DESCRIPTION

The AM03N120S-Q is available in TO-263-2 Package.

BVDSS	RDS (on) TYP.	ESD
1200V	5Ω	3A

FEATURE

- Fast Switching
- Low Crss
- 100% avalanche tested
- Improved dv/dt capability
- AEC-Q101 qualified

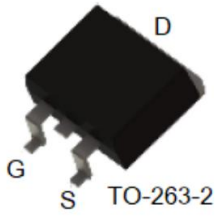
APPLICATIONS

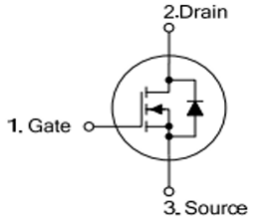
- High frequency switching mode power supply

ORDERING INFORMATION

Package Type	Part Number	
TO-263-2 AEC-Q101 SPQ: 800pcs/Reel	S	AM03N120S-Q
Note	Q: AEC-Q101 Qualified	
AiT provides all RoHS products		

PIN DESCRIPTION





Pin #	Symbol	Function
1	G	Gate
2	D	Drain
3	S	Source

ABSOLUTE MAXIMUM RATINGS

T_C = 25°C, unless otherwise specified.

V_{DSS}, Drain-to-Source Voltage		1200V
V_{GS}, Gate-to-Source Voltage		±30V
I_D, Continuous Drain Current		3A
I_{DM}, Pulsed Drain Current (1)		1.8A
E_{AS}, Single Pulsed Avalanche Energy (2)		45mJ
P_D, Power Dissipation	T_C = 25°C	125W
	Derating Factor above 25°C	1W/℃
$R_{\theta JC}$, Junction-to-Case		1°C/W
$R_{\theta JA}$, Junction-to-Ambient		62.5°C/W
T_{STG}, Storage Temperature Range		-55°C ~ +150°C
T_J, Junction Temperature Range		150°C
T_L, Maximum Temperature for Soldering		300°C

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.

ELECTRICAL CHARACTERISTICS

T_C = 25°C, unless otherwise specified.

Parameter	Symbol	Conditions	Min	Typ.	Max	Unit
Off Characteristics						
Drain to Source Breakdown Voltage	V_{DSS}	V_{GS}= 0V, I_D = 250μA	1200	-	-	V
BV_{DSS} Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	I_D = 250μA, Reference25℃	-	1.10	-	V/°C
Drain to Source Leakage Current	I_{DSS}	V_{DS}=250V, V_{GS}=0V, T_J =25℃	-	-	10	μA
		V_{DS}=200V, V_{GS}=0V, T_J =125℃	-	-	100	
Gate to Source Forward Leakage	$I_{GSS(F)}$	V_{GS}= 30V, V_{DS}=0V	-	-	100	nA
Gate to Source Reverse Leakage	$I_{GSS(R)}$	V_{GS}= -30V, V_{DS}=0V	-	-	-100	nA
On Characteristics						
Gate Threshold Voltage*	$V_{GS(TH)}$	V_{DS}= V_{GS}, I_D = 250μA	3	-	5	V
Drain-to-Source On-Resistance*	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 1.5A	-	5	6	Ω
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}= 25V, V_{GS}=0V, f=150MHz	-	951	-	pF
Output Capacitance	C_{oss}		-	73	-	
Reverse Transfer Capacitance	C_{rss}		-	4	-	
Gate Series Resistance	R_g	f=1.0MHz	-	2.70	-	Ω
Switching Characteristics						
Total Gate Charge	Q_g	V_{DD} = 960V , I_D =3A V_{GS}=10V	-	27	-	nC
Gate-Source Charge	Q_{gs}		-	8	-	
Gate-Drain(“Miller”) Charge	Q_{gd}		-	12	-	
Turn-On Delay Time	$t_{d(on)}$	V_{DD}=600V, I_D = 3A, R_g=10Ω, V_{GS}=10V	-	28	-	ns
Turn-On Rise Time	t_r		-	75	-	
Turn-Off Delay Time	$t_{d(off)}$		-	20	-	
Turn-Off Fall Time	t_f		-	203	-	
Source-Drain Diode Characteristics						
Continuous Source Current (Body Diode)	I_S	T_C = 25°C	-	-	3	A
Maximum Pulsed Current (Body Diode)	I_{SM}		-	-	12	A
Diode Forward Voltage*	V_{SD}	V_{GS}=0V, I_S= 7.4A	-	-	1.2	V
Reverse Recovery Time	T_{rr}	I_S=9.4A, T_j = 25°C dIF/dt=100A/us, V_{GS}=0V	-	500	-	ns
Reverse Recovery Charge	Q_{rr}		-	2300	-	nC

*Pulse width tp≤300μs, δ≤2%

TYPICAL PERFORMANCE CHARACTERISTICS

Fig 1. Safe Operating Area

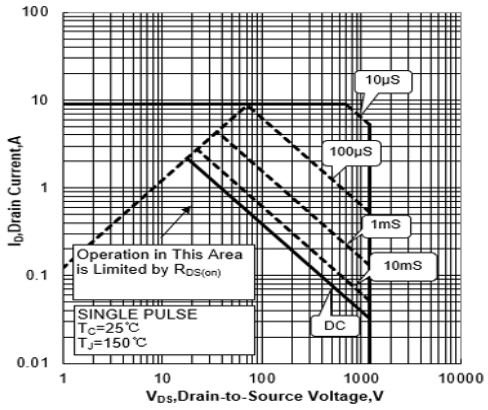


Fig 2. Power Dissipation

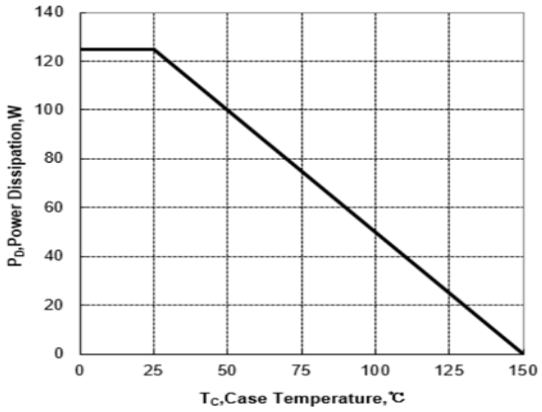
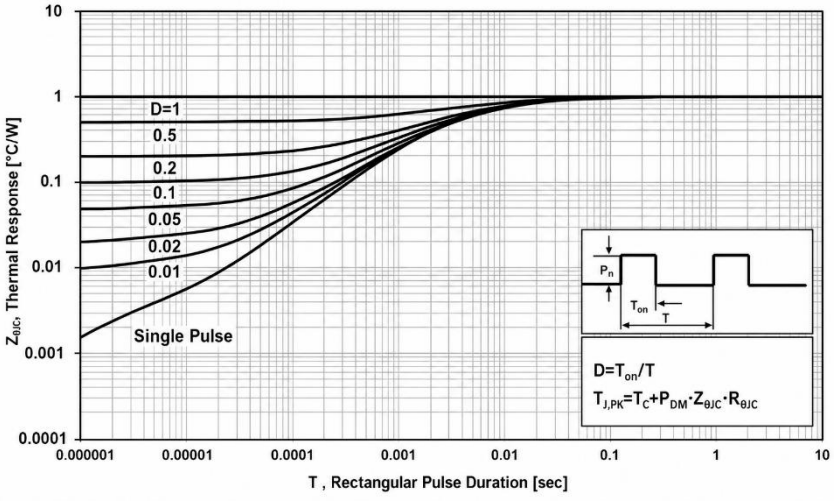


Fig 3. Max Thermal Impendence



a

Fig 4. Typical Output Characteristics

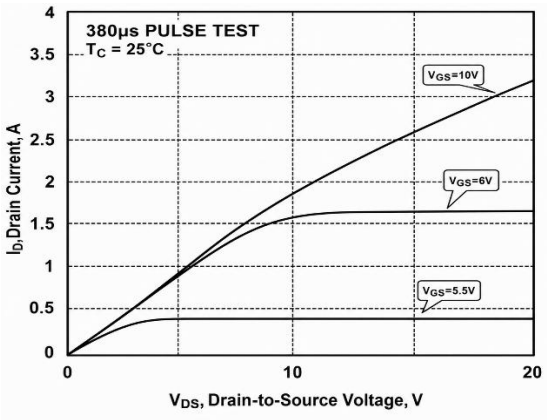


Fig 5. Typical Transfer Characteristics

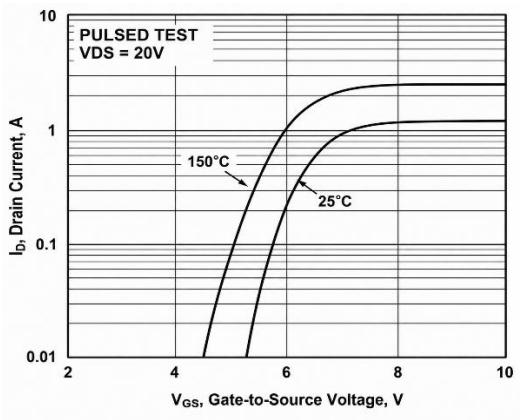


Fig 6. Typical Drain to Source ON Resistance vs. Drain Current

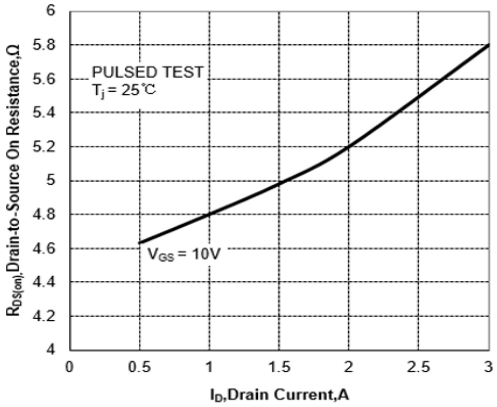


Fig 7. Typical Drain to Source on Resistance vs. Junction Temperature

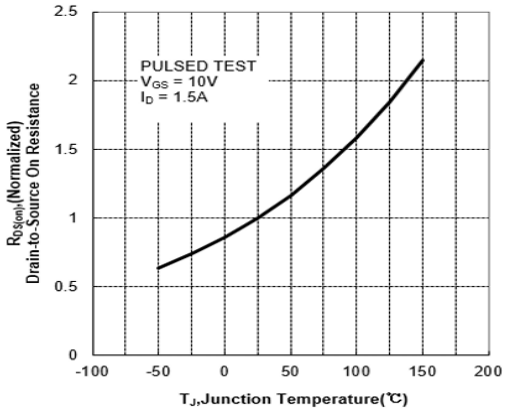


Fig 8. Typical Threshold Voltage vs. Junction Temperature

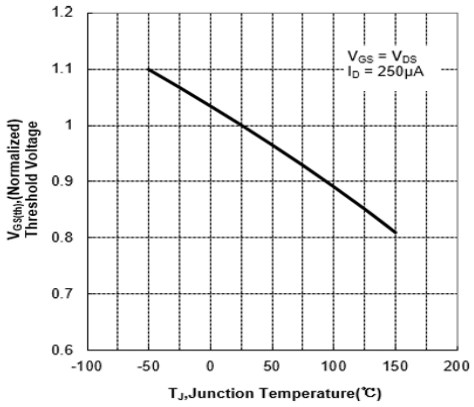


Fig 9. Typical Breakdown Voltage vs. Junction Temperature

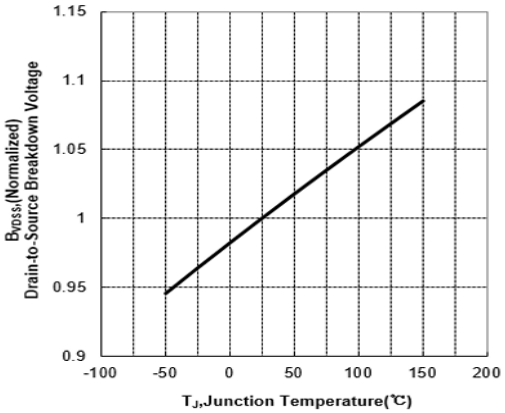


Fig 10. Typical Capacitance vs. Drain to Source Voltage

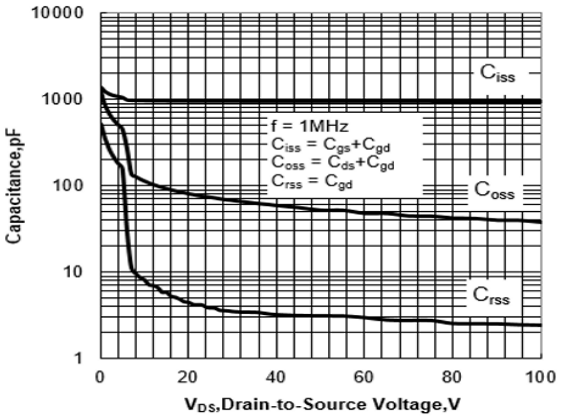


Fig 11. Typical Gate Charge vs Gate to Source Voltage

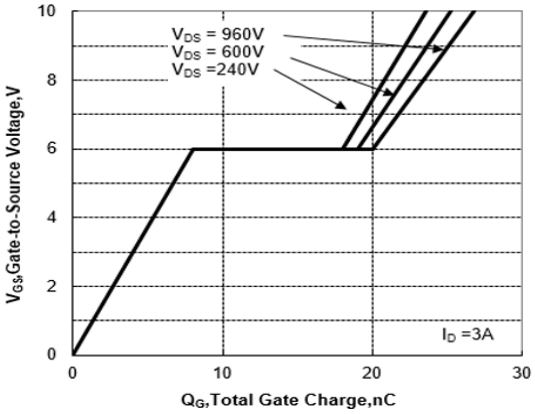


Fig 12. Gate Charge Test Circuit

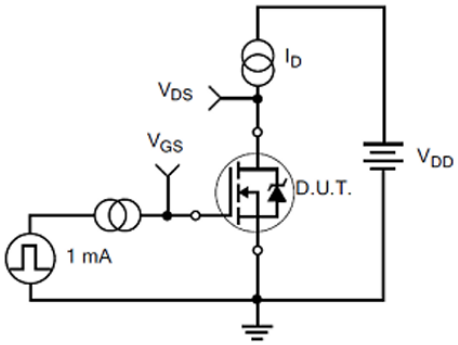


Fig 13. Gate Charge Waveforms

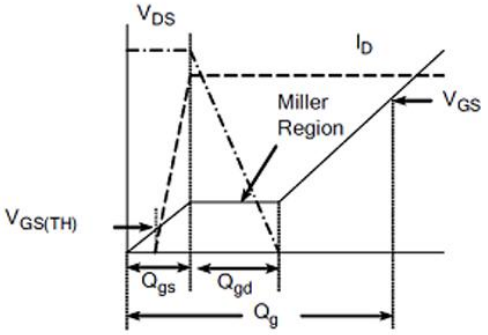


Fig 14. Resistive Switching Test Circuit

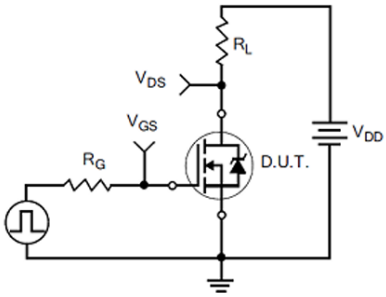


Fig 15. Resistive Switching Waveforms

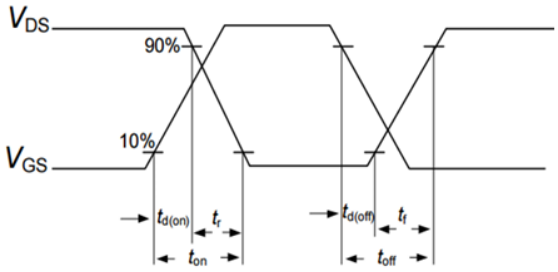


Fig 16. Diode Reverse Recovery Test Circuit

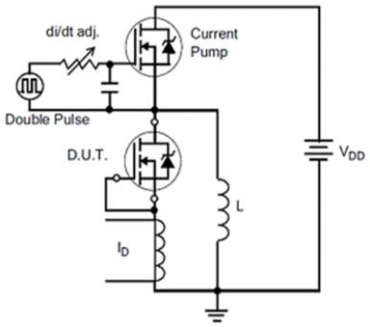


Fig 17. Diode Reverse Recovery Waveform

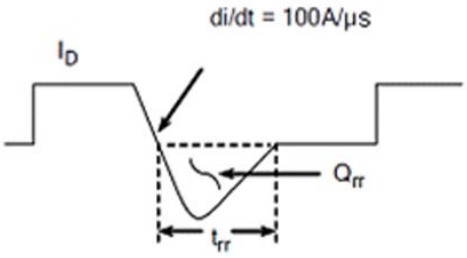


Fig 18. Unclamped Inductive Switching Test Circuit

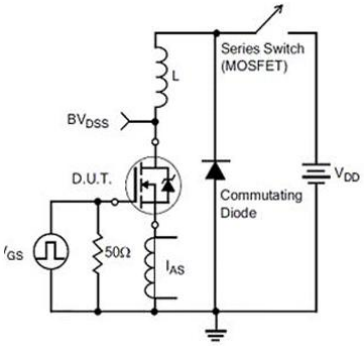
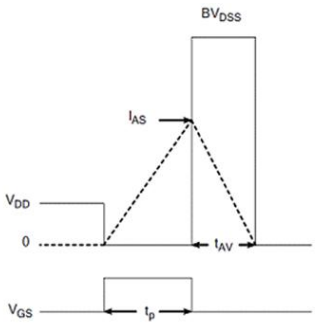
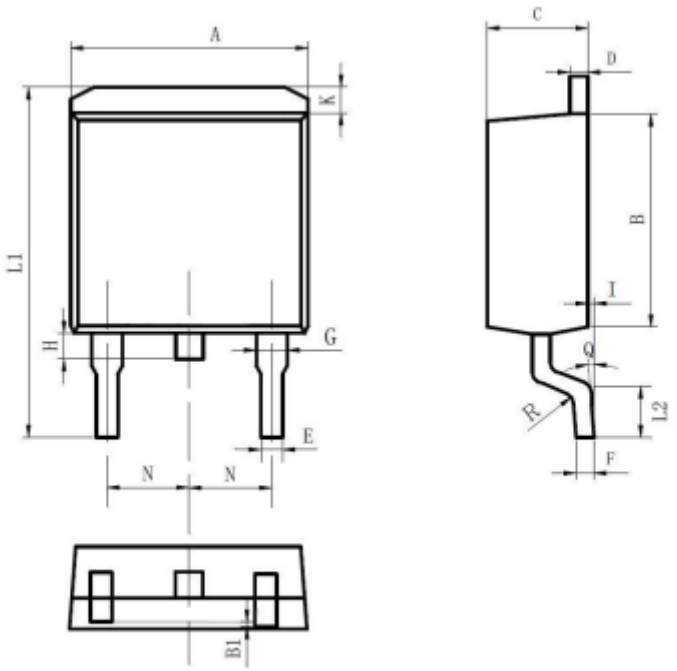


Fig 19. Unclamped Inductive Switching Waveform



PACKAGE INFORMATION

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



Symbol	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	0.4°	
N	2.390	2.690

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