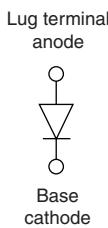


Schottky Rectifier, 240 A


HALF-PAK (D-67)


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
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT

DESCRIPTION

The VS-240NQ.. 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.

PRODUCT SUMMARY	
$I_{F(AV)}$	240 A
V_R	45 V

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	240	A
V_{RRM}		45	V
I_{FSM}	$t_p = 5 \mu s$ sine	26 000	A
V_F	240 Apk, $T_J = 125$ °C	0.64	V
T_J	Range	- 55 to + 150	°C

VOLTAGE RATINGS			
PARAMETER	SYMBOL	VS-240NQ045PbF	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 See fig. 5	$I_{F(AV)}$	50 % duty cycle at $T_C = 104$ °C, rectangular waveform		240	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	26 000	
Non-repetitive avalanche energy		10 ms sine or 6 ms rect. pulse		3400	
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		48	A

ELECTRICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum forward voltage drop See fig. 1	$V_{FM}^{(1)}$	240 A	$T_J = 25 \text{ }^\circ\text{C}$	0.72	V	
		480 A		1.04		
		240 A	$T_J = 125 \text{ }^\circ\text{C}$	0.64		
		480 A		0.97		
Maximum reverse leakage current per leg See fig. 2	$I_{RM}^{(1)}$	$T_J = 25 \text{ }^\circ\text{C}$	$V_R = \text{Rated } V_R$	20	mA	
		$T_J = 125 \text{ }^\circ\text{C}$		1120		
Maximum junction capacitance	C_T	$V_R = 5 \text{ V}_{DC}$ (test signal range 100 kHz to 1 MHz) $25 \text{ }^\circ\text{C}$		14 800	pF	
Typical series inductance	L_S	From top of terminal hole to mounting plane		5.0	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	$^\circ\text{C}$
Maximum thermal resistance, junction to case	R_{thJC}	DC operation See fig. 4		0.19	$^\circ\text{C}/\text{W}$
Typical thermal resistance, case to heatsink	R_{thCS}	Mounting surface, smooth and greased			
Approximate weight				30	g
				1.06	oz.
Mounting torque	minimum	Non-lubricated threads		3 (26.5)	$\text{N} \cdot \text{m}$ (lbf · in)
	maximum			4 (35.4)	
Terminal torque	minimum			3.4 (30)	
	maximum			5 (44.2)	
Case style				HALF-PAK module	

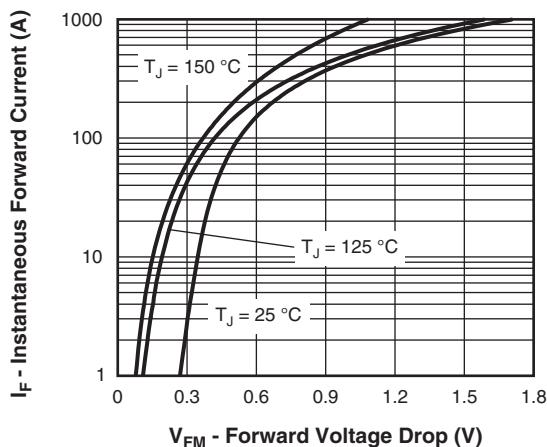


Fig. 1 - Maximum Forward Voltage Drop Characteristics

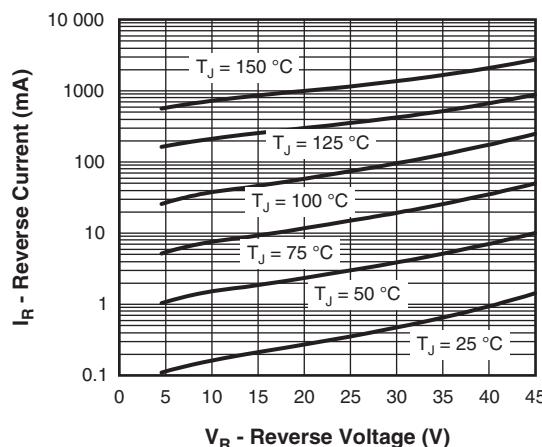


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

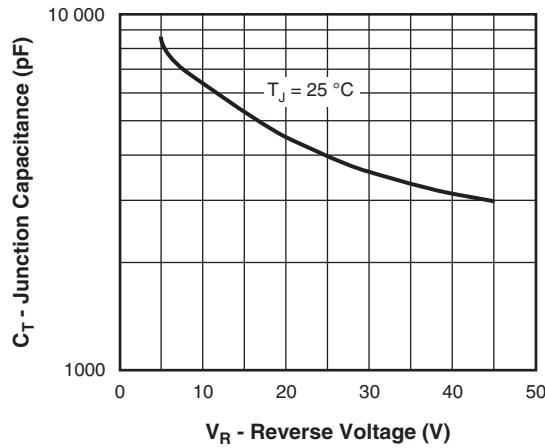


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

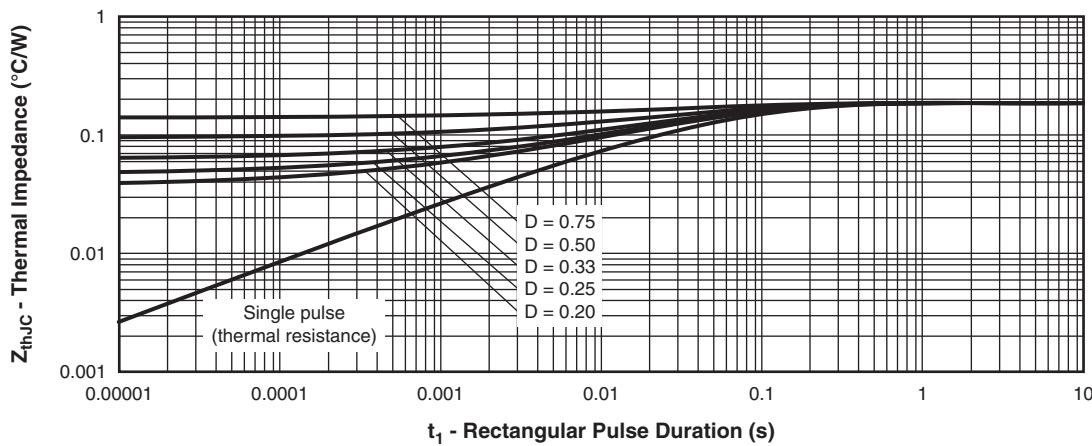


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

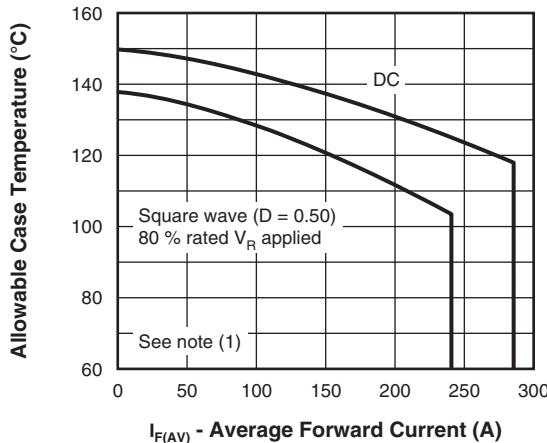


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

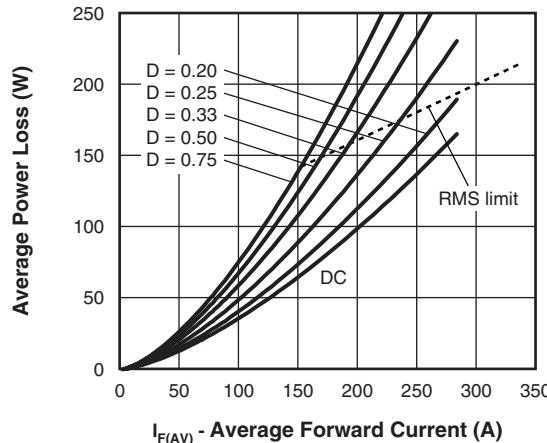


Fig. 6 - Forward Power Loss Characteristics

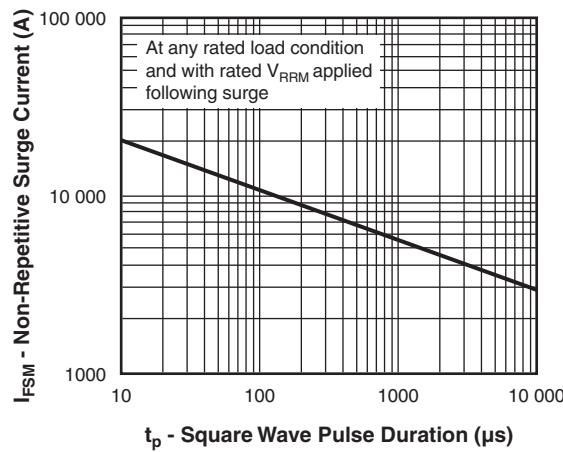


Fig. 7 - Maximum Non-Repetitive Surge Current

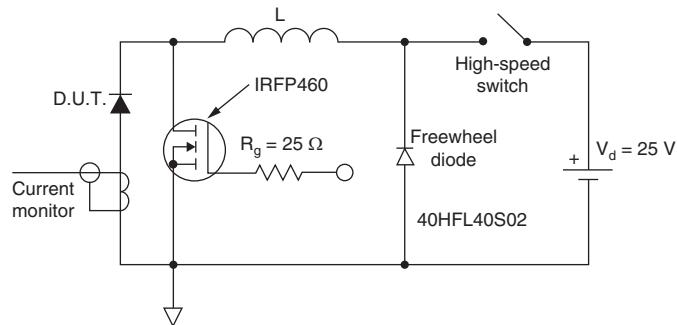


Fig. 8 - Unclamped Inductive Test Circuit

Note

(1) Formula used: $T_C = T_J - (P_d + P_{d,REV}) \times R_{thJC}$;
 $P_d = \text{Forward power loss} = I_{F(AV)} \times V_{FM}$ 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 $V_{R1} = \text{Rated } V_R$

ORDERING INFORMATION TABLE

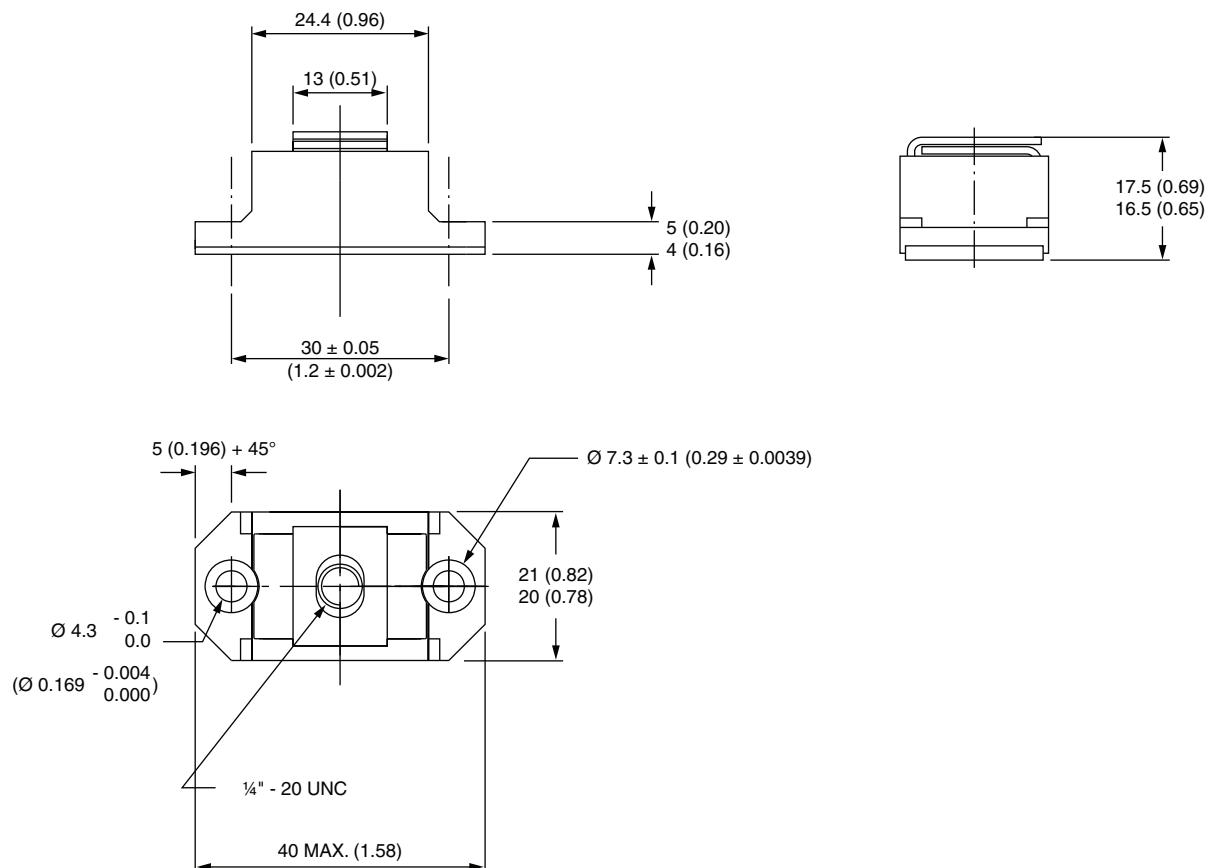
Device code	VS-	24	0	N	Q	045	PbF
	1	2	3	4	5	6	7
1 - Vishay Semiconductors product							
2 - Average current rating (x 10)							
3 - Product silicon identification							
4 - N = Not isolated							
5 - Q = Schottky rectifier diode							
6 - Voltage rating (045 = 45 V)							
7 - Lead (Pb)-free							

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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