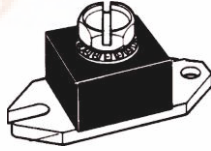


## Schottky Rectifier, 240 A



HALF-PAK (D-67) Reverse

Lug terminal cathode



Base anode



**RoHS**  
COMPLIANT

### FEATURES

- 175 °C  $T_J$  operation
- Unique high power, HALF-PAK module
- Replaces four parallel DO-5's
- Easier to mount and lower profile than DO-5's
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Compliant to RoHS directive 2002/95/EC
- Designed and qualified for industrial level

### DESCRIPTION

The 241NQ045R high current Schottky rectifier module 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 switching power supplies, converters, freewheeling diodes, 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
$V_{RRM}$	Range	45	V
$I_{FSM}$	$t_p = 5 \mu s$ sine	25 000	A
$V_F$	240 Apk, $T_J = 125 \text{ }^\circ\text{C}$	0.59	V
$T_J$	Range	- 55 to 175	$^\circ\text{C}$

### VOLTAGE RATINGS

PARAMETER	SYMBOL	241NQ045R	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 $T_C = 130 \text{ }^\circ\text{C}$ , rectangular waveform	240	A
Maximum peak one cycle non-repetitive surge current See fig. 7	$I_{FSM}$	5 $\mu s$ sine or 3 $\mu s$ rect. pulse	25 000	
		10 ms sine or 6 ms rect. pulse	3450	
Non-repetitive avalanche energy	$E_{AS}$	$T_J = 25 \text{ }^\circ\text{C}$ , $I_{AS} = 48 \text{ A}$ , $L = 0.28 \text{ mH}$	324	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	48	A



ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop See fig. 1	$V_{FM}^{(1)}$	240 A	$T_J = 25\text{ }^\circ\text{C}$	0.69	V
		480 A		0.82	
		240 A	$T_J = 125\text{ }^\circ\text{C}$	0.59	
		480 A		0.72	
Maximum reverse leakage current See fig. 2	$I_{RM}^{(1)}$	$T_J = 25\text{ }^\circ\text{C}$	$V_R = \text{Rated } V_R$	20	mA
		$T_J = 125\text{ }^\circ\text{C}$		180	
Maximum junction capacitance	$C_T$	$V_R = 5 V_{DC}$ (test signal range 100 kHz to 1 MHz), $25\text{ }^\circ\text{C}$		10 300	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/ $\mu\text{s}$

**Note**(1) Pulse width < 300  $\mu\text{s}$ , duty cycle < 2 %

THERMAL - MECHANICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum junction and storage temperature range	$T_J, T_{Stg}$			- 55 to 175	$^\circ\text{C}$
Maximum thermal resistance, junction to case	$R_{thJC}$	DC operation See fig. 4		0.20	$^\circ\text{C/W}$
Typical thermal resistance, case to heatsink	$R_{thCS}$	Mounting surface, smooth and greased		0.15	
Approximate weight				25.6	g
				0.9	oz.
Mounting torque	minimum	Non-lubricated threads		40 (35)	kgf · cm (lbf · in)
	maximum			58 (50)	
Terminal torque	minimum			58 (50)	
	maximum			86 (75)	
Case style				D-67 HALF-PAK Reverse	

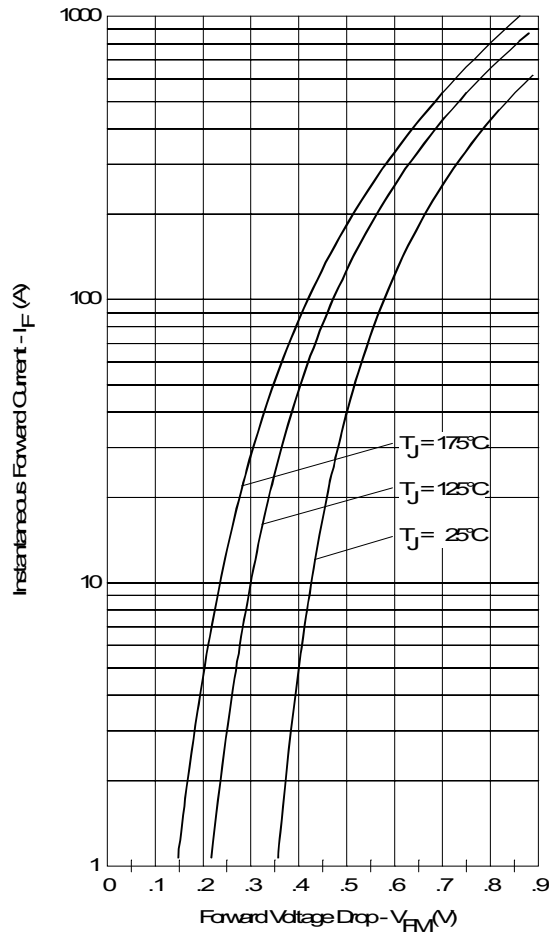


Fig. 1 - Maximum Forward Voltage Drop Characteristics

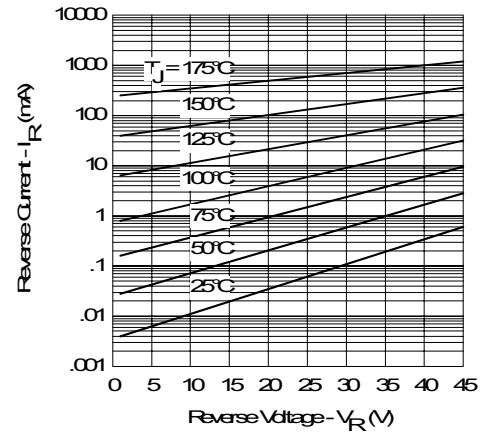


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

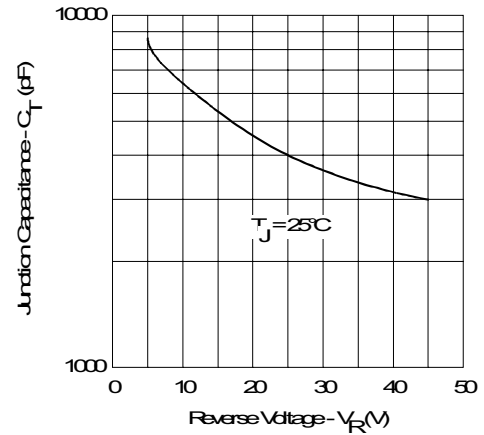


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

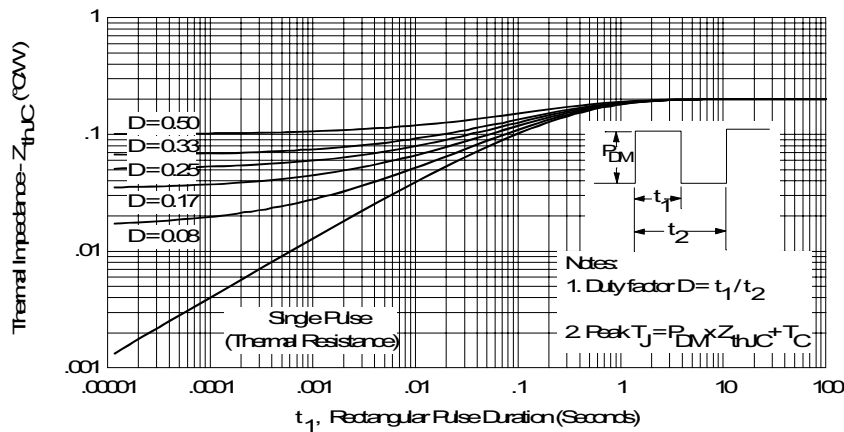


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

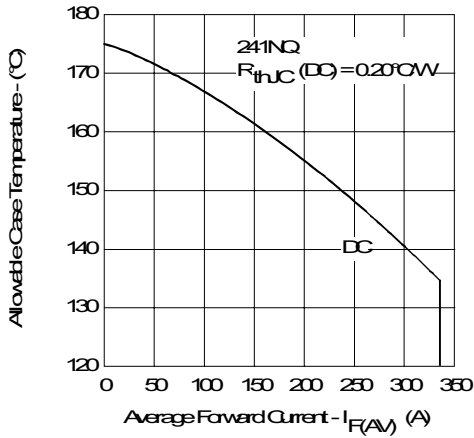


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

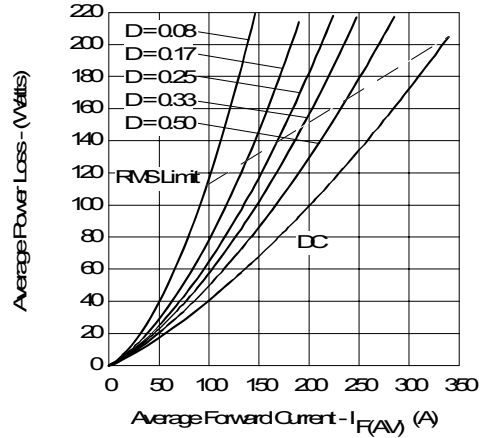


Fig. 6 - Forward Power Loss Characteristics

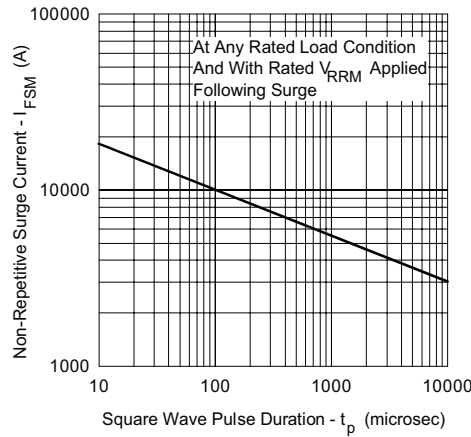


Fig. 7 - Maximum Non-Repetitive Surge Current

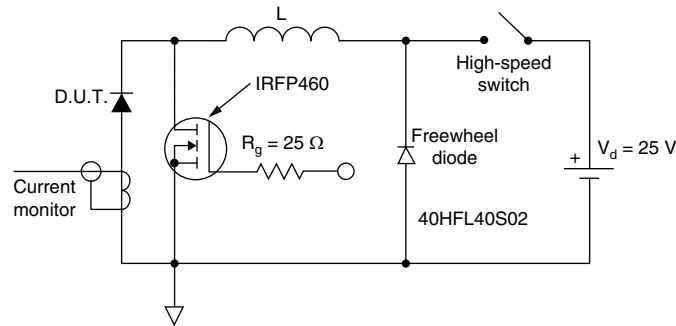


Fig. 8 - Unclamped Inductive Test Circuit

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95378">www.vishay.com/doc?95378</a>

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