

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

Mechanical Data

- Case:TO-247 Package

Application

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

Product Summary			
V _{DS}	R _{DS(on)} (mΩ)Typ	I _D (A)	Q _g (Typ)
750V	10@ 18V 90A	217	216nc



Block Diagram

Pin Definition:

1. Gate
2. Drain
3. Source

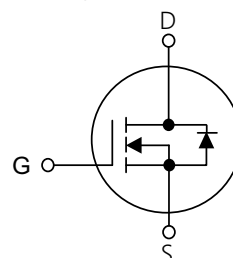


Table1 Absolute Maximum Ratings (T_C=25°C, unless otherwise specified)

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	I _D	T _C =25°C	217
		T _C =100°C	154
Pulsed Drain Current (Note 1)	I _{DM}	434	A
Power Dissipation T _C =25°C	P _D	750	W
Avalanche energy, single pulse	E _{AS}	1711	mJ
Avalanche Current, single pulse	I _{AS}	18.5	A
Operating Junction and Storage Temperature	T _J /T _{STG}	-55 ~ +175	°C

Table 2.Thermal Characteristics

Parameter	Symbol	SC10N75P	Unit
Thermal resistance Junction to Case	R _{θJC}	0.2	°C/W
Thermal resistance Junction to Ambient	R _{θJA}	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 =38.5mA	2.0	-	4.0	V
Static Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =15V,I _D =90A,T _J =25°C	-	13.5	-	mΩ
		V _{GS} =18V,I _D =90A,T _J =25°C	-	10	13	
		V _{GS} =18V,I _D =90A,T _J =175°C	-	12.5	-	
Gate Resisitance	R _G	f=1MHz	-	5.8	-	Ω
Dynamic Characteristics						
Input Capacitance	C _{ISS}	V _{DS} =500V,V _{GS} =0V, f=1MHz	-	5300	-	pF
Output Capacitance	C _{OSS}		-	420	-	pF
Reverse Transfer Capacitance	C _{RSS}		-	41	-	pF
Turn-On Delay Time	td(on)	V _{DS} =500V,V _{GS} = -4/18V, I _D =90A, R _G =25Ω	-	230	-	ns
Turn-On Rise Time	tr		-	120	-	ns
Turn-Off Delay Time	td(off)		-	210	-	ns
Turn-Off Fall Time	tf		-	70	-	ns
Total Gate Charge	Q _G	V _{DD} =500V,I _D =90A, V _{GS} = -4/18V	-	216	-	nC
Gate-Source Charge	Q _{GS}		-	64	-	nC
Gate-Drain Charge	Q _{GD}		-	103	-	nC
Drain-Source Diode Characteristics and Maximum Ratings(Note 2)						
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} = -4V,I _S =45A	-	4.2	-	V
Continuous Diode Forward Current	I _S		-	-	217	A
Reverse Recovery Time	trr	V _{GS} = -4/18V, I _F =90 A, V _R =500 V, di/dt=4150A/μs,	-	24.2	-	ns
Recovered charge	Q _{rr}		-	780	-	nC
Peak reverse recovery current	I _{rrm}		-	57	-	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

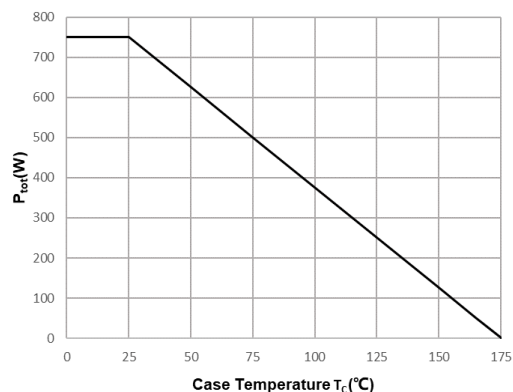


Fig2. Maximum Source Current vs. Case Temperature

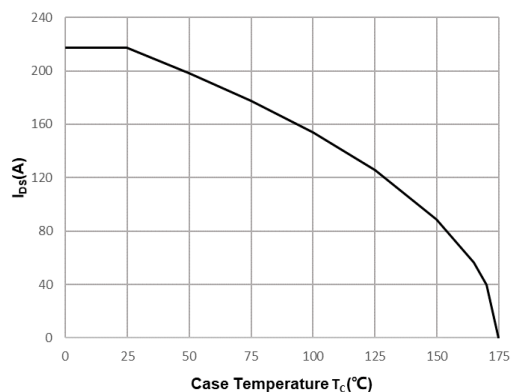


Fig3. Output Characteristics $T_j=25^\circ\text{C}$

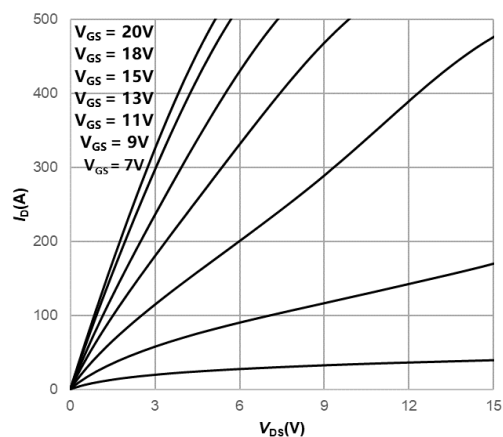


Fig4. Output Characteristics $T_j=175^\circ\text{C}$

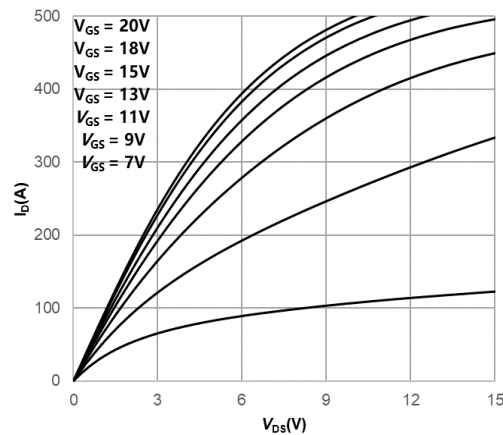


Fig5. Output Characteristics $T_j=-40^\circ\text{C}$

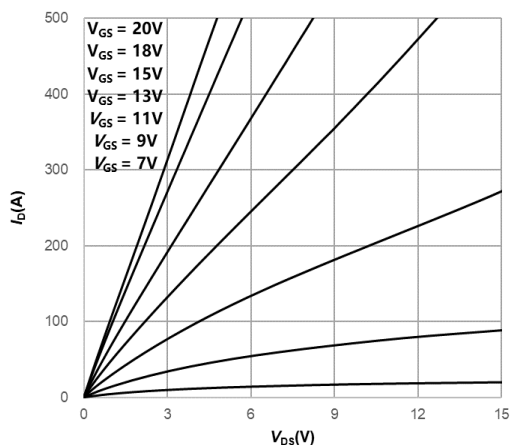


Fig6. Normalized Threshold Voltage vs. Temperature

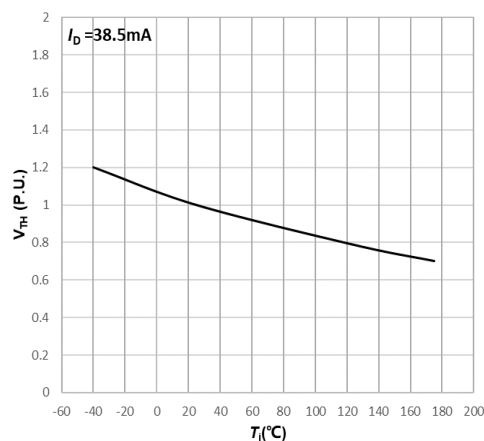


Fig7. Normalized On-Resistance vs. Temperature For Various V_{GS}

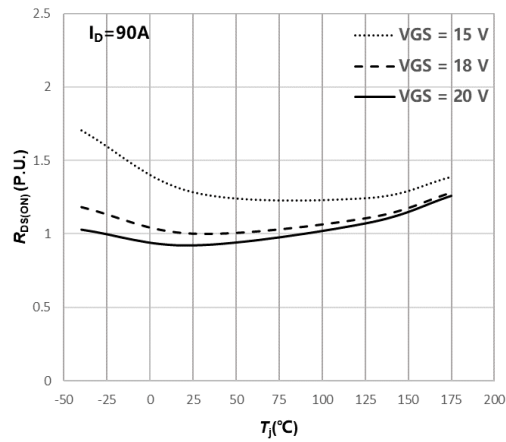


Fig8. Normalized On-Resistance vs. Drain Current For Various V_{GS}

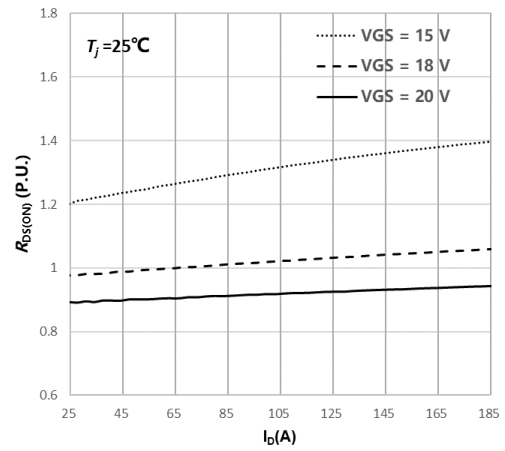


Fig9. Capacitances vs. Drain-Source Voltage (0-800V)

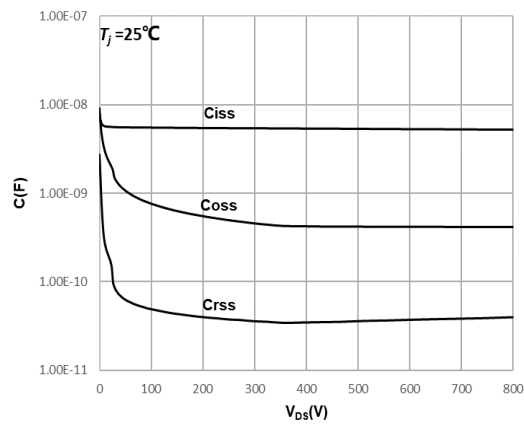


Fig10. Output capacitor stored energy as a function of drain-source voltage

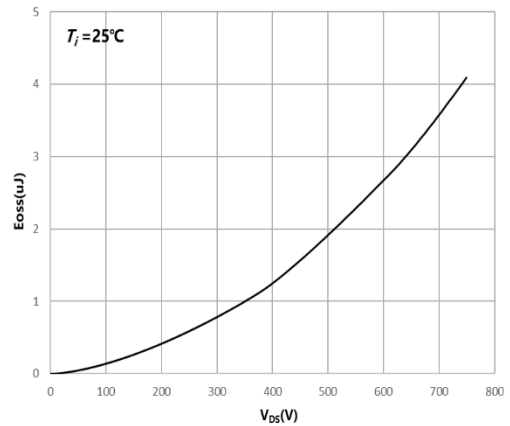


Fig11. Typical Gate Charge

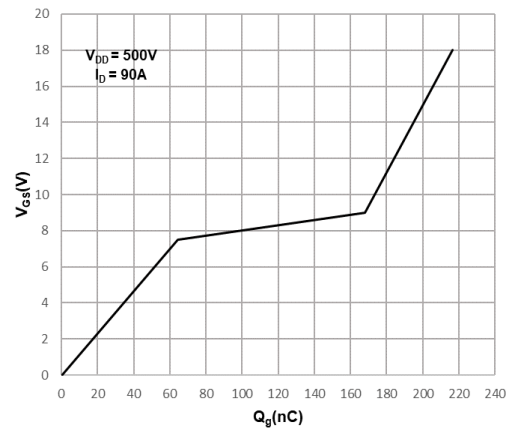
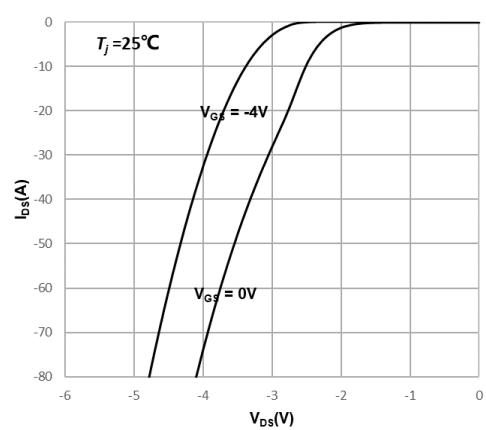
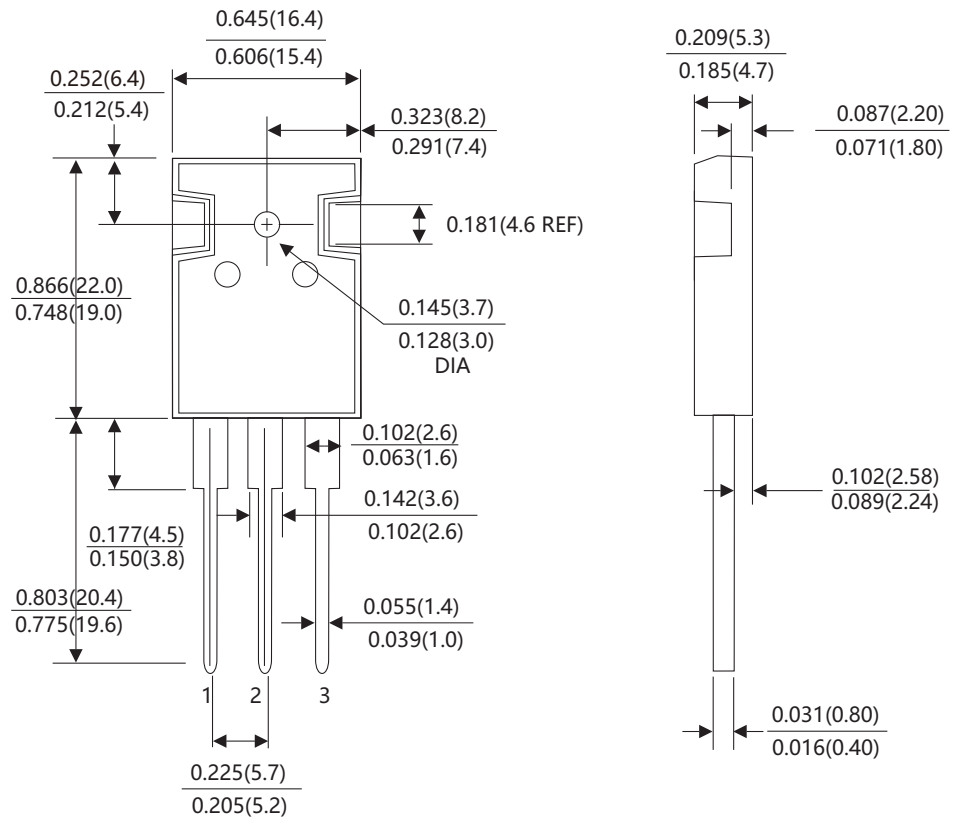
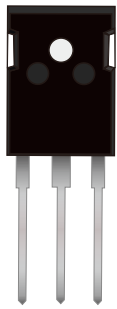


Fig12. Body Diode Characteristics



Dimensions

TO-247 package



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