SEMICONDUCTOR

D220N20S7P

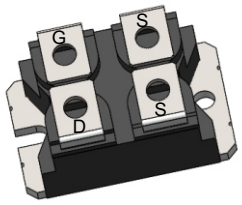
220A 200V N-Channel Enhancement Mode Power MOSFET

Features

- Fast switching
- High input impedance
- Fully Avalanche Rated
- Isolation Type Package
- Electrically Isolation Base Plate

Product Summary			
V_{DS}	$R_{DS(on)}$(mΩ)Typ	I_D(A)	Qg(Max)
200V	7.5 @ 10V 100A	220	335nc

SOT-227



Mechanical Data

- Case:SOT-227 Package

Application

- Synchronous Recification
- Backlighting
- Battery Chargers
- Power Converters
- AC Motor Drives

Pin Definition:

G. Gate
D. Drain
S. Source

Block Diagram

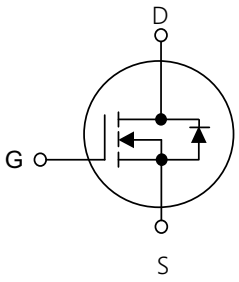


Table1 Absolute Maximum Ratings (T_C=25°C, unless otherwise specified)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	200	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C=25°C	I_D	220	A
	T_C=100°C		180	
Pulsed Drain Current (Note 1)		I_{DM}	760	A
Power Dissipation	T_C=25°C	P_D	560	W
Isolation Voltage (A.C. 1 minute)		Viso	2500	V
Operating Junction and Storage Temperature		T_J/T_{STG}	-55~+150	°C

Table 3. Electrical Characteristics (T_J=25°C, unless otherwise specified)

Parameter		Symbol	Test Conditions	Min	Typ	Max	Unit
Off Characteristics							
Drain-Source Breakdown Voltage		BV_{DSS}	V_{GS}=0V,I_D=3mA	200	-	-	V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=200V,V_{GS}=0V	-	-	50	μA
Gate- Source Leakage Current	Forward	I_{GSS}	V_{GS}=20V,V_{DS}=0V	-	-	200	nA
	Reverse		V_{GS}=-20V,V_{DS}=0V	-	-	-200	nA
On Characteristics							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS},I_D=8mA	2.0	2.5	3.5	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=10V,I_D=100A	-	7.5	7.8	mΩ
Gate Resisitance		R_G	V_{DD}=0V,V_{GS}=0V,f=1MHz	-	1.6	2.9	Ω
Dynamic Characteristics							
Input Capacitance		C_{ISS}	V_{DS}=25V,V_{GS}=0V,f=1MHz	-	46.68	-	nF
Output Capacitance		C_{OSS}		-	993	-	pF
Reverse Transfer Capacitance		C_{RSS}		-	586	-	pF
Transconductance		g_{fs}	$\|V_{DS}\| > 2\|I_D\|R_{DS(ON)M}$, I_D = 100A	-	120	-	S
Switching Characteristics							
Turn-On Delay Time		td(on)	V_{DD}=75V,I_D=150A V_{GS}=10V,R_G=1.6Ω,	-	112	-	ns
Turn-On Rise Time		t_R		-	44	-	ns
Turn-Off Delay Time		td(off)		-	248	-	ns
Turn-Off Fall Time		tf		-	48	-	ns
Total Gate Charge		Q_G	V_{DS}=10V,I_D=100A, V_{GS}=10V	-	335	-	nC
Gate-Source Charge		Q_{GS}		-	188	-	nC
Gate-Drain Charge		Q_{GD}		-	115	-	nC
Drain-Source Diode Characteristics and Maximum Ratings(Note 2)							
Drain-Source Diode Forward Voltage		V_{SD}	V_{GS}=0V,I_S=100A	-	-	0.85	V
Maximum Continuous Drain-Source Diode Forward Current		I_S		-	-	180	A
Reverse Recovery Time		trr	I_F=0.5A,I_R=1.0A I_{RR}=0.25A	-	-	300	ns

Notes: 1 RepetitiveRating Pulse width limited by maximum junction temperature

2 Pulse Test: Pulse width ≤300μS,Duty cycle≤2%

Typical Characteristics Diagrams

Fig 1. Power dissipation

P_{tot} =f(T_C)

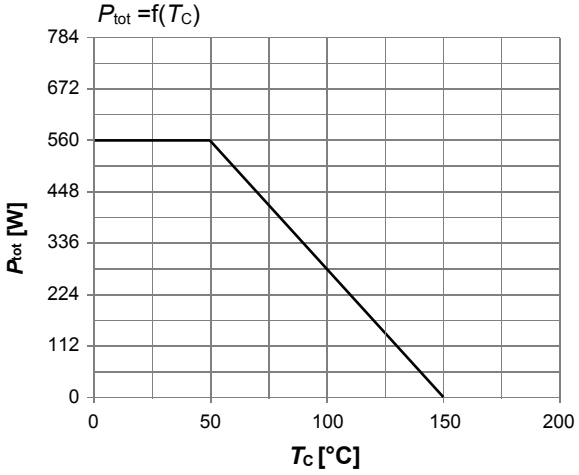


Fig 2. Drain current

I_D=f(T_C); V_{GS} ≥10V

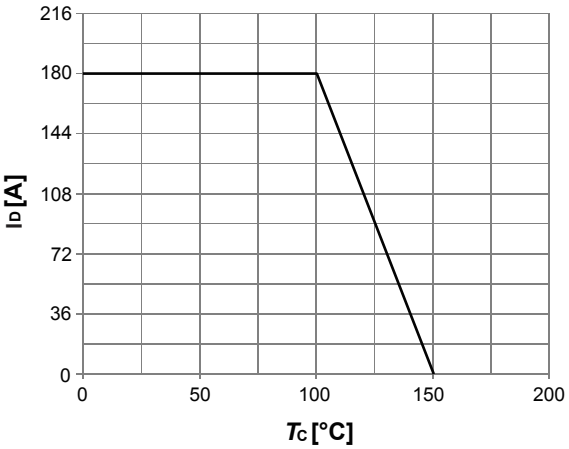


Fig 3. Safe operating area

I_D=f(V_{DS}); T_C=25°C; D=0;parameter: t_p

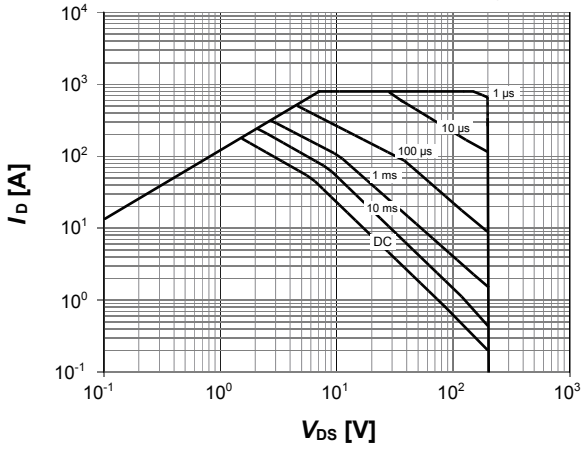


Fig 4. Maximium Transient Thermal Impedance

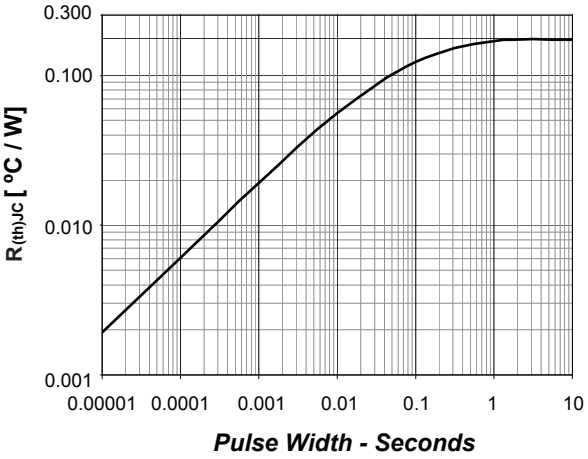


Fig 5. Typ. output characteristics

I_D=f(V_{DS}); T_j=25°C;parameter: V_{GS}

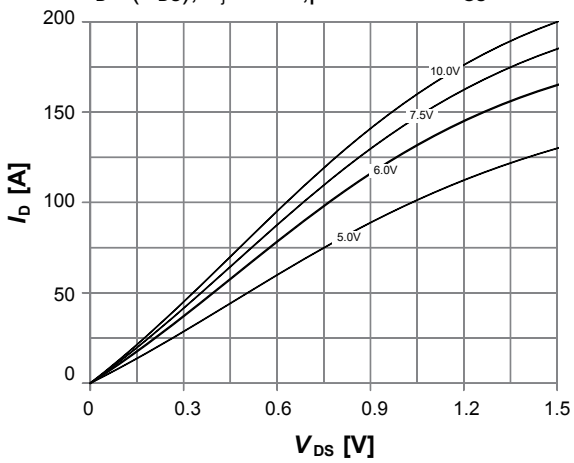


Fig 6. Typ. drain-source on resistance

$R_{DS(on)}$=f(I_D); T_j=25°C;parameter: V_{GS}

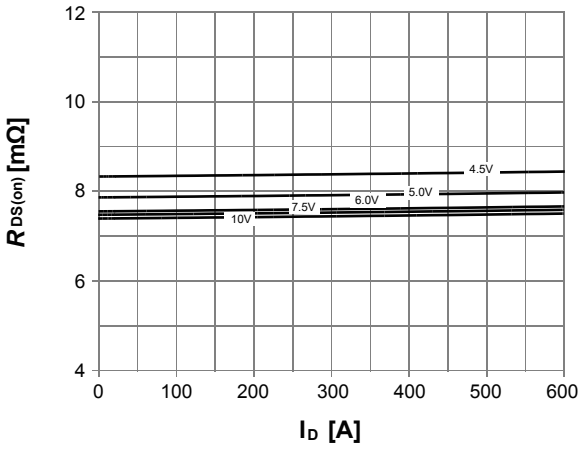


Fig 7. Typ. transfer characteristics

$I_D=f(V_{GS})$;| V_{DS}|>2|I_D|$R_{DS(on)max}$;parameter: T_j

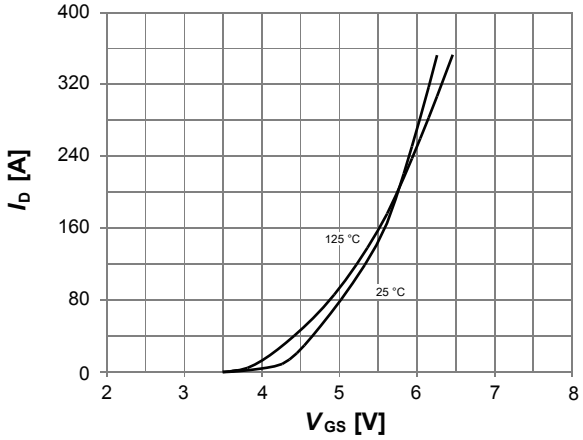


Fig 8. Typ. forward transconductance

$g_{fs}=f(I_D)$; T_j=25°C

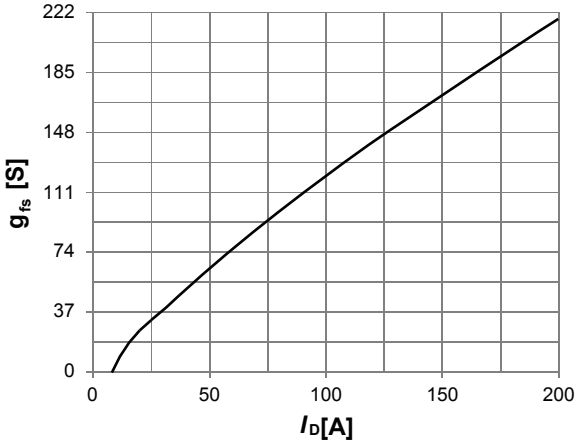


Fig 9. Drain-source on-state resistance

$R_{DS(on)}=f(T_j)$; I_D=150A; V_{GS}=10V

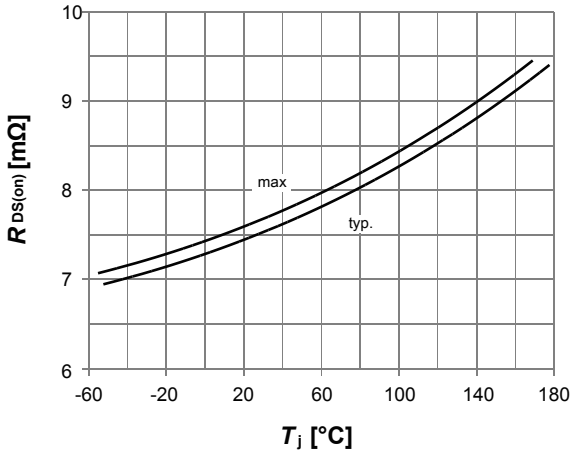


Fig 10. Typ. gate threshold voltage

$V_{GS(th)}=f(T_j)$; $V_{GS}=V_{DS}$;parameter: I_D

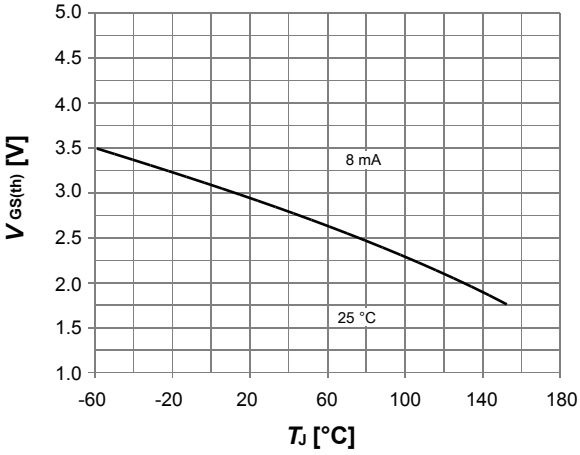


Fig 11. Typ. capacitances

$C=f(V_{DS})$; V_{GS}=0V; f=1MHz

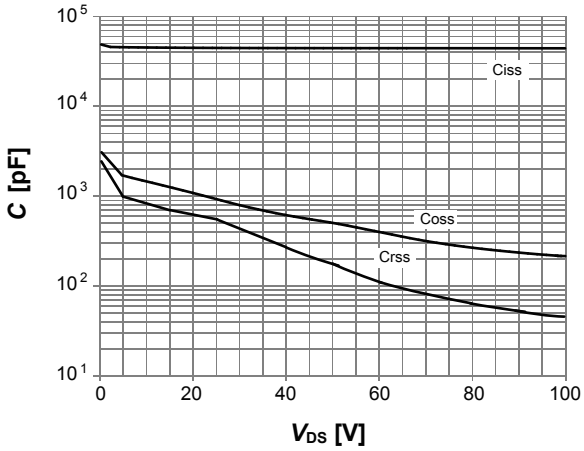


Fig 12. Typical forward characteristics of reverse diode

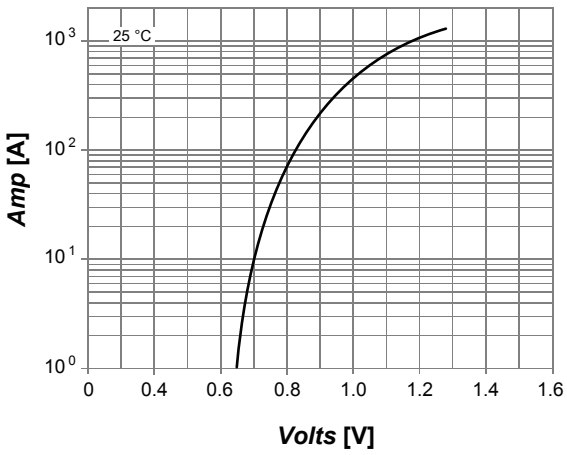


Fig 13. Forward derating curve of reverse diode

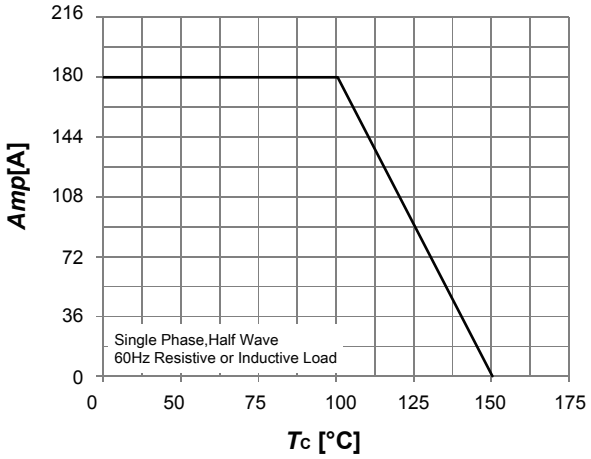


Fig 14. Peak forward surge current of reverse diode

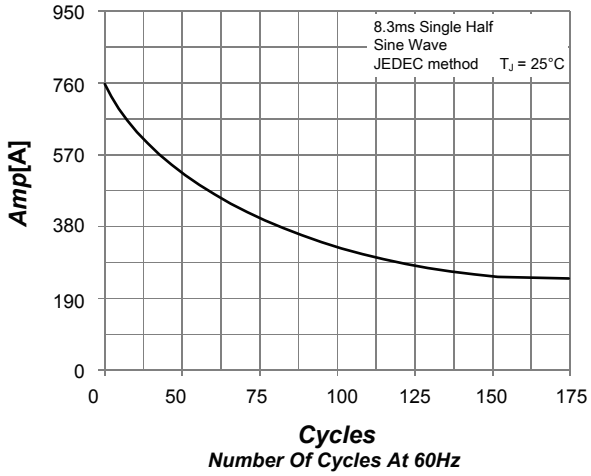


Fig 15. Typical reverse diode characteristics

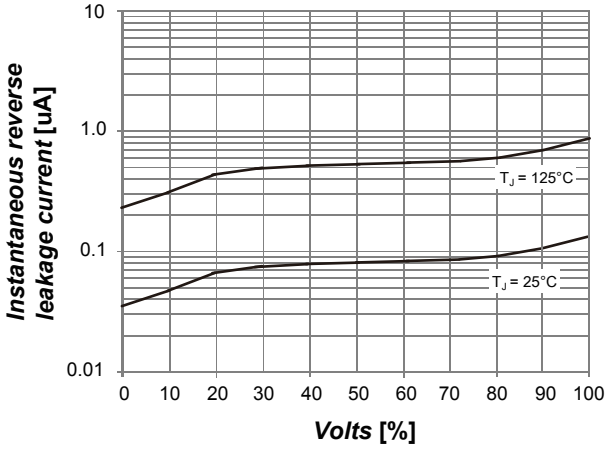


Fig 16. Typ. gate charge

V_{GS}=f(Q_{gate}); I_D=100A pulsed; parameter: V_{DD}

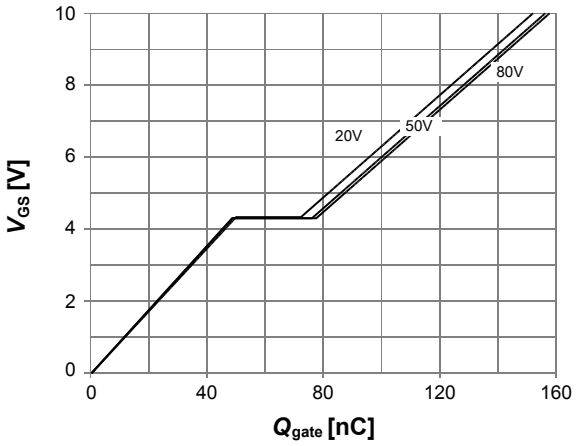
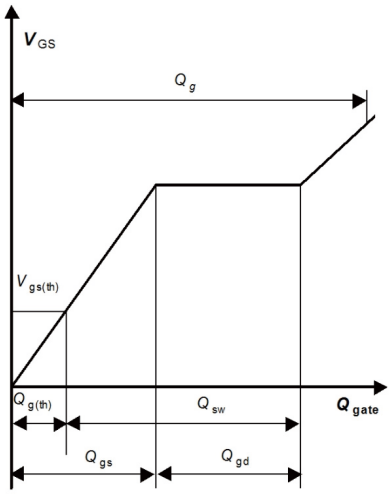
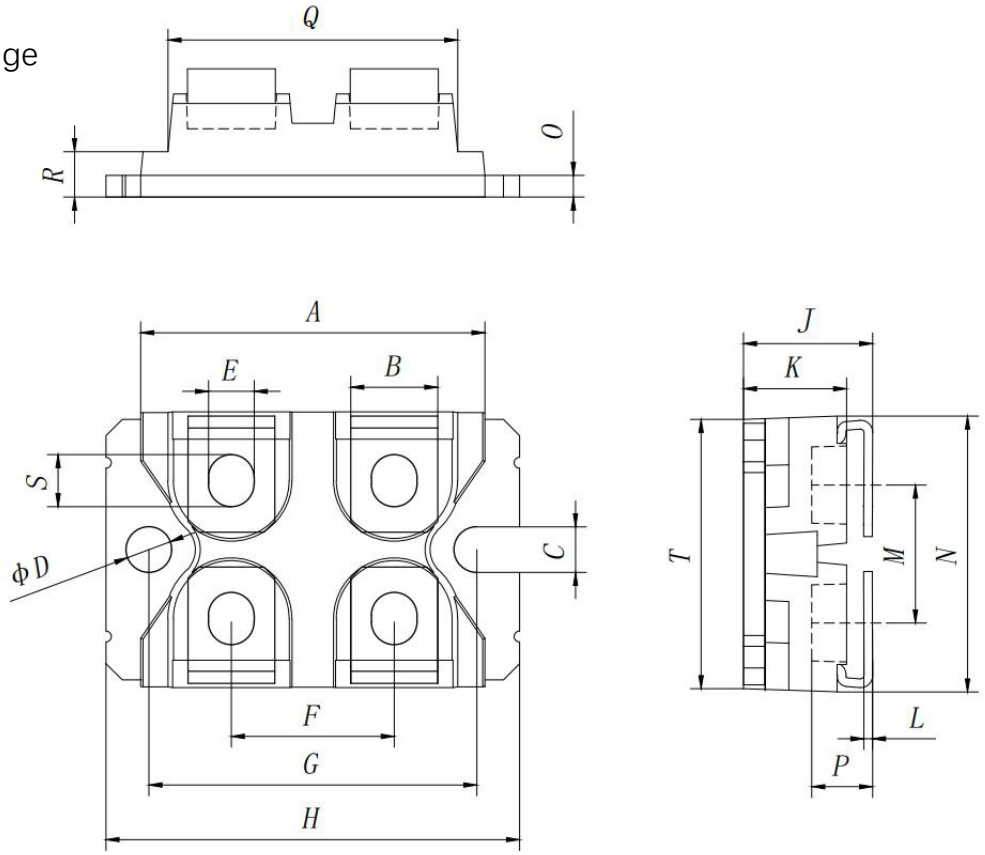


Fig 17. Gate charge waveforms



Dimensions

SOT-227package



SYMBOLS	DIMENSION IN MM		
	MIN	NOM	MAX
A	31.20	31.70	32.20
B	7.50	8.00	8.50
C	3.80	4.20	4.60
D	3.80	4.20	4.60
E	3.80	4.20	4.60
F	14.50	15.00	15.50
G	29.80	30.20	30.60
H	37.70	38.10	38.50
J	11.50	11.90	12.30
K	8.90	9.50	10.00
L	0.75	0.80	0.85
M	12.40	12.70	13.00
N	25.00	25.40	25.80
O	1.70	2.00	2.30
P	4.95	5.60	6.10
Q	26.40	26.70	27.00
R	3.90	4.18	4.45
S	4.20	4.80	5.40
T	23.80	24.80	25.80

Friendship Reminder

■ JiNan JingHeng（hereinafter referred to as JH） reserves the right to make changes to this document and its products and specifications at anytime without notice.

■ Customers should obtain and confirm the latest product information and specifications before final design, purchase or use.

■ JH makes no warranty, representation or guarantee regarding the suitability ofi ts products for any particular purpose, nor does JH assume any liability for application assistance or customer product design.

■ JH does not warrant or accept any liability with products which are purchased or used for any unintended or unauthorized application.

■ No license is granted by implication or otherwise under any intellectual property rights of JH.

■ JH's products are not authorized for use as critical components in life support devices or systems without express written approval of JH.