ASZM090065N

N-Channel Silicon Carbide Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D@25℃
650V	105mΩ@18V	31A
	94mΩ@20V	

Feature

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

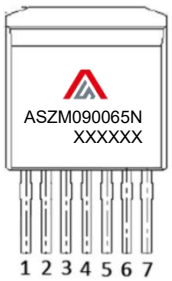
Application

- Switch Mode Power Supplies
- Renewable Energy
- Motor Drives
- High Voltage DC/DC Converters

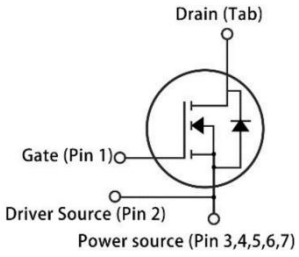
Package

TO-263-7

Marking



Circuit diagram



Absolute maximum ratings (T_C=25℃ unless otherwise noted)

Parameter	Symbol	Test Condition	Value	Unit
Drain-Source Voltage	V_{DSmax}	V_{GS} = 0V, I_D =100μA	650	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}=20V, T_C=25℃	31	A
	I_D	V_{GS}=20V, T_C=100℃	22	A
Pulsed Drain Current	$I_{D,pulse}$	Pulse with t_p limited by T_{jmax} at 1 ms Pulse with t_p limited by T_{jmax} at 10 μs	53 131	A
Power Dissipation	P_D	T_C=25℃	130	W
Thermal Resistance（Typ）	$R_{\theta JC}$	Junction-to-Case	1.15	℃/W
Junction Temperature	T_J		-55 ~ +175	℃
Storage Temperature	T_{STG}		-55 ~ +175	℃

Electrical characteristics (T_j=25℃ 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	650			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =650V,V_{GS} = 0V		1	50	μA
Gate-Source leakage current	I_{GSS}	V_{GS} =20V, V_{DS} = 0V			250	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =5mA		2.7		V
		V_{DS} =V_{GS}, I_D =5mA ,T_J=175℃		1.8		
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =18V, I_D =10A		105	150	mΩ
		V_{GS} =20V, I_D =10A		94		
		V_{GS} =18V, I_D =10A,T_J=175℃		140		
		V_{GS} =20V, I_D =10A,T_J=175℃		130		
Transconductance	g_{fs}	V_{GS} =20V, I_D =10A		13		S
		V_{GS} =20V, I_D =10A,T_j = 175℃		9		
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =600V,V_{GS} =0V,f =1MHz V_{AC}=25mV		767		pF
Output Capacitance	C_{oss}			55		
Reverse Transfer Capacitance	C_{rss}			7		
Total Gate Charge	Q_g	V_{DS} =400V,V_{GS} =-4V/18V, I_D =10A		35.8		nC
Gate-Source Charge	Q_{gs}			8.3		
Gate-Drain Charge	Q_{gd}			12.1		
Internal Gate Resistance	$R_{G(int)}$	f=1 MHz, V_{AC} = 25mV		2.8		Ω
Source-Drain Diode characteristics						
Diode Forward Current	I_S	V_{GS} =-5V,T_C=25℃		26		A
Diode Forward voltage	V_{SD}	V_{GS} =-5V, I_{SD}=7.5A		4.0		V
		V_{GS} =-5V, I_{SD}=7.5A,T_J=175℃		3.5		
Diode pulse Current	$I_{S,pulse}$	V_{GS} =-5V, pulse width t_p limited by T_{jmax}		53		A
Reverse Recovery Time	t_{rr}	V_{GS} = -5V, I_{SD} = 12A, V_R = 400V dif/dt = 1050A/us		14.2		nS
Reverse Recovery Charge	Q_{rr}			63		nC
Peak Reverse Recovery Current	I_{rrm}			6		A

Typical Characteristics

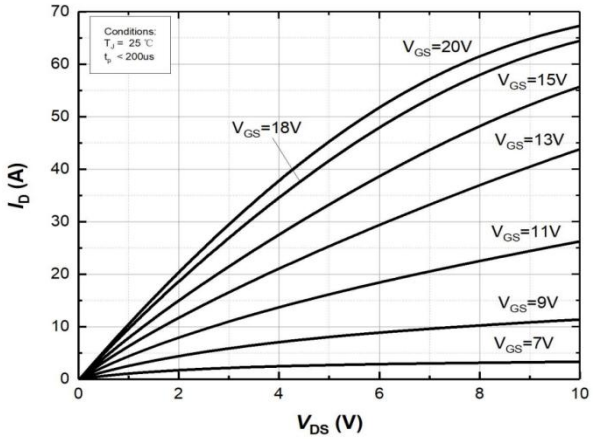


Figure 1. Output characteristics at Tj=25°C

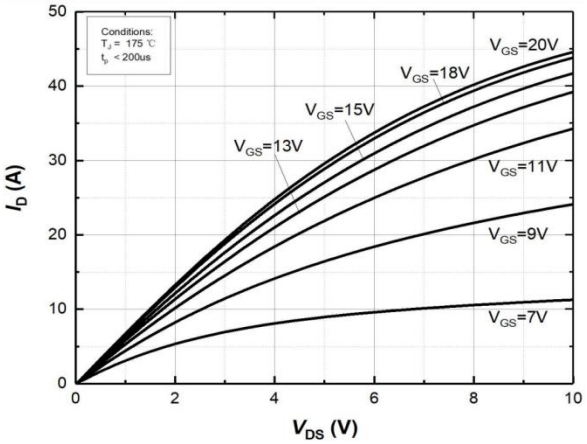


Figure 2. Output characteristics at Tj=175°C

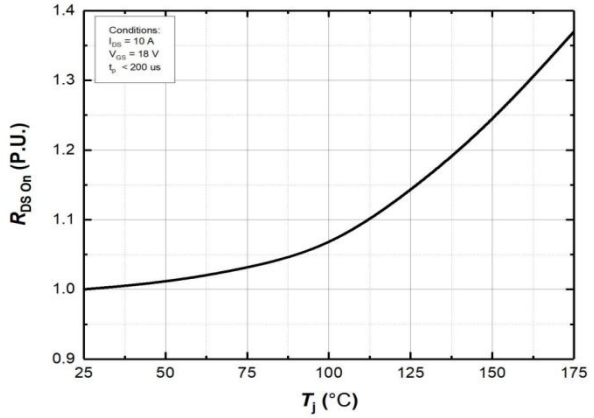


Figure 3. Normalized On-Resistance vs. Temperature

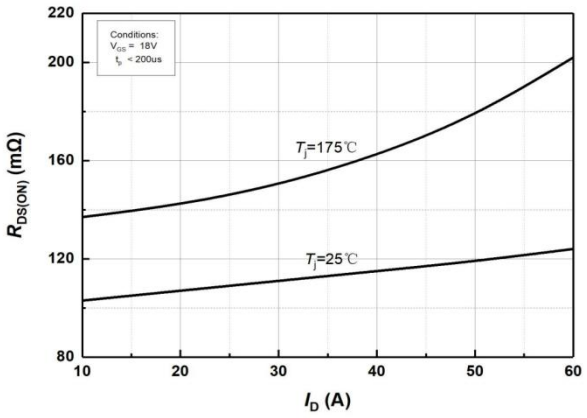


Figure 4. On-Resistance vs. Drain current for Various Temperature

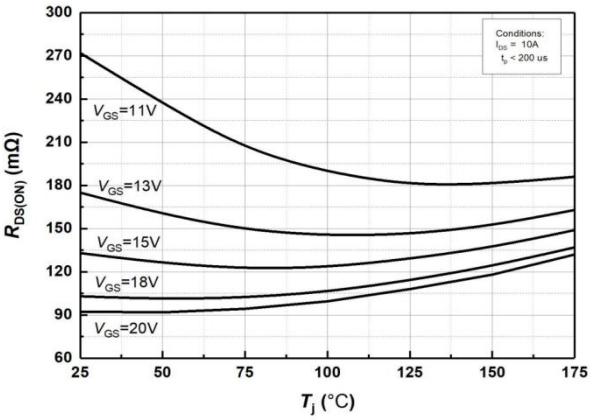


Figure 5. On-Resistance vs. Temperature for Various Gate Voltage

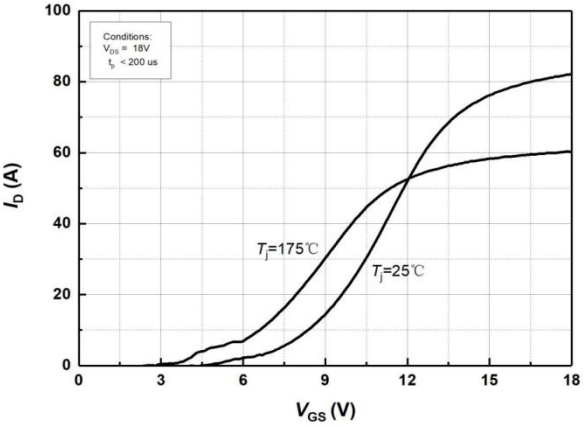


Figure 6. Transfer Characteristics for Various Junction Temperatures

Typical Characteristics

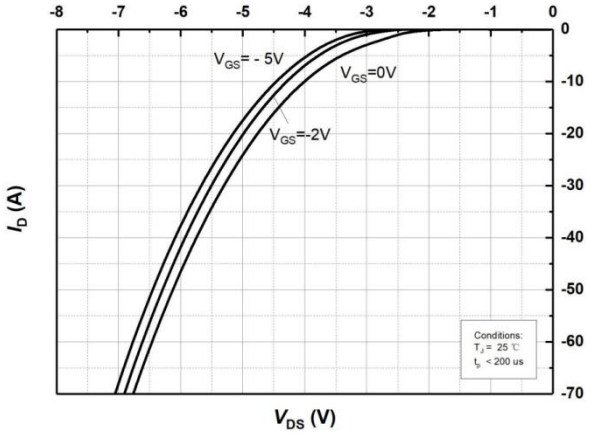


Figure 7. Body Diode Characteristics at Tj=25°C

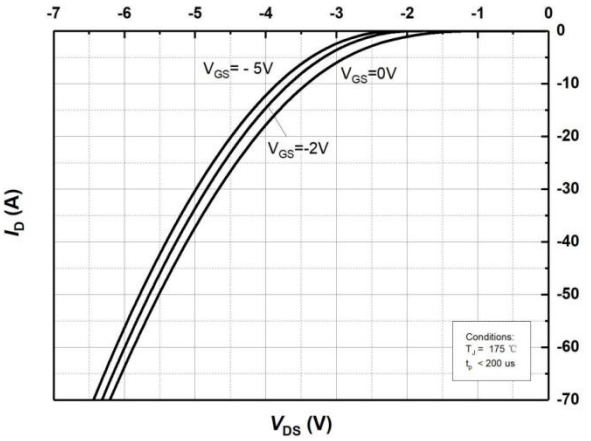


Figure 8. Body Diode Characteristics at Tj=175°C

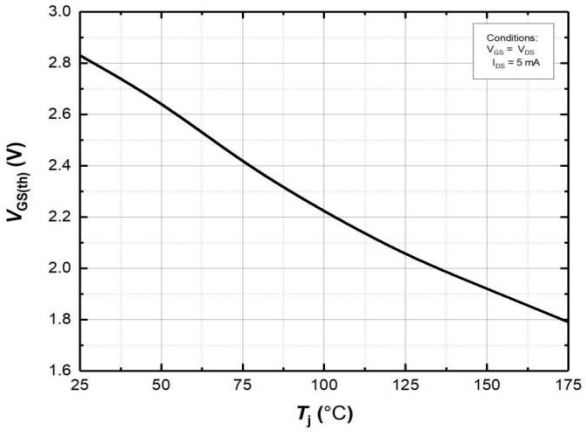


Figure 9. Threshold Voltage vs. Temperature

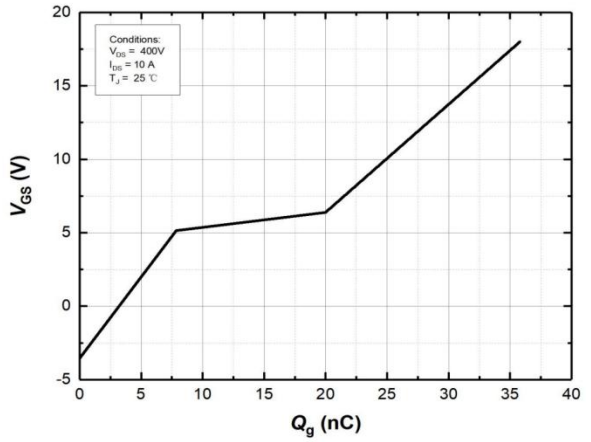


Figure 10 Gate Charge Characteristics

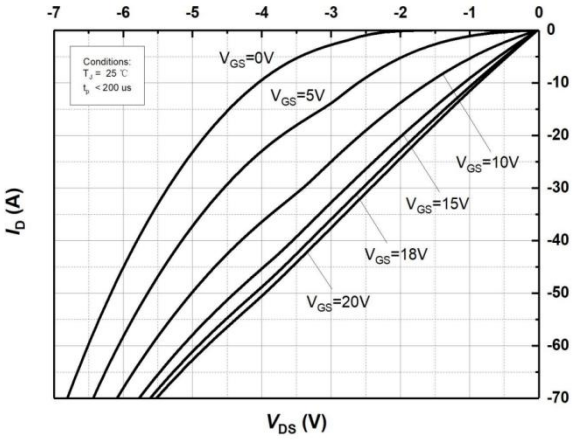


Figure 11. 3rd Quadrant Characteristic at Tj=25°C

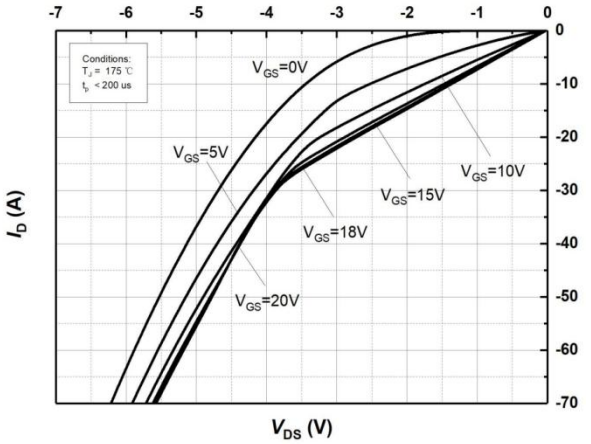


Figure 12. 3rd Quadrant Characteristic at Tj=175°C

Typical Characteristics

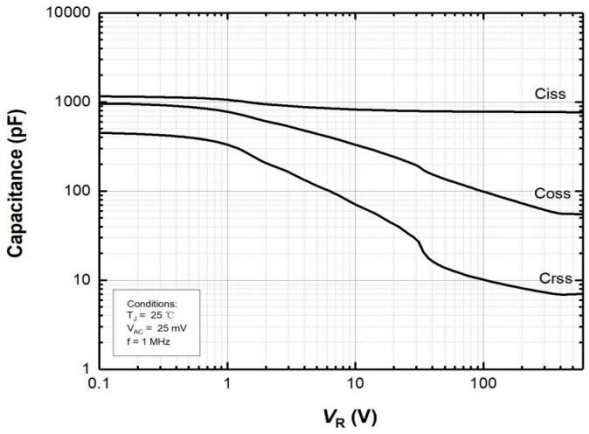


Figure 13. Capacitances vs. Drain-Source Voltage (0 – 1000V)

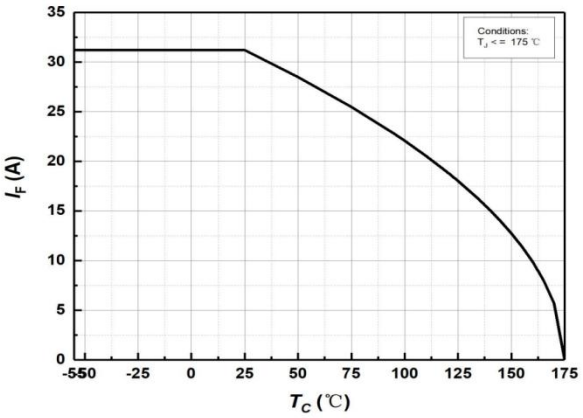


Figure 14. Continuous Drain Current Derating vs Case Temperature

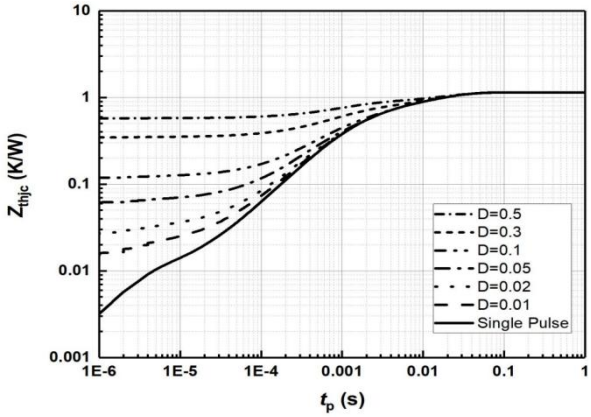


Figure 15.Transient Thermal Impedance (Junction – Case)

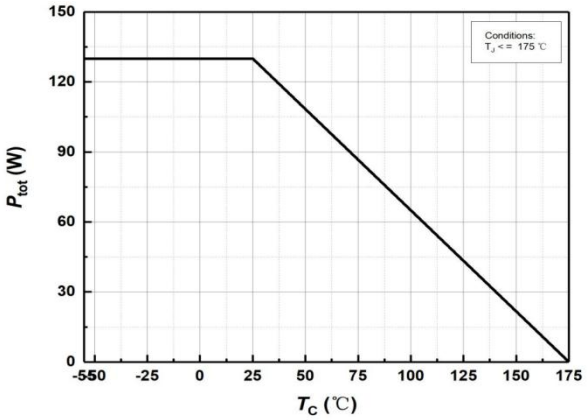


Figure 16. Maximum Power Dissipation Derating vs. Case Temperature

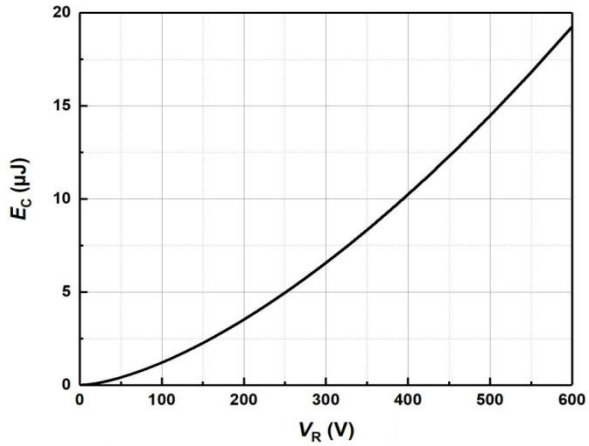


Figure 17. Output Capacitor Stored Energy

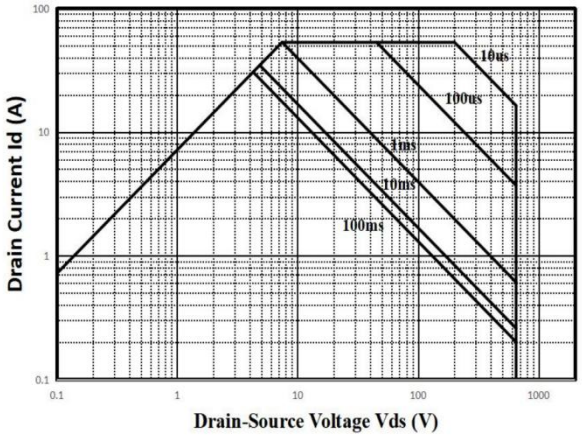
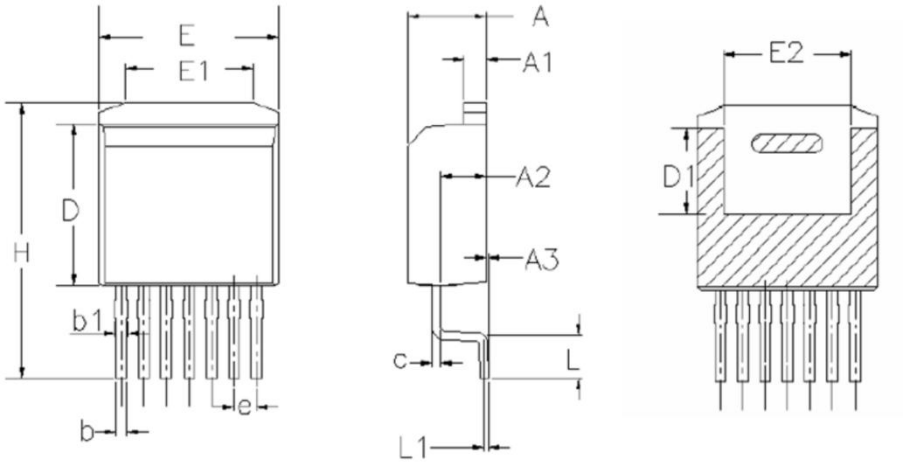


Figure 18. Safe Operating Area

TO-263-7 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.300	4.600	0.169	0.181
A1	1.200	1.400	0.047	0.055
A2	2.400	2.750	0.094	0.108
A3	0.000	0.250	0.000	0.010
b	0.500	0.700	0.020	0.028
b1	0.600	0.900	0.024	0.035
c	0.400	0.600	0.016	0.024
D	8.880	9.280	0.350	0.365
D1	4.650	6.650	0.183	0.262
e	1.270 BSC		0.050 BSC	
E	10.080	10.280	0.397	0.405
E1	6.500	8.300	0.256	0.327
E2	6.820	7.97	0.269	0.314
H	14.800	16.000	0.583	0.630
L	1.900	2.750	0.075	0.108