

# S2F100N/P60NI

## 600V Non-isolation FRD Module

### Features

- Repetitive Reverse Voltage:  $V_{RRM} = 600V$
- Low Forward Voltage:  $V_F(\text{typ.}) = 1.2V @ I_F=100A$
- Average Forward Current:  $I_{F(AV)} = 100A @ T_C=100^\circ C$
- Reverse Recovery Time:  $t_{rr}(\text{typ.}) = 110ns$
- Extensive Characterization of Recovery Parameters
- Reduced EMI and RFI
- Non-isolation Type Package
- $175^\circ C$  Operating Junction Temperature
- Built-in Dual FRD Construction

### Applications

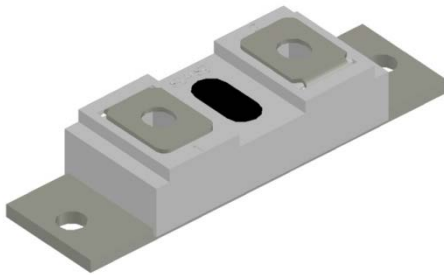
- High Speed & High Power converters, Inverter Welders
- Various Switching and Telecommunication Power Supply

### Description

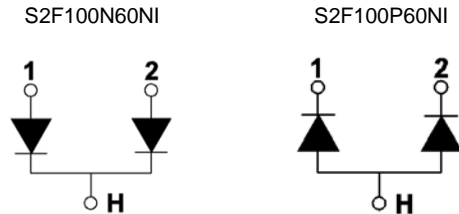
The Fast Recovery Diode module devices are optimized to reduce losses and EMI/RFI in high frequency power conditioning electrical systems.

The Fast Recovery Diode module is ideally suited for power converters, inverter welders, motor drives and other applications where switching losses are significant portion of the total losses.

### Package Type & Internal Circuit



3SM-NI



Internal Circuit

### Absolute Maximum Ratings ( $T_C=25^\circ C$ , unless otherwise noted)

Symbol	Parameter		Ratings	Unit	
$V_{RRM}$	Repetitive Peak Reverse Voltage		600	V	
$V_R$	DC Blocking Voltage		480	V	
$I_{F(AV)}$	Average Rectified Forward Current	Per Diode	$T_C = 25^\circ C$	200	A
			$T_C = 100^\circ C$	100	
		Per Package	$T_C = 25^\circ C$	400	
			$T_C = 100^\circ C$	200	
$I_{FSM}$	Non-repetitive Peak Surge Current (Per Diode) 60Hz Single Half-sine Wave		1750	A	
$I^2t$	$I^2t$ For Fusing 60Hz Sine Wave		$12.7 * 10^3$	A <sup>2</sup> S	
$P_D$	Maximum Power Dissipation	S2F100N60NI	520	W	
		S2F100P60NI	410		
$T_J$	Junction Temperature		-55 ~ +175	$^\circ C$	
$T_{STG}$	Storage Temperature Range		-55 ~ +150	$^\circ C$	
	Mounting Torque (M6)		5.0	N.m	
	Terminal Torque (M6)		3.0	N.m	
	Weight		95	g	



**Electrical Characteristics** (Per Diode,  $T_C=25\text{ }^\circ\text{C}$ , unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_F$	Forward Voltage Drop	$I_F=100\text{A}$	-	1.2	1.6	V
		$I_F=100\text{A}, T_C=100^\circ\text{C}$	-	1.0	-	V
$I_{RM}$	Reverse Leakage Current	$V_R=600\text{V}$	-	-	0.5	mA
		$V_R=600\text{V}, T_C=100^\circ\text{C}$	-	-	1	mA
$t_{rr}$	Reverse Recovery Time	$I_F=1\text{A}, di/dt=-200\text{A/us}$	-	35	-	ns
$t_{rr}$	Reverse Recovery Time	$I_F=100\text{A}, di/dt=-200\text{A/us}$	-	110	150	ns
$I_{rr}$	Reverse Recovery Current		-	10.4	-	A
$t_{rr}$	Reverse Recovery Time	$I_F=100\text{A}, di/dt=-200\text{A/us}, T_C=100^\circ\text{C}$	-	250	-	ns
$I_{rr}$	Reverse Recovery Current		-	21.5	-	A

**Thermal Characteristics**

Symbol	Parameter	Ratings	Unit
$R_{th(J-C)}$	Thermal Resistance, Junction to case	S2F100N60NI	0.24
		S2F100P60NI	0.3

### Typical Performance Characteristics

Fig. 1. Typical Characteristics:  $V_F$  vs.  $I_F$

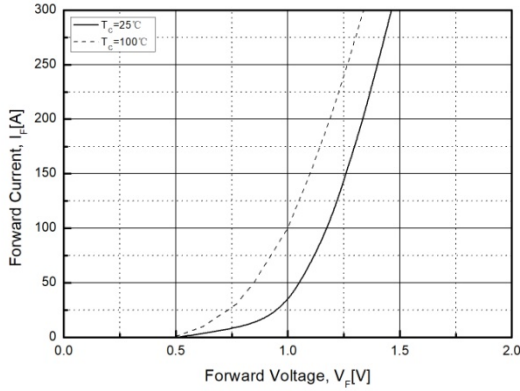


Fig. 2. Typical Reverse Recovery Time vs.  $di/dt$

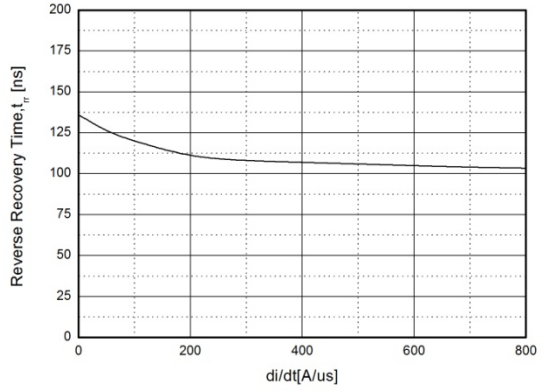


Fig. 3. Transient Thermal Impedance Characteristics ( $R_{th(J-C)}$ )

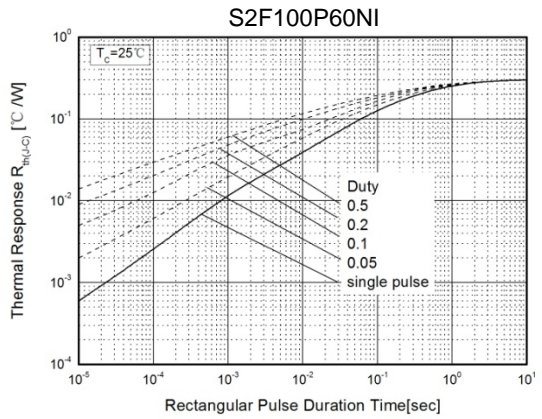
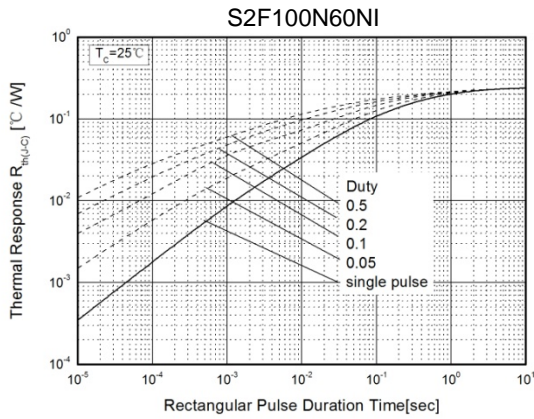
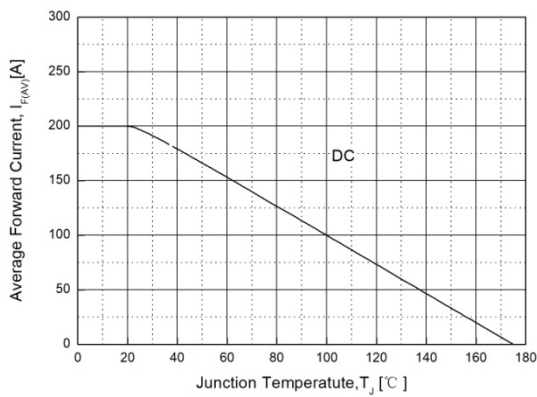
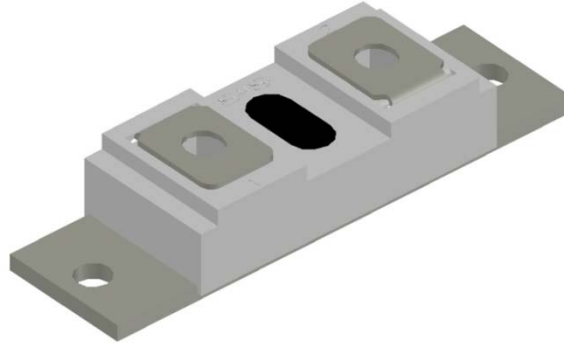


Fig. 4. Forward Current Derating Curve

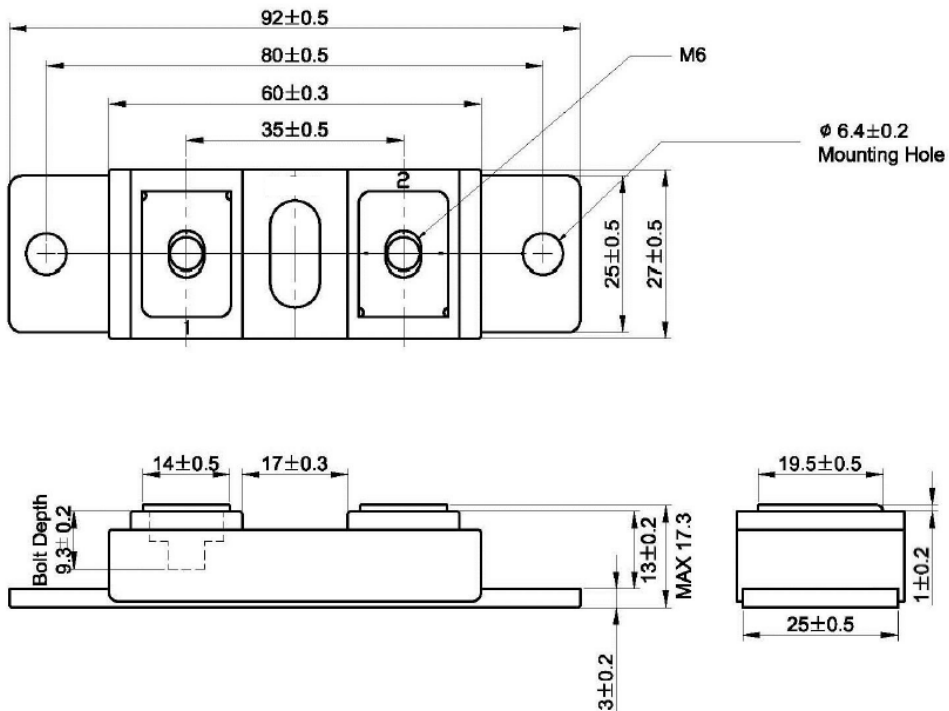


## Package Dimensions

### 3SM-NI




(Dimensions in Millimeters)



#### DISCLAIMER:

The products are not designed for use in hostile environments, including, without limitation, aircraft, nuclear power generation, medical appliances, and devices or systems in which malfunction of any product can reasonably be expected to result in a personal injury. Seller's customers using or selling seller's products for use in such applications do so at their own risk and agree to fully defend and indemnify Seller.

Sunnychip reserves the right to change the specifications and circuitry without notice at any time. Sunnychip does not consider responsibility for use of any circuitry other than circuitry entirely included in a Sunnychip product.  is a registered trademark of Sunnychip Semiconductor Co., Ltd.