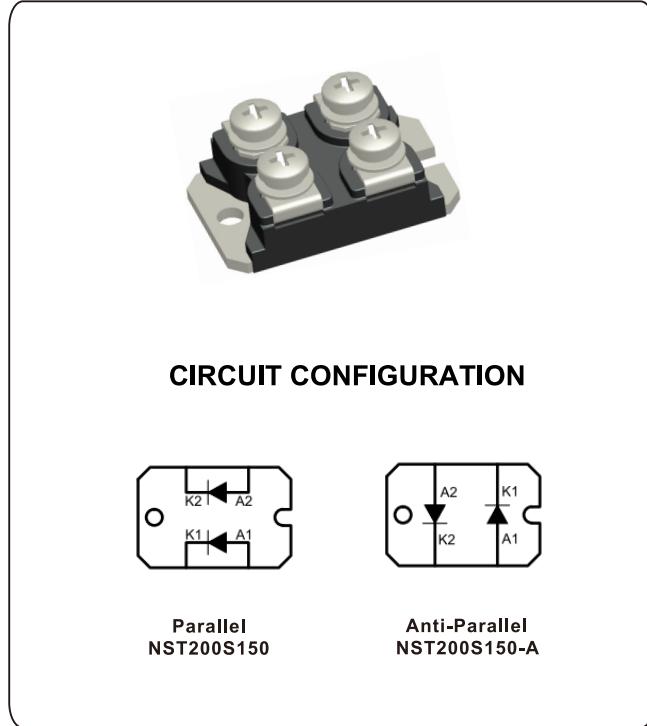


# High Performance Schottky Rectifier

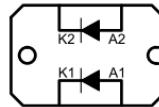
## 2 x 100A/150V

### FEATURES

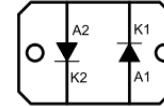
- 175°C  $T_J$  operation
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Extremely low switching losses
- Designed and qualified for industrial level
- International standard package SOT-227
- Low  $I_{RM}$  values
- UL approved file E320098 



### CIRCUIT CONFIGURATION



Parallel  
NST200S150



Anti-Parallel  
NST200S150-A

### DESCRIPTION

The NST200S150 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

$I_{F(AV)}$	100Ax2
$V_R$	150V

### MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNIT
$I_{F(AV)}$	Rectangular waveform	100	A
$V_{RRM}$		150	V
$I_{FSM}$	$t_p = 5 \mu s$ sine	8500	A
$V_F$	100 Apk, $T_J = 125^\circ C$	0.75	V
$T_J$	Range	-55 to 175	°C

### VOLTAGE RATINGS

PARAMETER	SYMBOL	VALUE	UNIT
Maximum DC reverse voltage	$V_R$	150	V
Maximum working peak reverse voltage	$V_{RVM}$		

ABSOLUTE MAXIMUM RATINGS								
PARAMETER	SYMBOL	TEST CONDITIONS			VALUES	UNIT		
Maximum average forward current per leg	$I_{F(AV)}$	50% duty cycle at $T_C = 105^\circ\text{C}$ , rectangular waveform			100	A		
Maximum peak one cycle non-repetitive surge current	$I_{FSM}$	5 $\mu\text{s}$ sine or 3 $\mu\text{s}$ rect. pulse	Following any rated load condition and with rated $V_{RRM}$ applied		8500			
		10 ms sine or 6 ms rect. pulse			1200			
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 $\mu\text{s}$ $f = 10 \text{ KHz}$ , $V_A=1.5xV_R$ typical			1.0	A		

ELECTRICAL SPECIFICATIONS							
PARAMETER	SYMBOL	TEST CONDITIONS			VALUES	UNIT	
Maximum forward voltage drop per leg	$V_{FM}^{(1)}$	100A		$T_J = 25^\circ\text{C}$	0.90	V	
		200A			1.10		
		100A		$T_J = 125^\circ\text{C}$	0.75		
		200A			1.00		
Maximum reverse leakage current per leg	$I_{RM}^{(1)}$	$T_J = 25^\circ\text{C}$		$V_R = \text{Rated } V_R$	10	$\mu\text{A}$	
		$T_J = 125^\circ\text{C}$			10	mA	
Maximum junction capacitance per leg	$C_T$	$V_R = 5 \text{ V}_{\text{DC}}$ (test signal range 100 kHz to 1 MHz) $25^\circ\text{C}$			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	$\text{V}/\mu\text{s}$	
Maximum RMS insulation voltage	$V_{INS}$	50/60Hz, $I_{INS} < 1\text{mA}$			2500 (1 min) 3000 (1 s)	V	

**Note**

(1) Pulse width < 500  $\mu\text{s}$ , duty cycle < 2%

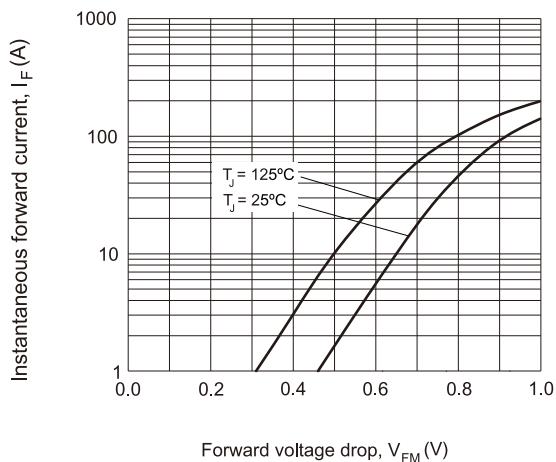
THERMAL-MECHANICAL SPECIFICATIONS					
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
Maximum junction and storage temperature range	$T_J, T_{stg}$	-55	-	175	$^\circ\text{C}$
Thermal resistance, junction to case	$R_{thJC}$	-	-	0.40	$^\circ\text{C}/\text{W}$
Thermal resistance, case to heatsink	$R_{thCS}$	-	0.10	-	
Weight		-	30 (1.06)	-	g(oz.)
Mounting torque, $\pm 10\%$	to heatsink, M4 busbar, M4	-	1.1 (9.7)	-	$\text{N}\cdot\text{m}$ ( $\text{lbf}\cdot\text{in}$ )
		-	1.1 (9.7)	-	
Case style		JEDEC SOT-227 module (insulated)			

### Ordering Information Table

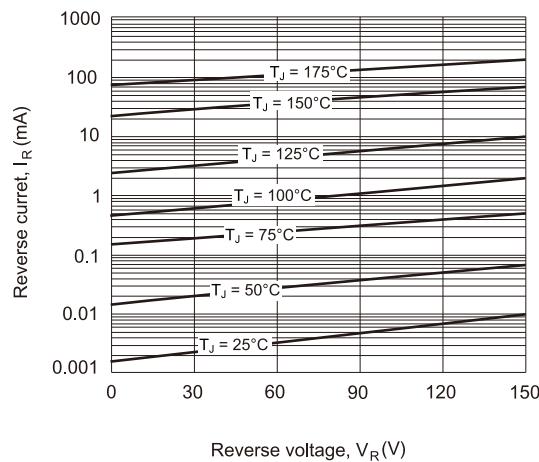
Device code	<b>N</b>	<b>ST</b>	<b>200</b>	<b>S</b>	<b>150</b>	<b>-</b>	<b>A</b>
	1	2	3	4	5		6

- [1] - Nell's high power module
- [2] - Package indicator, "ST" for SOT-227
- [3] - Maximum average forward current, 200 = 100A x 2
- [4] - S = Schottky family
- [5] - Voltage rating (150 = 150V)
- [6] - Circuit type, A for Anti-Parallel type  
Blank for Parallel type

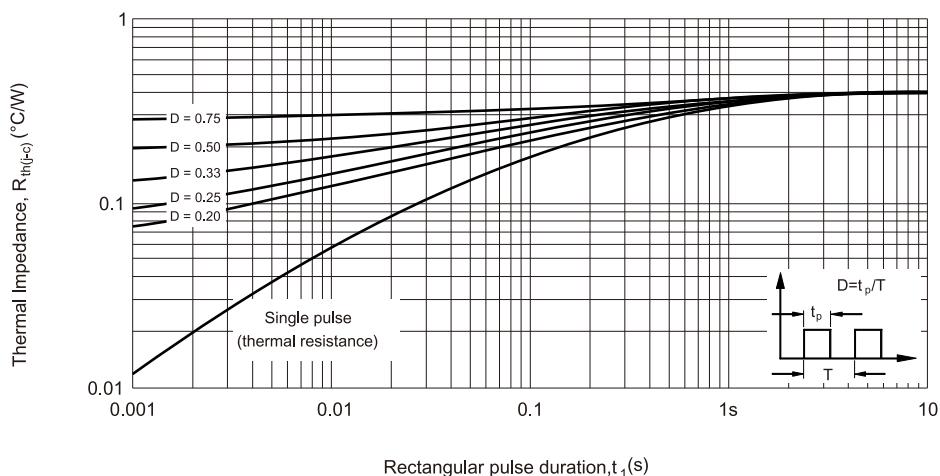
**Fig.1 Maximum forward voltage drop characteristics**



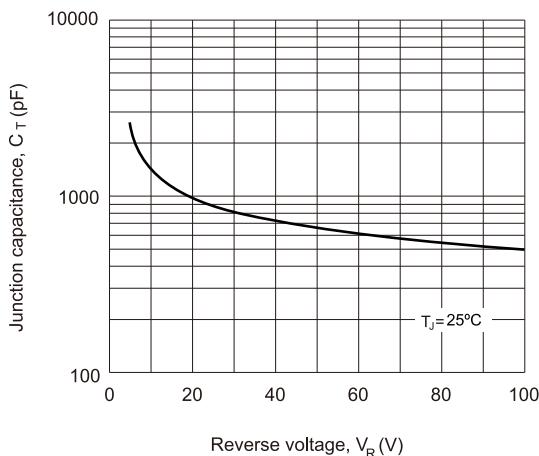
**Fig.2 Typical values of reverse current vs. reverse voltage**



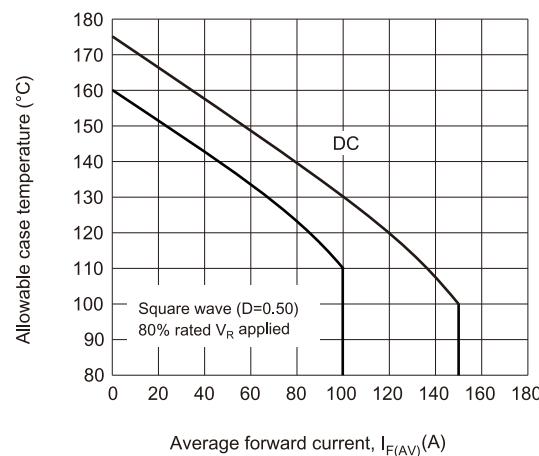
**Fig.3 Maximum thermal impedance  $R_{th(j-c)}$  characteristics**



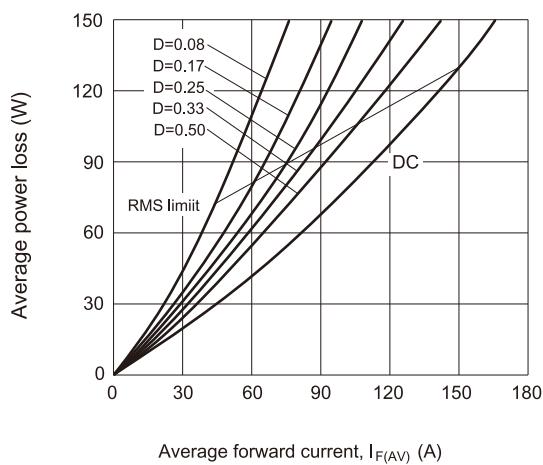
**Fig.4 Typical junction capacitance vs. reverse voltage**



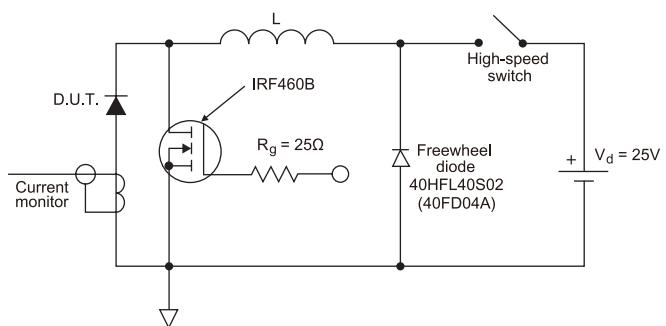
**Fig.5 Maximum allowable case temperature vs. Average forward current**



**Fig.6 Forward power loss characteristics**



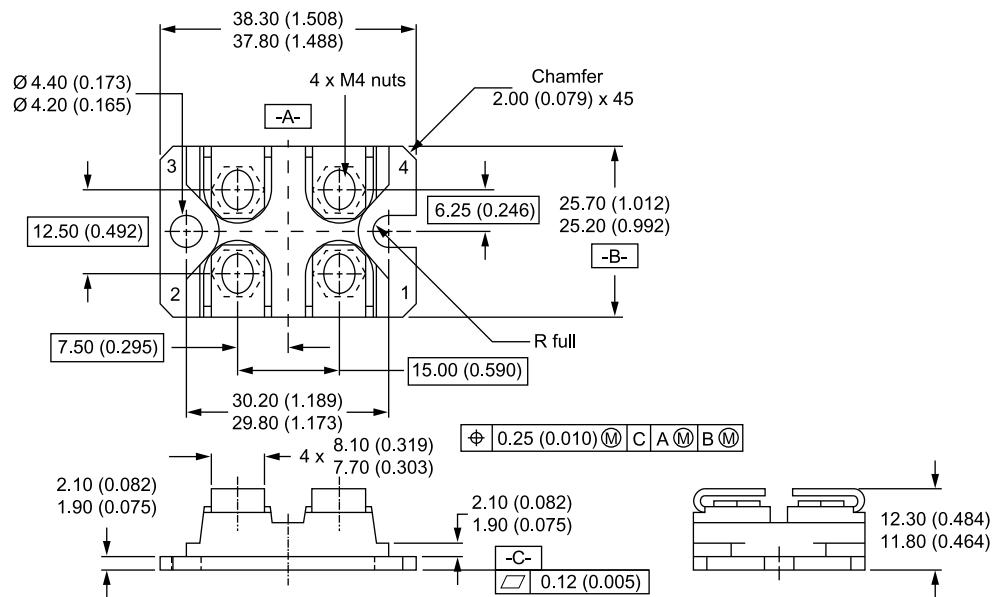
**Fig.7 Unclamped Inductive test circuit**



#### Note

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

SOT-227



All dimensions in millimeters (inches)

## Notes

- Dimensioning and tolerancing per ANSI Y14.5M-1982
  - Controlling dimension: millimeter