SEMICONDUCTOR

SC35N75P

750V 54A N-Channel SIC Power MOSFET

Features

- High blocking voltage with low on-resistance
- High speed switching with low capacitance
- High operating junction temperature capability
- Wide bandgap SiC MOSFET technology
- Halogen free, RoHs compliant

Product Summary			
V_{DS}	$R_{DS(on)}$(mΩ)Typ	I_D(A)	Qg(Typ)
750V	35@ 18V 27A	54	64nc

TO-247



Mechanical Data

- Case:TO-247 Package

Application

- Motor drivers
- Renewable energy
- Automotive DC/DC converters
- Switch mode power supplies

Pin Definition:

1. Gate
2. Drain
3. Source

Block Diagram

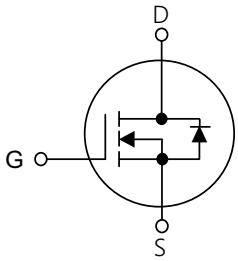


Table1 Absolute Maximum Ratings (T_C=25°C, unless otherwise specified)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	750	V
Gate-Source Voltage(Max)		$V_{GS(max)}$	-10/+22	V
Recommend Gate-Source Voltage		V_{GSop}	-4/+18	V
Continuous Drain Current	T_C=25°C	I_D	54	A
	T_C=100°C		36	
Pulsed Drain Current (Note 1)		I_{DM}	115	A
Power Dissipation	T_C=25°C	P_D	176	W
Avalanche energy, single pulse		E_{AS}	270	mJ
Avalanche Current, single pulse		I_{AS}	7.5	A
Operating Junction and Storage Temperature		T_J/T_{STG}	-55 ~ +175	°C

Table 2.Thermal Characteristics

Parameter	Symbol	SC35N75P	Unit
Thermal resistance Junction to Case	$R_{\theta JC}$	0.86	°C/W
Thermal resistance Junction to Ambient	$R_{\theta JA}$	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=500μA	750	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=750V,V_{GS}=0V,T_J=25°C	-	1	10	μA
		V_{DS}=750V,V_{GS}=0V,T_J=175°C	-	-	3.5	mA
Gate- Source Leakage Current	I_{GSS}	V_{GS}=18V,V_{DS}=0V	-	-	250	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS},I_D=23mA	2.0	-	4.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=15V,I_D=27A,T_J=25°C	-	45	-	mΩ
		V_{GS}=18V,I_D=27A,T_J=25°C	-	35	45	
		V_{GS}=18V,I_D=27A,T_J=175°C	-	46	-	
Gate Resisitance	R_G	f=1MHz	-	2.1	-	Ω
Dynamic Characteristics						
Input Capacitance	C_{ISS}	V_{DS}=500V,V_{GS}=0V, f=100KHz	-	1640	-	pF
Output Capacitance	C_{OSS}		-	125	-	pF
Reverse Transfer Capacitance	C_{RSS}		-	14	-	pF
Turn-On Delay Time	td(on)	V_{DS}=500V,V_{GS}=-4/18V, I_D=27A, R_G=5Ω	-	9.6	-	ns
Turn-On Rise Time	t_R		-	28	-	ns
Turn-Off Delay Time	td(off)		-	31	-	ns
Turn-Off Fall Time	tf		-	16	-	ns
Total Gate Charge	Q_G	V_{DD}=500V,I_D=27A, V_{GS}=-4/18V	-	64	-	nC
Gate-Source Charge	Q_{GS}		-	22	-	nC
Gate-Drain Charge	Q_{GD}		-	16	-	nC
Drain-Source Diode Characteristics and Maximum Ratings(Note 2)						
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S=13.5A	-	2.9	-	V
Continuous Diode Forward Current	I_S		-	54	-	A
Reverse Recovery Time	trr	V_{GS}=-4/18 V, I_F=27 A, V_R=500 V, di/dt=2860A/μs,	-	15	-	ns
Recovered charge	Qrr		-	248	-	nC
Peak reverse recovery current	Irrm		-	26	-	A

Notes: 1 RepetitiveRating Pulse width limited by maximum junction temperature

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

Typical Characteristics Diagrams

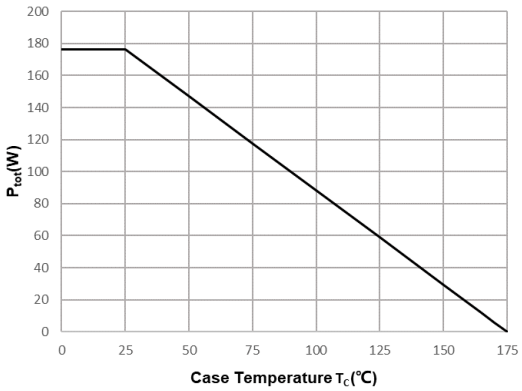


Fig1. Power Dissipation vs. Case Temperature

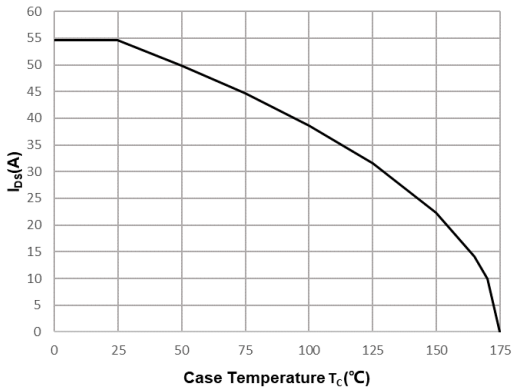


Fig2. Maximum DC Drain to Source Current vs. Case Temperature

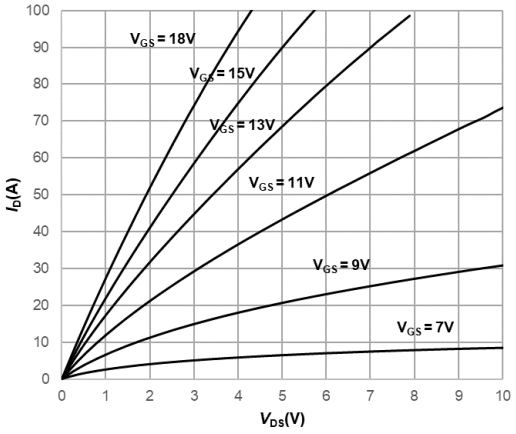


Fig3. Output Characteristics T_j=25℃

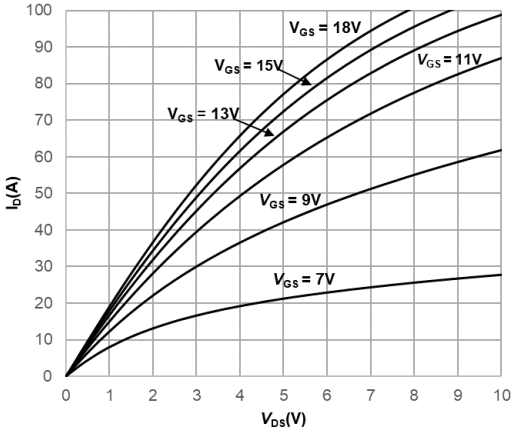


Fig4. Output Characteristics T_j=175℃

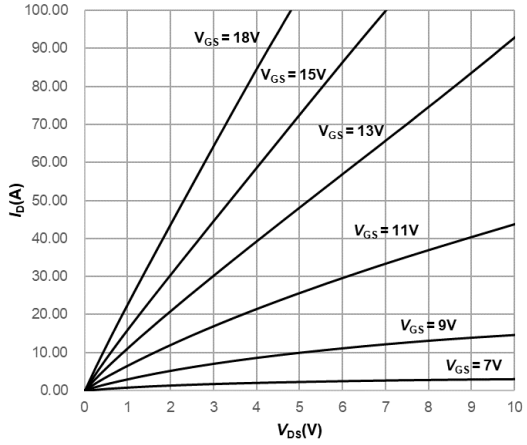


Fig5. Output Characteristics T_j=-40℃

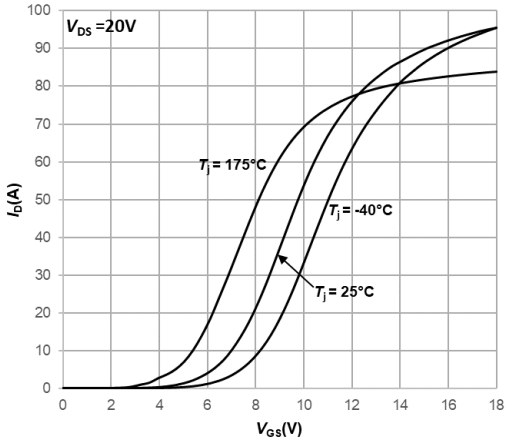


Fig6. Typical Transfer Characteristics

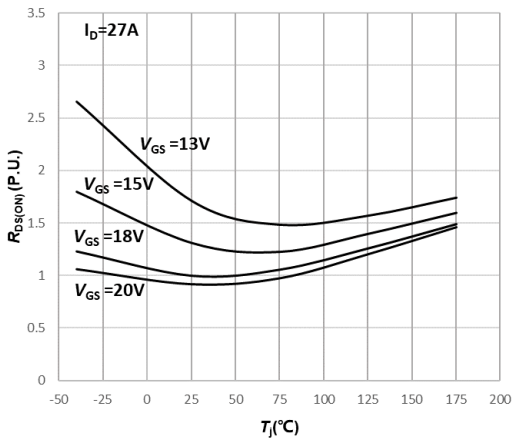


Fig7. Normalized On-Resistance vs. Temperature For Various V_{GS}

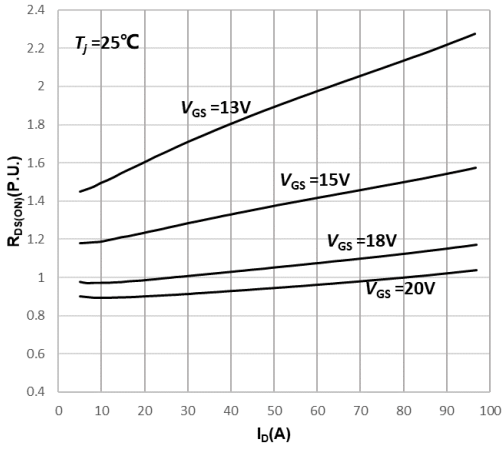


Fig8. Normalized On-Resistance vs. Drain Current For Various V_{GS}

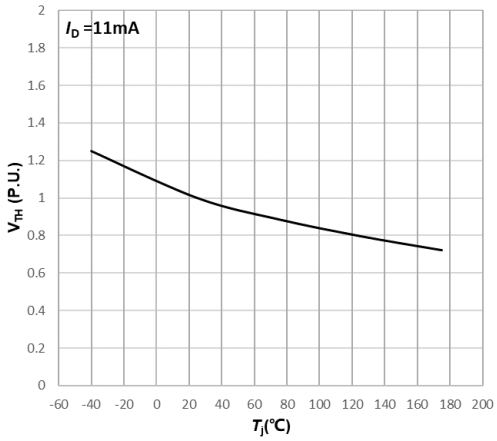


Fig9. Body Diode Characteristics

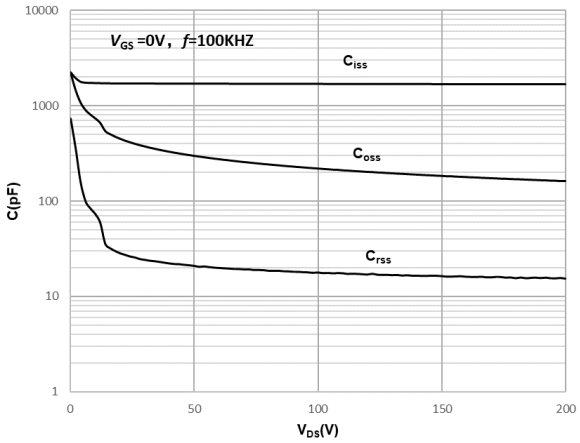


Fig10. Capacitances vs. Drain-Source Voltage (0-200V)

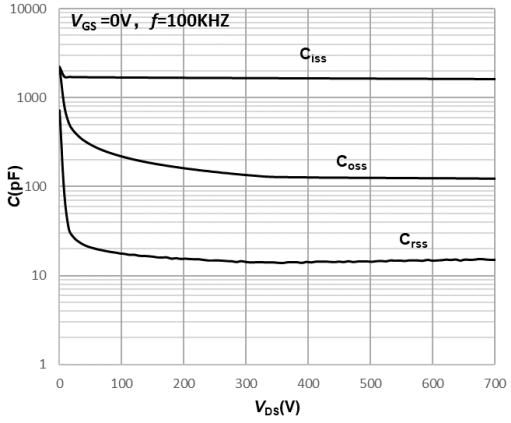


Fig11. Capacitances vs. Drain-Source Voltage (0-700V)

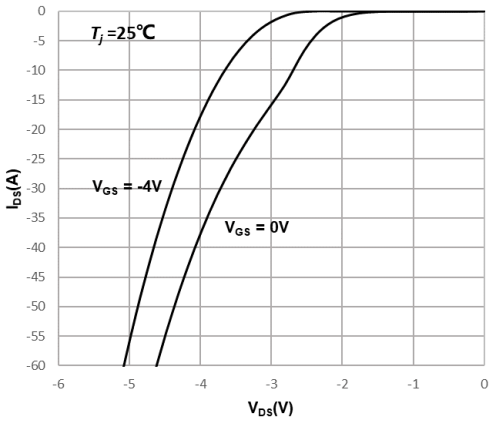


Fig12. Body Diode Characteristics

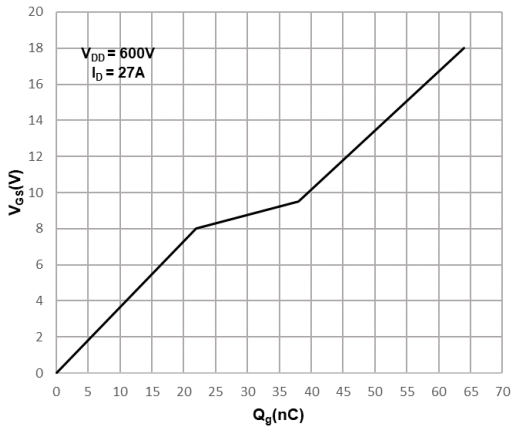
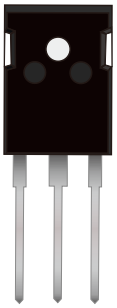
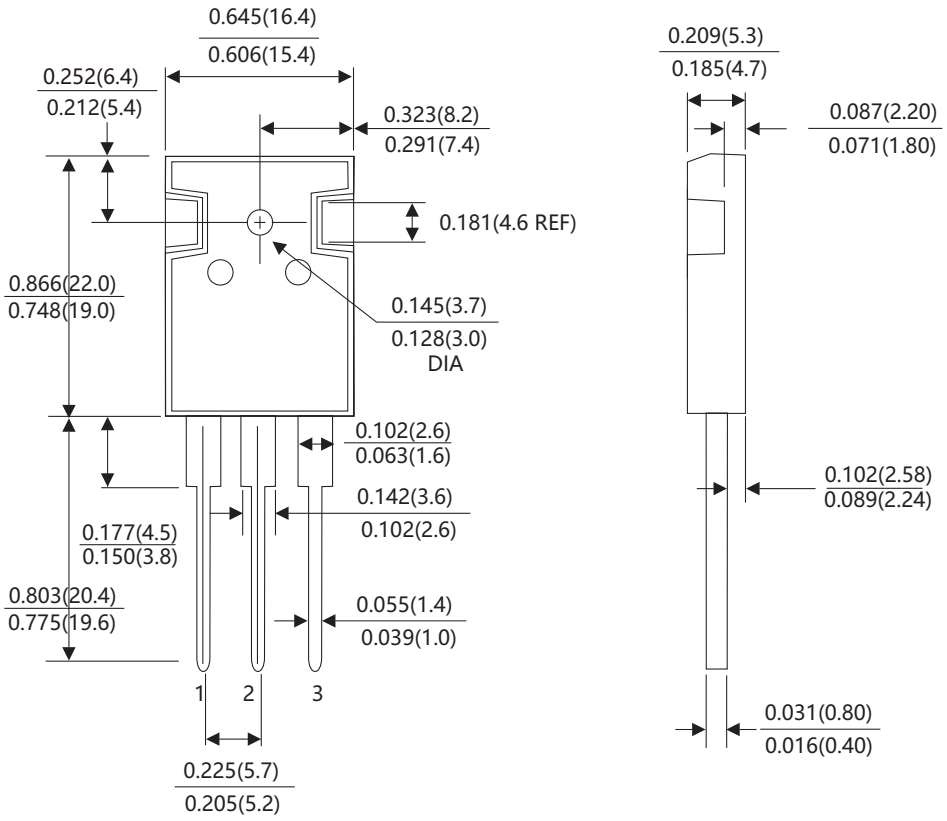


Fig13. Typical Gate Charge

Dimensions

TO-247 package





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