ASZM016120DT

N-Channel Silicon Carbide Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D@25℃
1200V	16mΩ@15V	140A
	14mΩ@18V	

Feature

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

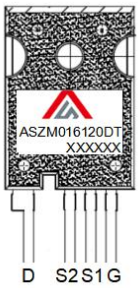
Application

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

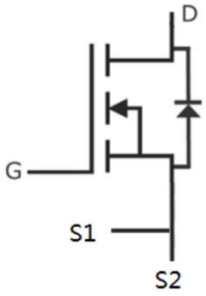
Package

TO-247-4

Marking



Circuit diagram



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

Parameter	Symbol	Test Condition	Value	Unit
Drain-Source Voltage	V_{DS}	V_{GS} = 0V, I_D = 100μA	1200	V
Gate-Source Voltage	V_{GSmax}	AC (f > 1 Hz)	-10/+25	V
Gate-Source Voltage	V_{GSOP}	Static	-4/+15 -4/+18	V
Continuous Drain Current	I_D	V_{GS} = 15V, T_C=25℃ V_{GS} = 18V, T_C=25℃	140	A
		V_{GS} = 15V, T_C=100℃ V_{GS} = 18V, T_C=100℃	99	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 100 μs	243 477	A
Power Dissipation	P_D	T_C=25℃	577	W
Thermal Resistance（Typ）	$R_{\theta JC}$	Junction-to-Case	0.26	K/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,T_j = 25℃		1	50	μA
Gate-Source leakage current	I_{GSS}	V_{GS} =15V, V_{DS} = 0V			250	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =25mA		2.9		V
		V_{DS} =V_{GS}, I_D =25mA,T_j = 175℃		2.0		
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =15V, I_D =75A		16	24	mΩ
		V_{GS} =18V, I_D =75A		14		
		V_{GS} =15V, I_D =75A,T_j = 175℃		30		
		V_{GS} =18V, I_D =75A,T_j = 175℃		28		
Transconductance	g_{fs}	V_{GS} =15V, I_D =75A		63		S
		V_{GS} =15V, I_D =75A,T_j = 175℃		58		
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =1000V,V_{GS} =0V,f =100KHz V_{AC} = 25mV		6534		pF
Output Capacitance	C_{oss}			212		
Reverse Transfer Capacitance	C_{rss}			21		
Total Gate Charge	Q_g	V_{DS} =800V,I_D =75A V_{GS} =-4V/15V		221		nC
Gate-Source Charge	Q_{gs}			113		
Gate-Drain Charge	Q_{gd}			49		
Internal Gate Resistance	$R_{G(int)}$	f=1 MHz, V_{AC} = 25mV		1.3		Ω
Source-Drain Diode characteristics						
Diode Forward Current	I_S	V_{GS} =-4V,T_C=25℃		129		A
Diode Forward voltage	V_{SD}	V_{GS} =-4V, I_{SD}= 37.5A		4.0		V
		V_{GS} =-4V, I_{SD}= 37.5A,T_J=175℃		3.5		V
Diode pulse Current	I_S, pulse	V_{GS} = -4V, pulse width t_p limited by T_{jmax}		243		A

Typical Characteristics

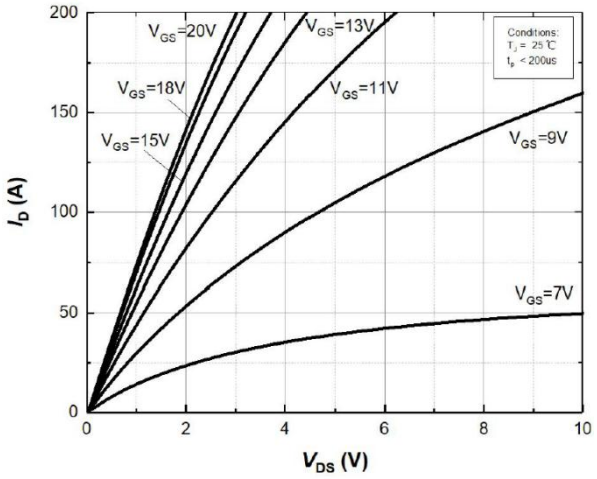


Figure 1. Output characteristics at Tj=25°C

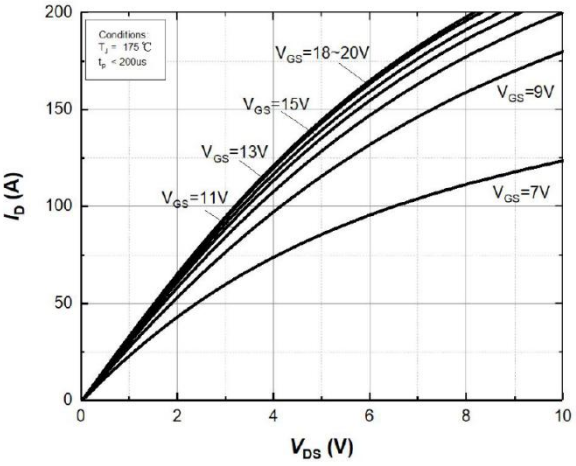


Figure 2. Output characteristics at Tj=175°C

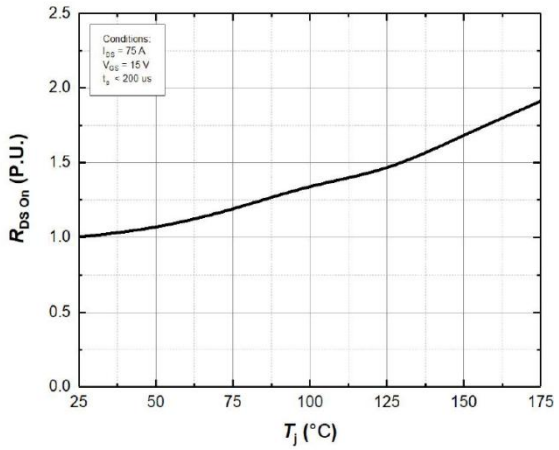


Figure 3. Normalized On-Resistance vs. Temperature

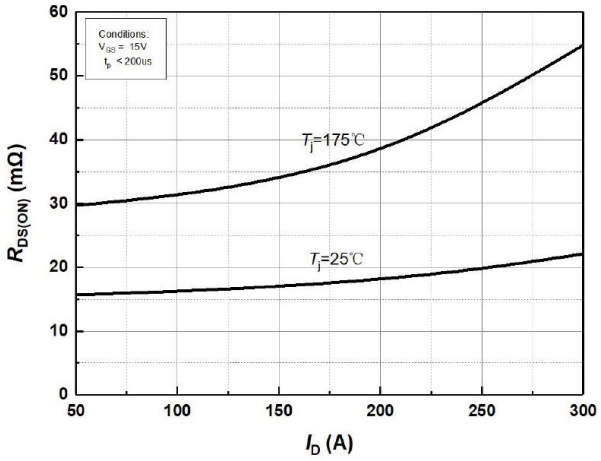


Figure 4. On-Resistance vs. Drain current for Various Temperature

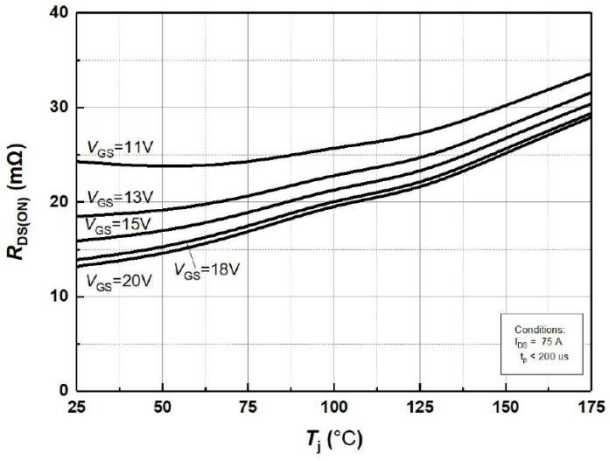


Figure 5. On-Resistance vs. Temperature for Various Gate Voltage

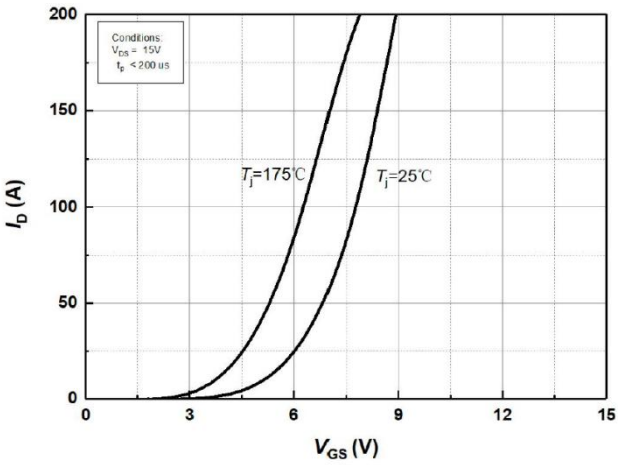


Figure 6. Transfer Characteristics for Various Junction Temperatures

Typical Characteristics

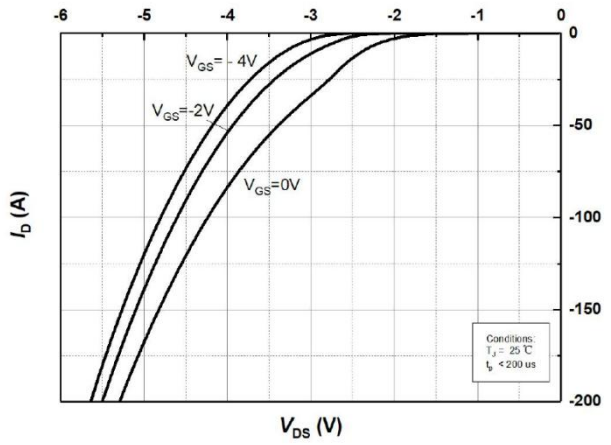


Figure 7. Body Diode Characteristics at Tj=25°C

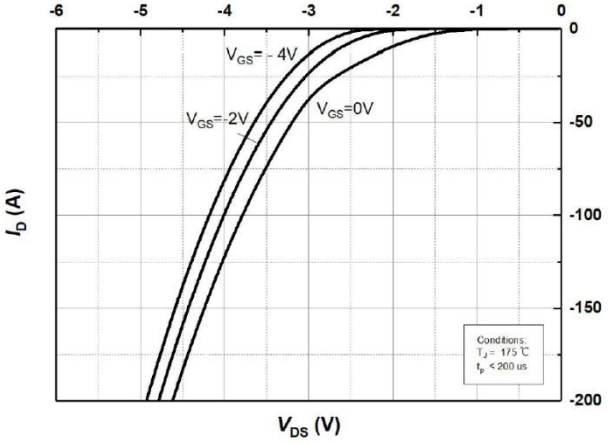


Figure 8. Body Diode Characteristics at Tj=175°C

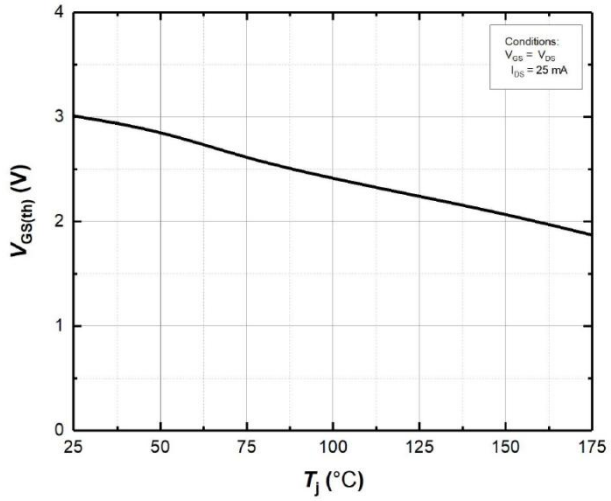


Figure 9. Threshold Voltage vs. Temperature

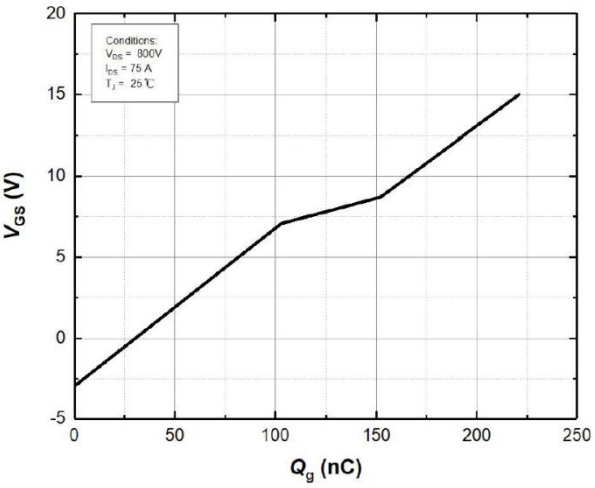


Figure 10 Gate Charge Characteristics

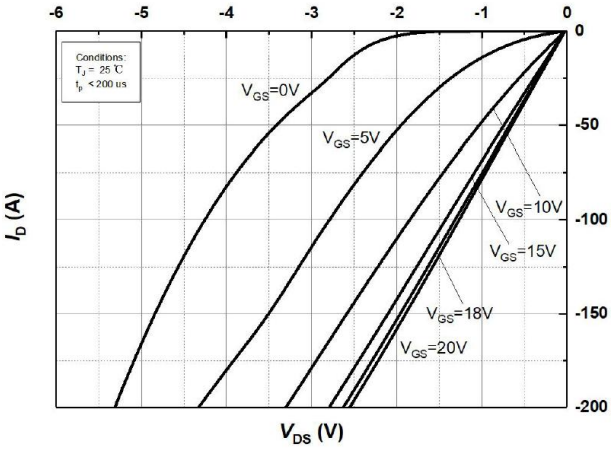


Figure 11. 3rd Quadrant Characteristic at Tj=25°C

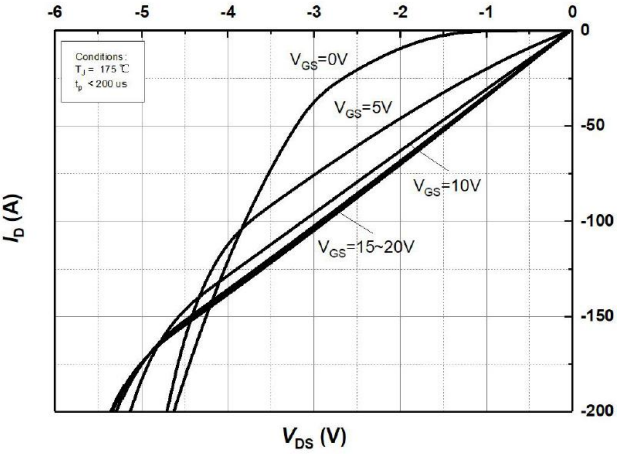


Figure 12. 3rd Quadrant Characteristic at Tj=175°C

Typical Characteristics

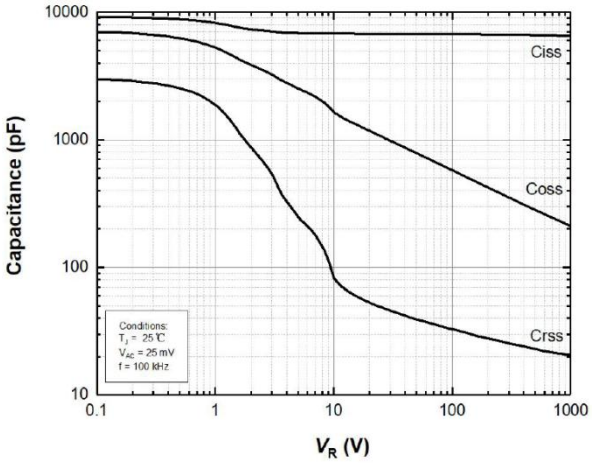


Figure 13. Capacitances vs. Drain-Source Voltage (0 – 1000V)

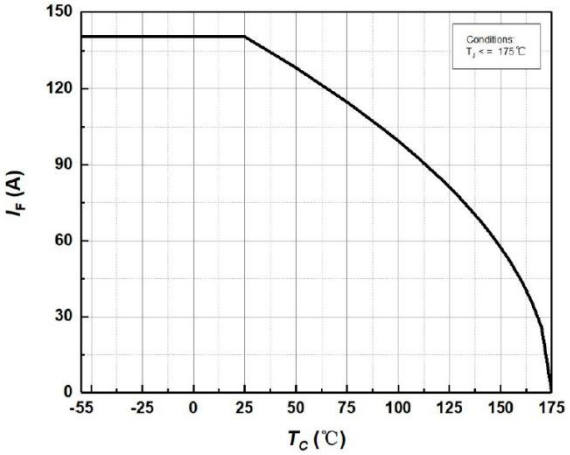


Figure 14. Continuous Drain Current Derating vs Case Temperature

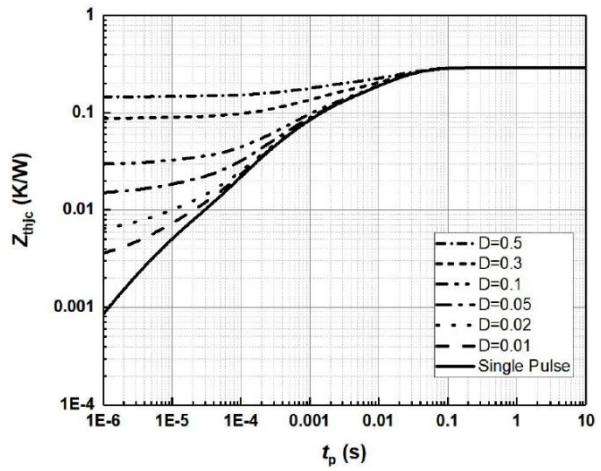


Figure 15.Transient Thermal Impedance (Junction – Case)

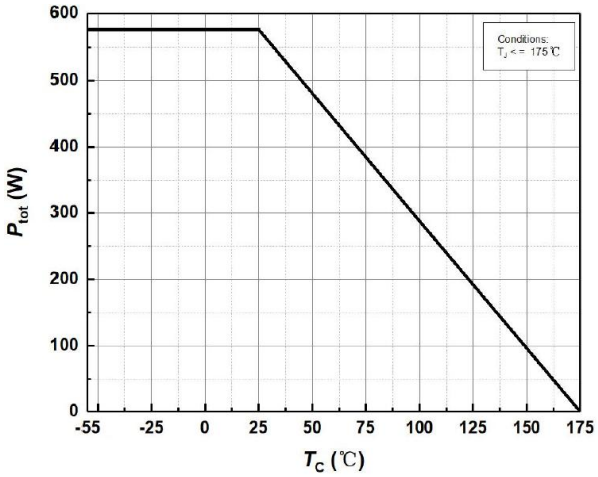


Figure 16. Maximum Power Dissipation Derating vs. Case Temperature

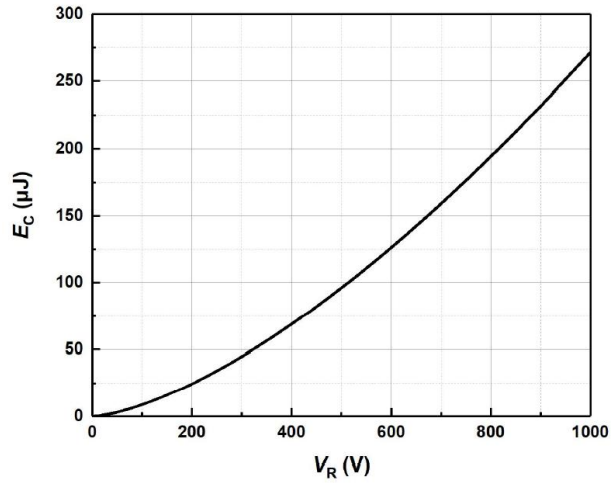


Figure 17. Output Capacitor Stored Energy

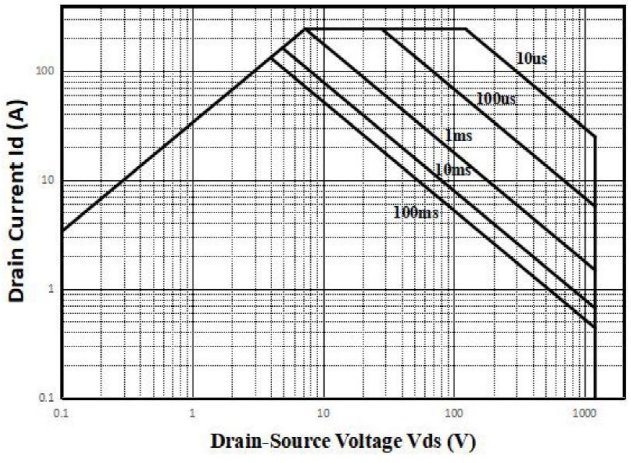
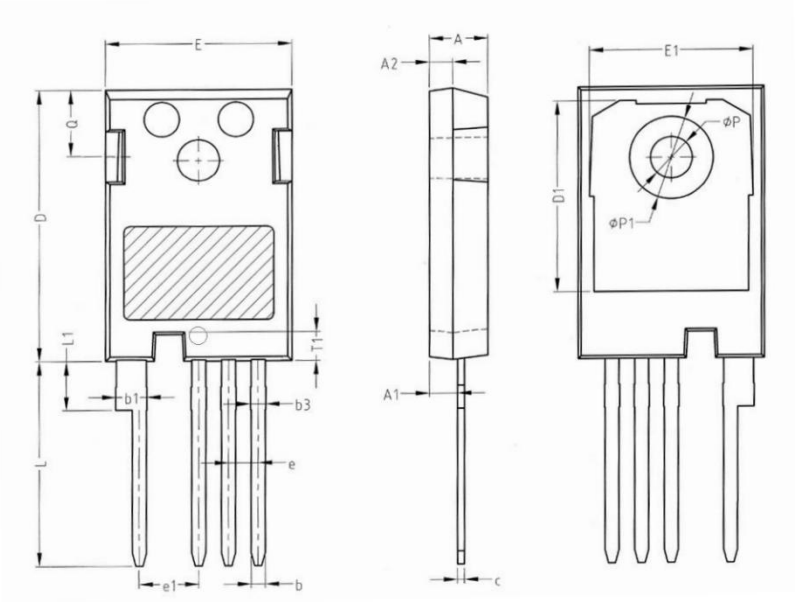


Figure 18. Safe Operating Area

Document ID	Issued Date	Revised Date	Revision	Page.
AS-3270093	2018/03/08	2024/04/23	B	6

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	