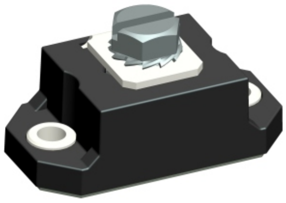
NKS200-100 Series RoHS

Nell High Power Products

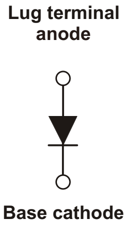
High Performance Schottky Rectifier
200A/100V

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



D-67（Half-Pak）



DESCRIPTION

The NKS200-100 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.

PRODUCT SUMMARY	
$I_{F(AV)}$	200A
V_R	100V

MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNIT
$I_{F(AV)}$	Rectangular waveform	200	A
V_{RRM}		100	V
I_{FSM}	$t_p = 5$ μs sine	23000	A
V_F	200 Apk, T_J = 125°C	0.75	V
T_J	Range	-55 to 175	°C

VOLTAGE RATINGS

PARAMETER	SYMBOL	NKS200-100	UNIT
Maximum DC reverse voltage	V_R	100	V
Maximum working peak reverse voltage	V_{RWM}		

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNIT
Maximum average forward current	$I_{F(AV)}$	50% duty cycle at T_C = 125°C, rectangular waveform		200	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	23000	
		10 ms sine or 6 ms rect. pulse		2300	
Non- repetitive avalanche energy	E_{AS}	T_J=25°C, I_{AS}=5.5A, L=1.0mH		15	mJ
Repetitive avalanche current	I_{AR}	Current decaying linearly to zero in 1 µs Frequency limited by T_J maximum V_A=1.5xV_R typical		1	A

ELECTRICAL SPECIFICATIONS

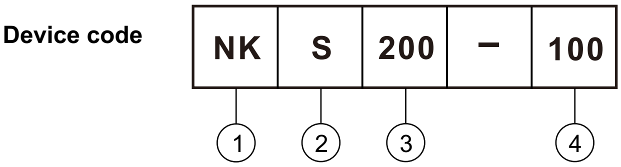
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNIT
Maximum forward voltage drop per leg	V_{FM}(1)	200A	T_J = 25°C	0.86	V
		400A		1.25	
		200A	T_J = 125°C	0.75	
		400A		0.90	
Maximum reverse leakage current per leg	I_{RM}(1)	T_J = 25°C	V_R = Rated V_R	30	µA
		T_J = 125°C		30	mA
Maximum junction capacitance per leg	C_T	V_R = 5 V_{DC} (test signal range 100 kHz to 1 MHz) 25°C		4150	pF
Typical series inductance per leg	L_S	From top of terminal hole to mounting plane		6.0	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	°C
Thermal resistance, junction to case	R_{thJC}	-	-	0.23	°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



- 1 - Nell's power module
- 2 - S for Schottky Barrier Diode, single diode, D-67 package (Half-Pack)
- 3 - Maximum average forward current, 200 = 200A
- 4 - Voltage rating (100 = 100V)

Fig.1 Maximum forward voltage drop characteristics

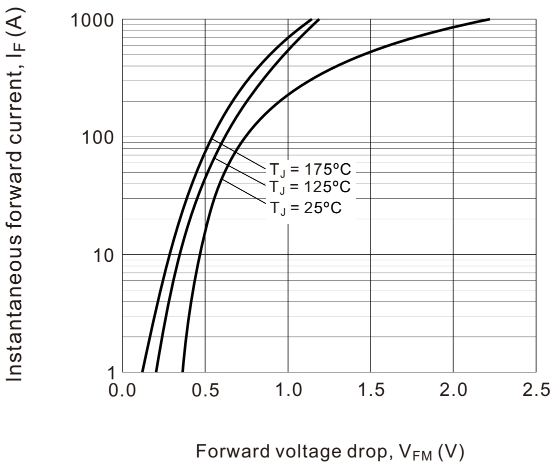


Fig.2 Typical values of reverse current vs. reverse voltage

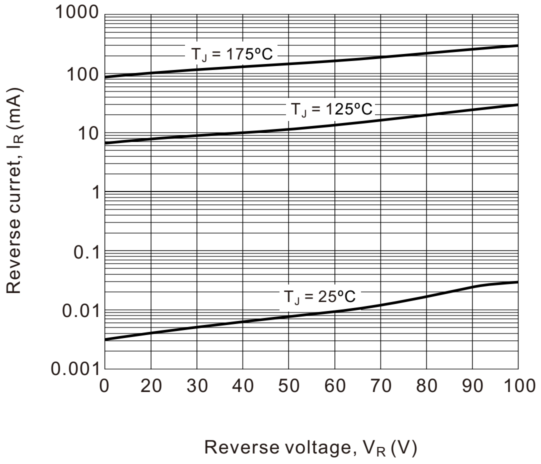


Fig.3 Maximum thermal impedance $R_{th(j-c)}$ characteristics

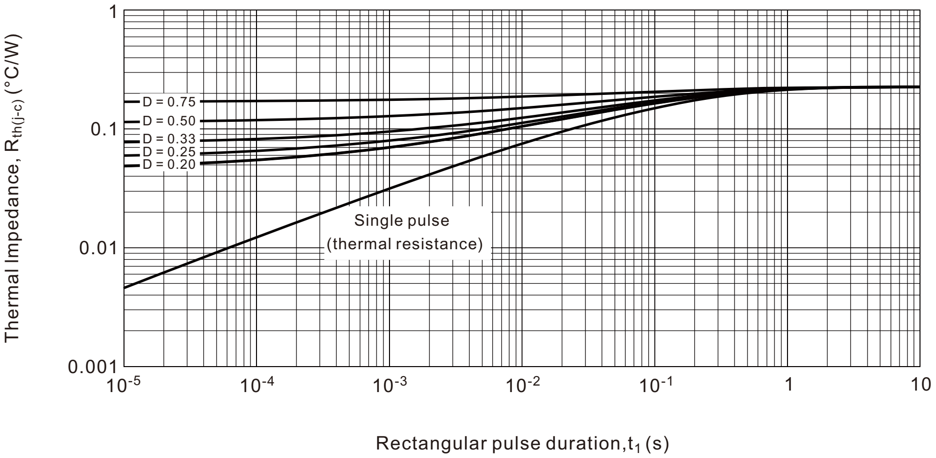


Fig.4 Typical junction capacitance vs. reverse voltage

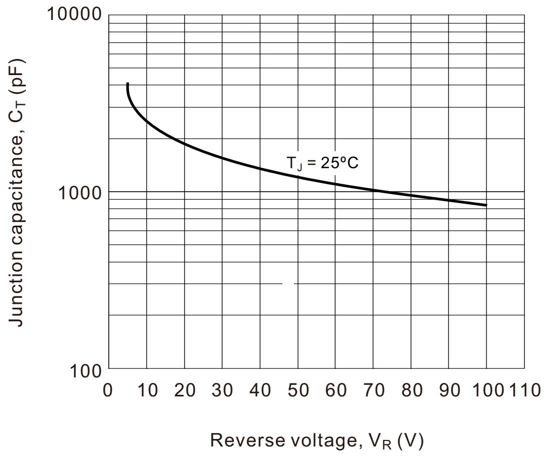


Fig.5 Maximum allowable case temperature vs. Average forward current

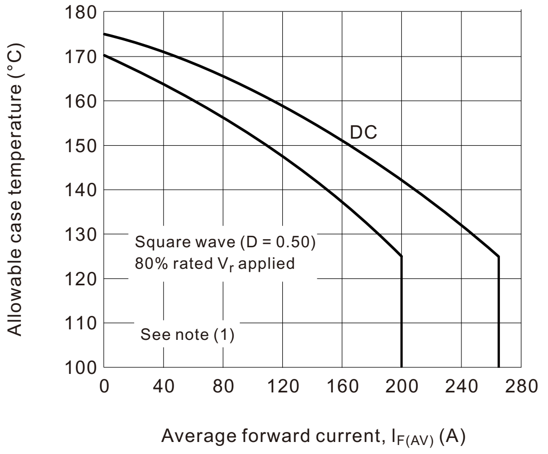


Fig.6 Forward power loss characteristics

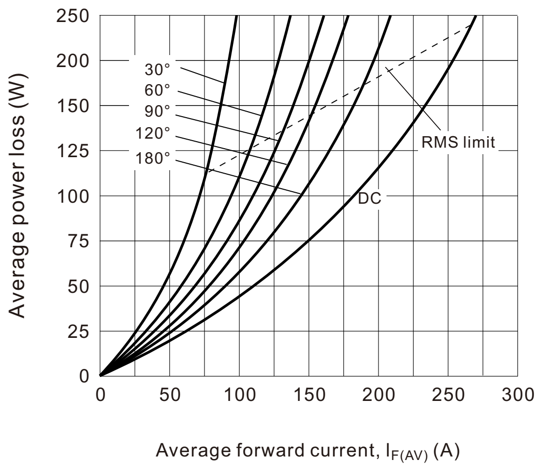


Fig.7 Maximum non-repetitive surge current

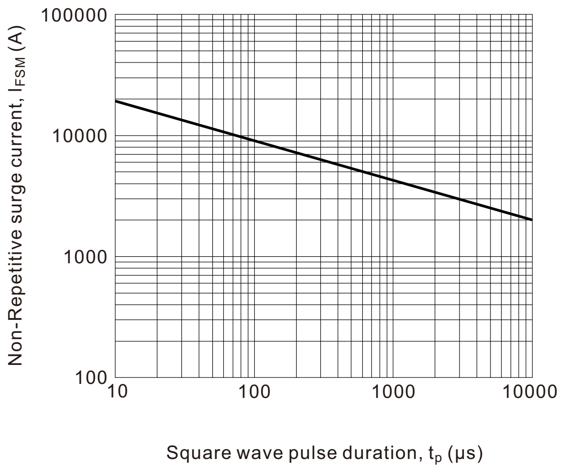
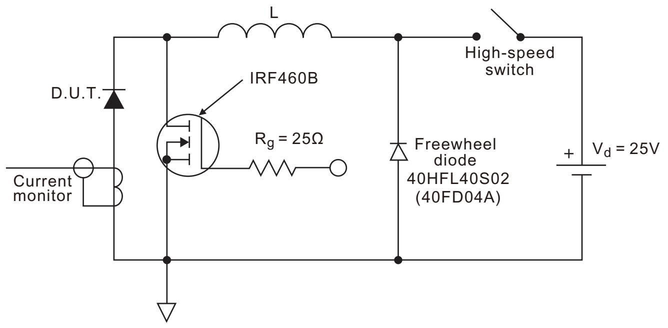


Fig.8 Unclamped Inductive test circuit



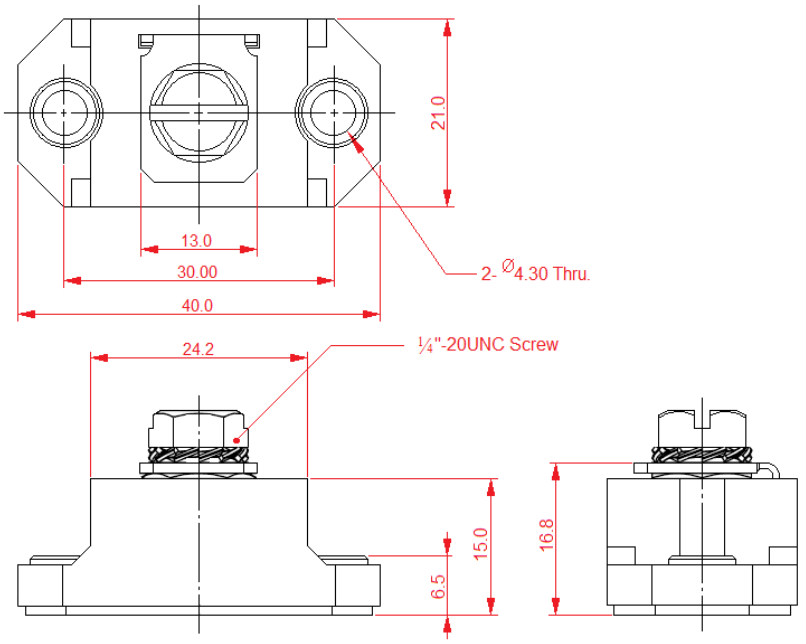
Note

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

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

Pd_{REV} = 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