

High Performance Schottky Rectifier 100A/100V

FEATURES

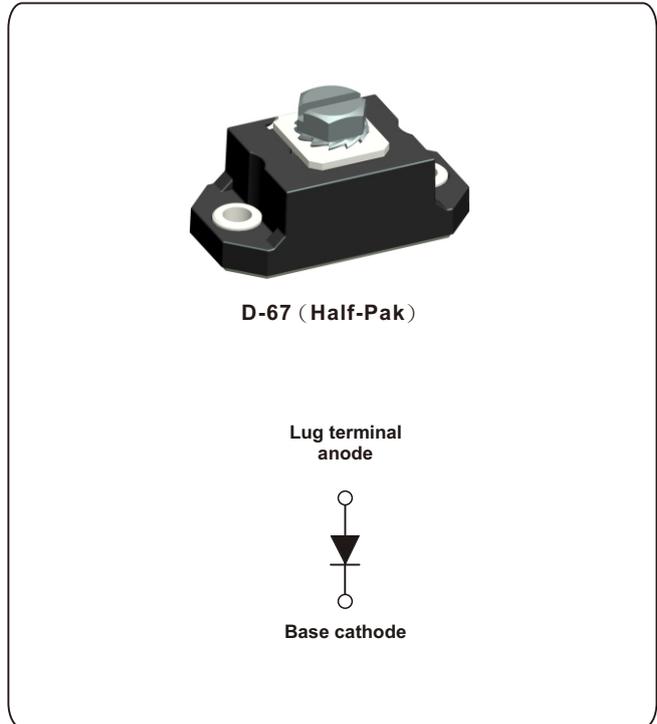
- 175°C T_J operation
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Lead (Pb)-free
- Designed and qualified for industrial level

DESCRIPTION

The NKS100-100 Schottky rectifier module series has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 175 °C junction temperature.

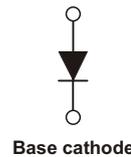
TYPICAL APPLICATIONS

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



D-67 (Half-Pak)

Lug terminal
anode



Base cathode

PRODUCT SUMMARY

I _{F(AV)}	100A
V _R	100V

MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNIT
I _{F(AV)}	Rectangular waveform	100	A
V _{R(RM)}		100	V
I _{F(SM)}	t _p = 5 μs sine	8500	A
V _F	100 Apk, T _J = 125°C	0.73	V
T _J	Range	-55 to 175	°C

VOLTAGE RATINGS

PARAMETER	SYMBOL	NKS100-100	UNIT
Maximum DC reverse voltage	V _R	100	V
Maximum working peak reverse voltage	V _{R(WM)}		

ABSOLUTE MAXIMUM RATINGS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNIT
Maximum average forward current	$I_{F(AV)}$	50% duty cycle at $T_C = 130^\circ\text{C}$, rectangular waveform		100	A
Maximum peak one cycle non-repetitive surge current	I_{FSM}	5 μs sine or 3 μs rect. pulse	Following any rated load condition and with rated V_{RRM} applied	8500	
		10 ms sine or 6 ms rect. pulse		1150	
Non- repetitive avalanche energy	E_{AS}	$T_J=25^\circ\text{C}$, $I_{AS}=5.5\text{A}$, $L=1.0\text{mH}$		15	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		1	A

ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNIT
Maximum forward voltage drop per leg	$V_{FM}^{(1)}$	100A	$T_J = 25^\circ\text{C}$	0.86	V
		200A		1.25	
		100A	$T_J = 125^\circ\text{C}$	0.73	
		200A		0.90	
Maximum reverse leakage current per leg	$I_{RM}^{(1)}$	$T_J = 25^\circ\text{C}$	$V_R = \text{Rated } V_R$	20	μA
		$T_J = 125^\circ\text{C}$		20	mA
Maximum junction capacitance per leg	C_T	$V_R = 5 V_{DC}$ (test signal range 100 kHz to 1 MHz) 25°C		2650	pF
Typical series inductance per leg	L_S	From top of terminal hole to mounting plane		7	nH
Maximum voltage rate of change	dV/dt	Rated V_R		10000	V/ μs

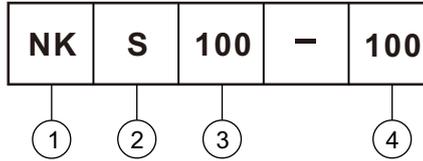
Note

(1) Pulse width < 500 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	R_{thJC}	-	-	0.46	$^\circ\text{C/W}$	
Thermal resistance, case to heatsink	R_{thCS}	-	0.05	-		
Weight		-	30 (1.06)	-	g(oz.)	
Mounting torque		3 (26.5)	-	4 (35.4)	N·m (lbf · in)	
Terminal torque		3.4 (30)	-	5 (44.2)		
Case style		JEDEC D-67 Half-Pak module				

Ordering Information Tabel

Device code



- 1 - Nell's power module
- 2 - S for Schottky Barrier Diode, single diode, D-67 package (Half-Pack)
- 3 - Maximum average forward current, 100 = 100A
- 4 - Voltage rating (100 = 100V)

Fig.1 Maximum forward voltage drop characteristics

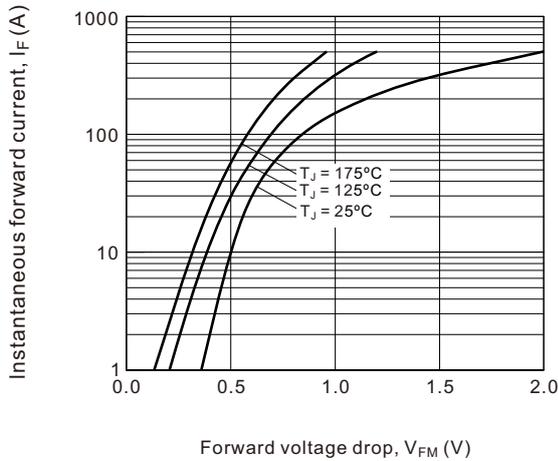


Fig.2 Typical values of reverse current vs. reverse voltage

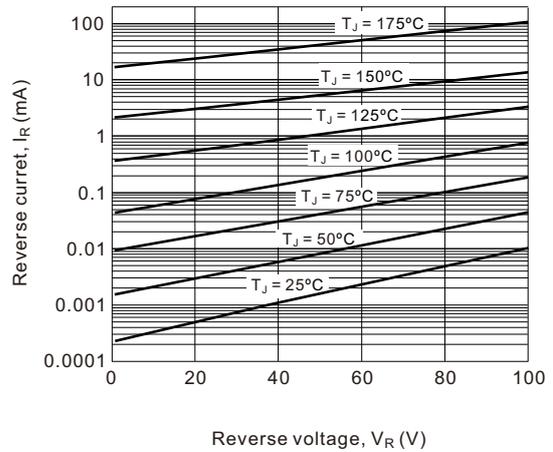


Fig.3 Maximum thermal impedance $R_{th(j-c)}$ characteristics

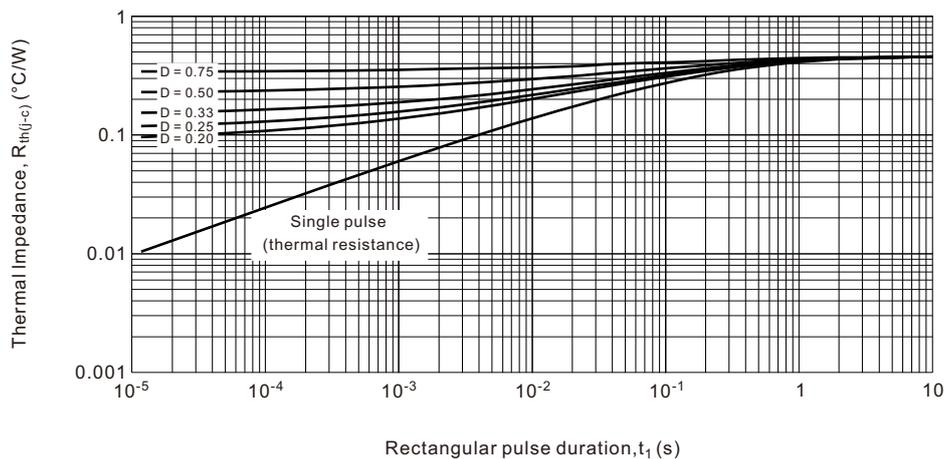


Fig.4 Typical junction capacitance vs. reverse voltage

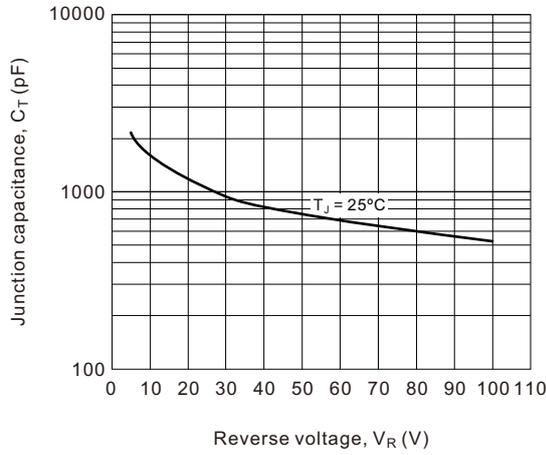


Fig.5 Maximum allowable case temperature vs. Average forward current

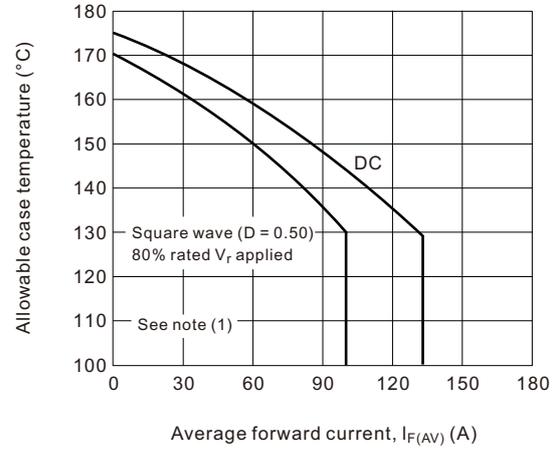


Fig.6 Forward power loss characteristics

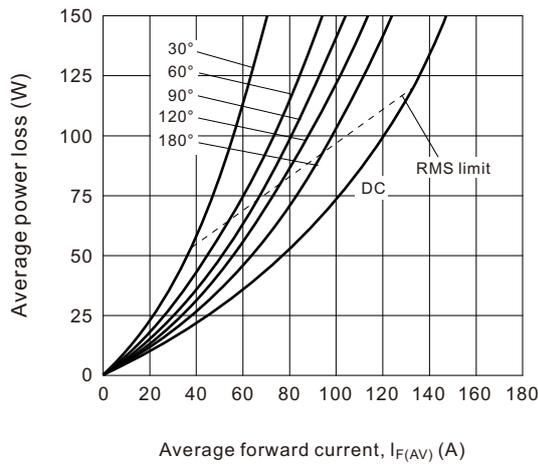


Fig.7 Maximum non-repetitive surge current

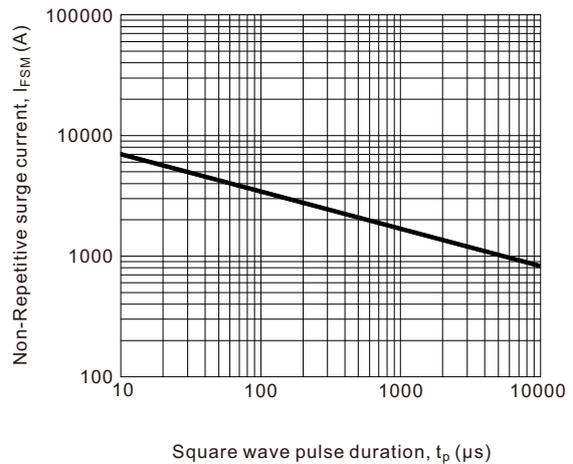
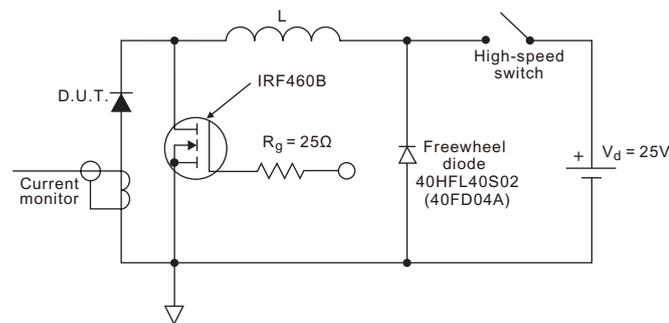


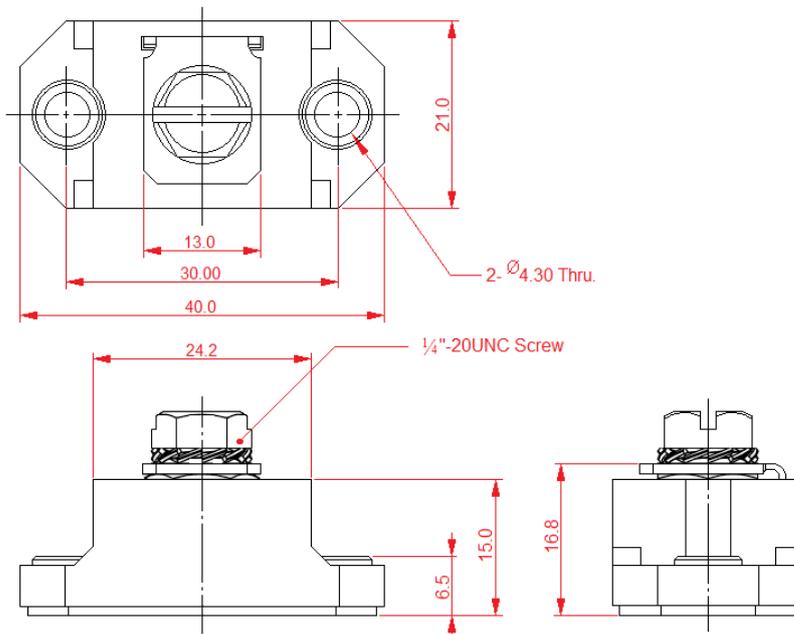
Fig.8 Unclamped Inductive test circuit



Note

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

D-67 (Half-Pak)



All dimensions in millimeters