

## Schottky Rectifier, 180 A



Lug terminal anode  
  
 Base cathode

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



**RoHS**  
COMPLIANT

### DESCRIPTION

The 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.

PRODUCT SUMMARY	
$I_{F(AV)}$	180 A
$V_R$	30 V

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 Apk, $T_J = 125$ °C	0.45	V
$T_J$	Range	- 55 to 150	°C

VOLTAGE RATINGS			
PARAMETER	SYMBOL	182NQ030PbF	UNITS
Maximum DC reverse voltage	$V_R$		
Maximum working peak reverse voltage	$V_{RWM}$	30	V

ABSOLUTE MAXIMUM RATINGS						
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum average forward current See fig. 5	$I_{F(AV)}$	50 % duty cycle at $T_C = 108$ °C, rectangular waveform		180	A	
Maximum peak one cycle non-repetitive surge current See fig. 7	$I_{FSM}$	5 $\mu s$ sine or 3 $\mu s$ 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 $\mu s$ 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	$T_J = 25 \text{ }^\circ\text{C}$	0.59	V	
		360 A		0.8		
		180 A	$T_J = 125 \text{ }^\circ\text{C}$	0.45		
		360 A		0.65		
Maximum reverse leakage current See fig. 2	$I_{RM}$	$T_J = 25 \text{ }^\circ\text{C}$	$V_R = \text{Rated } V_R$	15	mA	
		$T_J = 125 \text{ }^\circ\text{C}$		840		
Maximum junction capacitance	$C_T$	$V_R = 5 \text{ V}_{\text{DC}}$ (test signal range 100 kHz to 1 MHz) $25 \text{ }^\circ\text{C}$		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/ $\mu$ s	

**Note**(1) Pulse width = 500  $\mu$ 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		0.28	$^\circ\text{C}/\text{W}$
Typical thermal resistance, case to heatsink	$R_{thCS}$	Mounting surface, smooth and greased		0.05	
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	

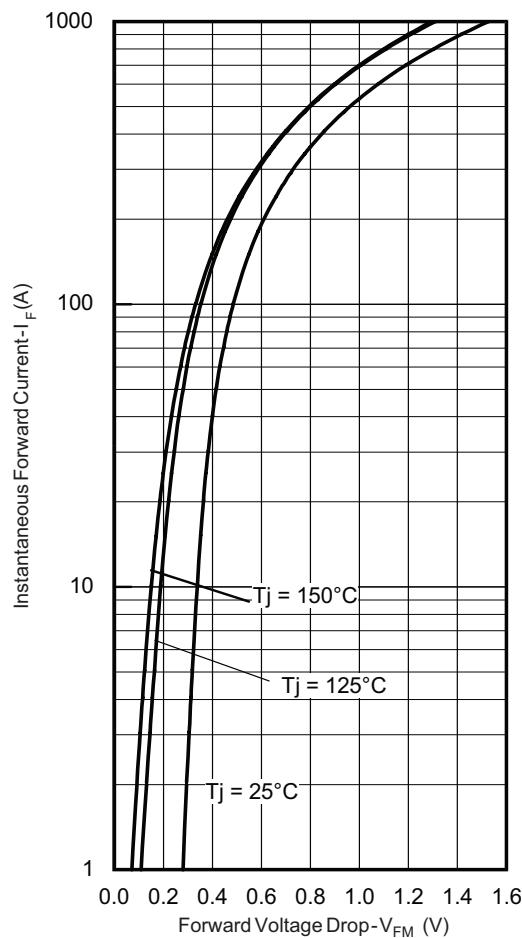


Fig. 1 - Maximum Forward Voltage Drop Characteristics

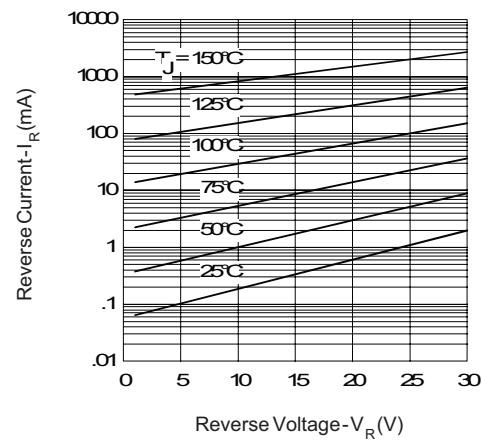


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

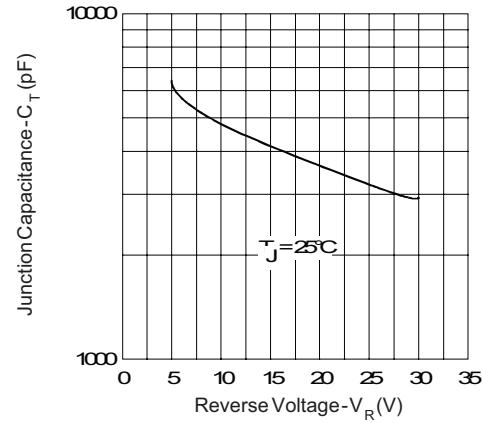


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

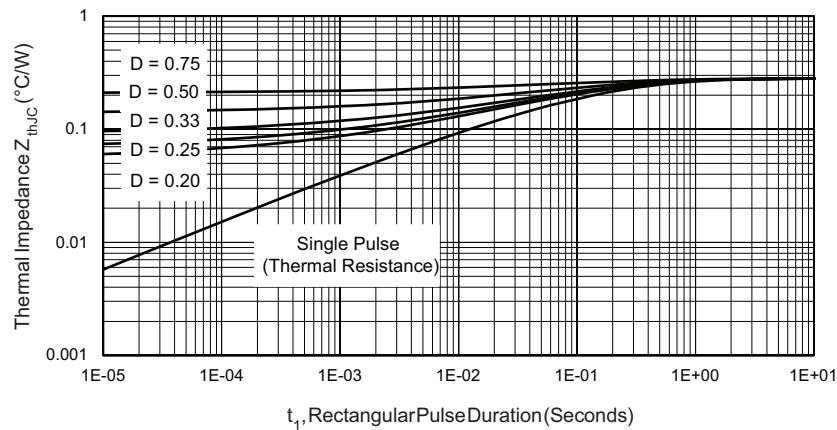


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

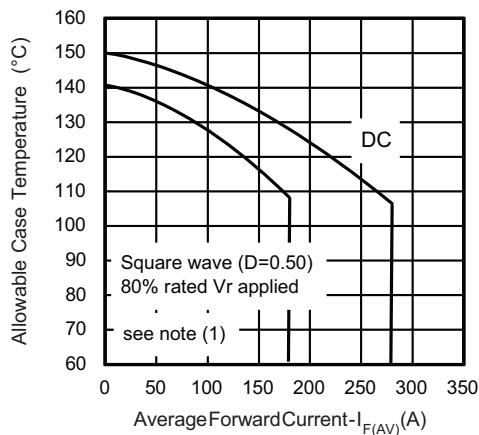


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

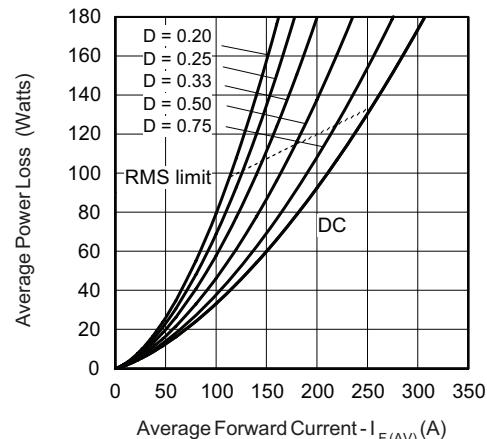


Fig. 6 - Forward Power Loss Characteristics

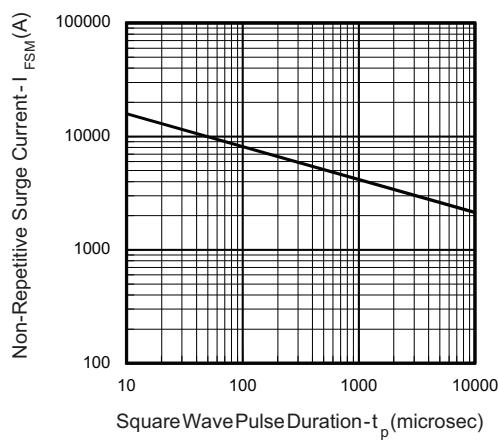


Fig. 7 - Maximum Non-Repetitive Surge Current

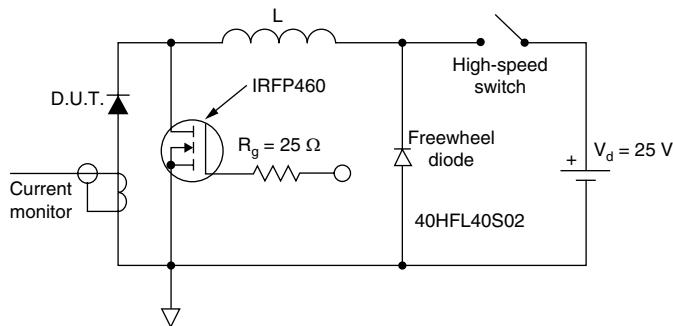


Fig. 8 - Unclamped Inductive Test Circuit

**Note**

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

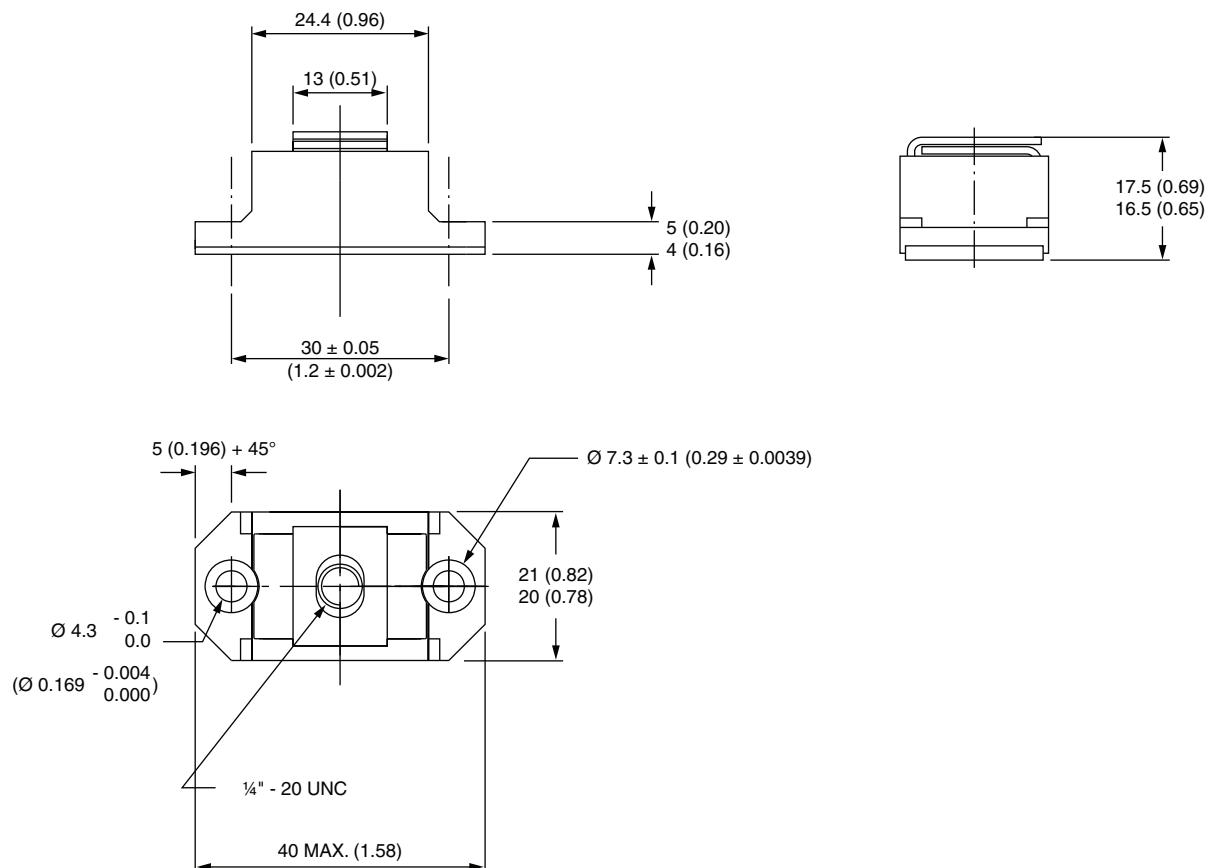
**ORDERING INFORMATION TABLE**

Device code	18	2	N	Q	030	PbF
	1	2	3	4	5	6
	<b>1</b>	- Average current rating (x 10)				
	<b>2</b>	- Product silicon identification				
	<b>3</b>	- N = Not isolated				
	<b>4</b>	- Q = Schottky rectifier diode				
	<b>5</b>	- Voltage rating (030 = 30 V)				
	<b>6</b>	- Lead (Pb)-free				

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95020">http://www.vishay.com/doc?95020</a>

### D-67 HALF-PAK

#### DIMENSIONS in millimeters (inches)



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