ASZM028120P

N-Channel Silicon Carbide Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D@25℃
1200V	28mΩ@18V	90A
	25mΩ@20V	

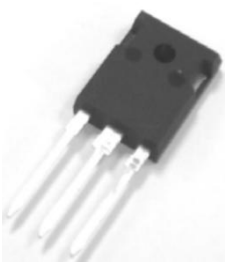
Feature

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

Application

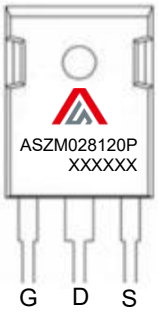
- Switch Mode Power Supplies
- Renewable energy
- Motor drives
- High Voltage DC/DC Converters

Package

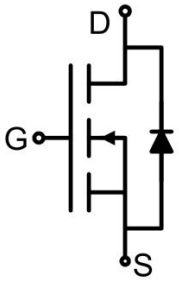


TO-247-3

Marking



Circuit diagram



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

Parameter	Symbol	Test Condition	Value	Unit
Drain-Source Voltage	V_{DSmax}	V_{GS}=0V, I_D = 100μA	1200	V
Gate-Source Voltage	V_{GSmax}	AC (f >1Hz)	-10/+25	V
Gate-Source Voltage	V_{GSOP}	Static	-4/+18	V
Continuous Drain Current	I_D	V_{GS}=18V,T_C=25℃	90	A
	I_D	V_{GS}=18V,T_C=100℃	63	A
Pulsed Drain Current	$I_{D,pulse}$	Pulse width t_p limited by T_{jmax} at 1ms Pulse width t_p limited by T_{jmax} at 100μs	175 426	A
Power Dissipation	P_D	T_C=25℃	517	W
Thermal Resistance（Typ）	$R_{\theta JC}$	Junction-to-Case	0.29	℃/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	1200			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =1200V,V_{GS} = 0V		1	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 =12mA		3.0		V
		V_{DS} =V_{GS}, I_D =12mA ,T_J=175℃		2.0		
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =18V, I_D =40A		28	42	mΩ
		V_{GS} =20V, I_D =40A		25		
		V_{GS} =18V, I_D =40A,T_J=175℃		50		
		V_{GS} =20V, I_D =40A,T_J=175℃		48		
Transconductance	g_{fs}	V_{GS} =18V, I_D =40A		38		S
		V_{GS} =18V, I_D =40A,T_J=175℃		24		
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =1000V,V_{GS} =0V,f =1MHz V_{AC}=25mV		3290		pF
Output Capacitance	C_{oss}			124		
Reverse Transfer Capacitance	C_{rss}			7.8		
Total Gate Charge	Q_g	V_{DS} =800V,V_{GS} =-4V/18V, I_D =40A		137		nC
Gate-Source Charge	Q_{gs}			42		
Gate-Drain Charge	Q_{gd}			48		
Internal Gate Resistance	$R_{G(int)}$	f =1MHz,V_{AC}=25mV		1		Ω
Source-Drain Diode characteristics						
Diode Forward Current	I_S	V_{GS}=-4V,T_C=25℃			90	A
Diode Forward voltage	V_{SD}	V_{GS} =-4V, I_{SD}=20A		3.8		V
		V_{GS} =-4V, I_{SD}=20A,T_J=175℃		3.3		
Diode pulse Current	$I_{S,pulse}$	V_{GS}=-4V, pulse width t_p limited by T_{jmax}		175		A

Typical Characteristics

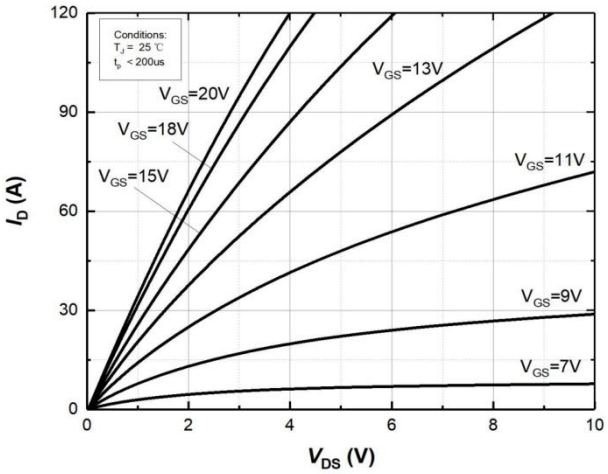


Figure 1. Output characteristics at Tj=25°C

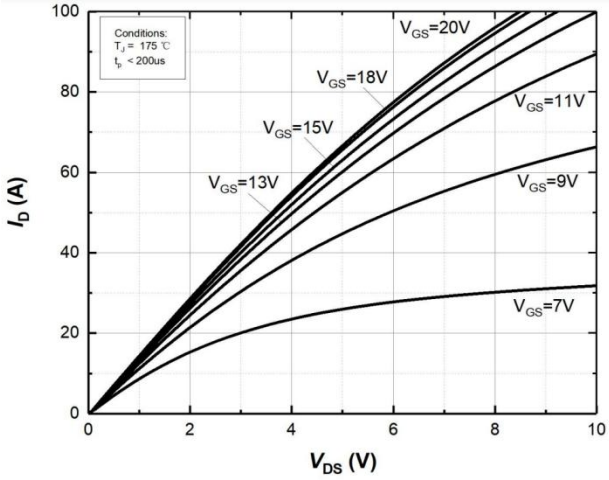


Figure 2. Output characteristics at Tj=175°C

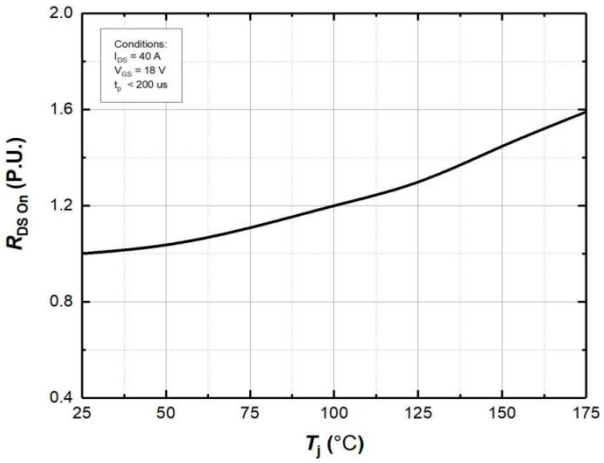


Figure 3. Normalized On-Resistance vs. Temperature

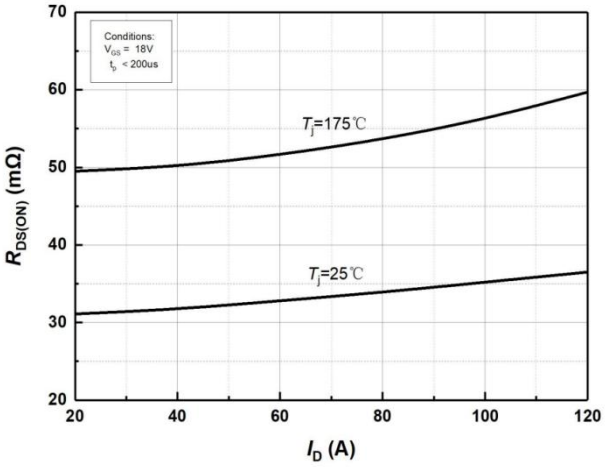


Figure 4. On-Resistance vs. Drain current for Various Temperature

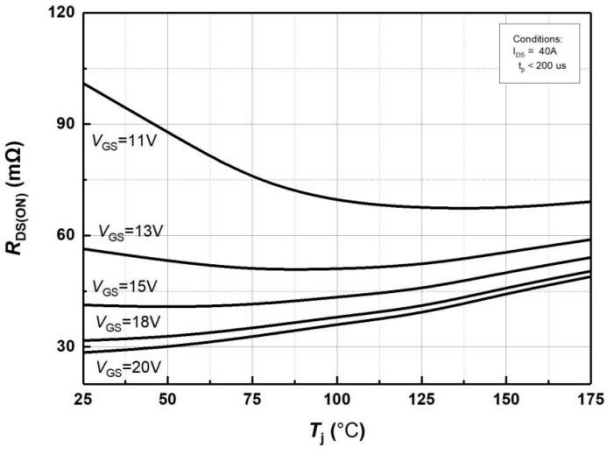


Figure 5. On-Resistance vs. Temperature for Various Gate Voltage

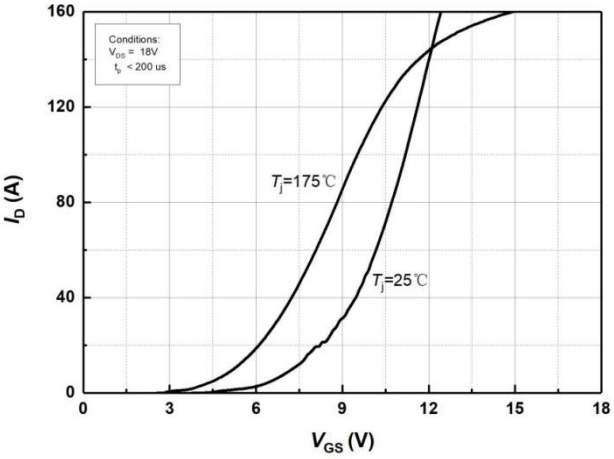


Figure 6. Transfer Characteristics for Various Junction Temperatures

Typical Characteristics

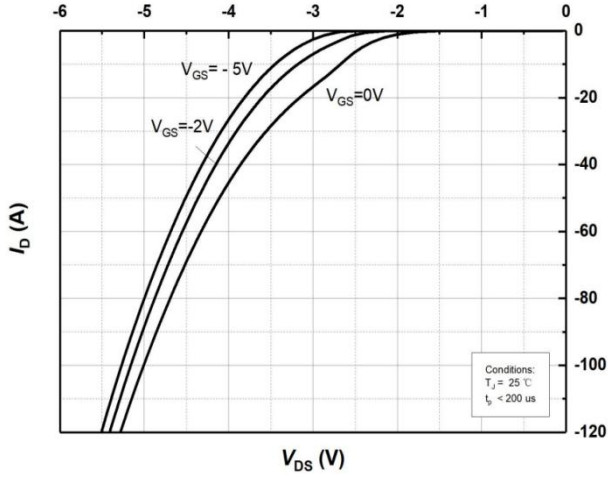


Figure 7. Body Diode Characteristics at Tj=25°C

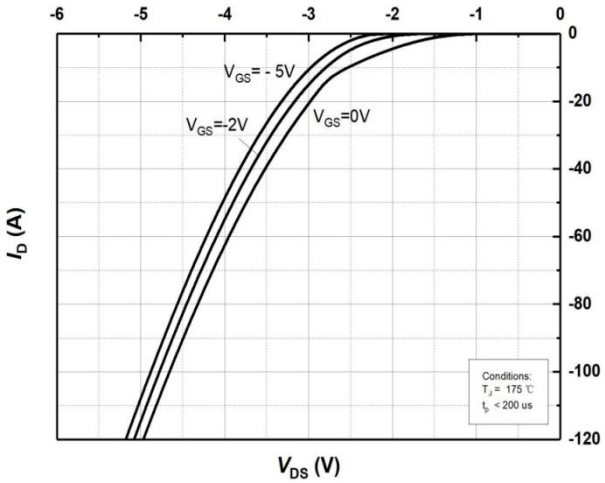


Figure 8. Body Diode Characteristics at Tj=175°C

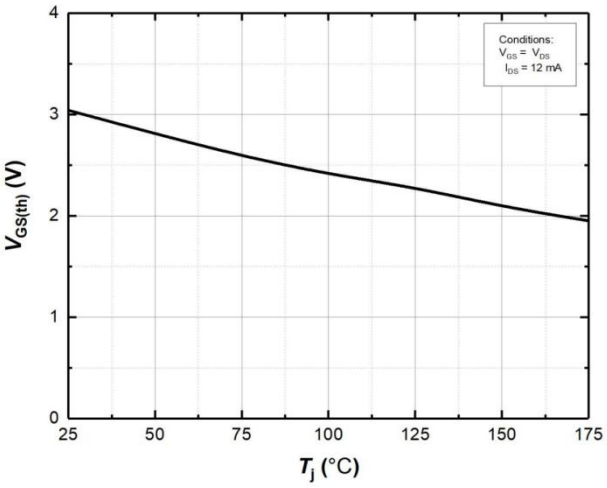


Figure 9. Threshold Voltage vs. Temperature

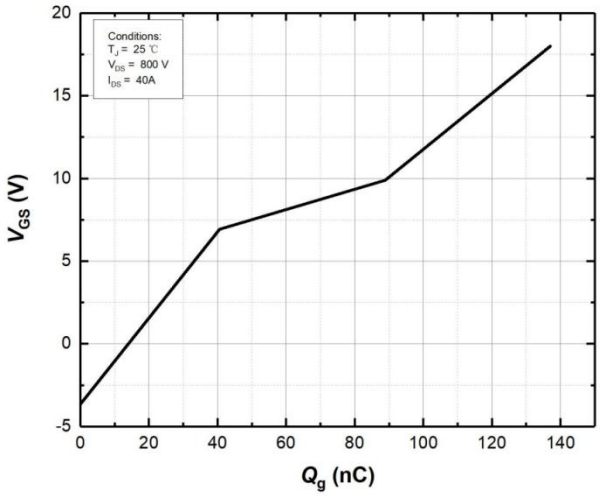


Figure 10 Gate Charge Characteristics

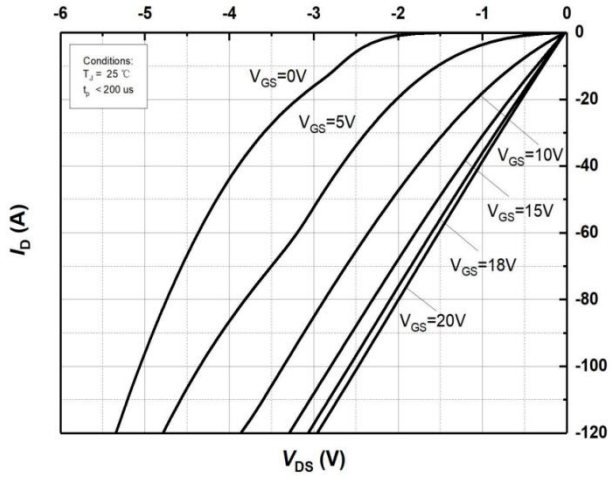


Figure 11. 3rd Quadrant Characteristic at Tj=25°C

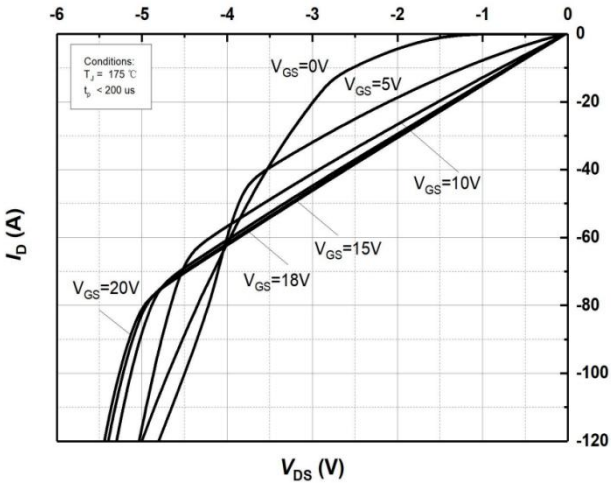


Figure 12. 3rd Quadrant Characteristic at Tj=175°C

Typical Characteristics

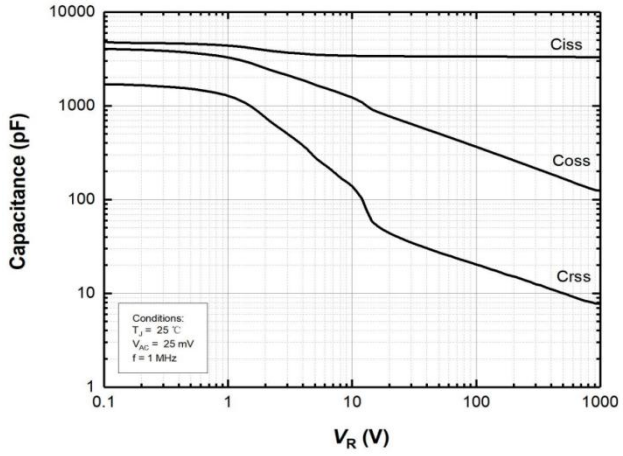


Figure 13. Capacitances vs. Drain-Source Voltage (0 – 1000V)

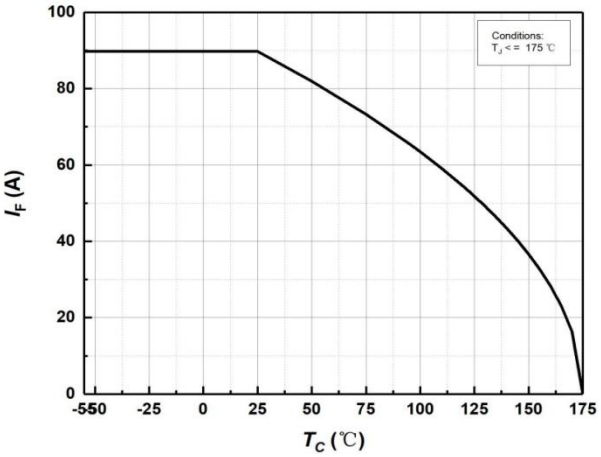


Figure 14. Continuous Drain Current Derating vs Case Temperature

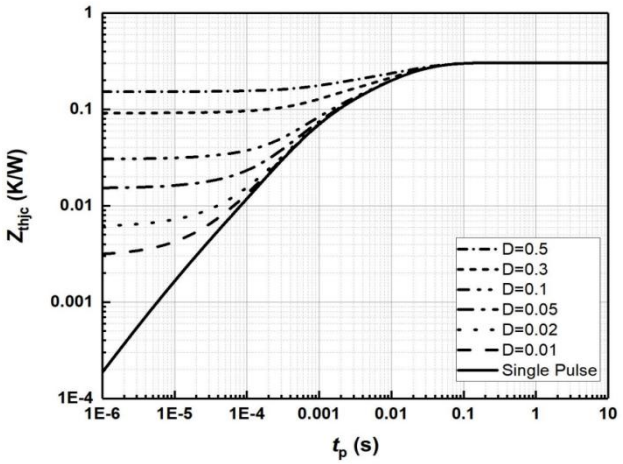


Figure 15.Transient Thermal Impedance (Junction – Case)

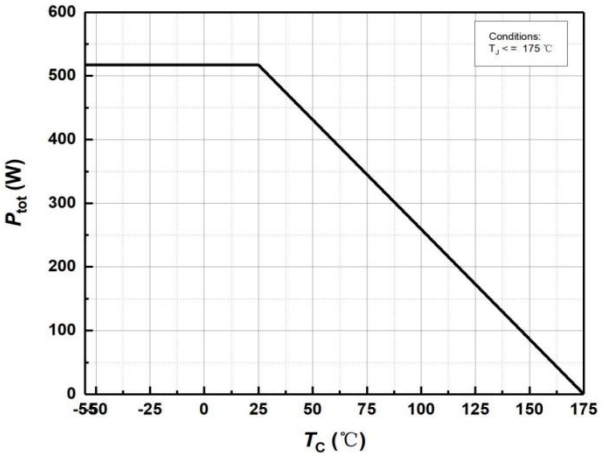


Figure 16. Maximum Power Dissipation Derating vs. Case Temperature

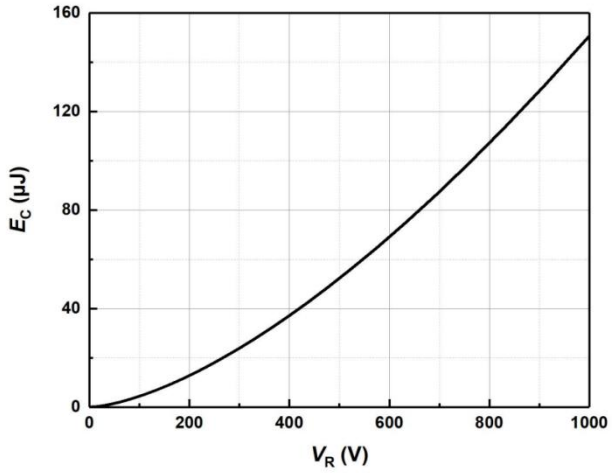


Figure 17. Output Capacitor Stored Energy

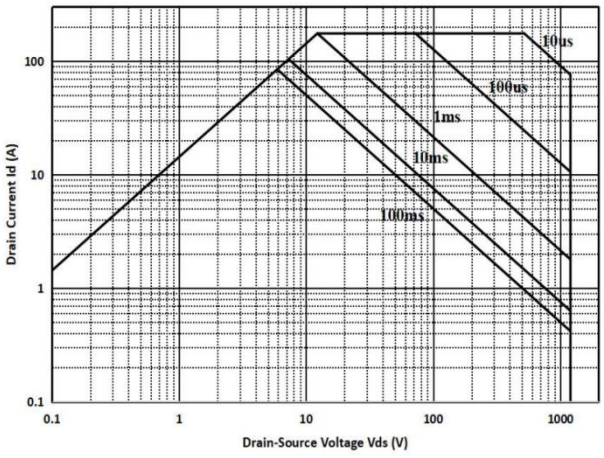
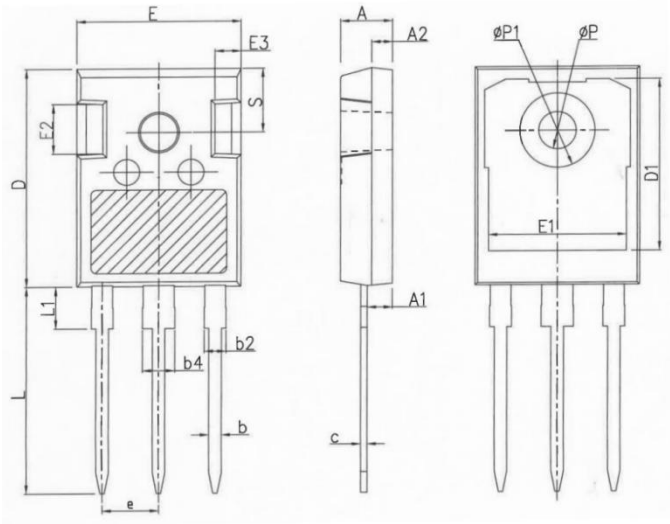


Figure 18. Safe Operating Area

TO-247-3 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.800	5.200	0.189	0.205
A1	2.210	2.590	0.087	0.102
A2	1.850	2.150	0.073	0.085
b	1.110	1.360	0.044	0.054
b2	1.910	2.210	0.075	0.087
b4	2.910	3.210	0.115	0.126
c	0.510	0.750	0.020	0.030
D	20.700	21.300	0.815	0.839
D1	16.250	16.850	0.640	0.663
E	15.500	16.100	0.610	0.634
E1	13.000	13.600	0.512	0.535
E2	4.800	5.200	0.189	0.205
E3	2.300	2.700	0.091	0.106
e	5.440 BSC		0.214 BSC	
L	19.620	20.220	0.772	0.796
L1	-	4.300	-	0.169
ΦP	3.400	3.800	0.134	0.150
ΦP1	-	7.300	-	0.287
S	6.150 BSC		0.242 BSC	