

Schottky Rectifier, 200Ax2 / 200V

FEATURES

- 175°C T_J operation
- Center tap module
- 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

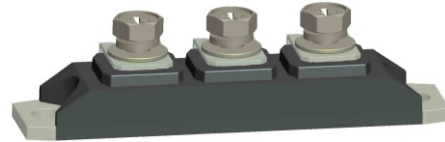
DESCRIPTION

The NKSD400IM Schottky rectifier module series has been optimized for low reverse f leakage at high temperature.

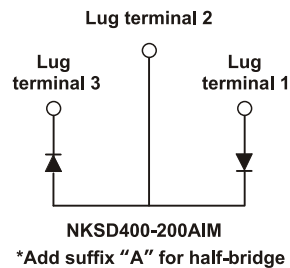
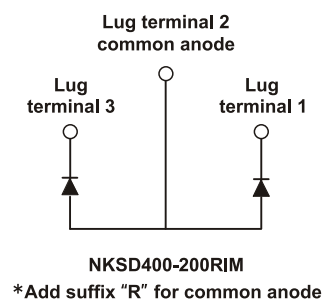
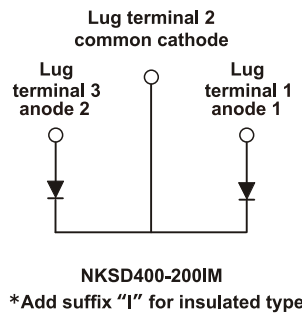
The proprietary barrier technology allows for reliable operation up to 175 °C junction temperature.

TYPICAL APPLICATIONS

- High current switching power supplies
- Plating power supplies
- UPS system
- Converters
- Freewheeling
- Welder
- Reverse battery protection.



TO-244M (insulated)



PRODUCT SUMMARY

I _{F(AV)}	400A
V _R	200V

MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNIT
I _{F(AV)}	Rectangular waveform	400	A
V _{RRM}		200	V
I _{FSM}	t _p = 5 μs sine	20000	A
V _F	200 Apk, T _j = 125°C (per leg)	0.75	V
T _J	Range	-55 to 175	°C

VOLTAGE RATINGS

PARAMETER	SYMBOL	NKSD400-200	UNIT
Maximum DC reverse voltage	V _R	200	V
Maximum working peak reverse voltage	V _{RWM}		

NPS High Power Products

ABSOLUTE MAXIMUM RATINGS								
PARAMETER		SYMBOL	TEST CONDITIONS		VALUES	UNIT		
Maximum average forward current See fig.5	per leg	$I_{F(AV)}$	50% duty cycle at $T_C = 110^{\circ}\text{C}$, rectangular waveform		200	A		
	per device				400			
Maximum peak one cycle non-repetitive surge current per leg See fig.7		I_{FSM}	5 μs sine or 3 μs rect. pulse	Following any rated load condition and with rated V_{RRM} applied	20000			
			10 ms sine or 6 ms rect. pulse		2300			
Non- repetitive avalanche energy per leg		E_{AS}	$T_J=25^{\circ}\text{C}$, $I_{AS}=5.5\text{A}$, $L=1.0\text{mH}$		15		mJ	
Repetitive avalanche current per leg		I_{AR}	Current decaying linearly to zero in 1 μs Frequency limited by T_J maximum $V_A=1.5\times V_R$ typical		1		A	

ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNIT
Maximum forward voltage drop per leg See fig.1	V _{FM} (¹)	200A	T _J = 25°C	1.0	V
		400A		1.3	
		200A	T _J = 125°C	0.75	
		400A		0.85	
Maximum reverse leakage current per leg See fig.2	I _{RM} (¹)	T _J = 25°C	V _R = Rated V _R	100	μA
		T _J = 125°C		50	mA
Maximum junction capacitance per leg	C _T	V _R = 5 V _{DC} (test signal range 100 kHz to 1 MHz) 25°C		6500	pF
Typical series inductance per leg	L _S	From top of terminal hole to mounting plane		5	nH
Maximum voltage rate of change	dV/dt	Rated V _R		10000	V/μs
Maximum RMS insulation voltage (for insulated type)	V _{INS}			1000 (1min)	V

Note

(1) Pulse width < 300 μs , duty cycle < 2%

THERMAL-MECHANICAL SPECIFICATIONS					
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
Maximum junction and storage temperature range	T_J, T_{Stg}	-55	-	175	$^\circ\text{C}$
Thermal resistance, junction to case per leg	R_{thJC}	-	-	0.26	$^\circ\text{C/W}$
Thermal resistance, junction to case per module	R_{thJC}	-	-	0.13	
Thermal resistance, case to heatsink	R_{thCS}	-	0.10	-	
Weight		-	95 (3.35)	-	g(oz.)
Mounting torque, M6		30 (3.4)	-	40 (4.6)	lbf • in (N•m)
Terminal torque, M6		30 (3.4)	-	40 (4.6)	
vertical pull		-	-	80	lbf • in
2" lever pull		-	-	35	

Fig.4 Typical junction capacitance vs. Reverse voltage (Per Leg)

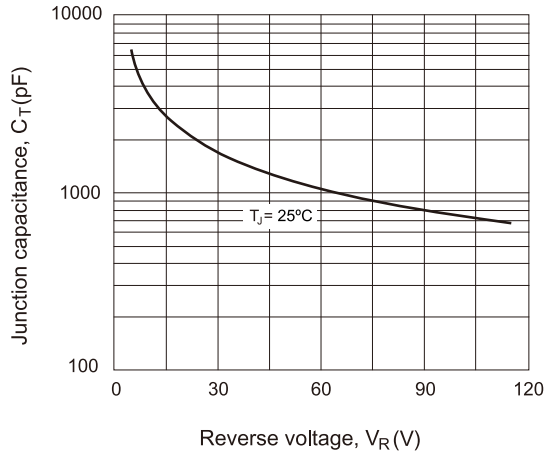


Fig.5 Maximum allowable case temperature vs. Average forward current (Per Leg)

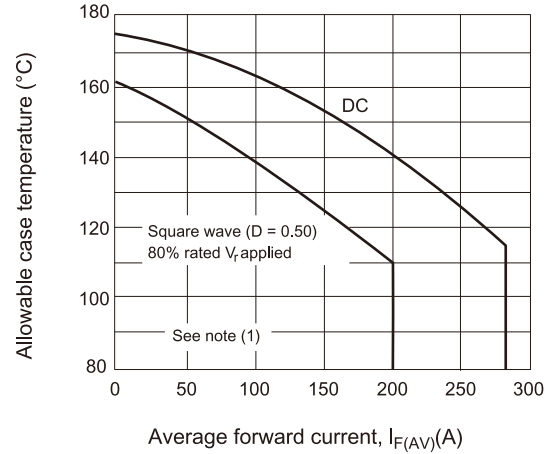


Fig.6 Forward power loss characteristics (Per Leg)

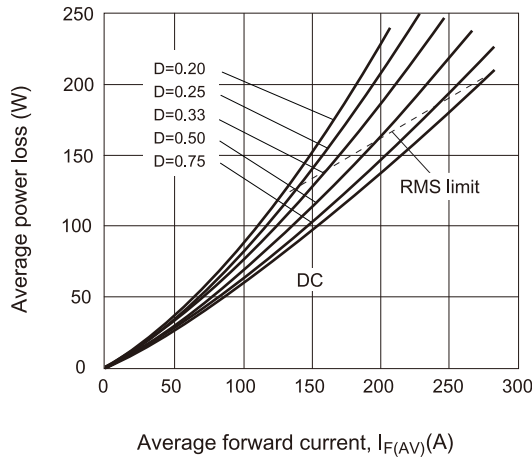


Fig.7 Maximum non-repetitive surge current (Per Leg)

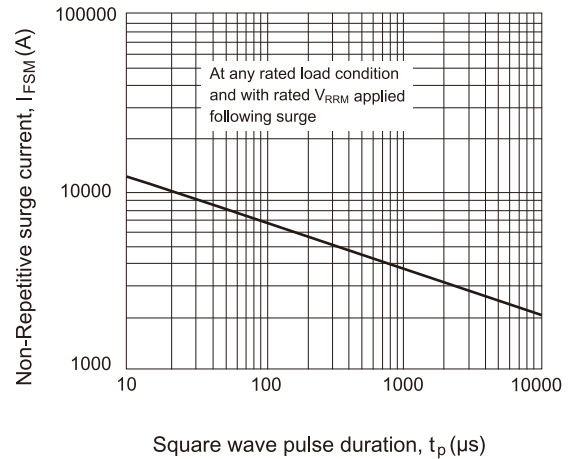
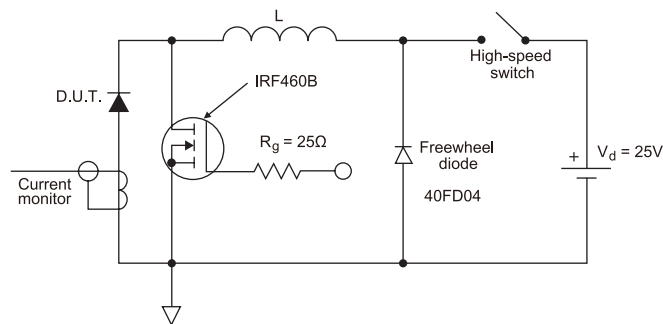


Fig.8 Unclamped Inductive test circuit



Note

(1) Formula used: $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$;

P_d = Forward power loss = $I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig.6)

$P_{d_{REV}}$ = Inverse power loss = $V_{R1} \times I_R(1-D)$; I_R at $V_{R1} = 80\%$ rated V_R

