DESCRIPTION

The AM055NS09H is available in TO-220 and TO-263-2 packages.

VDSS	RDSON	ID
90V	5mΩ	120A

FEATURE

- Fast Switching
- Low On-Resistance ($R_{DS(on)}$≦5.5 mΩ)
- Low Gate Charge
- Low Reverse Transfer Capacitances
- High Avalanche Ruggedness

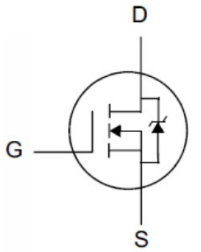
APPLICATION

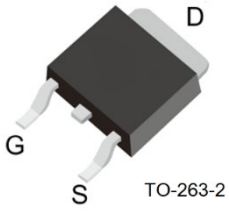
- BMS
- Motor Drivers

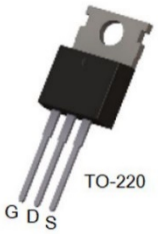
ORDERING INFORMATION

Package Type	Part Number	
TO-220 SPQ: 50pcs/Tube	T3	AM055NS09HT3U
		AM055NS09HT3VU
TO-263-2 SPQ: 800pcs/Reel	S2	AM055NS09HS2R
		AM055NS09HS2VR
Note	U:Tube R: Tape & Reel V: Halogen free Package	
AiT provides all RoHS products		

PIN DESCRIPTION







Pin#		Symbol	Function
TO-220	TO-263-2		
1	1	G	Gate
2	3	D	Drain
3	2	S	Source

ABSOLUTE MAXIMUM RATINGS

T_C=25℃, unless otherwise specified

V_{DSS}, Drain-Source Voltage		90V
I_D, Continuous Drain Current	Silicon Limited	131A
	Package Limited	120A
	T_C=100°C, Silicon Limited	83.3A
I_{DM}(1), Pulsed Drain Current		480A
V_{GS}, Gate-Source Voltage		±20V
E_{AS}(2), Avalanche Energy		306mJ
P_D, Power Dissipation		173.6W
P_D, Derating Factor above 25℃		1.39W/℃
T_J, Operating Junction Temperature Range		150℃
T_{STG}, Storage Temperature Range		-55℃~+150℃
T_L, Maximum Temperature for Soldering		260℃

Stresses above may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated in the Electrical Characteristics are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

(1) Repetitive Rating：Pulse width limited by maximum junction temperature

(2) L=0.5mH, Ias=35A, Start T_J=25℃

THERMAL CHARACTERISTICS

Parameter	Symbol	Value	Units
Thermal Resistance, Junction-Case	$R_{\theta JC}$	0.72	℃/W
Thermal Resistance, Junction-Ambient	$R_{\theta JA}$	62.5	

ELECTRICAL CHARACTERISTICS

T_C = 25°C, unless otherwise specified

Parameter	Symbol	Conditions	Min	Typ.	Max	Unit
OFF Characteristics						
Drain-Source Breakdown Voltage	V_{DSS}	V_{GS}=0V, I_D=250μA	90	99	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}= 90V, V_{GS}=0V,	-	-	1	μA
		V_{DS}= 72V, V_{GS}=0V, T_C=125℃	-	-	100	
Gate-Source Forward Current	$I_{GSS(F)}$	V_{GS} =+20V	-	-	100	nA
Gate-Source Reverse Current	$I_{GSS(R)}$	V_{GS} =-20V	-	-	-100	
ON Characteristics						
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=50A	-	5	5.5	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_{DS}=250uA	2	3	4	V
Pulse width tp≤300μs, δ≤2%						
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=45V, V_{GS}=0, f=1MHz	-	3777	-	pF
Output Capacitance	C_{oss}		-	678	-	
Reverse Transfer Capacitance	C_{rss}		-	25.7	-	
Total Gate Charge	Q_g	V_{DD}=45V, I_D=50A, V_{GS}=10V	-	69.7	-	nC
Gate-Source Charge	Q_{gs}		-	20.6	-	
Gate-Drain Charge	Q_{gd}		-	18.9	-	
Gate Resistance	R_G	V_{GS}=0, V_{DS}=0	-	2.3	-	Ω
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=45V, I_D=10A, V_{GS}=10V,R_G=3Ω, Resistive Load	-	22	-	ns
Rise Time	t_r		-	44	-	
Turn-Off Delay Time	$t_{d(off)}$		-	46	-	
Fall Time	t_f		-	23	-	
Source-Drain Diode Characteristics						
Continuous Source Current	I_S	-	-	-	120	A
Maximum Pulsed Current	I_{SM}		-	-	480	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=50A	-	-	1.2	V
Reverse Recovery Time	T_{rr}	I_S=20A, V_{GS}=0, di/dt=100A/us	-	67	-	ns
Reverse Recovery Charge	Q_{rr}		-	150	-	nC

TYPICAL PERFORMANCE CHARACTERISTICS

Fig 1. Safe Operating Area

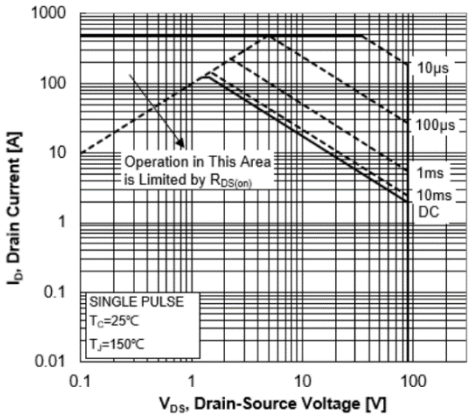


Fig 2. Maximum Power Dissipation vs. Case Temperature

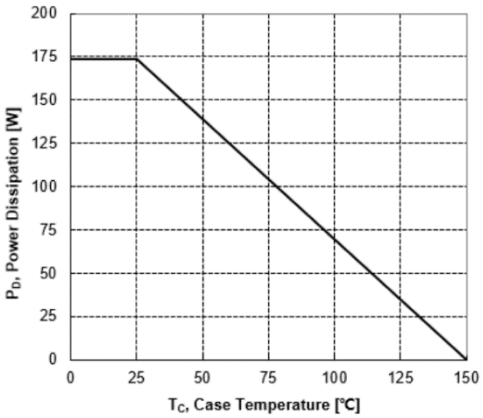


Fig 3. Maximum Continuous Drain Current vs. Case Temperature

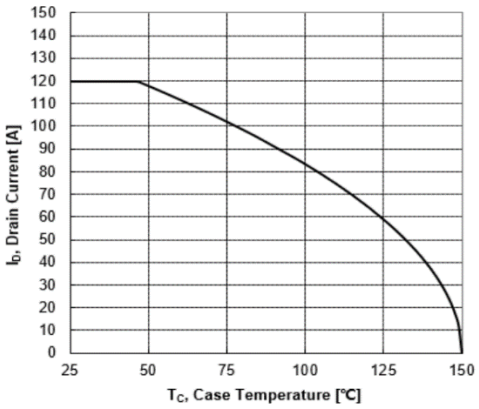


Fig 4. Typical Output Characteristics

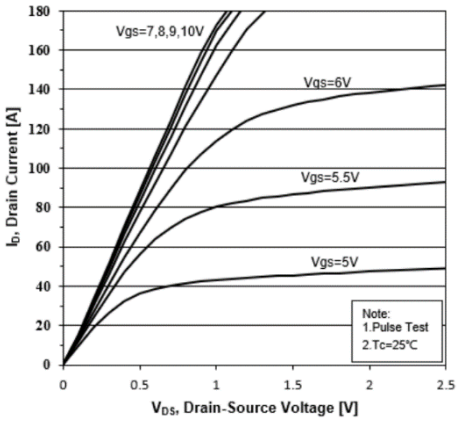


Fig 5. Transient Thermal Impedance

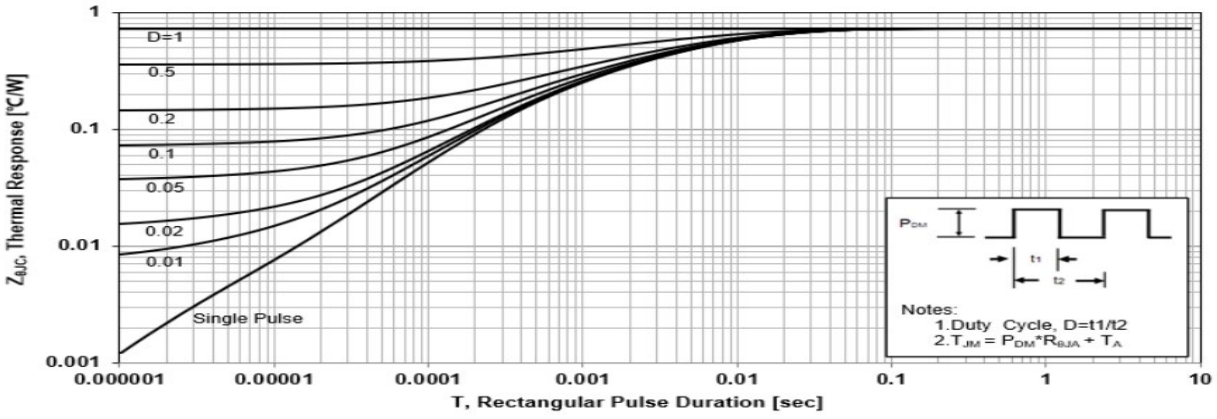


Fig 6. Typical Transfer Characteristics

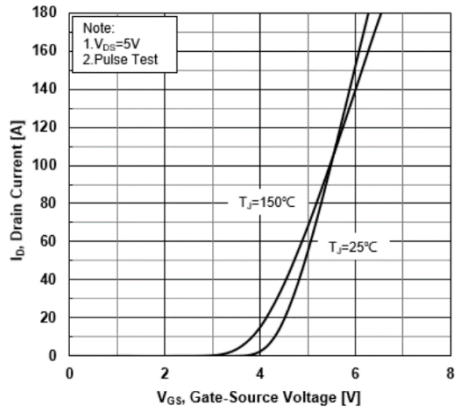


Fig 7. Source-Drain Diode Forward Characteristics

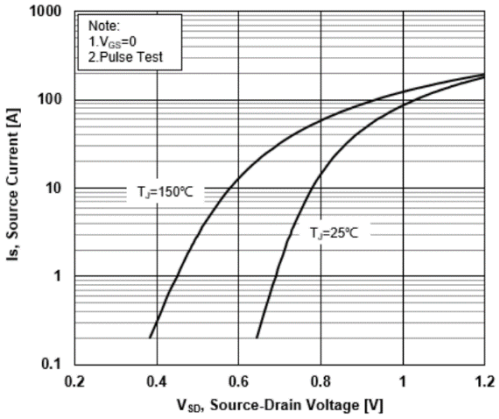


Fig 8. Drain-Source On-Resistance vs. Drain Current

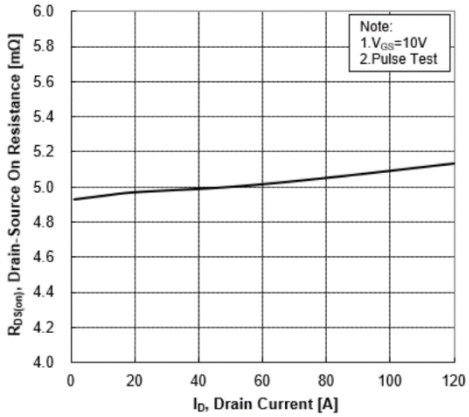


Fig 9. Normalized On-Resistance vs. Junction Temperature

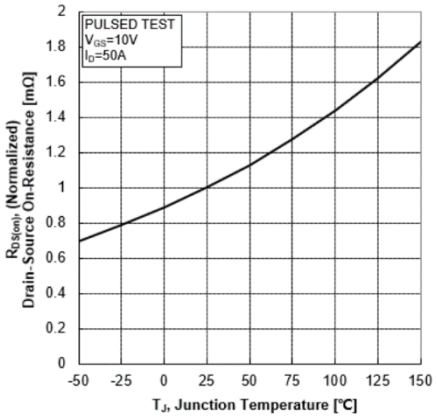


Fig 10. Normalized Threshold Voltage vs. Junction Temperature

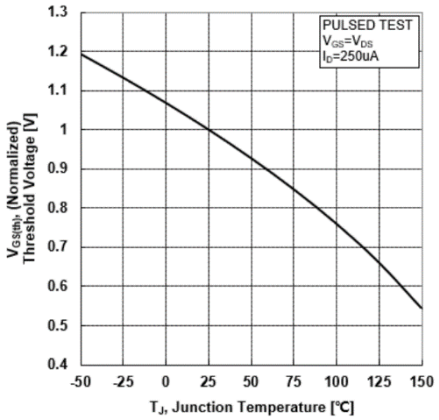


Fig 11. Normalized Breakdown Voltage vs. Junction Temperature

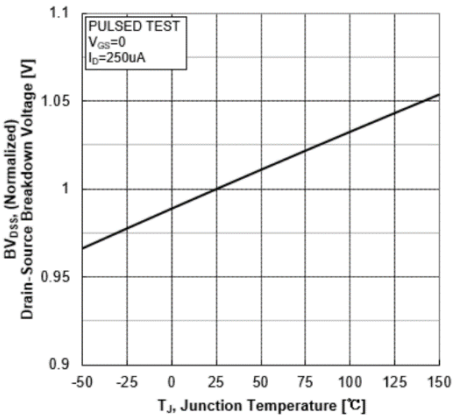


Fig 12. Capacitance Characteristics

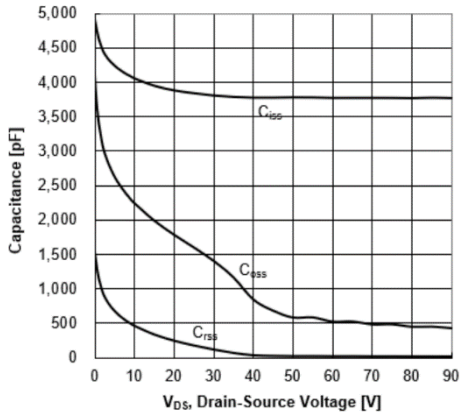


Fig 13. Typical Gate Charge vs. Gate-Source Voltage

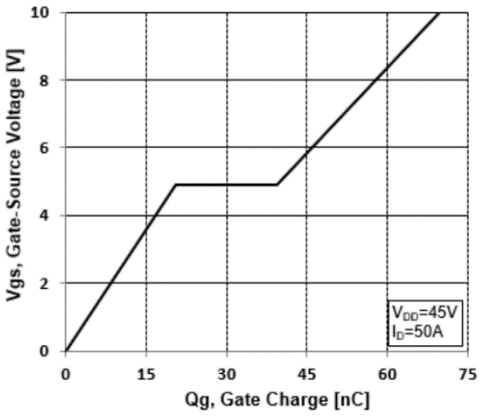


Fig 14. Resistive Switching Test Circuit

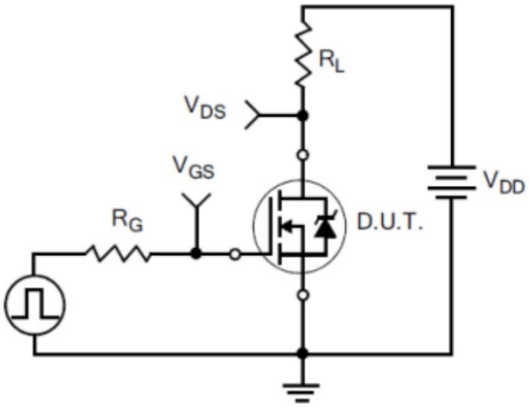


Fig 15. Resistive Switching Waveforms

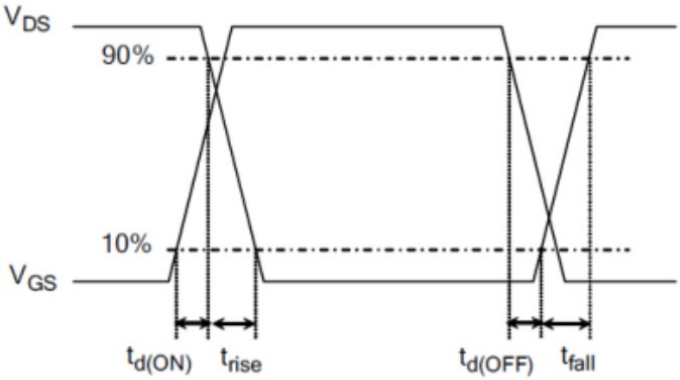


Fig 16. Gate Charge Test Circuit

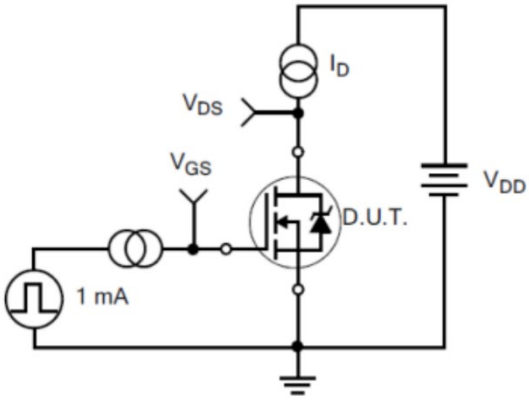


Fig 17. Gate Charge Waveforms

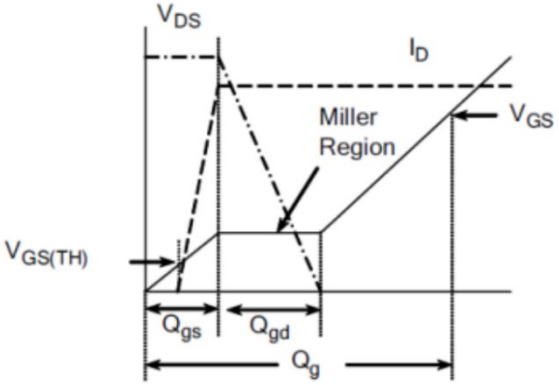


Fig 18. Diode Reverse Recovery Test Circuit

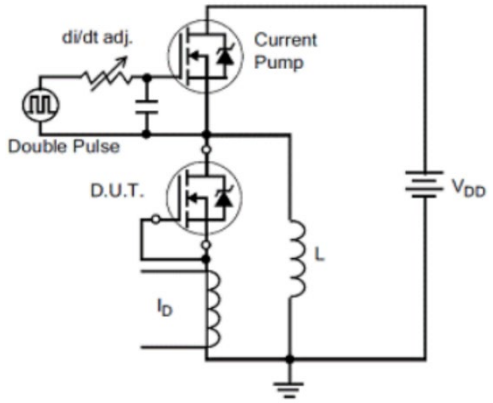


Fig 19. Diode Reverse Recovery Waveform

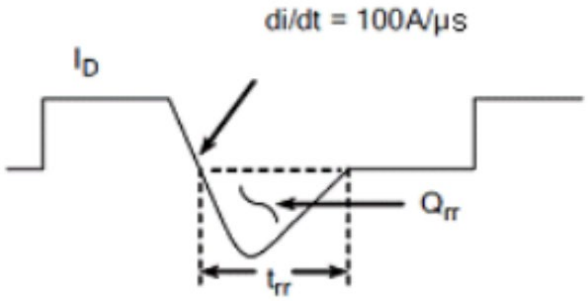


Fig 20. Unclamped Inductive Switching Test Circuit

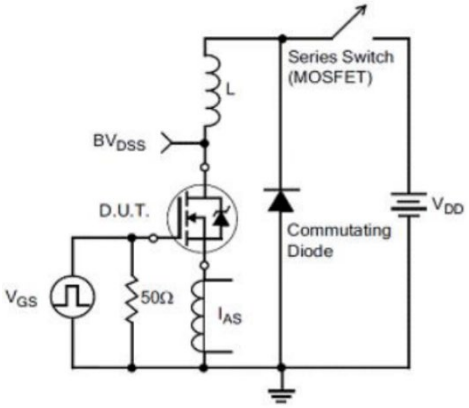
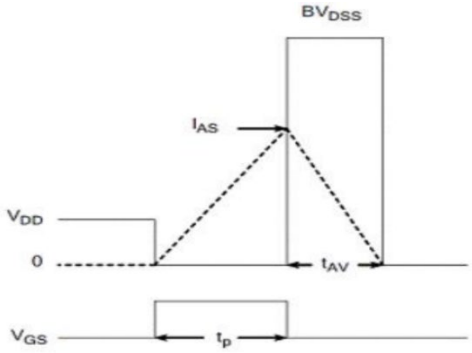
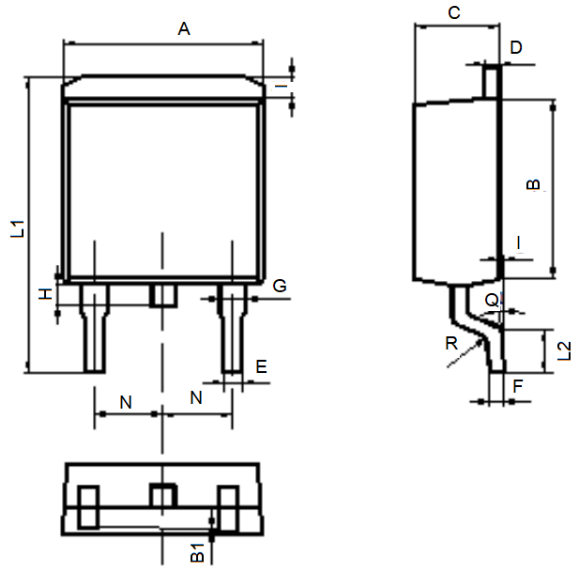


Fig 21. Unclamped Inductive Switching Waveform



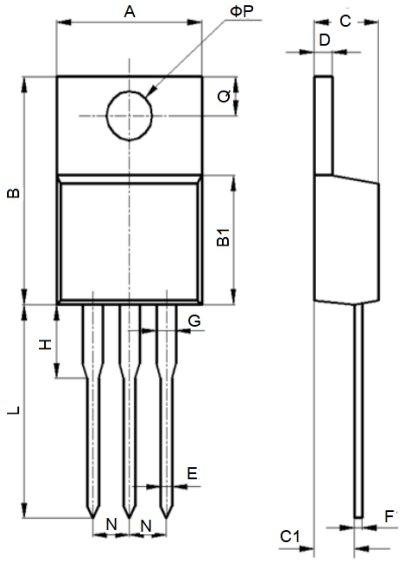
PACKAGE INFORMATION

Dimension in TO-263-2 (Unit: mm)



Symbol	Values(mm)	
	Min.	Max.
A	9.800	10.400
B	8.900	9.500
B1	0.000	0.100
C	4.400	4.800
D	1.160	1.370
E	0.700	0.950
F	0.300	0.600
G	1.070	1.470
H	1.300	1.800
K	0.950	1.370
L1	14.500	16.500
L2	1.600	2.300
I	0.000	0.200
Q	0°	8°
R	0.400	0.400
N	2.390	2.690

Dimension in TO-220 (Unit: mm)



Symbol	Values(mm)	
	Min.	Max.
A	9.600	10.600
B	15.000	16.000
B1	8.900	9.500
C	4.300	4.800
C1	2.300	3.100
D	1.200	1.400
E	0.700	0.900
F	0.300	0.600
G	1.170	1.370
H	2.700	3.800
L	12.600	14.800
N	2.340	2.740
Q	2.400	3.000
ΦP	3.500	3.900

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