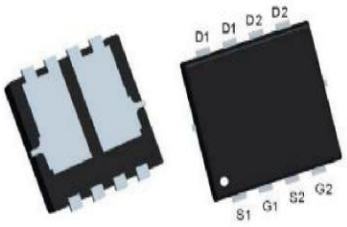
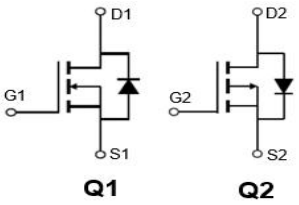
30V/-30V N and P-Channel Enhancement Mode MOSFET

Features

- Q1: V_{DS}=30V;I_D=40A
- Q1: $R_{DS(ON)}$=10mΩ（TYP.）V_{GS}=10V,I_D=
- Q2: V_{DS}=-30V;I_D=-25A
- Q2: $R_{DS(ON)}$=-25mΩ（TYP.）V_{GS}=-10V,I_D
- Reliable and Rugged
- Avalanche Rated
- Low On-Resistance
- High Current Capability

PDFN5060





Ordering Information

Device	package	Device Marking	Package Qty.
AGM310MA	PDFN5060	AGM310MA	5000/PCS

Absolute Maximum Ratings (T_A=25℃,unless otherwise noted)

Parameter	Symbol	Value(Q1)	Value(Q2)	Unit
Drain-Source Voltage (V_{GS}=0V)	V_{DS}	30	-30	V
Gate-Source Voltage (V_{GS}=0V,static)	V_{GS}	±20	±20	V
Continuous Drain Current (T_C=25℃)	I_D	40	-25	A
Continuous Drain Current (T_C=100℃)		30	-20	A
Single Pulsed Avalanche Energy	E_{AS}	-	-	mJ
Maximum Power Dissipation (T_C =25℃)	P_D	33.5	28	W
Operating,Storage Temperature Range	T_J,T_{STG}	-55~150	-55~150	℃

Thermal Characteristics

Parameter	Symbol	N-CH	P-CH	Unit
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	3.6	5.4	℃/ W
Thermal Resistance,Junction-to-Ambient	$R_{\theta JA}$	62	62	℃/ W

Q1:Electrical Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=250μA	30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=40V, V_{GS}=0V	-	-	1	μA
Gate -Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS},I_D=250μA	1.2	-	2.5	V
Drain-Source On-stage Resistance	$R_{DS(ON)}$	V_{GS}=10V,I_D=1A	-	7.5	10	mΩ
		V_{GS}=4.5V,I_D=1A	-	11	18	

Dynamic Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Input capacitance	C_{iss}	V_{DS}=20V	-	930	-	pF
Output capacitance	C_{oss}	V_{GS}=0V	-	118	-	
Reverse transfer capacitance	C_{rss}	f=1MHz	-	100	-	
Gate Resistance	R_g	f=1MHz	-	3.0	-	Ω
Total Gate Charge	Q_g	V_{DS}=20V	-	9	-	nC
Gate Source Charge	Q_{gs}	V_{GS}=10V	-	4	-	
Gate Drain Charge	Q_{gd}	I_D=6A	-	3.3	-	
Turn-on delay Time	$t_{d(on)}$	V_{GS}=10V	-	3	-	ns
Rise time	t_r	V_{DS}=20V	-	6	-	
Turn-off delay Time	$t_{d(off)}$	R_L=3.2Ω	-	28	-	
Fall time	t_f	R_G=3Ω	-	3	-	

Reverse Diode Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Body Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_{SD}=1A	-	-	1.0	V
Reverse Recovery Time	t_{rr}	V_{GS}=0V,I_{SD}=6A	-	8.5	-	ns
Reverse Recovery Charge	Q_{rr}	d_i/d_t=500A/μs	-	2.2	-	nC

Q1:Electrical Characteristics Diagrames

Figure 1. On-Regin Characteristics

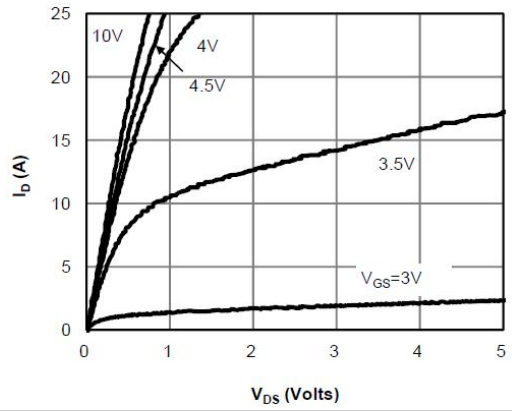


Figure 2. Transfer Characteristics

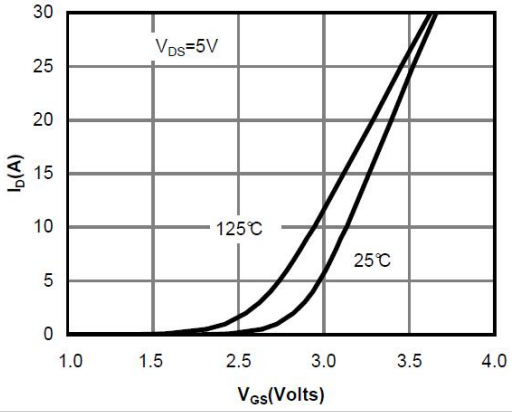


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

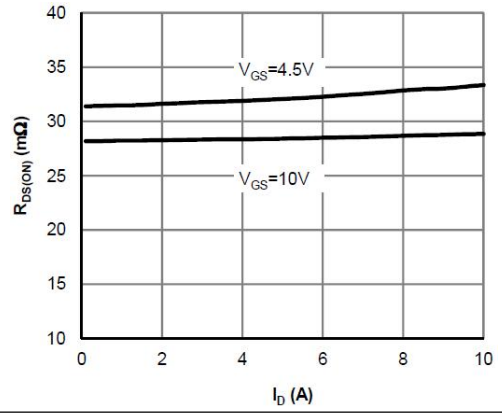


Figure 4. On-Resistance vs. Junction Temperature

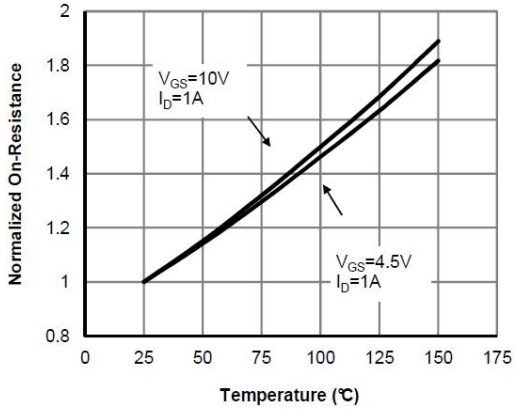


Figure 5. On-Resistance vs. Gate-Source Voltage

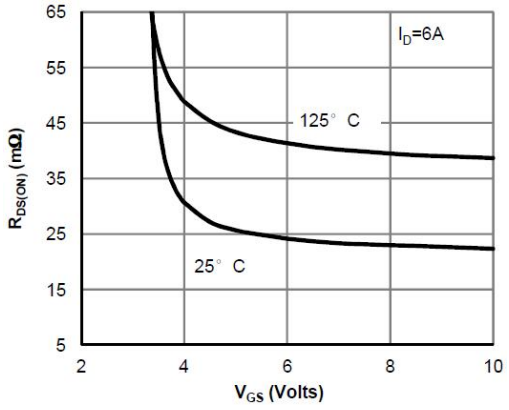


Figure 6. Body-Diode Characteristics

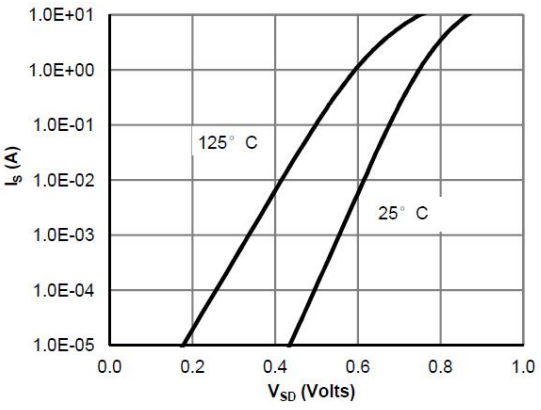


Figure 7. Gate-Charge Characteristics

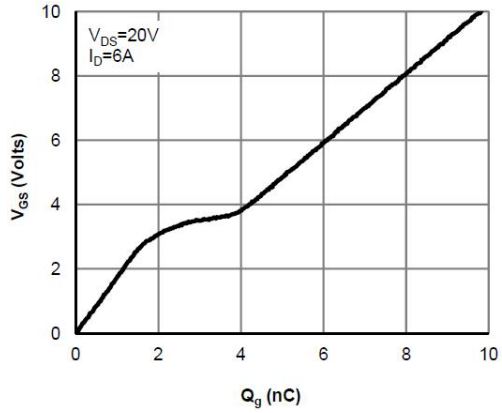
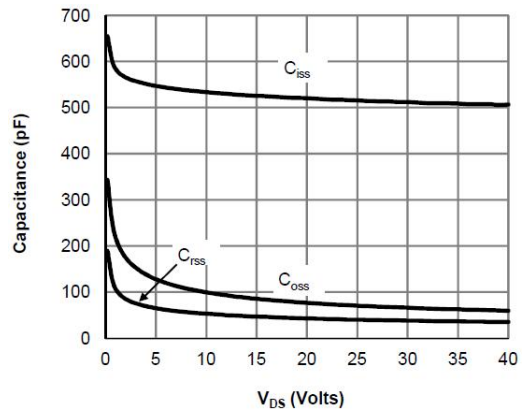


Figure 8. Capacitance Characteristics



Q2:Electrical Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=-250μA	-30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-40V, V_{GS}=0V	-	-	-1	μA
Gate -Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS},I_D=-250μA	-1	-1.5	-2.5	V
Drain-Source On-stage Resistance	$R_{DS(ON)}$	V_{GS}=-10V,I_D=-1A	-	19	25	mΩ
		V_{GS}=-4.5V,I_D=-1A	-	27	35	

Dynamic Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Input capacitance	C_{iss}	V_{DS}=-20V	-	1050	-	pF
Output capacitance	C_{oss}	V_{GS}=0V	-	140	-	
Reverse transfer capacitance	C_{rss}	f=1MHz	-	130	-	
Gate Resistance	R_g	f=1MHz	-	-	-	Ω
Total Gate Charge	Q_g	V_{DS}=-20V	-	50	-	nC
Gate Source Charge	Q_{gs}	V_{GS}=-10V	-	9.5	-	
Gate Drain Charge	Q_{gd}	I_D=-5A	-	8.1	-	
Turn-on delay Time	$t_{d(on)}$	V_{GS}=-10V	-	12	-	ns
Rise time	t_r	V_{DS}=-20V	-	14	-	
Turn-off delay Time	$t_{d(off)}$	R_L=4Ω	-	195	-	
Fall time	t_f	R_G=3Ω	-	95	-	

Reverse Diode Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Body Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_{SD}=-1A	-	-	-1.2	V
Reverse Recovery Time	t_{rr}	V_{GS}=0V,I_{SD}=-5A	-	23	-	ns
Reverse Recovery Charge	Q_{rr}	d_i/d_t=500A/μs	-	14	-	nC

Q2:Electrical Characteristics Diagrames

Figure 1. On-Regin Characteristics

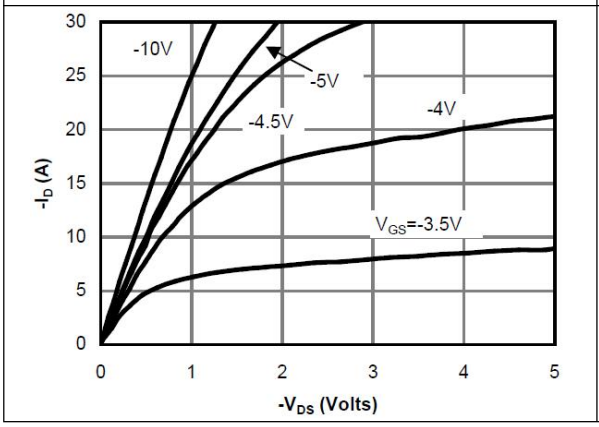


Figure 2. Transfer Characteristics

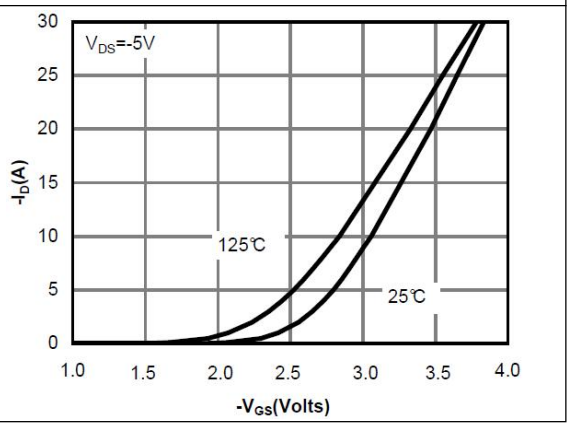


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

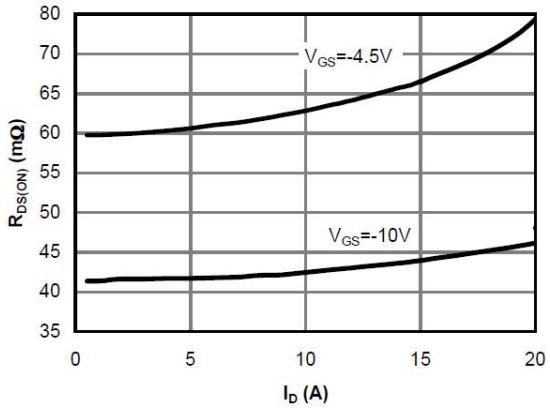


Figure 4. On-Resistance vs. Junction Temperature

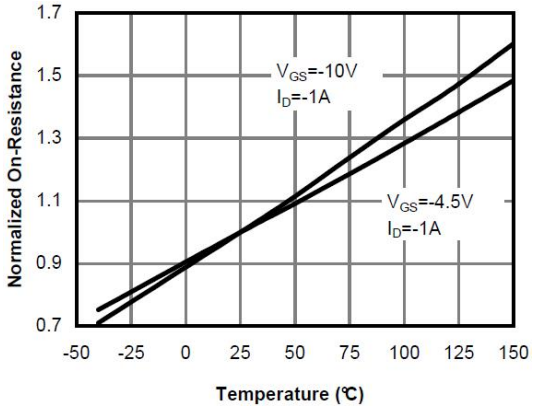


Figure 5. On-Resistance vs. Gate-Source Voltage

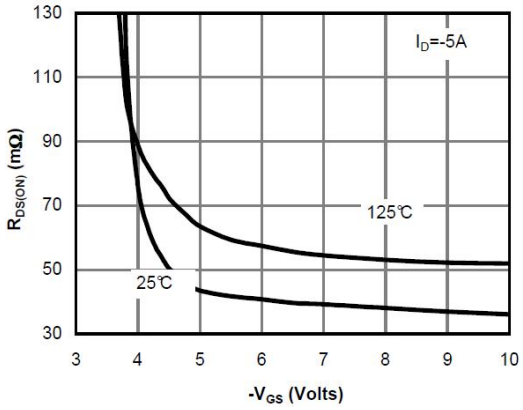


Figure 6. Body-Diode Characteristics

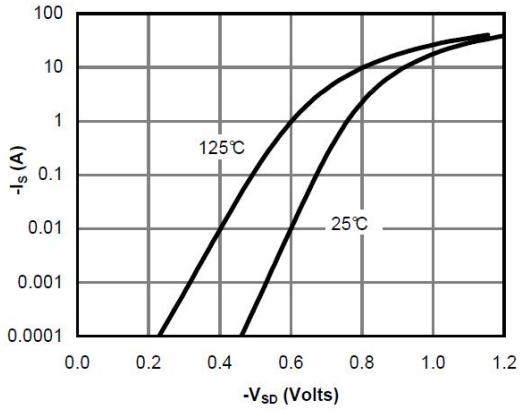


Figure 7. Gate-Charge Characteristics

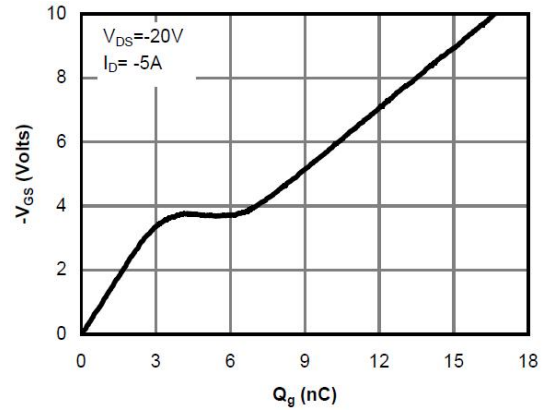


Figure 8. Capacitance Characteristics