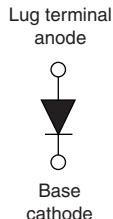


High Performance Schottky Rectifier, 180 A


HALF-PAK (D-67)


Lug terminal anode

Base cathode

FEATURES

- 150 °C T_J operation
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Designed and qualified for industrial level
- UL approved file E222165
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT

DESCRIPTION

The VS-182NQ.. 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 150 °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	
$I_{F(AV)}$	180 A
V_R	30 V
Package	HALF-PAK (D-67)
Circuit configuration	Single diode

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	180	A
V_{RRM}		30	V
I_{FSM}	$t_p = 5 \mu s$ sine	20 000	A
V_F	180 A _{pk} , $T_J = 125$ °C	0.45	V
T_J	Range	-55 to +150	°C

VOLTAGE RATINGS			
PARAMETER	SYMBOL	VS-182NQ030PbF	UNITS
Maximum DC reverse voltage	V_R	30	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 $T_C = 108$ °C, rectangular waveform		180	A	
Maximum peak one cycle non-repetitive surge current See fig. 7	I_{FSM}	5 μs sine or 3 μs rect. pulse	Following any rated load condition and with rated V_{RRM} applied	20 000		
		10 ms sine or 6 ms rect. pulse		2500		
Non-repetitive avalanche energy	E_{AS}	$T_J = 25$ °C, $I_{AS} = 18$ A, $L = 1$ mH		162	mJ	
Repetitive avalanche current	I_{AR}	Current decaying linearly to zero in 1 μs Frequency limited by T_J maximum $V_A = 1.5 \times V_R$ typical		36	A	

ELECTRICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum forward voltage drop See fig. 1	$V_{FM}^{(1)}$	180 A	$T_J = 25^\circ C$	0.59	V	
		360 A		0.8		
		180 A	$T_J = 125^\circ C$	0.45		
		360 A		0.65		
Maximum reverse leakage current See fig. 2	I_{RM}	$T_J = 25^\circ C$	$V_R = \text{Rated } V_R$	15	mA	
		$T_J = 125^\circ C$		840		
Maximum junction capacitance	C_T	$V_R = 5 V_{DC}$ (test signal range 100 kHz to 1 MHz) $25^\circ C$		7700	pF	
Typical series inductance	L_S	From top of terminal hole to mounting plane		6.0	nH	
Maximum voltage rate of change	dV/dt	Rated V_R		10 000	V/ μ s	

Note
⁽¹⁾ Pulse width = 500 μ s

THERMAL - MECHANICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum junction and storage temperature range	T_J, T_{Stg}			-55 to 150	°C	
Maximum thermal resistance, junction to case	R_{thJC}	DC operation See fig. 4		0.28	°C/W	
Typical thermal resistance, case to heatsink	R_{thCS}	Mounting surface, smooth and greased		0.05		
Approximate weight				30	g	
Mounting torque	minimum maximum	Non-lubricated threads		1.06	oz.	
Terminal torque	minimum			3 (26.5)	N · m (lbf · in)	
	maximum			4 (35.4)		
Case style	minimum			3.4 (30)		
	maximum			5 (44.2)		
				HALF-PAK module		

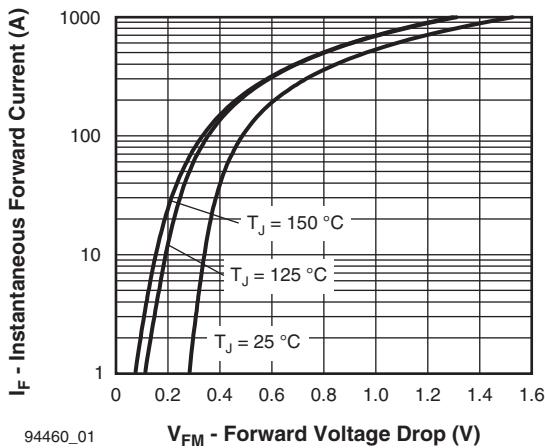

94460_01 V_{FM} - Forward Voltage Drop (V)

Fig. 1 - Maximum Forward Voltage Drop Characteristics

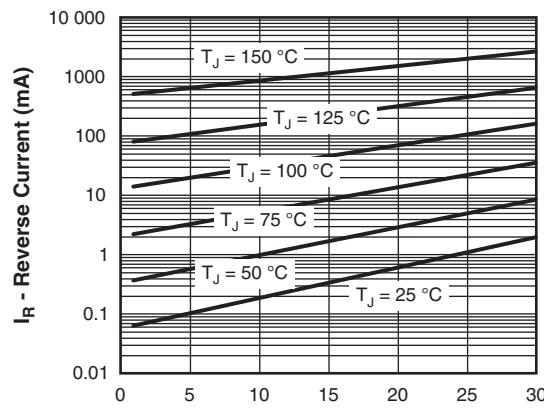

94460_02 V_R - Reverse Voltage (V)

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

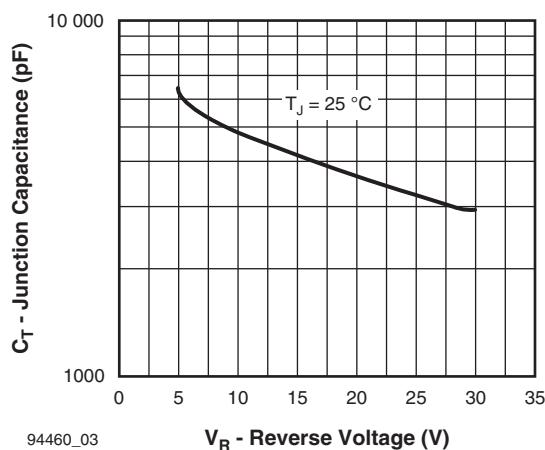


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

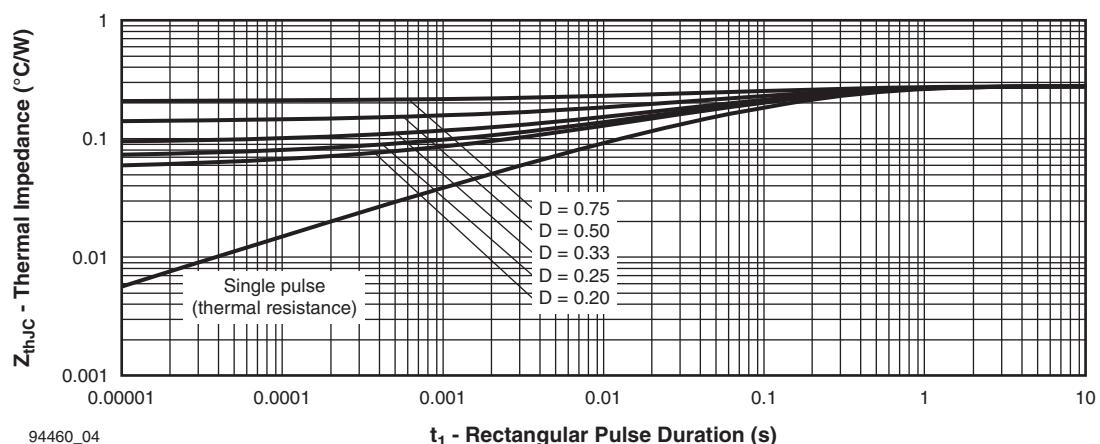


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

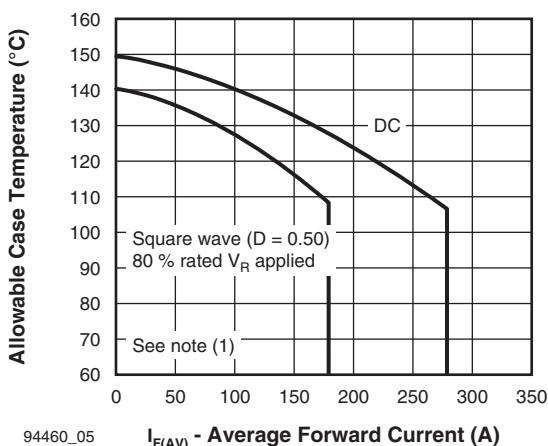


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

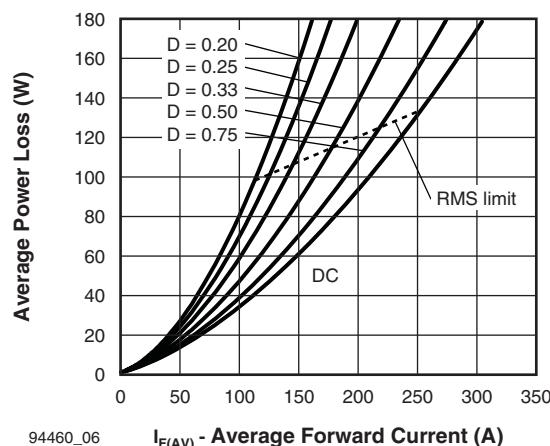


Fig. 6 - Forward Power Loss Characteristics

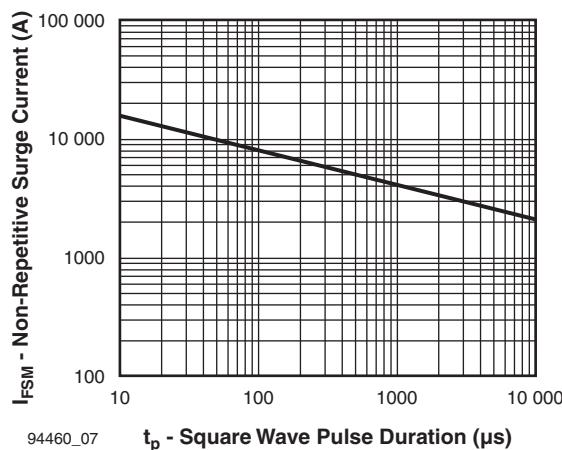


Fig. 7 - Maximum Non-Repetitive Surge Current

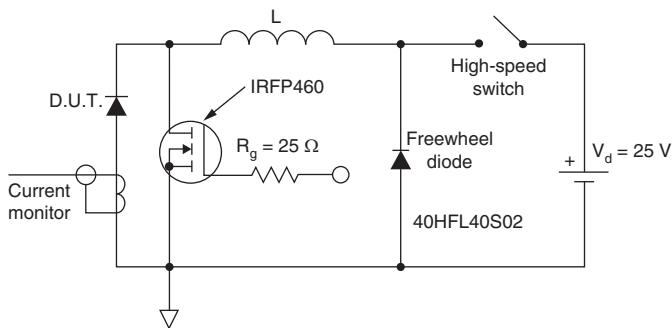


Fig. 8 - Unclamped Inductive Test Circuit

Note

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

ORDERING INFORMATION TABLE

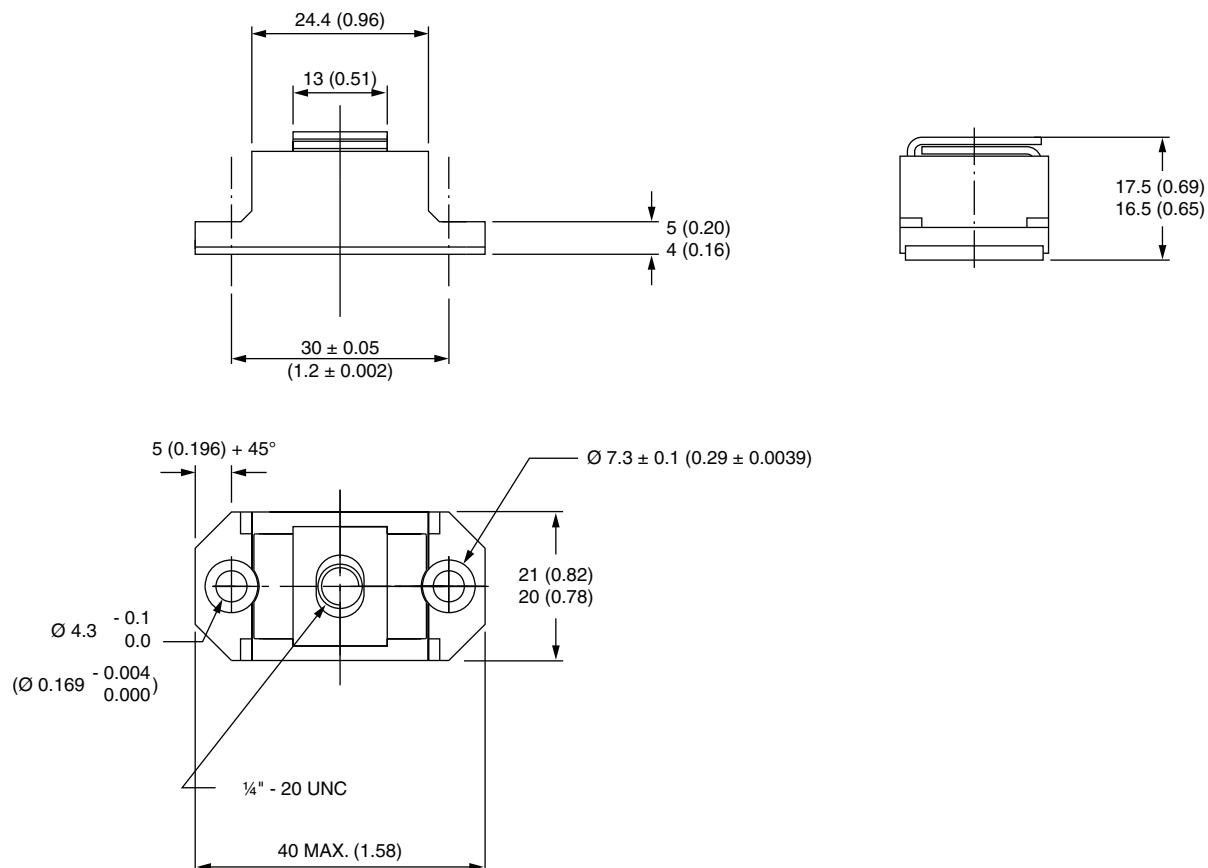
Device code	VS-	18	2	N	Q	030	PbF
	1	2	3	4	5	6	7
	1	- Vishay Semiconductors product					
	2	- Average current rating (x 10)					
	3	- Product silicon identification					
	4	- N = not isolated					
	5	- Q = Schottky rectifier diode					
	6	- Voltage rating (030 = 30 V)					
	7	- Lead (Pb)-free					

LINKS TO RELATED DOCUMENTS

Dimensions	www.vishay.com/doc?95020
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D-67 HALF-PAK

DIMENSIONS in millimeters (inches)



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