AG420SN060MTC

N-Channel Enhancement Mode MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
60V	2mΩ@10V	420A

Feature

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

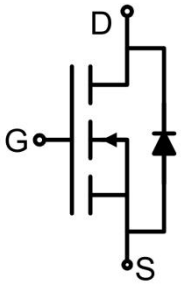
Application

- Battery protection
- UPS

Package

TO-220AB

Circuit diagram



Marking

Absolute maximum ratings(T_C=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[1)]	I_D	420	A
Continuous Drain Current[1)] (T_C=100℃)	I_D (100℃)	238	A
Pulsed Drain Current	I_{DM}	1340	A
Single Pulse Avalanche Energy[2)]	E_{AS}	580	mJ
Power Dissipation[3)]	P_D	231	W
Thermal Resistance Junction to Case[1)]	$R_{\theta JC}$	0.65	℃/W
Operating Junction Temperature	T_J	-55 ~ +150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

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 =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	2	2.9	4	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =20A		1.8	2	mΩ
Dynamic characteristics[4)]						
Input Capacitance	C_{iss}	V_{DS} =30V, V_{GS} =0V, f =1MHz		7312		pF
Output Capacitance	C_{oss}			2239		
Reverse Transfer Capacitance	C_{rss}			53		
Total Gate Charge	Q_g	V_{DS} =30V, V_{GS} =10V, I_D =20A		102		nC
Gate-Source Charge	Q_{gs}			25		
Gate-Drain Charge	Q_{gd}			15.8		
Turn-on delay time	$t_{d(on)}$	V_{DS} =30V, V_{GS} =10V, I_D =20A R_G =3Ω		24		nS
Turn-on rise time	t_r			71		
Turn-off delay time	$t_{d(off)}$			129		
Turn-off fall time	t_f			92		
Source-Drain Diode characteristics						
Diode Continuous Current	I_S	T_C =25°C			420	A
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_S =20A			1.2	V
Reverse recover time	T_{rr}	I_F =20A, di/dt =100A/μs		86		nS
Reverse recovery charge	Q_{rr}			61		nC

Notes:

1) The data tested by surface mounted on a 1 inch ^{2} FR-4 board with 2OZ copper.

2) EAS condition: T_J=25℃, V_{DD}=48V, V_G=10V, R_G=25Ω, L=0.1mH, I_{AS}= 55A.

3) The power dissipation is limited by 150℃ junction temperature

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

Typical Characteristics

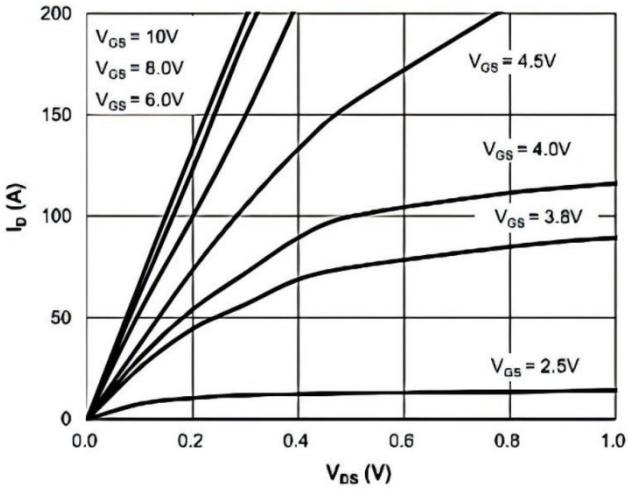


Figure 1: Saturation Characteristics

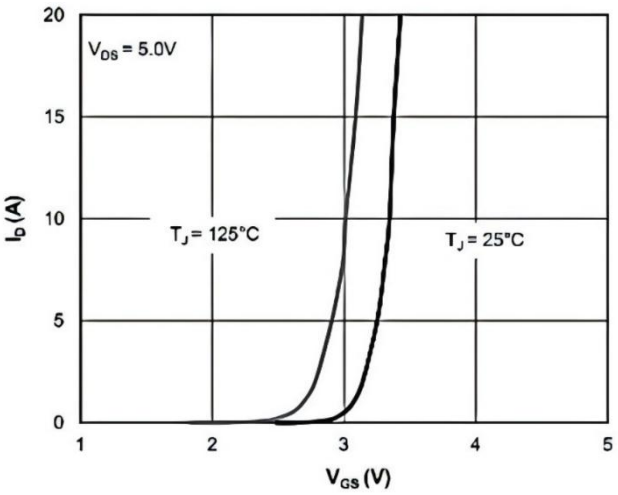


Figure 2: Transfer Characteristics

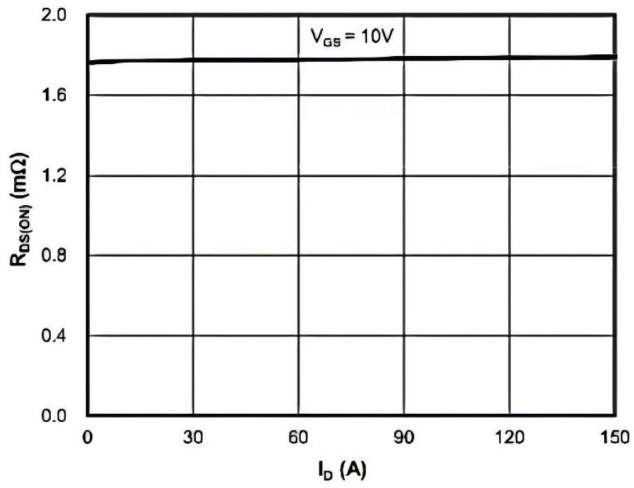


Figure 3: $R_{DS(ON)}$ vs. Drain Current

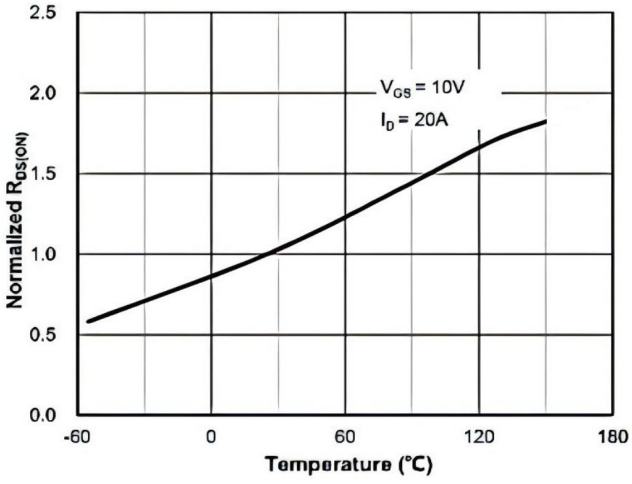


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

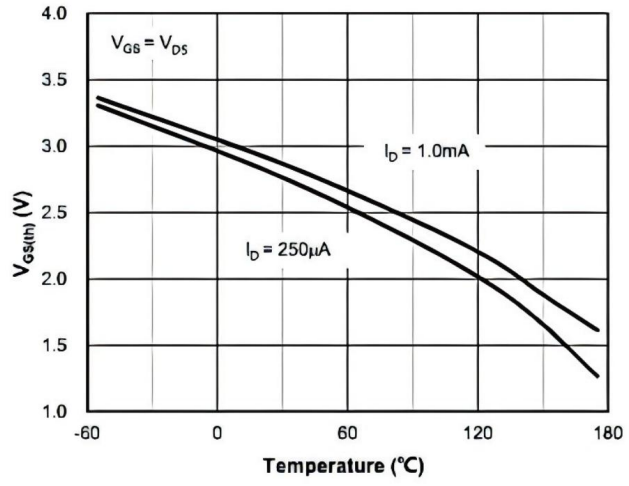


Figure 5: $V_{GS(th)}$ vs. Junction Temperature

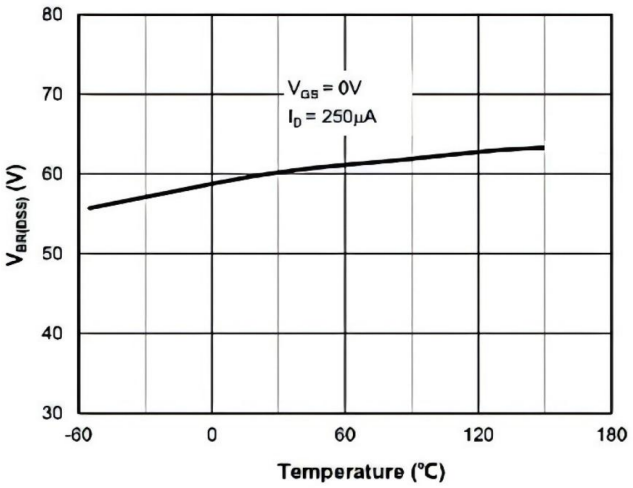


Figure 6: $V_{BR(DSS)}$ vs. Junction Temperature

Typical Characteristics

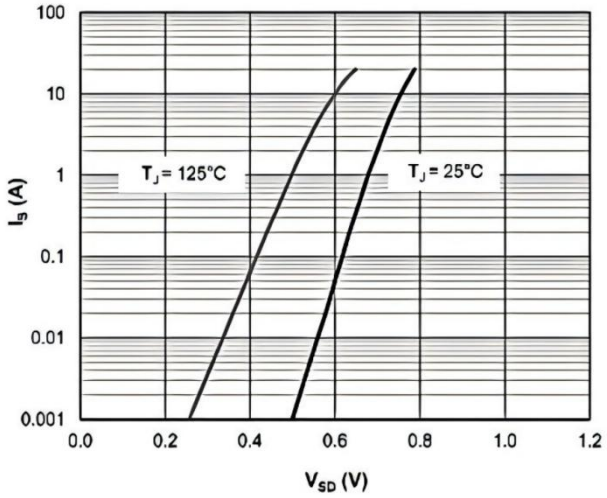


Figure 7: Body-Diode Characteristics

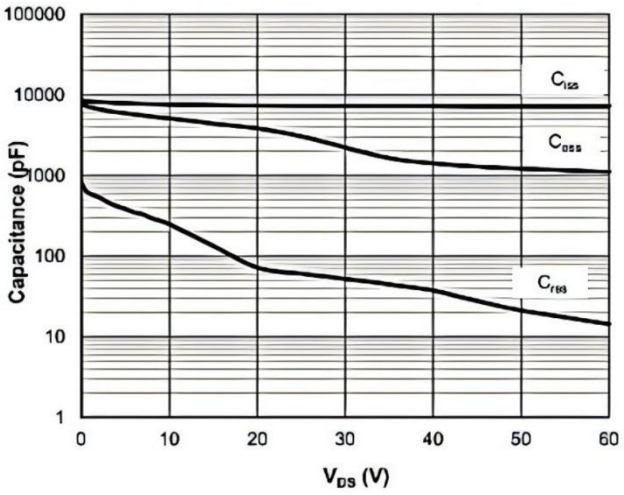


Figure 8: Capacitance Characteristics

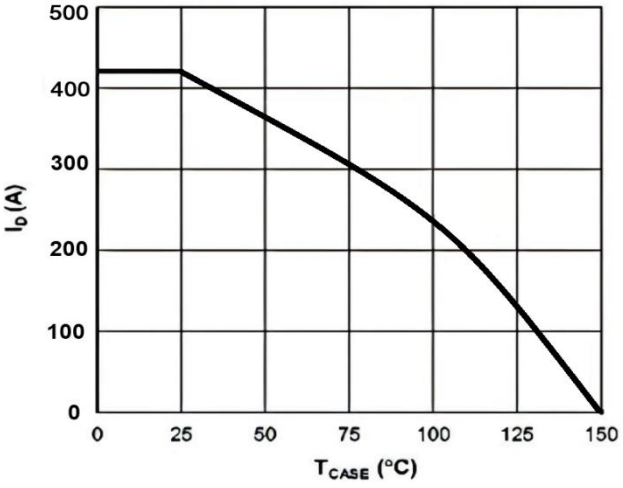


Figure 9: Current De-rating

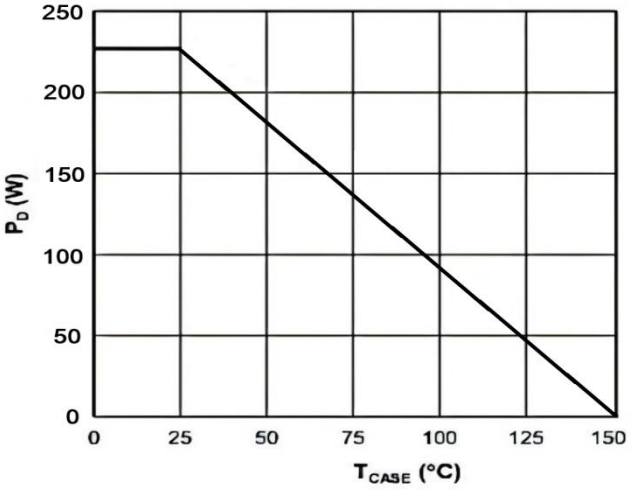


Figure 10: Power De-rating

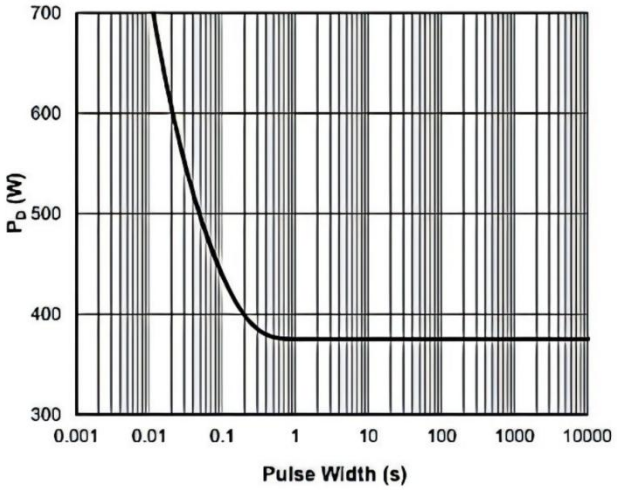


Figure 11: Single Pulse Power Rating, Junction-to-Case

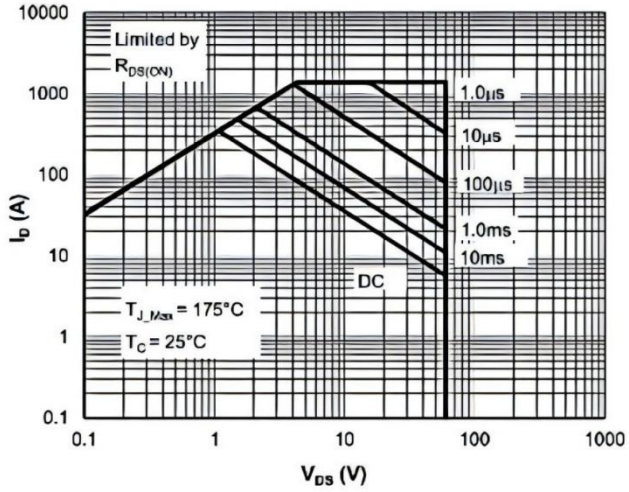


Figure 12: Maximum Safe Operating Area

Typical Characteristics

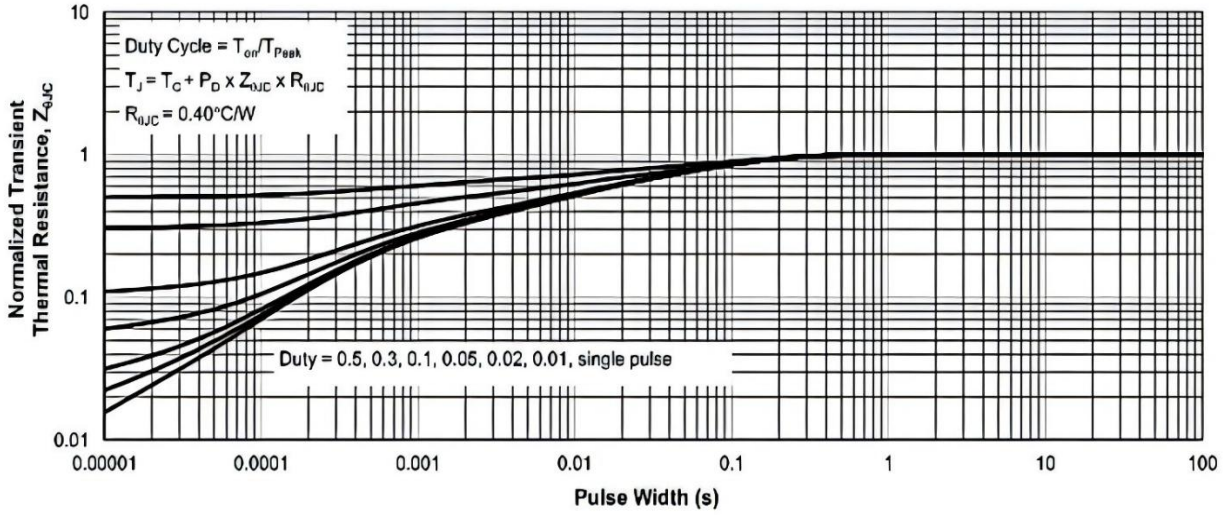
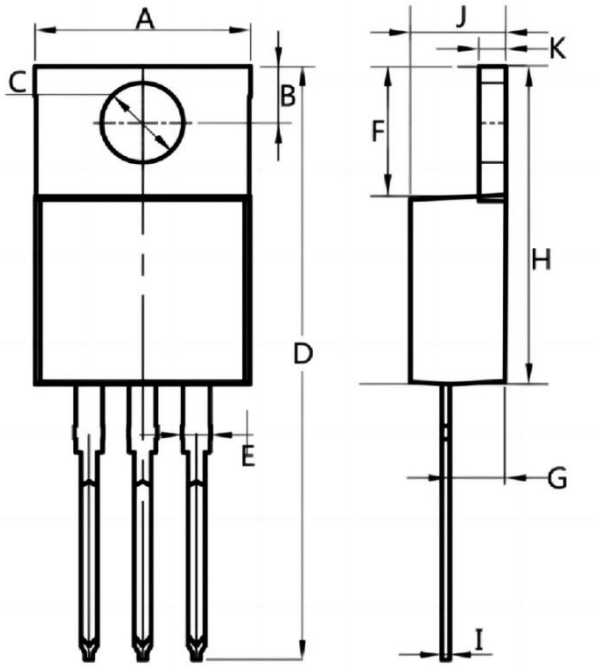


Figure 13: Normalized Maximum Transient Thermal Impedance

TO-220AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	10.000	10.400	0.394	0.409
B	2.500	3.000	0.098	0.118
C	3.500	4.000	0.138	0.157
D	28.000	30.000	1.102	1.181
E	1.100	1.500	0.043	0.059
F	6.200	6.600	0.244	0.260
G	2.900	3.300	0.114	0.130
H	15.000	16.000	0.591	0.630
I	0.350	0.450	0.014	0.018
J	4.300	4.700	0.169	0.185
K	1.200	1.400	0.047	0.055