

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D@25^{\circ}C$
750V	15mΩ@18V	189A

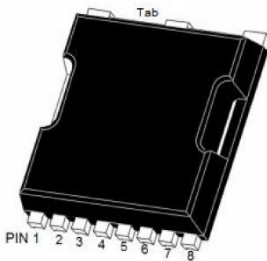
Feature

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

Application

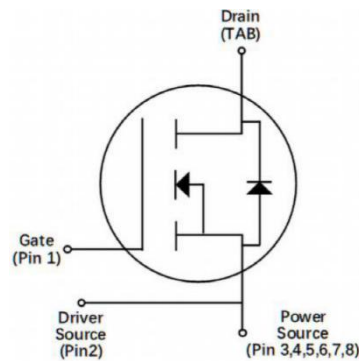
- Switch mode power supplies
- Renewable energy
- On Board Charger
- High voltage DC/DC converters

Package

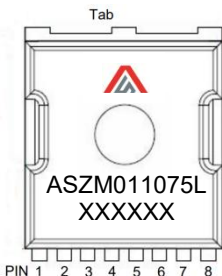


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Circuit diagram



Marking



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

Parameter	Symbol	Test Condition	Value	Unit
Drain-Source Voltage	V_{DS}	$V_{GS} = 0V, I_D = 100\mu A$	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	$V_{GS} = 18V, T_C=25^\circ C$	189	A
	I_D	$V_{GS} = 18V, T_C=100^\circ C$	133	
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 100 μs	698	
Power Dissipation	P_D	$T_C=25^\circ C$	577	W
Thermal Resistance (Typ)	$R_{\theta JC}$	Junction-to-Case	0.26	$^\circ C/W$
Junction Temperature	T_J		-55~ +175	$^\circ C$
Storage Temperature	T_{STG}		-55~ +175	$^\circ C$

Electrical characteristics (Tj=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 100\mu A$	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
		$V_{DS} = V_{GS}, I_D = 36mA, T_J = 175^\circ C$		2.0		
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS} = 18V, I_D = 80A$		11	15	m Ω
		$V_{GS} = 18V, I_D = 80A, T_J = 175^\circ C$		14		
Transconductance	g_{fs}	$V_{DS} = 18V, I_D = 80A$		60		S
		$V_{DS} = 18V, I_D = 80A, T_J = 175^\circ C$		54		
Dynamic characteristics						
Input Capacitance	C_{iss}	$V_{DS} = 600V, V_{GS} = 0V, f = 1 MHz$ $V_{AC} = 25mV$		5670		pF
Output Capacitance	C_{oss}			383		
Reverse Transfer Capacitance	C_{rss}			37		
Internal Gate Resistance	$R_{G(int)}$	$f = 1 MHz, V_{AC} = 25mV$		1.2		Ω
Total Gate Charge	Q_g	$V_{DS} = 400V, I_D = 80A$ $V_{GS} = -4/18V$		235		nC
Gate-Source Charge	Q_{gs}			84		
Gate-Drain Charge	Q_{gd}			62		
Source-Drain Diode characteristics						
Diode Forward Current	I_S	$V_{GS} = -4V, T_C = 25^\circ C$		130		A
Diode Forward voltage	V_{SD}	$V_{GS} = -4V, I_{SD} = 40A$		3.9		V
		$V_{GS} = -4V, I_{SD} = 40A, T_J = 175^\circ C$		3.4		V
Diode pulse Current	$I_S, pulse$	$V_{GS} = -4V, pulse width t_p$ limited by T_{jmax}		356		A

Typical Characteristics

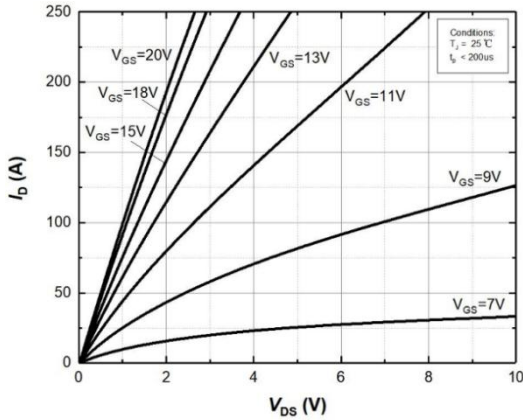


Figure 1. Output characteristics at $T_j=25^\circ\text{C}$

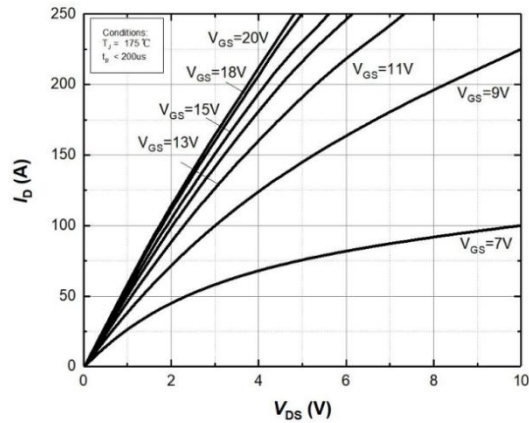


Figure 2. Output characteristics at $T_j=175^\circ\text{C}$

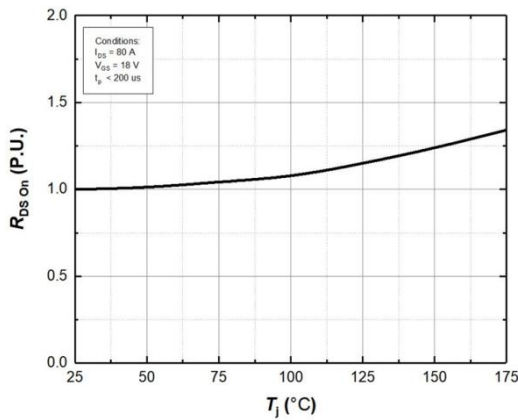


Figure 3. Normalized On-Resistance vs. Temperature

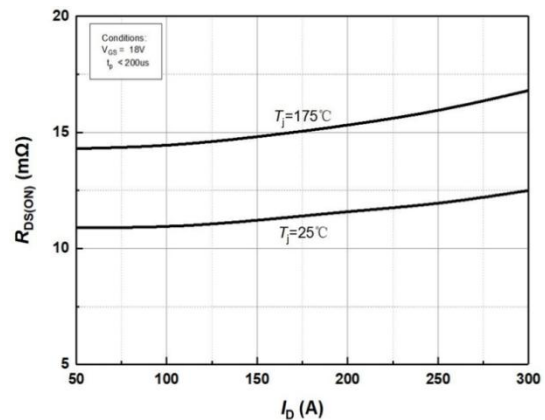


Figure 4. On-Resistance vs. Drain current for Various Temperature

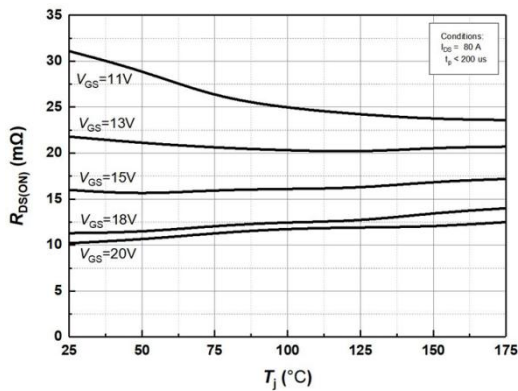


Figure 5. On-Resistance vs. Temperature for Various Gate Voltage

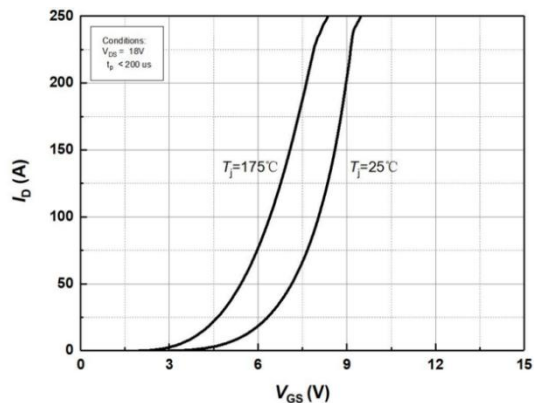


Figure 6. Transfer Characteristics for Various Junction Temperatures

Typical Characteristics

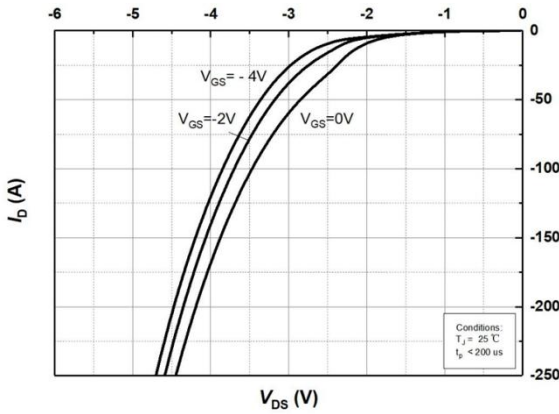


Figure 7. Body Diode Characteristics at $T_j=25^\circ\text{C}$

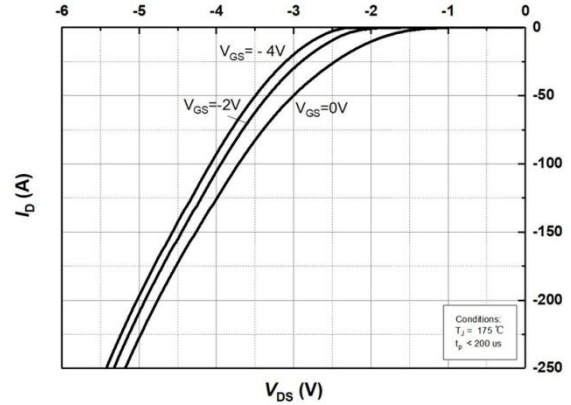


Figure 8. Body Diode Characteristics at $T_j=175^\circ\text{C}$

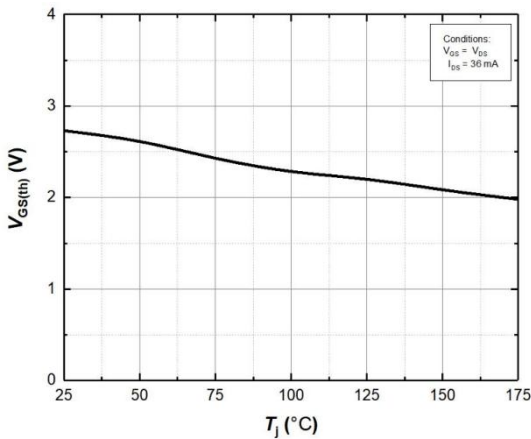


Figure 9. Threshold Voltage vs. Temperature

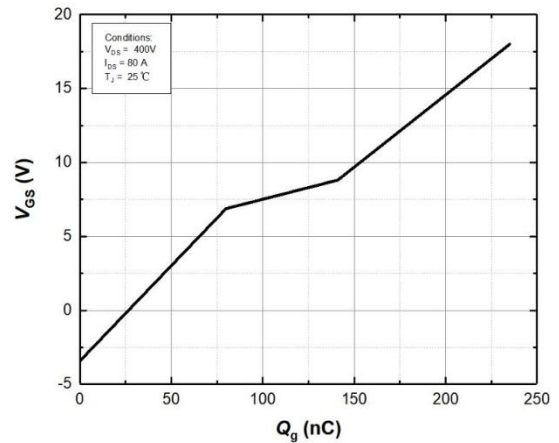


Figure 10 Gate Charge Characteristics

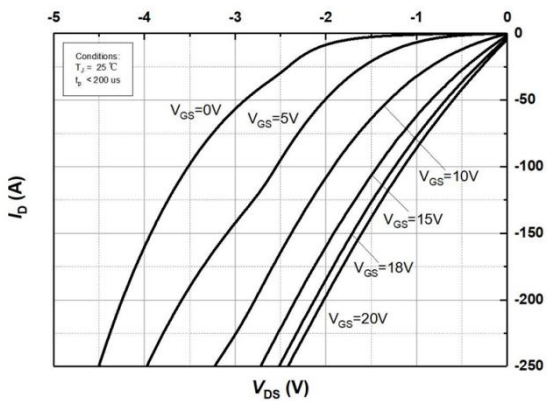


Figure 11. 3rd Quadrant Characteristic at $T_j=25^\circ\text{C}$

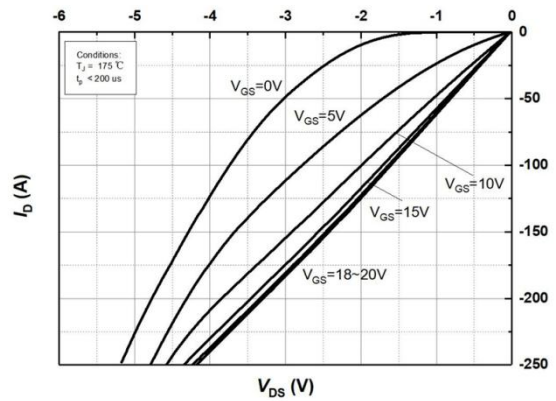


Figure 12. 3rd Quadrant Characteristic at $T_j=175^\circ\text{C}$

Typical Characteristics

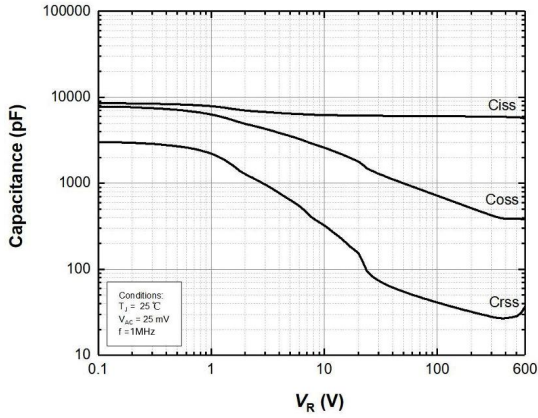


Figure 13. Capacitances vs. Drain-Source Voltage (0 – 600V)

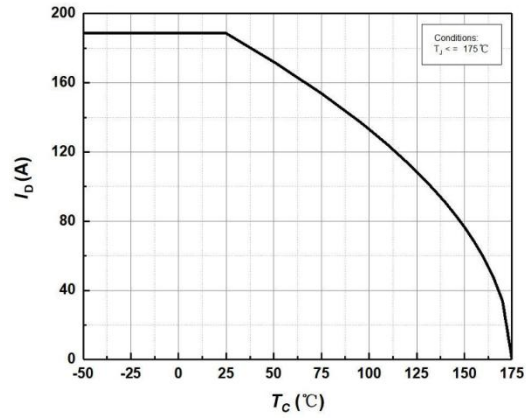


Figure 14. Continuous Drain Current Derating vs Case Temperature

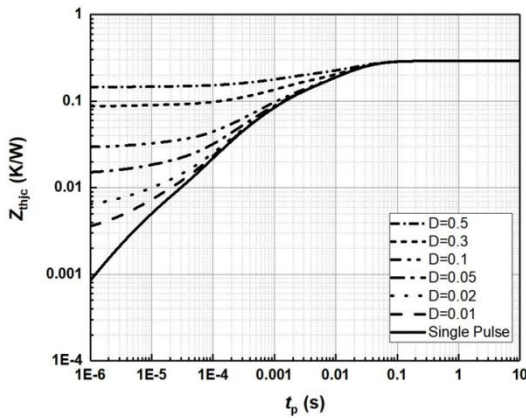


Figure 15. Transient Thermal Impedance (Junction – Case)

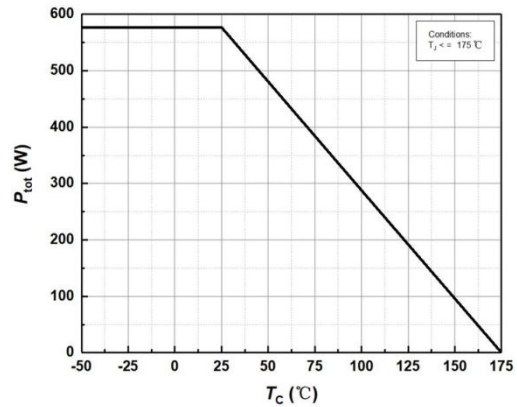


Figure 16. Maximum Power Dissipation Derating vs. Case Temperature

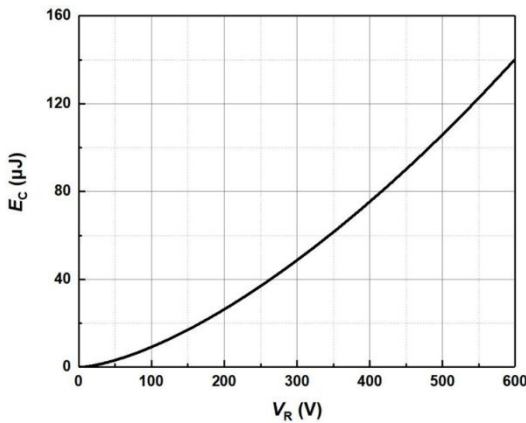


Figure 17. Output Capacitor Stored Energy

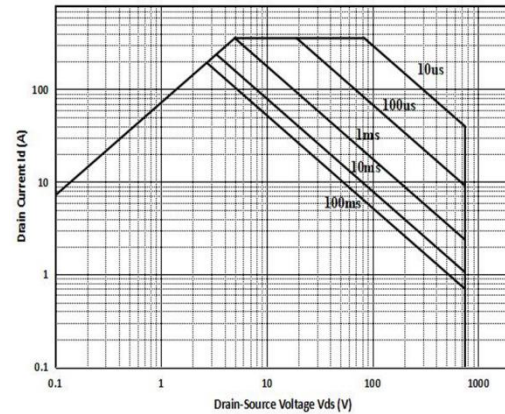
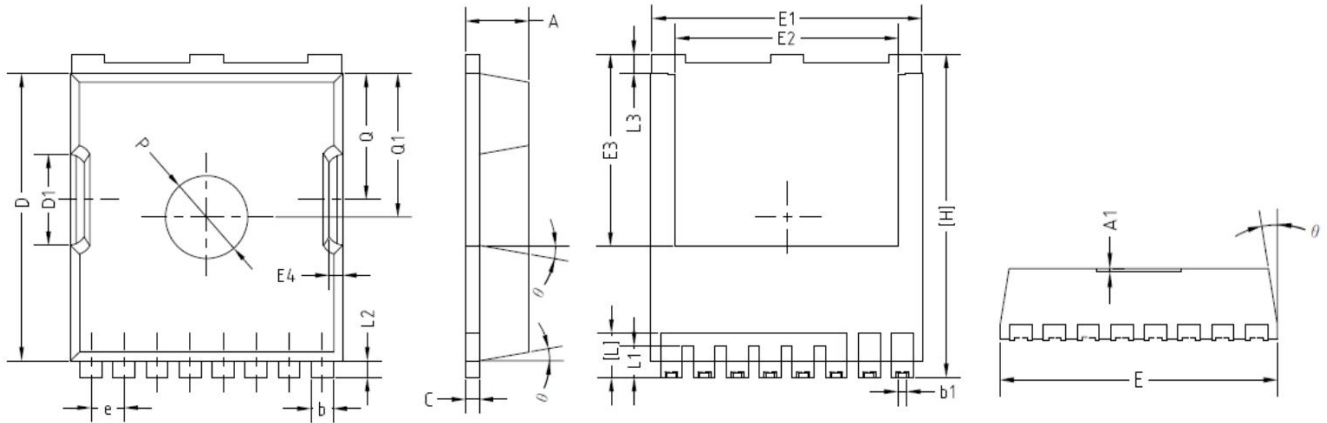


Figure 18. Safe Operating Area

TOLL Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.050	0.150	0.002	0.006
b	0.700	0.900	0.028	0.035
b1	0.350	0.450	0.014	0.018
C	0.400	0.650	0.016	0.026
D	10.280	10.700	0.405	0.421
D1	3.200	3.400	0.126	0.134
E	9.800	10.000	0.386	0.394
E1	9.700	9.900	0.382	0.390
E2	7.950	8.250	0.313	0.325
E3	6.800	7.200	0.268	0.283
E4	0.300	0.750	0.012	0.030
e	1.150	1.250	0.045	0.049
L	1.400	2.100	0.055	0.083
L1	1.050	1.350	0.041	0.053
L2	0.500	0.700	0.020	0.028
L3	0.600	0.800	0.024	0.031
θ	8°	12°	8°	12°
P	2.900	3.100	0.114	0.122
Q	4.450	4.700	0.175	0.185
Q1	5.100	5.300	0.201	0.209
H	11.550	11.900	0.455	0.469