

Product Summary

V_{(BR)DSS}	R_{DS(on)MAX}	I_{D@25°C}
750V	15mΩ@18V	189A

Feature

- Wide bandgap SiC MOSFET technology
- Low On-Resistance with High Blocking Voltage
- Low Capacitances with High-Speed switching
- Low reverse recovery(Qrr)

Application

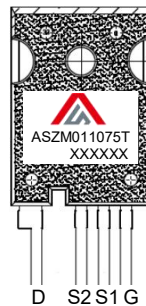
- Switch Mode Power Supplies
- Renewable Energy
- On Board Charger
- High Voltage DC/DC Converters

Package

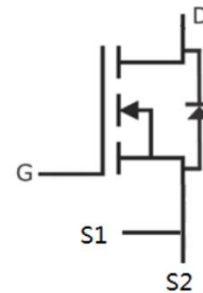


TO-247-4

Marking



Circuit diagram



Absolute maximum ratings (T_C=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Value	Unit
Drain-Source Voltage	V _{DS}	V _{GS} = 0V, I _D = 100μA	750	V
Gate-Source Voltage	V _{GSmax}	AC (f > 1 Hz)	-10/+25	V
Gate-Source Voltage	V _{GSOP}	Static	-4/+18	V
Continuous Drain Current	I _D	V _{GS} = 18V, T _C =25°C	189	A
		V _{GS} = 18V, T _C =100°C	133	A
Pulsed Drain Current	I _{D,pulse}	Pulse with t _p limited by T _{Jmax} at 1ms	356	A
		Pulse with t _p limited by T _{Jmax} at 100μs	698	A
Power Dissipation	P _D	T _J =175°C	577	W
Thermal Resistance (Typ)	R _{θJC}	Junction-to-Case	0.26	K/W
Junction Temperature	T _J		-55~ +175	°C
Storage Temperature	T _{STG}		-55~ +175	°C

Electrical characteristics (T_j=25°C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 100μA	750			V
Zero gate voltage drain current	I _{DSS}	V _{DS} = 750V, V _{GS} = 0V			50	μA
Gate-Source leakage current	I _{GSS}	V _{GS} = 18V, V _{DS} = 0V			250	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 36mA		2.8		V
		V _{DS} = V _{GS} , I _D = 36mA, T _j = 175°C		2.0		
Drain-source on-resistance	R _{DS(on)}	V _{GS} = 18V, I _D = 80A		11	15	mΩ
		V _{GS} = 18V, I _D = 80A, T _j = 175°C		14		
Transconductance	g _{fs}	V _{DS} = 18V, I _D = 80A		60		S
		V _{DS} = 18V, I _D = 80A, T _j = 175°C		54		
Dynamic characteristics						
Input Capacitance	C _{iss}	V _{DS} = 600V, V _{GS} = 0V, f = 1MHz V _{AC} = 25mV		5670		pF
Output Capacitance	C _{oss}			383		
Reverse Transfer Capacitance	C _{rss}			37		
Total Gate Charge	Q _g	V _{DS} = 400V, I _D = 80A V _{GS} = -4V/18V		235		nC
Gate-Source Charge	Q _{gs}			84		
Gate-Drain Charge	Q _{gd}			62		
Internal Gate Resistance	R _{G(int)}	f = 1 MHz, V _{AC} = 25mV		1.2		Ω
Source-Drain Diode characteristics						
Diode Forward Current	I _S	V _{GS} = -4V, T _C = 25°C		130		A
Diode Forward voltage	V _{SD}	V _{GS} = -4V, I _{SD} = 40A		3.9		V
		V _{GS} = -4V, I _{SD} = 40A, T _j = 175°C		3.4		V
Diode pulse Current	I _{S, pulse}	V _{GS} = -4V, pulse width t _p limited by T _{jmax}		356		A

Typical Characteristics

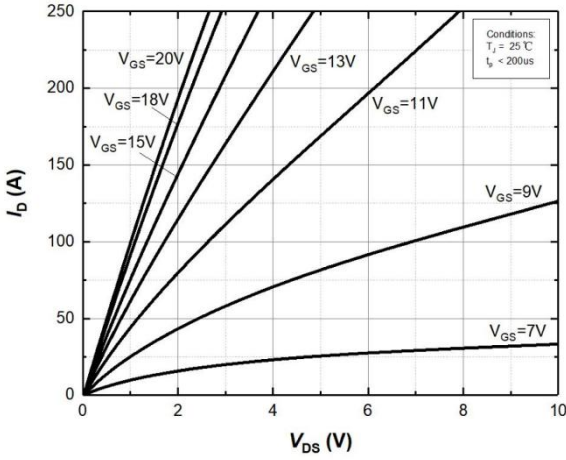


Figure 1. Output characteristics at $T_j=25^\circ\text{C}$

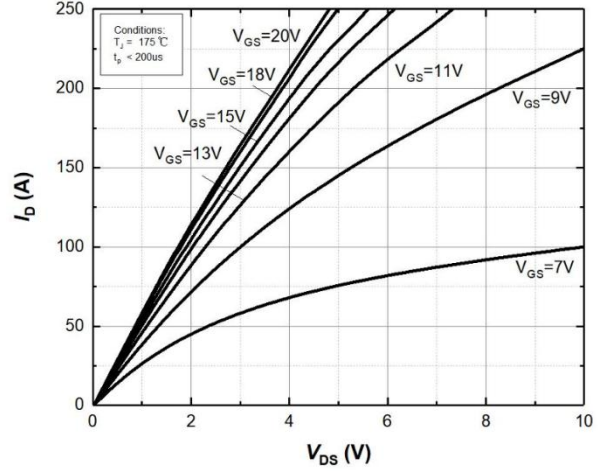


Figure 2. Output characteristics at $T_j=175^\circ\text{C}$

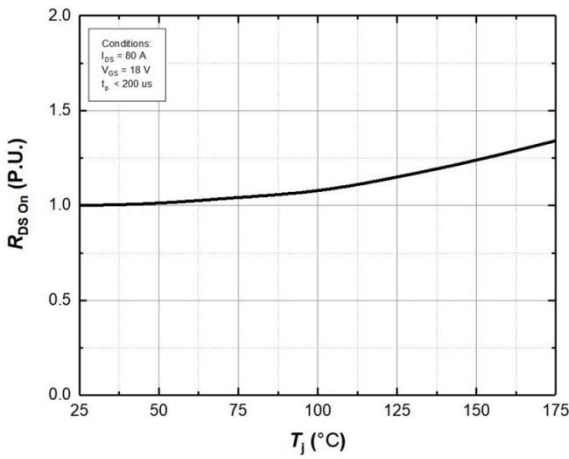


Figure 3. Normalized On-Resistance vs. Temperature

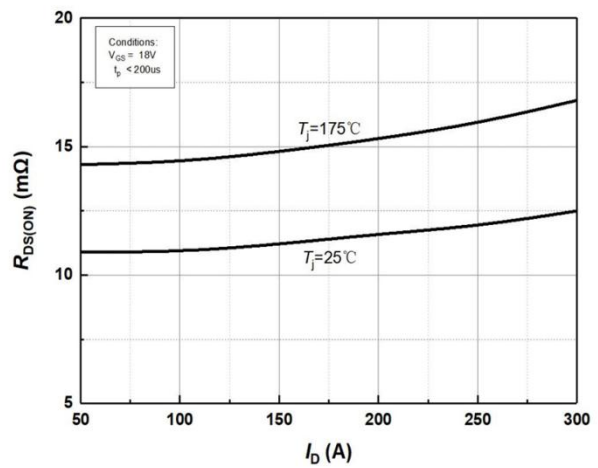


Figure 4. On-Resistance vs. Drain current for Various Temperature

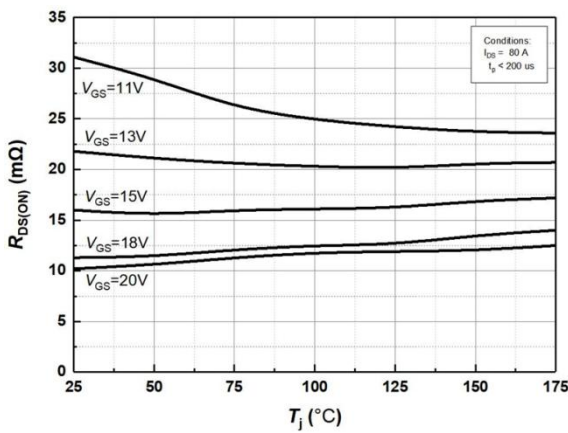


Figure 5. On-Resistance vs. Temperature for Various Gate Voltage

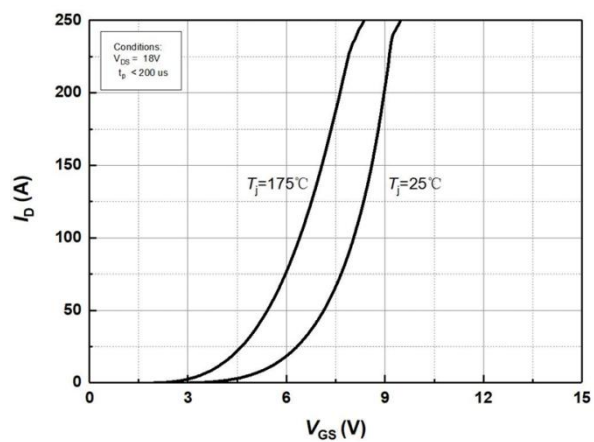


Figure 6. Transfer Characteristics for Various Junction Temperatures

Typical Characteristics

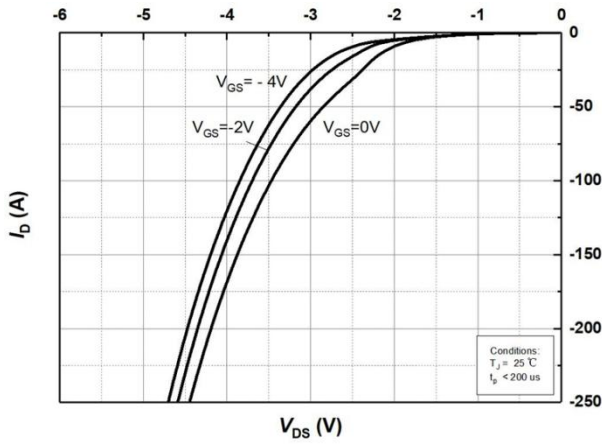


Figure 7. Body Diode Characteristics at $T_j=25^\circ\text{C}$

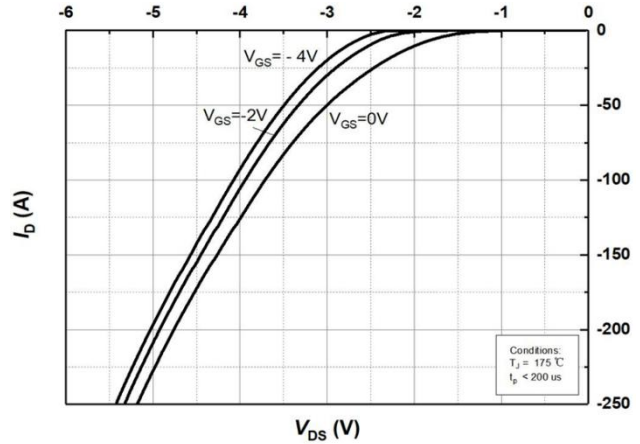


Figure 8. Body Diode Characteristics at $T_j=175^\circ\text{C}$

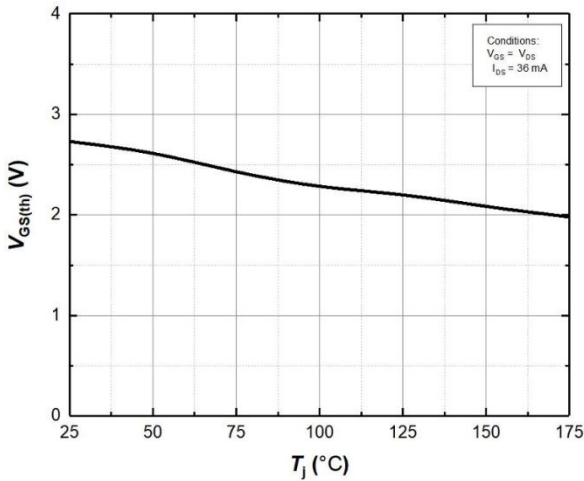


Figure 9. Threshold Voltage vs. Temperature

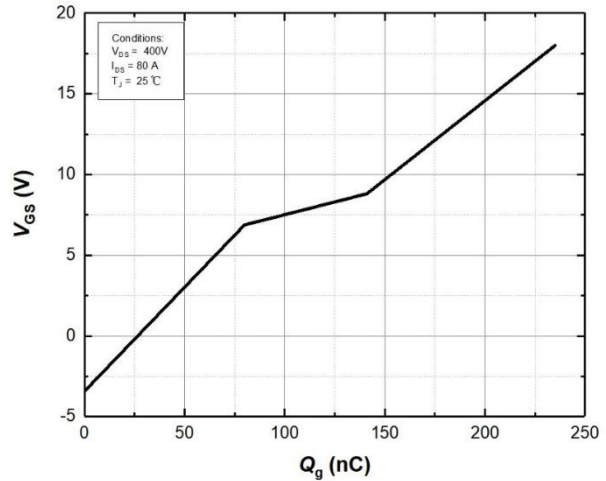


Figure 10. Gate Charge Characteristics

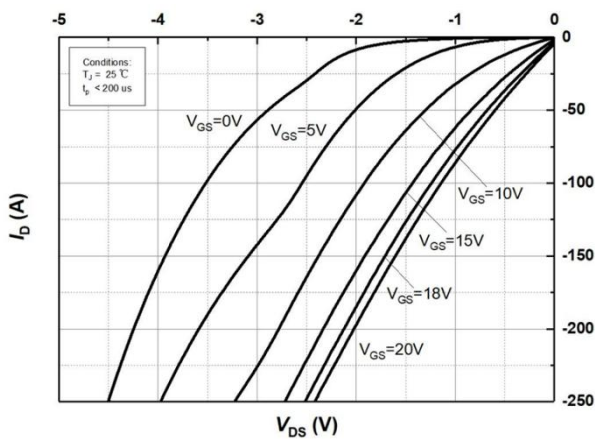


Figure 11. 3rd Quadrant Characteristic at $T_j=25^\circ\text{C}$

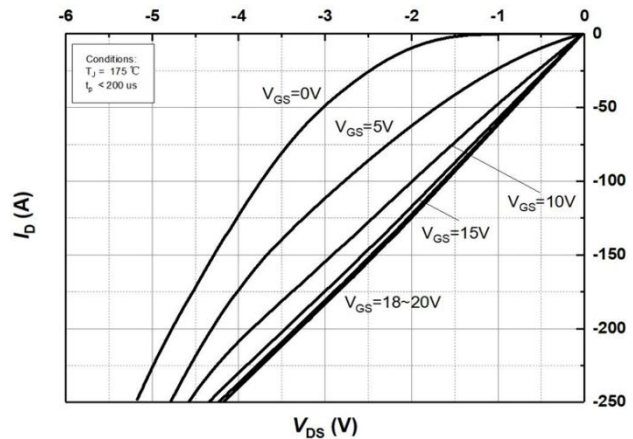


Figure 12. 3rd Quadrant Characteristic at $T_j=175^\circ\text{C}$

Typical Characteristics

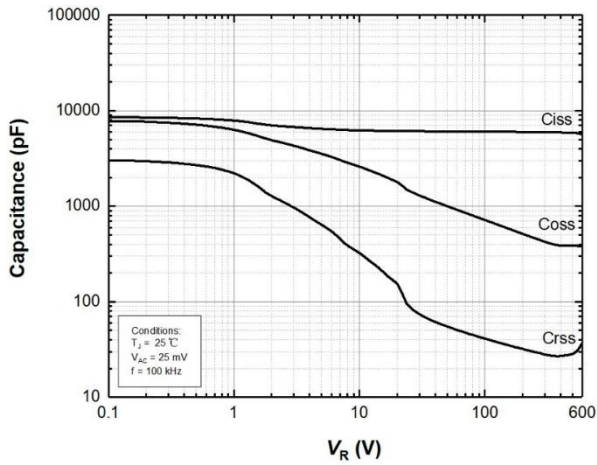


Figure 13. Capacitances vs. Drain-Source Voltage (0 – 600V)

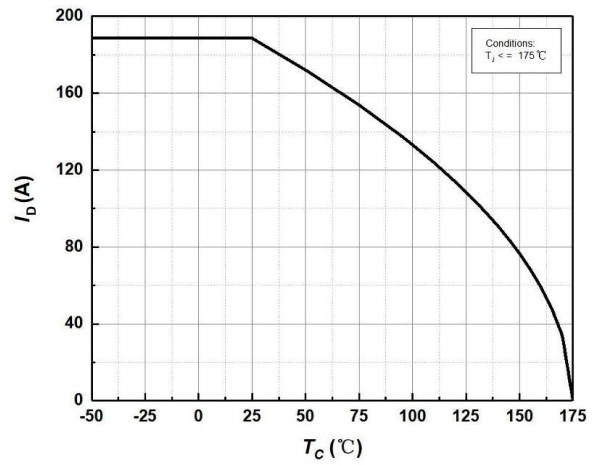


Figure 14. Continuous Drain Current Derating vs Case Temperature

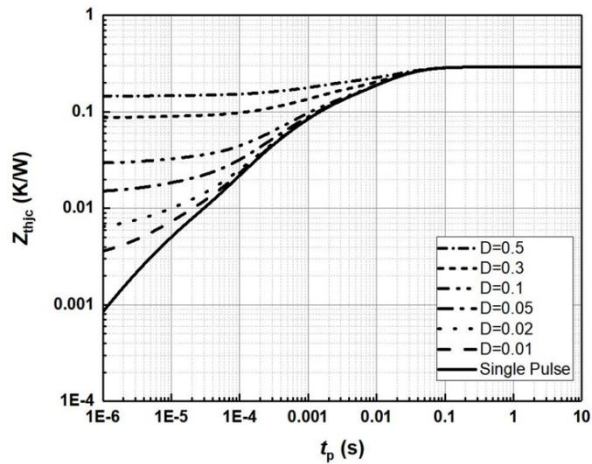


Figure 15. Transient Thermal Impedance (Junction – Case)

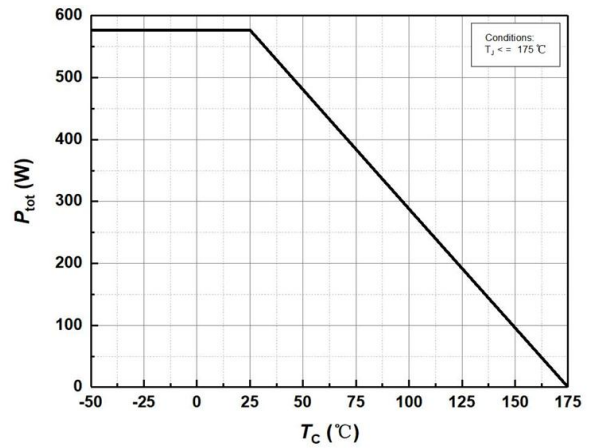


Figure 16. Maximum Power Dissipation Derating vs. Case Temperature

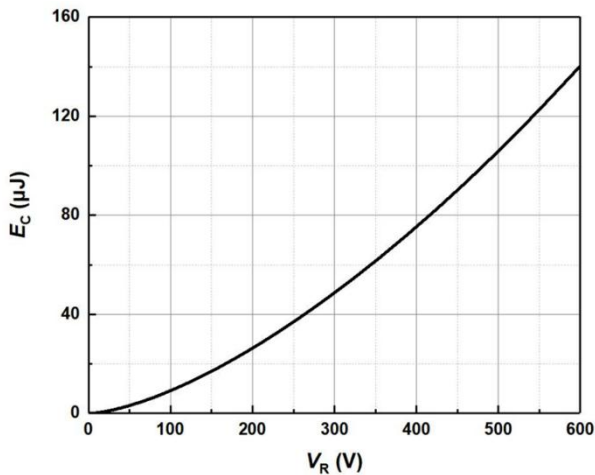


Figure 17. Output Capacitor Stored Energy

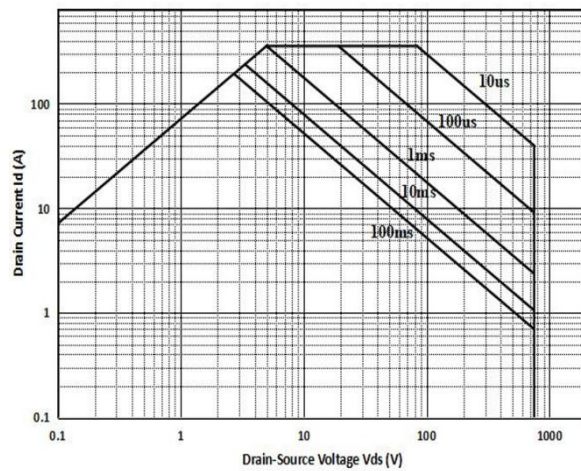
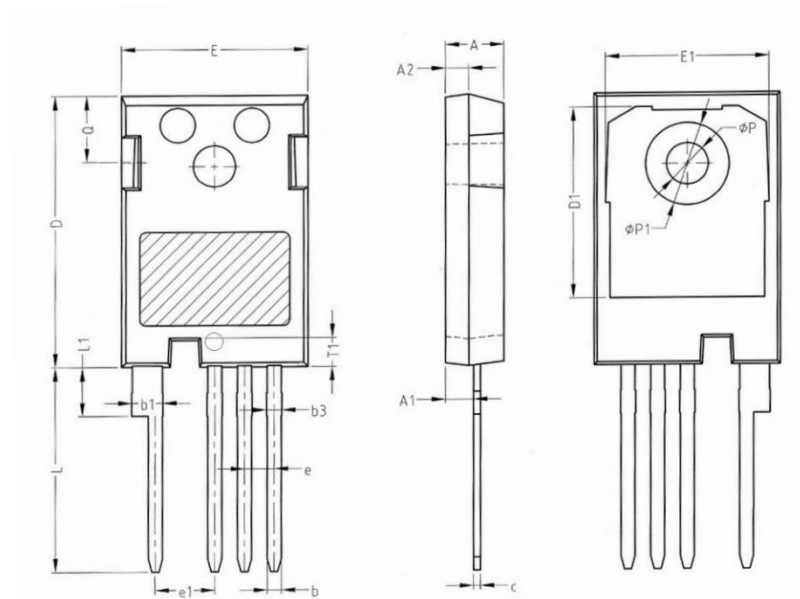


Figure 18. Safe Operating Area

TO-247-4 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.800	5.210	0.189	0.205
A1	2.210	2.610	0.087	0.103
A2	1.800	2.200	0.071	0.087
b	1.060	1.360	0.042	0.054
b1	2.330	2.940	0.092	0.116
b3	1.070	1.600	0.042	0.063
c	0.510	0.750	0.020	0.030
D	23.300	23.600	0.917	0.929
D1	16.250	17.650	0.640	0.695
E	15.740	16.140	0.620	0.635
E1	13.100	14.320	0.516	0.564
T1	2.350	2.650	0.093	0.104
e	2.540 BSC		0.100 BSC	
e1	5.080 BSC		0.200 BSC	
Q	5.490	6.090	0.216	0.240
L	17.270	17.870	0.680	0.704
L1	3.970	4.390	0.156	0.173
ΦP	3.400	3.800	0.134	0.150
ΦP1	7.190 REF		0.283 REF	