SEMICONDUCTOR

SC1000N170P

1700V 5A N-Channel SIC Power MOSFET

Features

- High blocking voltage with low on-resistance
- High speed switching with low capacitance
- Ultra-Low Drain-Gate Capacitance
- Halogen free, RoHs compliant

Product Summary			
V_{DS}	$R_{DS(on)}$(mΩ)Typ	I_D(A)	Qg(Typ)
1700V	1000 @ 20V 2A	5	5.2nc

TO-247



1 2 3

Mechanical Data

- Case:TO-247 Package

Application

- Switch mode power supplies
- Auxiliary Power Supplies
- Motor drives
- High voltage DC/DC converters

Pin Definition:

1. Gate
2. Drain
3. Source

Block Diagram

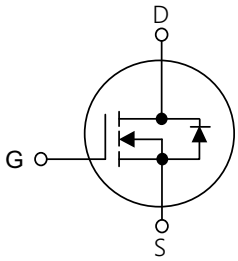


Table1 Absolute Maximum Ratings (T_C=25°C, unless otherwise specified)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	1700	V
Gate-Source Voltage(Max)		$V_{GS(max)}$	-10/+25	V
Recommend Gate-Source Voltage		V_{GSop}	-5/+20	V
Continuous Drain Current	T_C=25°C	I_D	5.0	A
	T_C=100°C		3.5	
Pulsed Drain Current @tp=1ms (Note 1)		I_{DM}	6.0	A
Power Dissipation	T_C=25°C	P_D	69	W
Operating Junction and Storage Temperature		T_J/T_{STG}	-55 ~ +150	°C

Table 2.Thermal Characteristics

Parameter	Symbol	SC1000N170P	Unit
Thermal resistance Junction to Case,Max	$R_{\theta JC}$	2.0	°C/W
Thermal resistance Junction to Ambient,Max	$R_{\theta JA}$	40	°C/W

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=100μA	1700	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=1700V,V_{GS}=0V	-	1	100	μA
Gate- Source Leakage Current	I_{GSS}	V_{GS}=20V,V_{DS}=0V	-	-	250	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS},I_D=1mA	2.5	3.0	4.5	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=20V,I_D=2A,T_J=25°C	-	1.0	1.3	Ω
		V_{GS}=20V,I_D=2A,T_J=150°C	-	1.5	-	
Gate Resisitance	R_G	f=1MHz	-	22	-	Ω
Dynamic Characteristics						
Input Capacitance	C_{ISS}	V_{DS}=1000V,V_{GS}=0V, f=1MHz,V_{AC}=25mV	-	186	-	pF
Output Capacitance	C_{OSS}		-	12	-	pF
Reverse Transfer Capacitance	C_{RSS}		-	1.6	-	pF
COSS Stored Energy	E_{OSS}		-	6.2	-	μJ
Turn-on switching energy	E_{ON}	V_{DS}=1200V,I_D=2A,L=1500μH	-	48	-	μJ
Turn-off switching energy	E_{OFF}	V_{GS}=-4/+20V,R_G=2.5Ω,T_J=25°C	-	18	-	μJ
Turn-On Delay Time	td(on)	V_{DS}=1200V,I_D=2A V_{GS}=-4/+20V,R_G=2.5Ω, R_L=600Ω,T_J=25°C	-	5.2	-	ns
Turn-On Rise Time	t_R		-	9.4	-	ns
Turn-Off Delay Time	td(off)		-	13.2	-	ns
Turn-Off Fall Time	tf		-	22.0	-	ns
Total Gate Charge	Q_G	V_{DD}=1200V,I_D=2A, V_{GS}=-5/20V	-	5.2	-	nC
Gate-Source Charge	Q_{GS}		-	7.3	-	nC
Gate-Drain Charge	Q_{GD}		-	21.8	-	nC
Drain-Source Diode Characteristics and Maximum Ratings(Note 2)						
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS}=-5V,I_S=1A	-	4.2	-	V
Continuous Diode Forward Current	I_S	T_C=25°C	-	-	4	A
Reverse Recovery Time	trr	V_{GS}=-5V, V_R=1200V, I_{SD}=2A	-	25	-	ns
Recovered charge	Qrr		-	15	-	nC
Peak reverse recovery current	Irrm		-	2.8	-	A

Notes: 1 RepetitiveRating Pulse width limited by maximum junction temperature

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

Typical Characteristics Diagrams

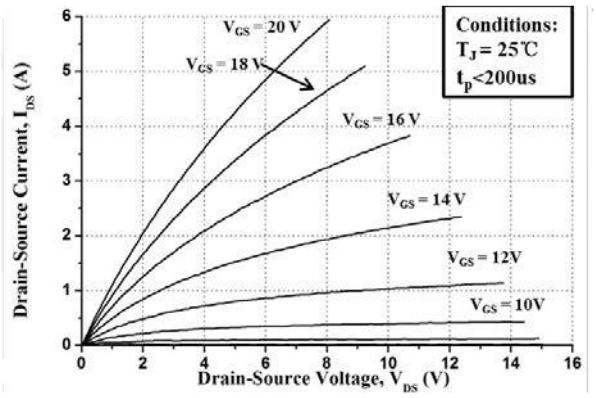


Figure 1. Output Characteristics T_J = 25 ºC

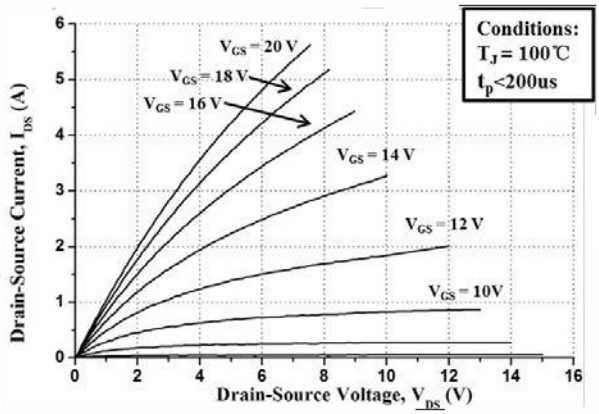


Figure 2. Output Characteristics T_J = 100 ºC

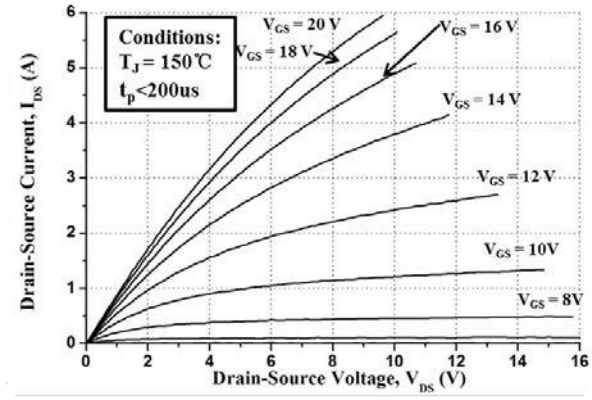


Figure 3. Output Characteristics T_J = 150 ºC

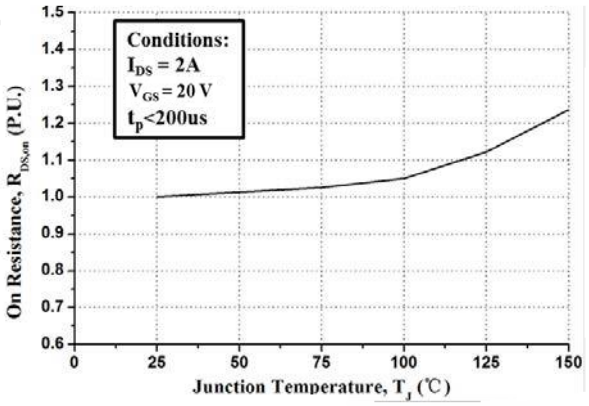


Figure 4. Normalized On-Resistance vs. Temperature

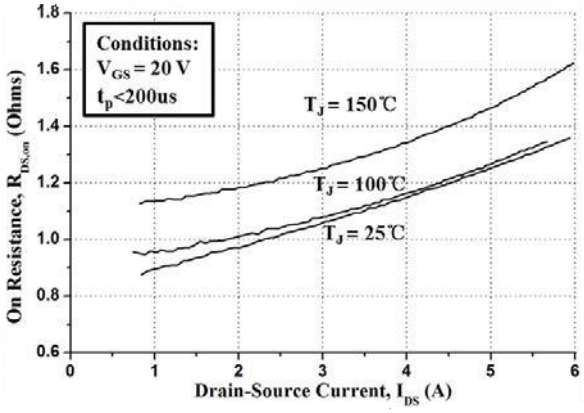


Figure 5. On-Resistance vs. Drain Current for Various Temperatures

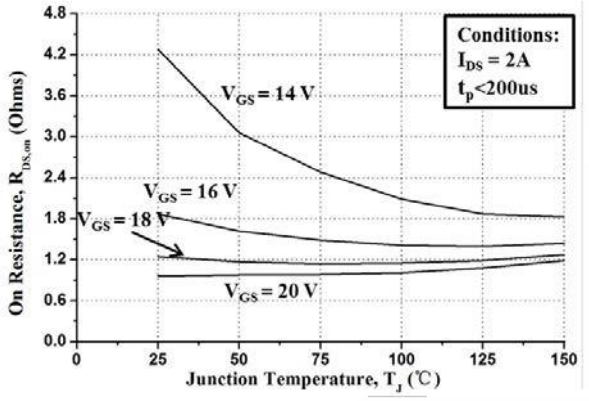


Figure 6. On-Resistance vs. Temperature for Various Gate Voltages

Typical Characteristics Diagrams

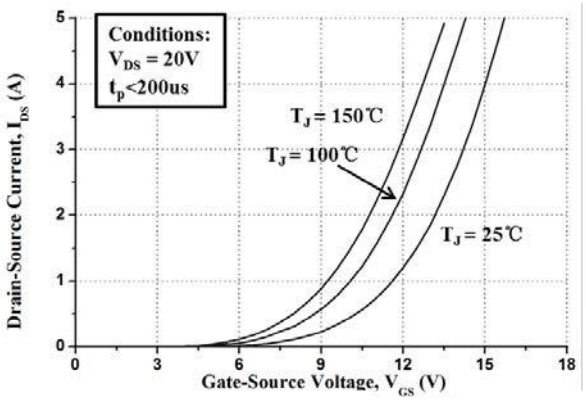


Figure 7. Transfer Characteristics for Various Junction Temperatures

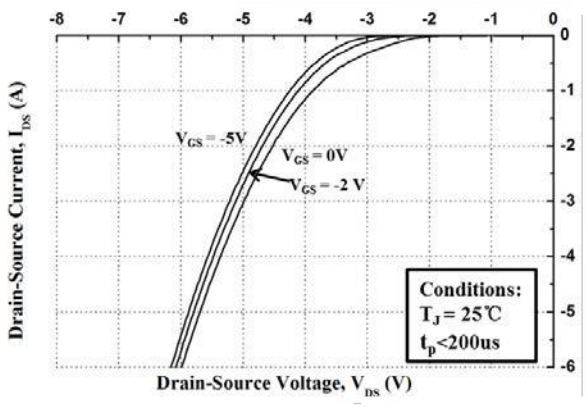


Figure 8. Body Diode Characteristics at 25 ºC

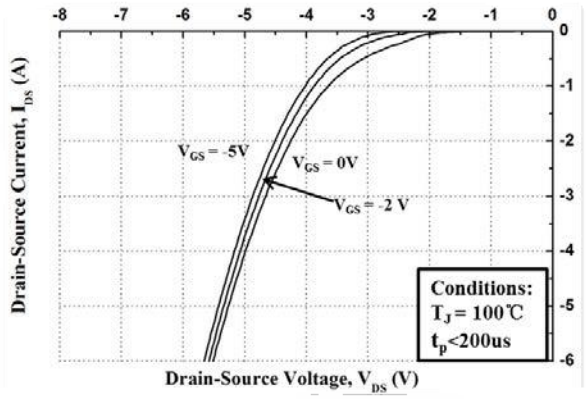


Figure 9. Body Diode Characteristics at 100 ºC

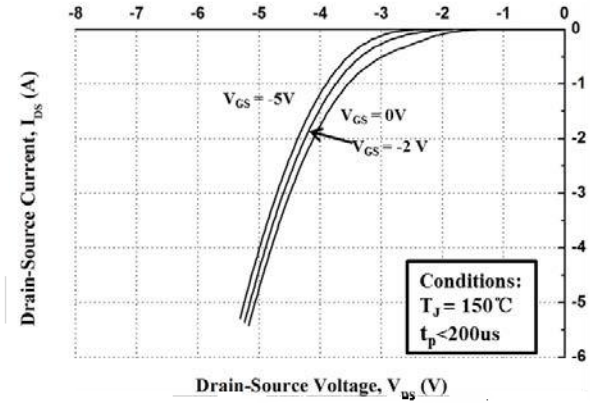


Figure 10. Body Diode Characteristics at 150 ºC

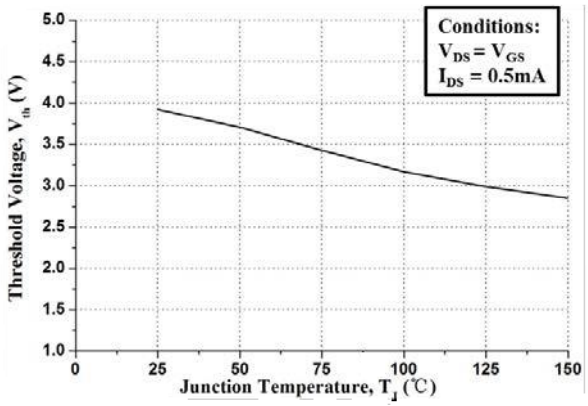


Figure 11. Threshold Voltage vs. Temperature

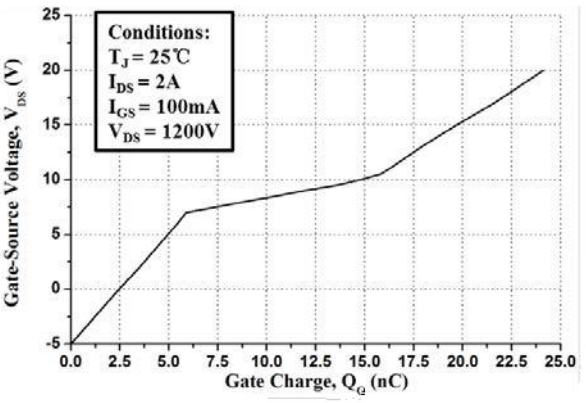


Figure 12. Gate Charge Characteristics

Typical Characteristics Diagrams

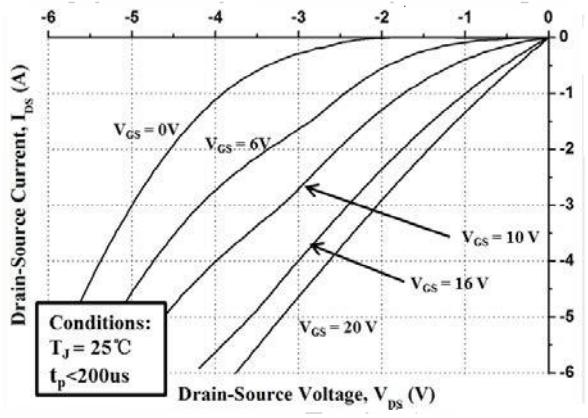


Figure 13. 3rd Quadrant Characteristics at 25 ºC

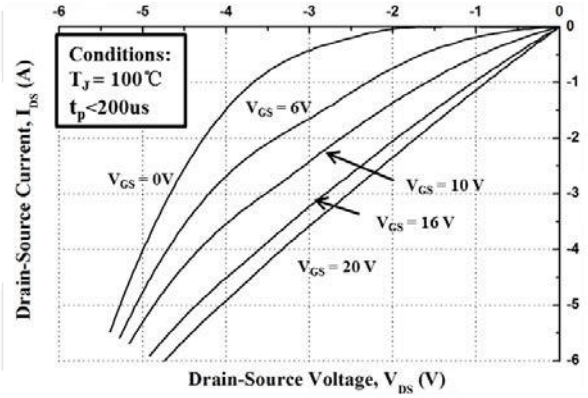


Figure 14. 3rd Quadrant Characteristics at 100 ºC

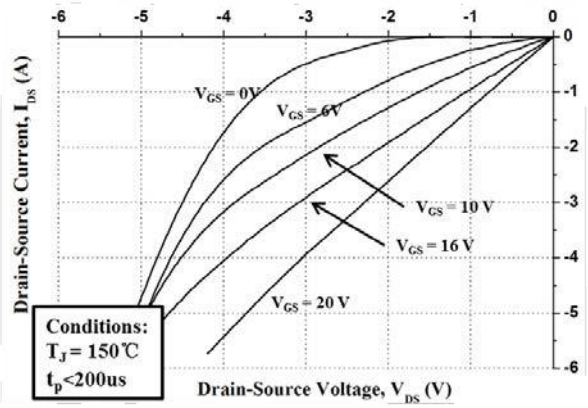


Figure 15. 3rd Quadrant Characteristics at 150 ºC

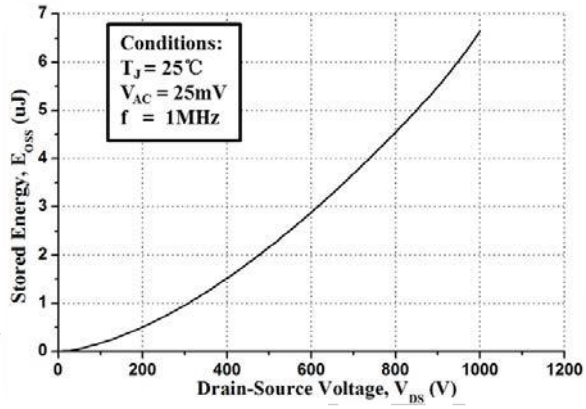


Figure 16. Output Capacitor Stored Energy

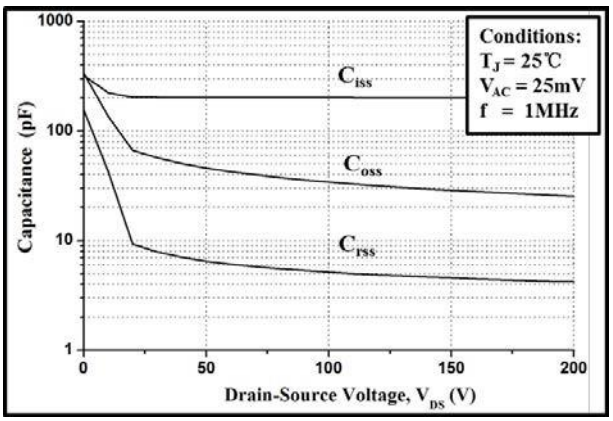


Figure 17. Capacitances vs. Drain-Source Voltage (0 - 200V)

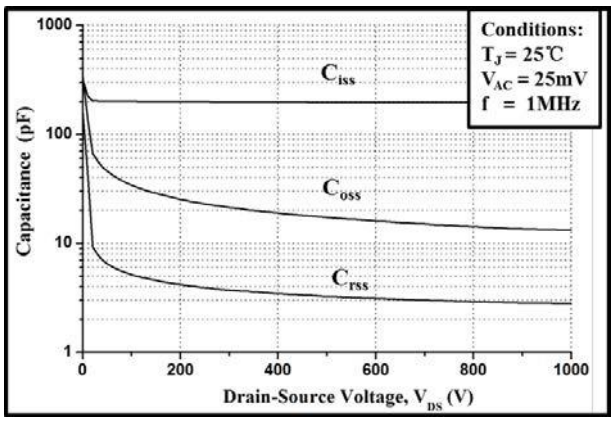
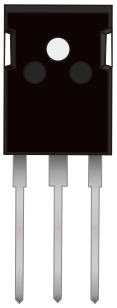
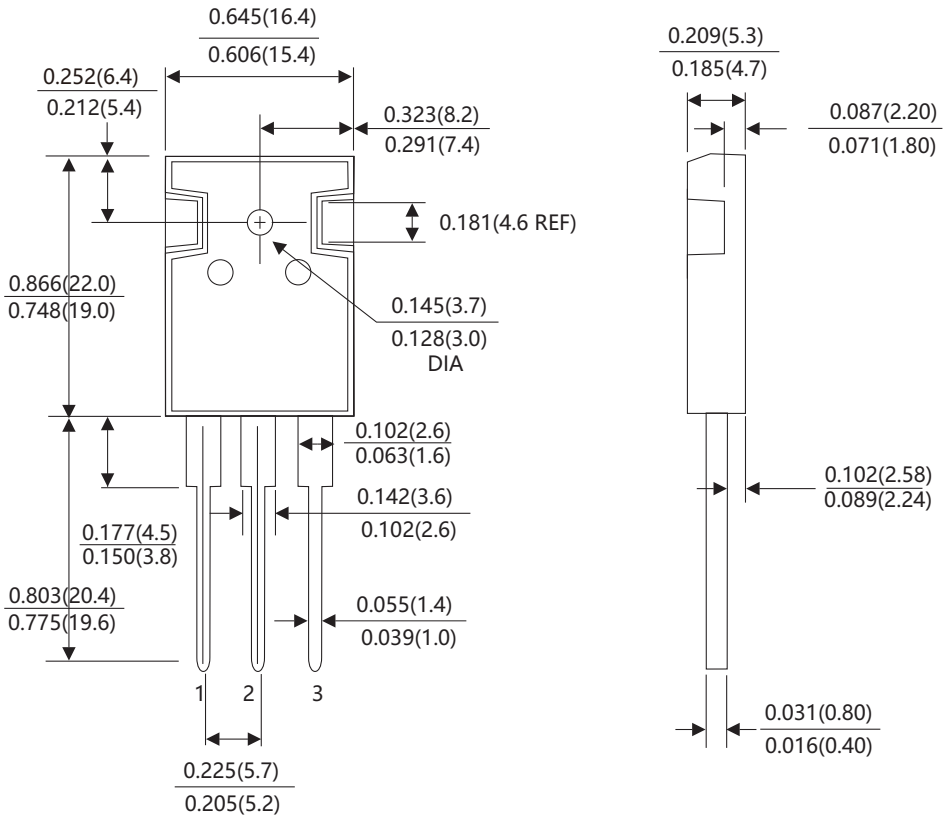


Figure 18. Capacitances vs. Drain-Source Voltage (0 - 1000V)

Dimensions

TO-247 package





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.