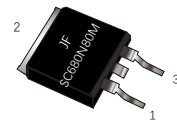


Features

- High blocking voltage with low on-resistance
- High speed switching with low capacitance
- Wide Bandgap SiC MOSFET Technology
- Halogen free, RoHs compliant

Product Summary			
V _{DS}	R _{DS(on)} (mΩ)Typ	I _D (A)	Q _g (Typ)
800V	680@ 18V 1.8A	7.2	17nc

TO-252
(DPAK)



Mechanical Data

- Case:TO-252 Package

Application

- Switch Mode Power Supplies
- High Voltage DC/DC Converters
- Battery Chargers
- Pulsed Power Applications
- Motor Drives

Block Diagram

Pin Definition:

1. Gate
2. Drain
3. Source

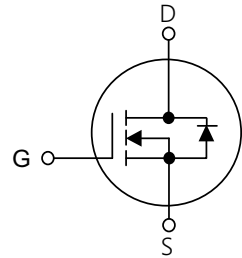


Table1 Absolute Maximum Ratings (T_c=25°C, unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	800	V
Gate-Source Voltage(Max)	V _{GS(max)}	-10/+22	V
Recommend Gate-Source Voltage	V _{GSop}	0/+18	V
Continuous Drain Current	I _D	T _C =25°C	7.2
		T _C =100°C	5.1
Pulsed Drain Current (Note 1)	I _{DM}	14.5	A
Power Dissipation T _C =25°C	P _D	47	W
Operating Junction and Storage Temperature	T _J /T _{STG}	-55 ~ +175	°C

Table 2.Thermal Characteristics

Parameter	Symbol	SC680N80M	Unit
Thermal resistance Junction to Case	R _{θJC}	3.1	°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	800	-	-	V
Drain-Source Leakage Current	I _{DSS}	V _D S=800V,V _{GS} =0V	-	-	10	μA
Gate- Source Leakage Current	I _{GSS}	V _{GS} =18V,V _D S=0V	-	10	250	nA
On Characteristics						
Gate Threshold Voltage	V _{GS(TH)}	V _D S=V _{GS} ,I _D =1.3mA	2.5	-	4.5	V
Static Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =15V,I _D =1.8A,T _J =25°C	-	1000	-	mΩ
		V _{GS} =15V,I _D =1.8A,T _J =175°C	-	820	-	
		V _{GS} =18V,I _D =1.8A,T _J =25°C	-	680	880	
		V _{GS} =18V,I _D =1.8A,T _J =175°C	-	670	-	
Gate Resisitance	R _G	f=1MHz	-	12	-	Ω
Dynamic Characteristics						
Input Capacitance	C _{ISS}	V _D S=400V,V _{GS} =0V, f=100KHz	-	126	-	pF
Output Capacitance	C _{OSS}		-	12	-	pF
Reverse Transfer Capacitance	C _{RSS}		-	1.1	-	pF
Turn-On Delay Time	td(on)	V _D S=500V,I _D =2A V _{GS} =0/18V,R _G =5Ω, L=200uH,T _J =25°C	-	10	-	ns
Turn-On Rise Time	t _R		-	37	-	ns
Turn-Off Delay Time	td(off)		-	15	-	ns
Turn-Off Fall Time	t _f		-	36	-	ns
Total Gate Charge	Q _G	V _{DD} =400V,I _D =2A, V _{GS} =0/18V	-	17	-	nC
Gate-Source Charge	Q _{GS}		-	6.5	-	nC
Gate-Drain Charge	Q _{GD}		-	3.5	-	nC
Drain-Source Diode Characteristics and Maximum Ratings(Note 2)						
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} =0V,I _S =1.1A	-	3.5	-	V
Continuous Diode Forward Current	I _S		-	7.2	-	A
Reverse Recovery Time	trr	V _R =400V,V _{GS} =0V I _{SD} =2A, di/dt=465A/us	-	12	-	ns
Recovered charge	Q _{rr}		-	19	-	nC
Peak reverse recovery current	I _{rrm}		-	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

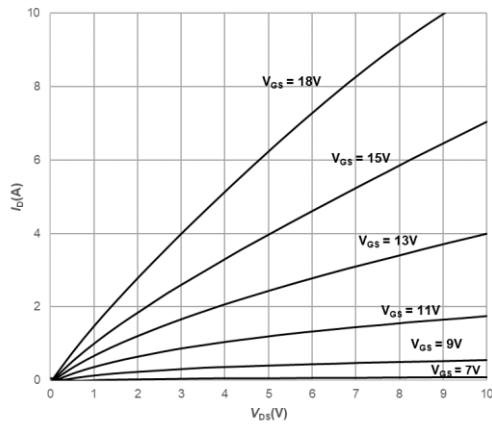


Fig1. Output Characteristics $T_j = 25^\circ\text{C}$

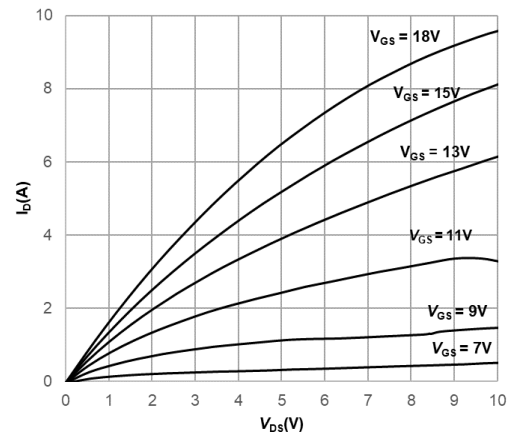


Fig2. Output Characteristics $T_j = 175^\circ\text{C}$

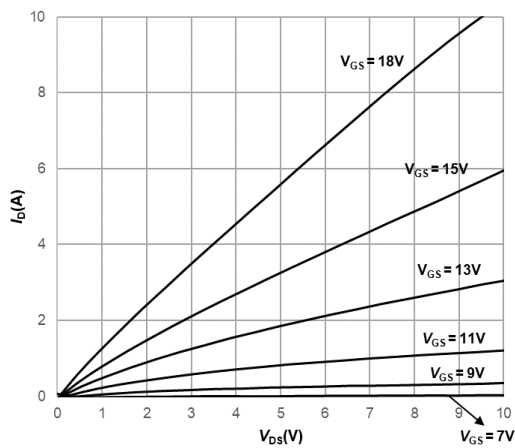


Fig3. Output Characteristics $T_j = -40^\circ\text{C}$

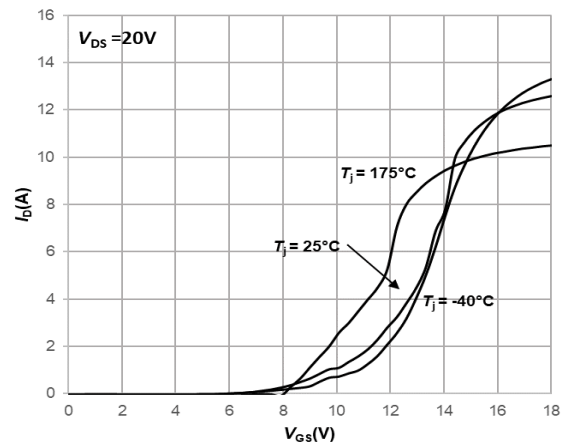


Fig4. Typical Transfer Characteristics

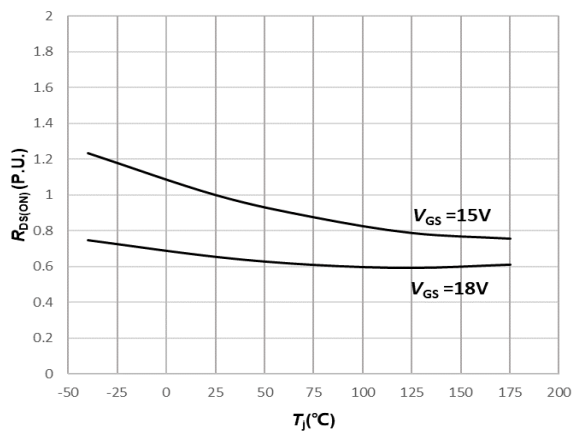


Fig5. Normalized On-Resistance vs. Temperature

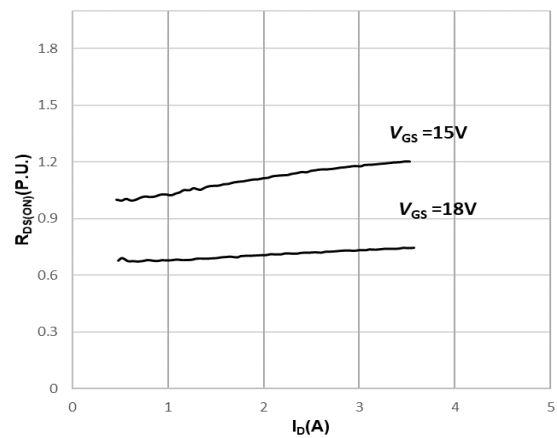


Fig6. Normalized On-Resistance vs. Drain Current For $T_j = 25^\circ\text{C}$

Typical Characteristics Diagrams

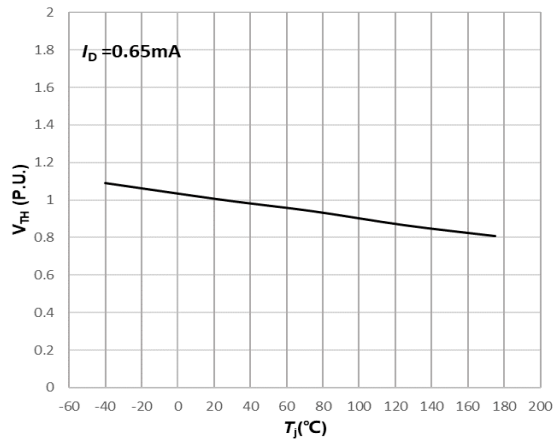


Fig7. Normalized Threshold Voltage vs. Temperature

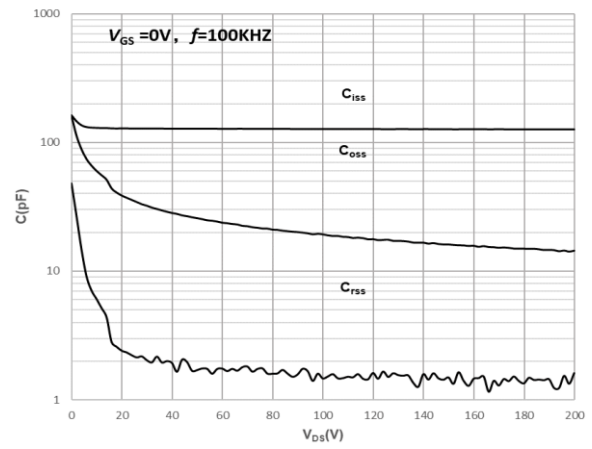


Fig8. Capacitances vs. Drain-Source Voltage (0-200V)

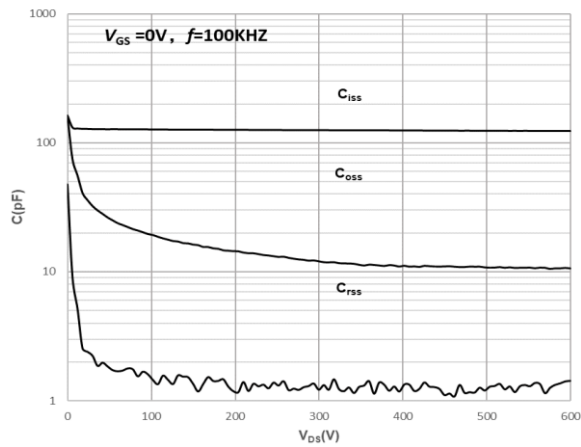


Fig9. Capacitances vs. Drain-Source Voltage (0-600V)

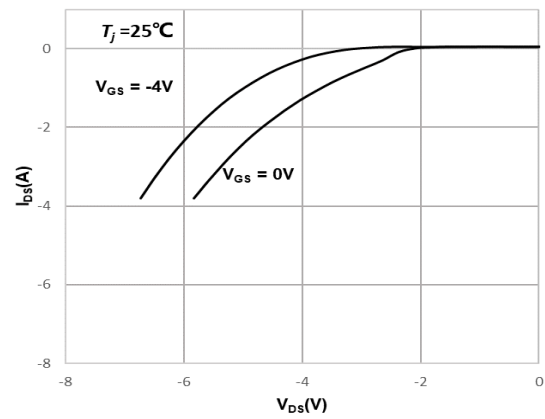


Fig10. Body Diode Characteristics

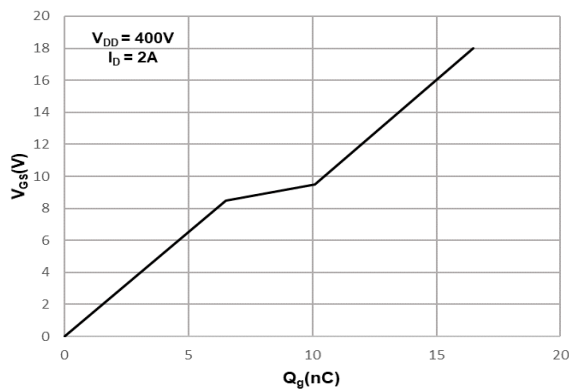


Fig11. Gate Charge Characteristic

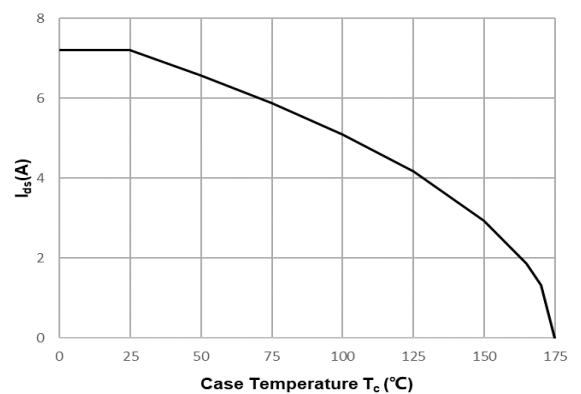
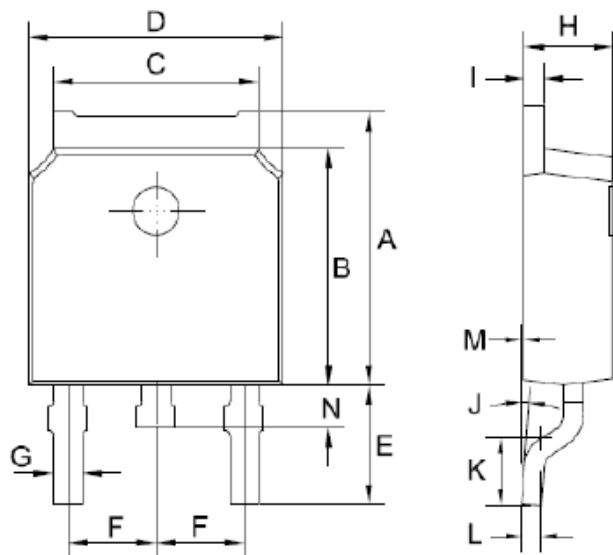


Fig12. Continuous Drain Current vs. Case Temperature

Dimensions

TO-252 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	6.85	7.25	0.270	0.285
B	5.8	6.3	0.228	0.248
C	5	5.53	0.197	0.218
D	6.3	6.8	0.248	0.268
E	2.6	3.3	0.102	0.130
F	2.19	2.39	0.086	0.094
G	0.45	0.85	0.018	0.033
H	2.2	2.4	0.087	0.094
I	0.41	0.61	0.016	0.024
J	0°	8°	0°	8°
K	1.45	1.85	0.057	0.073
L	0.41	0.61	0.016	0.024
M	0	0.12	0.000	0.005
N	0.6	1	0.024	0.039

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