30)	(lbf \cdot in)	
Terminal torque maximi	maximum			5 (44.2)		
Case style		HALF-PAK modu		K module		



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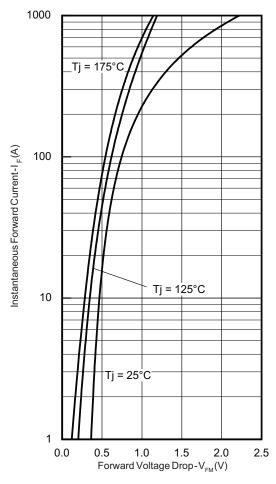


Fig. 1 - Maximum Forward Voltage Drop Characteristics

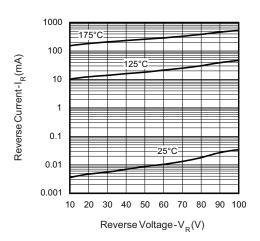


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

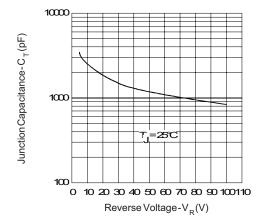


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

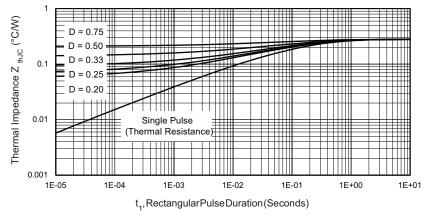


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

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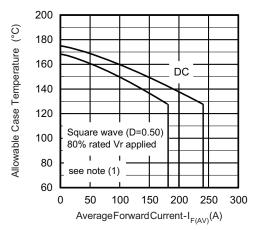


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

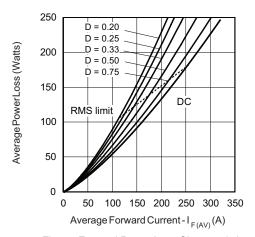


Fig. 6 - Forward Power Loss Characteristics

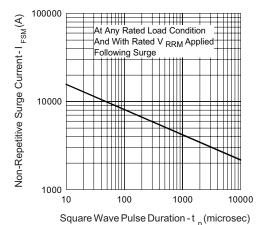


Fig. 7 - Maximum Non-Repetitive Surge Current

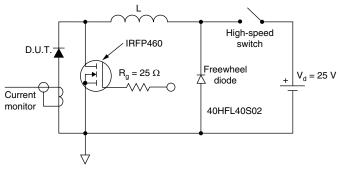


Fig. 8 - Unclamped Inductive Test Circuit

Note

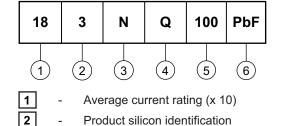
 $\begin{array}{l} \text{(1)} \ \ \text{Formula used: } T_C = T_J - (Pd + Pd_{REV}) \ x \ R_{thJC}; \\ Pd = \text{Forward power loss} = I_{F(AV)} \ x \ V_{FM} \ \text{at } (I_{F(AV)}/D) \ \text{(see fig. 6)}; \\ Pd_{REV} = \text{Inverse power loss} = V_{R1} \ x \ I_{R} \ (1 - D); \ I_{R} \ \text{at } V_{R1} = \text{Rated } V_{R} \\ \end{array}$



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ORDERING INFORMATION TABLE

Device code



3 - N = Not isolated

4 - Q = Schottky rectifier diode

5 - Voltage rating (100 = 100 V)

6 - Lead (Pb)-free

LINKS TO RELATED DOCUMENTS			
Dimensions	http://www.vishay.com/doc?95020		

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