AG020SN060MSP

N-Channel Enhancement Mode Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
60V	10mΩ@10V	20A
	13mΩ@4.5V	

Feature

- Advanced SGT technology
- Excellent $R_{DS(ON)}$
- Low gate charge

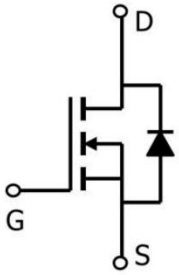
Application

- Battery protection
- Load switch
- Uninterruptible power supply

Package

SOP-8

Circuit diagram



Marking

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current (T_C=25℃)	I_D	20	A
Continuous Drain Current (T_C=70℃)	I_D (70℃)	11	A
Pulsed Drain Current	I_{DM}	60	A
Power Dissipation[1] (T_C=25℃)	P_D	60	W
Single Pulse Avalanche Energy[2]	E_{AS}	30	mJ
Thermal Resistance from Junction to Case[3]	$R_{\theta JC}$	2.1	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

Electrical characteristics (T_J=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 =250μA	60			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =60V, V_{GS} =0V			1	μA
Gate-body leakage current	I_{GSS}	V_{DS} =0V, V_{GS} =±20V			±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	1.2	1.5	2.5	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =20A		7.5	10	mΩ
		V_{GS} =4.5V, I_D =10A		10	13	
Dynamic characteristics[4]						
Input Capacitance	C_{iss}	V_{DS} =50V, V_{GS} =0V, f =100kHz		1182.1		pF
Output Capacitance	C_{oss}			199.5		
Reverse Transfer Capacitance	C_{rss}			4.1		
Total Gate Charge	Q_g	V_{DS} =50V, V_{GS} =10V, I_D =10A		18.4		nC
Gate-Source Charge	Q_{gs}			3.3		
Gate-Drain Charge	Q_{gd}			3.1		
Turn-on delay time	$t_{d(on)}$	V_{DS} =50V, V_{GS} =10V, I_D =10A R_G =2Ω		17.9		nS
Turn-on rise time	t_r			4		
Turn-off delay time	$t_{d(off)}$			34.9		
Turn-off fall time	t_f			5.5		
Source-Drain Diode characteristics						
Diode Forward Current	I_S				20	A
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_S =20A			1.3	V
Reverse recovery time	t_{rr}	I_S =10A, di/dt =100 A/μs		41.8		nS
Reverse recovery charge	Q_{rr}			36.1		nC
Peak reverse recovery current	I_{rrm}			1.4		A

Notes:

1) Pd is based on max. junction temperature, using junction-case thermal resistance.

2) V_{DD}=50 V, R_G=50 Ω, L=0.3 mH, starting T_J=25 ℃.

3) The value of $R_{\theta JA}$ is measured with the device mounted on 1 in ^{2} FR-4 board with 2oz. Copper, in a still air environment with T_A=25 ℃.

4) Guaranteed by design, not subject to production testing.

Typical Characteristics

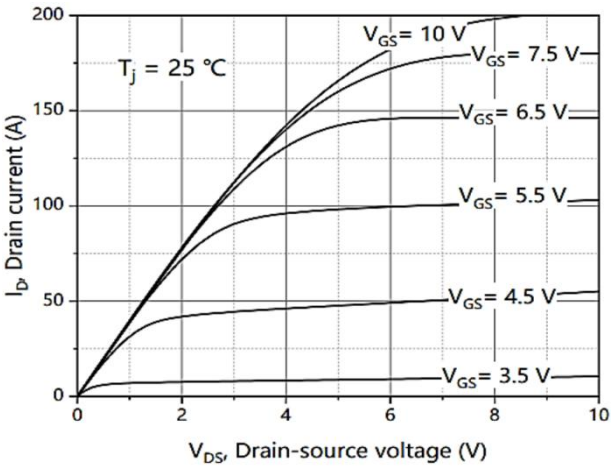


Figure 1. Typ. output characteristics

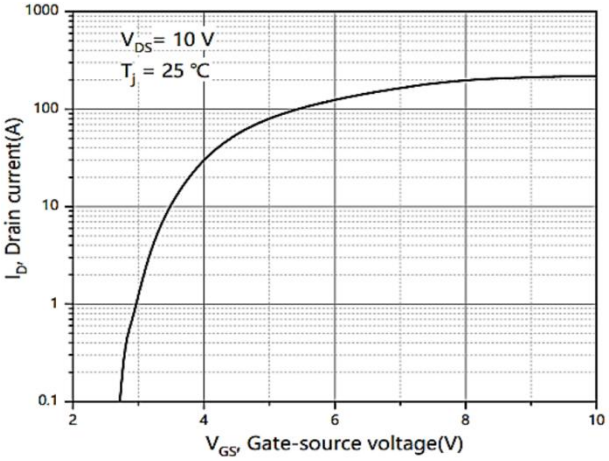


Figure 2. Typ. transfer characteristics

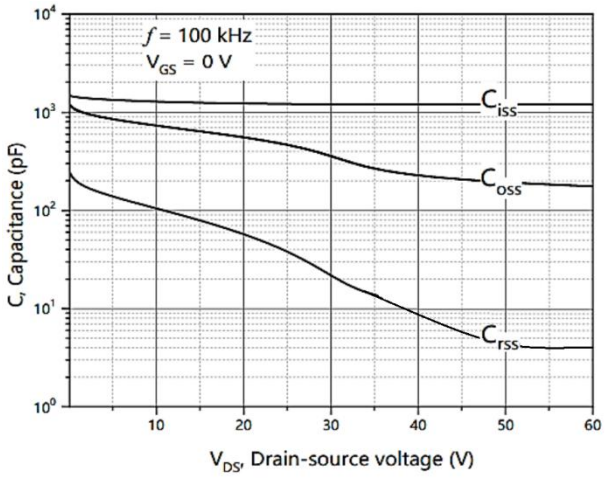


Figure 3. Typ. capacitances

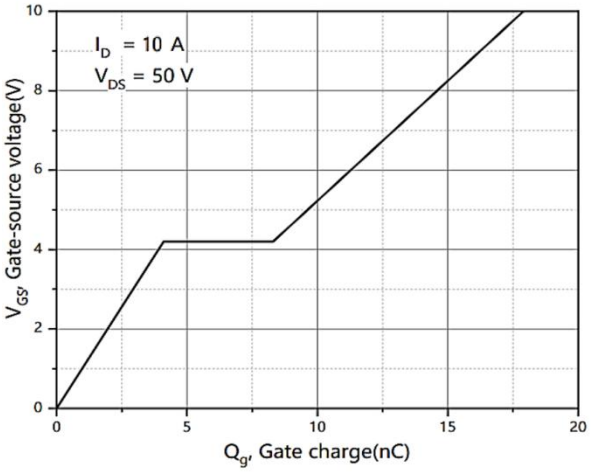


Figure 4. Typ. gate charge

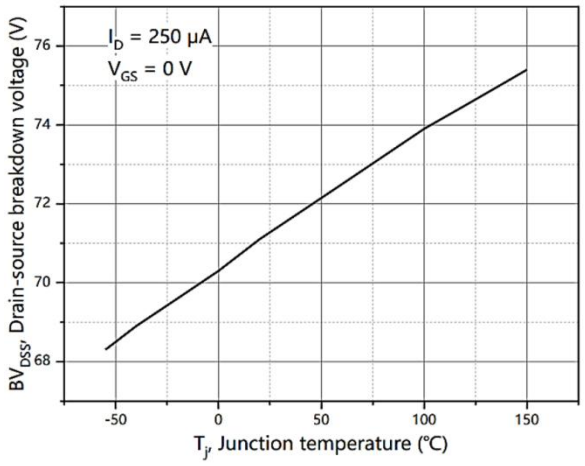


Figure 5. Drain-source breakdown voltage

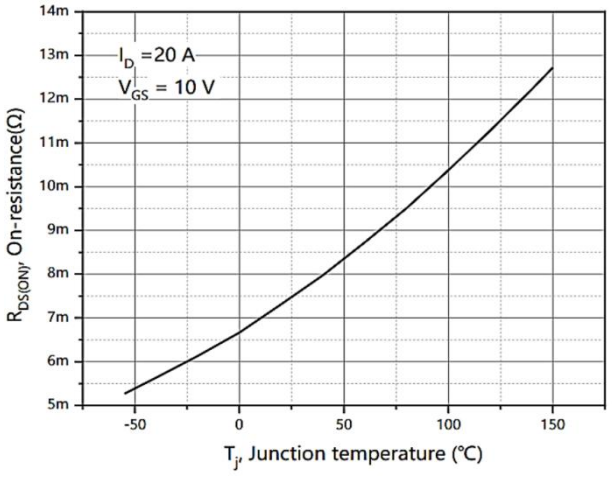


Figure 6. Drain-source on-state resistance

Typical Characteristics

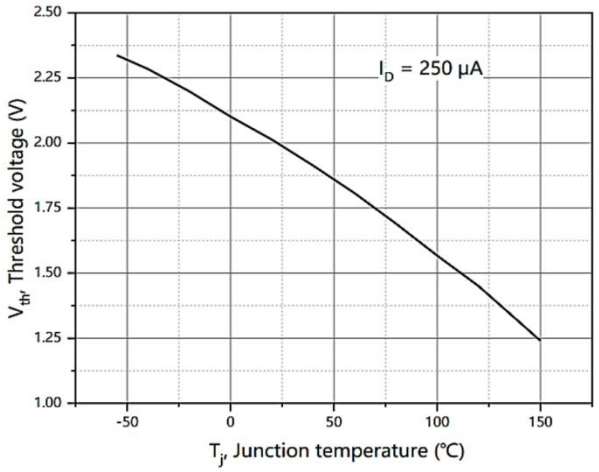


Figure 7. Threshold voltage

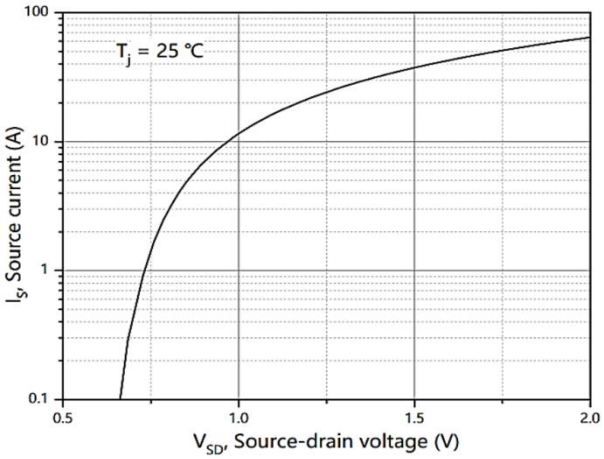


Figure 8. Forward characteristic of body diode

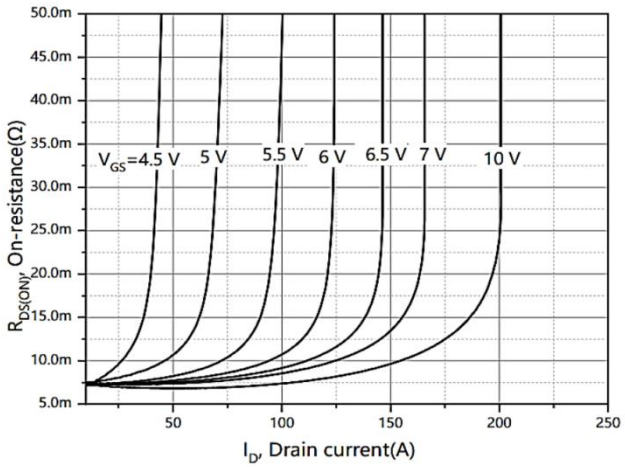


Figure 9. Drain-source on-state resistance

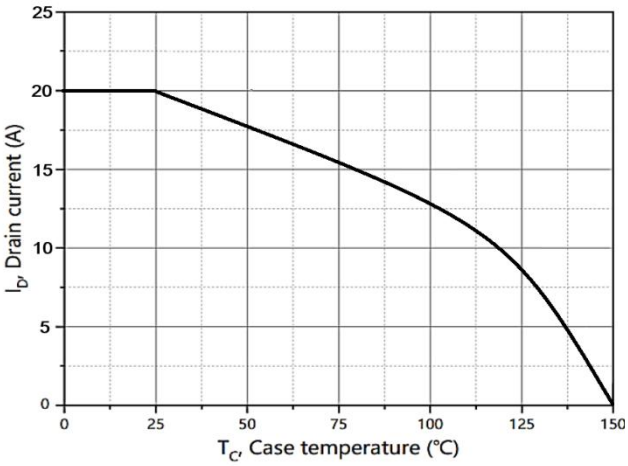


Figure 10. Drain current

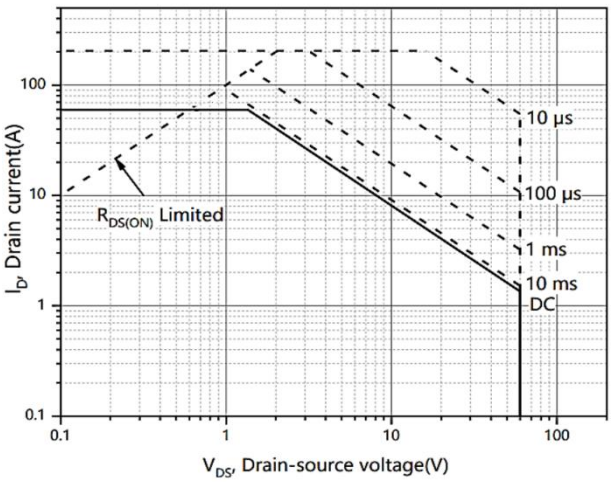


Figure 11. Safe operation area T_C=25 ℃

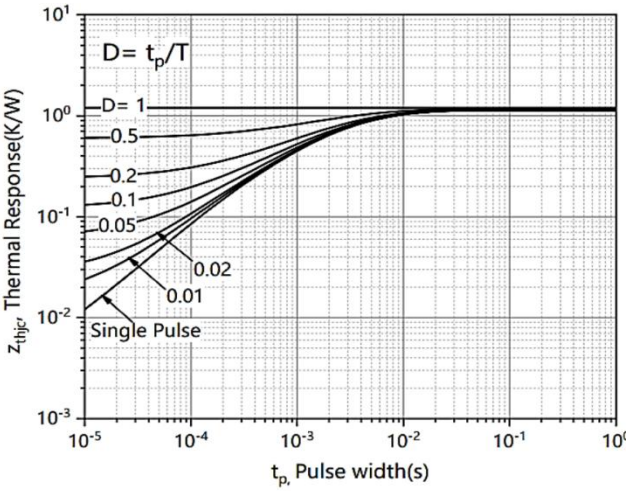
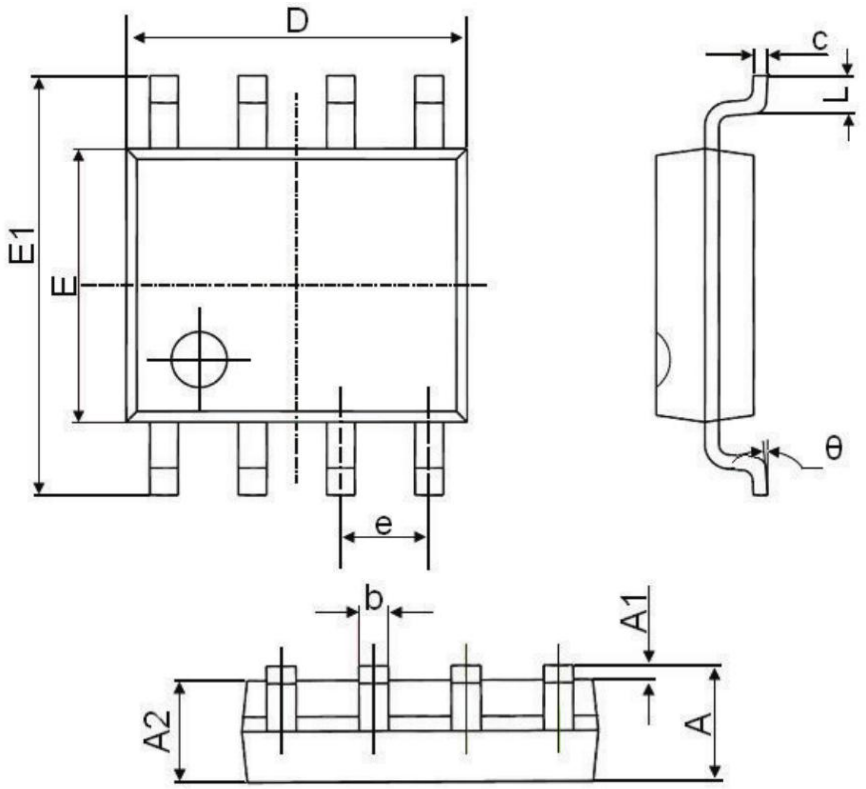


Figure 12. Max. transient thermal impedance

SOP-8 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	4.700	5.100	0.185	0.201
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°