

**DESCRIPTION**

The AM094NS15S is available in TO-263 Package.

BVDSS	RDSON	ID
150V	9.4mΩ	90A

APPLICATION

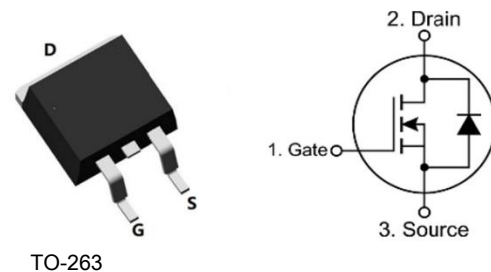
- PWM Application
- Hard switched and high frequency circuits
- Power Management

ORDERING INFORMATION

Package Type	Part Number	
TO-263 SPQ: 800pcs/Reel	S	AM094NS15SU
Note	R: Tape & Reel	
AiT provides all RoHS products		

FEATURE

- Fast Switching
- Low Gate Charge and $R_{ds(on)}$
- $R_{DS(ON)}$, Typ = 9.4mΩ @ $V_{GS}=10V$
- Advanced Split Gate Trench Technology
- 100% Single Pulse avalanche energy Test

PIN DESCRIPTION

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

ABSOLUTE MAXIMUM RATINGS

$T_A = 25^\circ\text{C}$, unless otherwise specified.

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DSS}	150	V
Gate-to-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	90	A
Continuous Drain Current $T_C = 100^\circ\text{C}$		60	A
Pulsed Drain Current ⁽¹⁾	I_{DM}	360	A
Single Pulse Avalanche Energy ⁽²⁾	E_{AS}	462	mJ
Power Dissipation	P_D	180	W
Power Dissipation $T_C = 100^\circ\text{C}$		72	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ\text{C}$
Thermal Resistance Junction to Case	$R_{\theta JC}$	0.69	$^\circ\text{C/W}$

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_A = 25°C, unless otherwise specified.

Parameter	Symbol	Conditions	Min	Typ.	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	150	160	-	V
Drain to Source Leakage Current	I _{DSS}	V _{DS} =120V, V _{GS} =0V	-	-	1	μA
Gate to Source Leakage Current	I _{GSS}	V _{GS} = ±20V	-	-	±100	nA
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} = V _{GS} , I _D = 250μA	2.8	3.2	3.8	V
Drain-to-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =20A	-	9.4	11.5	mΩ
Gate Resistance	R _g	V _{DS} =75V, f = 1.0MHz	-	1.5	-	Ω
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = 75V f = 1.0MHz	-	2206	-	pF
Output Capacitance	C _{oss}		-	381	-	
Reverse Transfer Capacitance	C _{rss}		-	9.0	-	
Total Gate Charge	Q _g	I _D =30A, V _{DS} =75V V _{GS} = 10V	-	34	-	nC
Gate to Source Charge	Q _{gs}		-	12.8	-	
Gate to Drain Charge	Q _{gd}		-	7.0	-	
Gate Plateau Voltage	V _{plateau}		-	4.5	-	
Switching Characteristics						
Turn-on Delay Time	t _{d(on)}	V _{GS} =10V, V _{DS} =50V, I _D =30A, R _G =6Ω	-	13	-	ns
Rise Time	t _r		-	25	-	
Turn-Off Delay Time	t _{d(off)}		-	31	-	
Fall Time	t _f		-	25	-	
Drain-Source Body Diode Characteristics						
Maximum Pulsed Current (Body Diode)	I _{SM}		-	-	90	A
Diode Forward Voltage	V _{SD}	I _S =1A, V _{GS} =0V	-	-	1.2	V
Reverse Recovery Time	T _{rr}	I _S =20A, di/dt=100A/us	-	76	-	ns
Reverse Recovery Charge	Q _{rr}		-	175	-	nC

Note:

1. The test condition is V_{DD}=50V, V_{GS}=10V, L=0.5mH, R_G=25Ω



TYPICAL PERFORMANCE CHARACTERISTICS

Fig1. Typical Output Characteristics

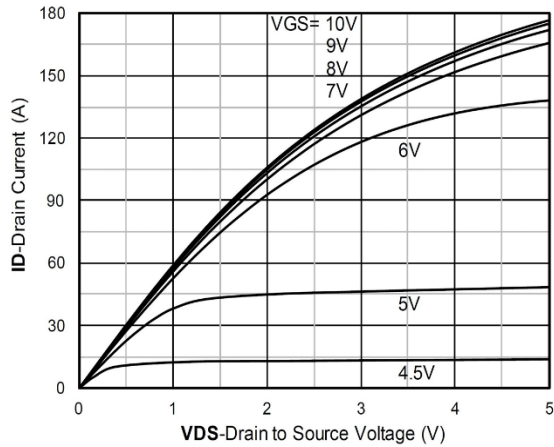


Fig 2. Typical Transfer Characteristics

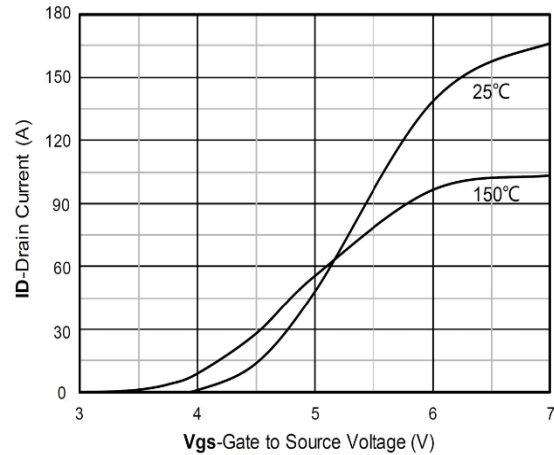


Fig 3. Typical Capacitance Characteristics

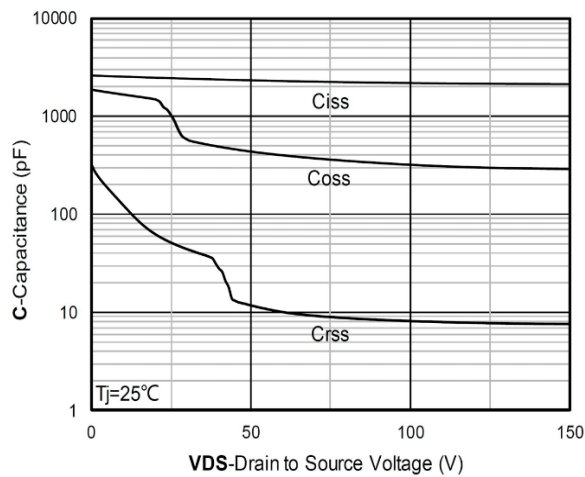


Fig 4. Typical Gate Charge

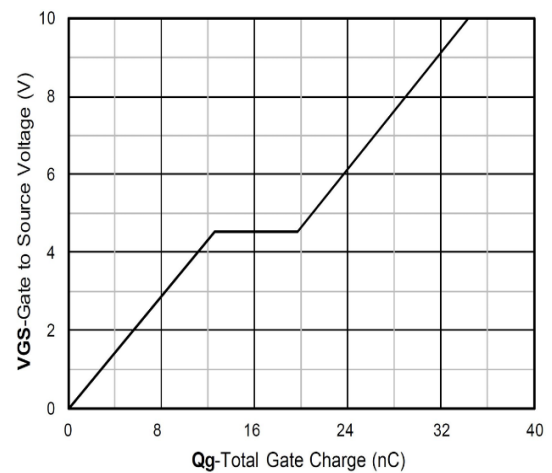


Fig 5. Current Dissipation

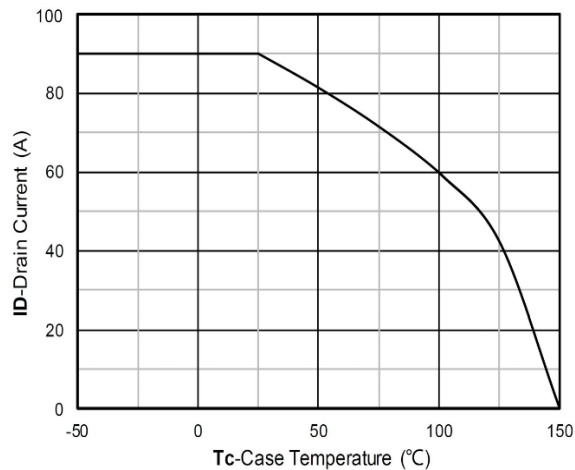


Fig 6. Power Dissipation

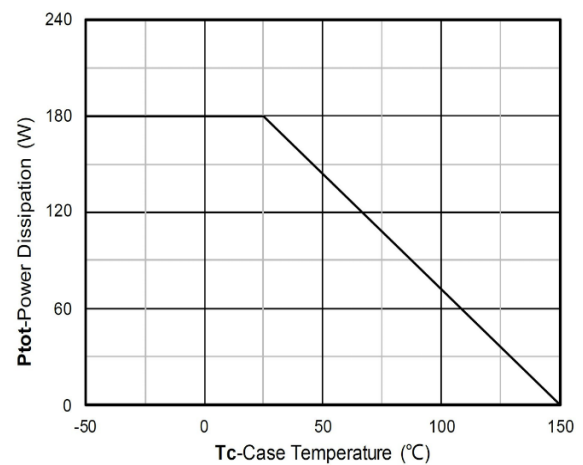




Fig 7. $R_{DS(on)}$ vs. Drain Current

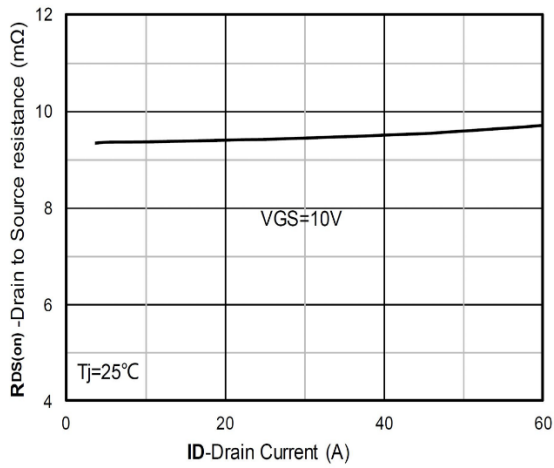


Fig 8. Forward characteristics of reverse diode

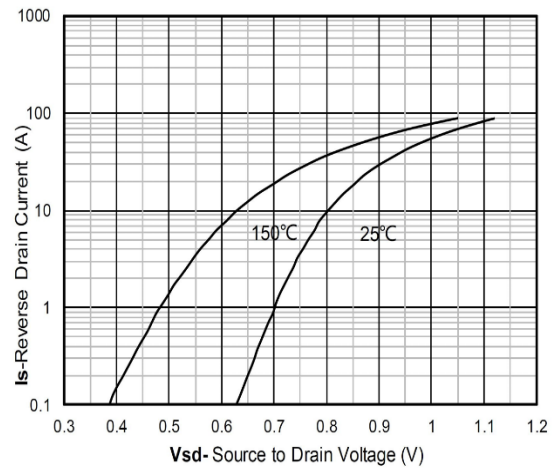


Fig 9. Normalized breakdown voltage

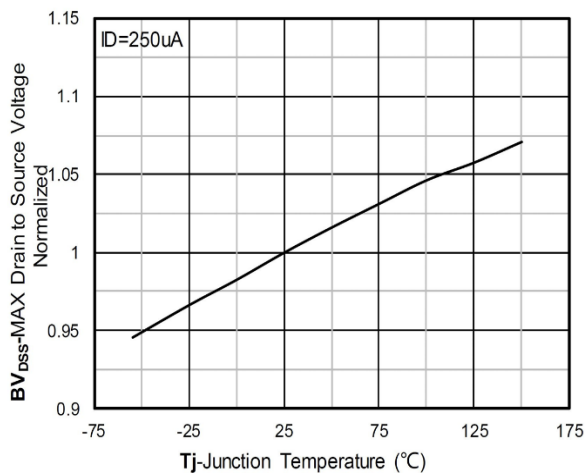


Fig 10. Normalized Threshold voltage

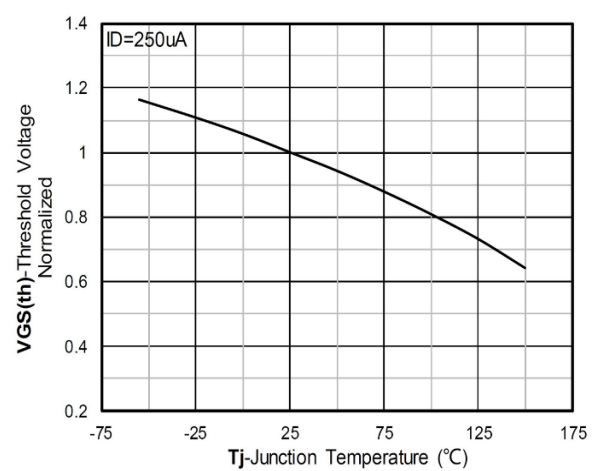


Fig 11. Safe Operation Area

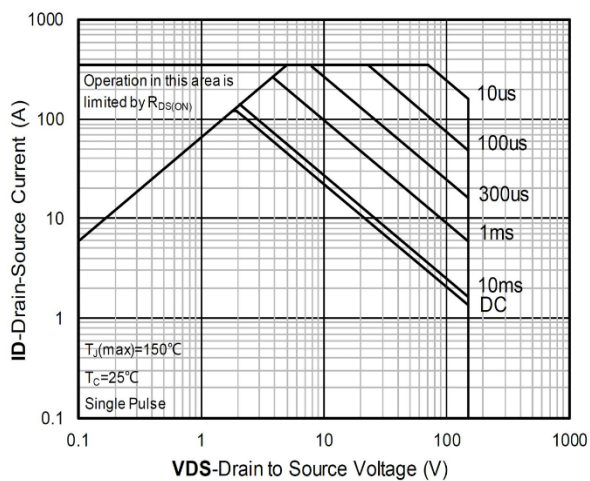
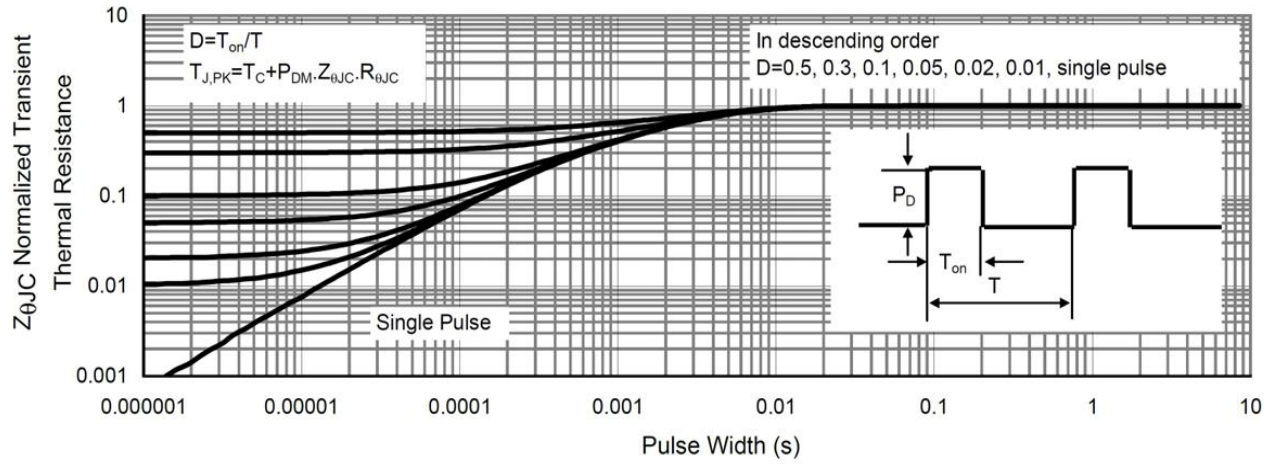




Fig 12. Normalized Maximum Transient Thermal Impedance





TEST CIRCUIT AND WAVEFORM

Fig 13. Gate Charge Test Circuit & Waveform

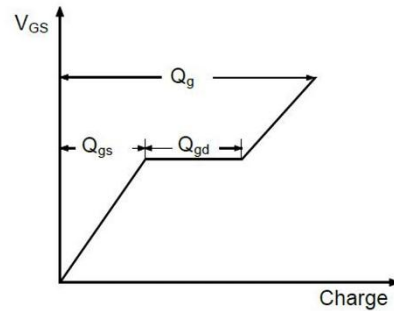
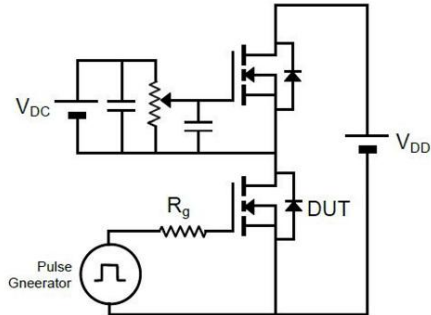


Fig 14. Resistive Switching Test Circuit & Waveform

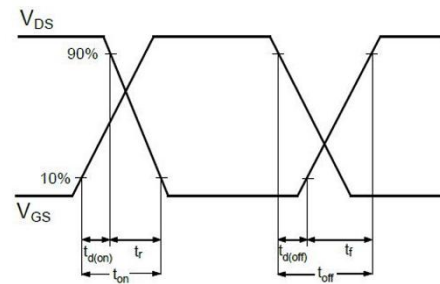
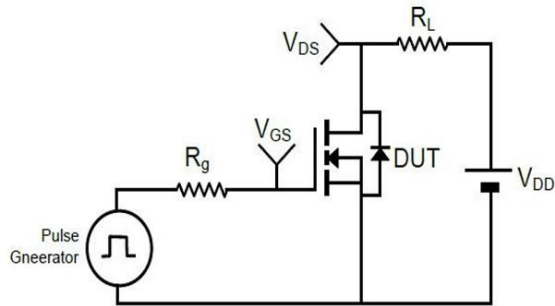


Fig 15. Un-clamped Inductive Load Switching Test Circuit & Waveform

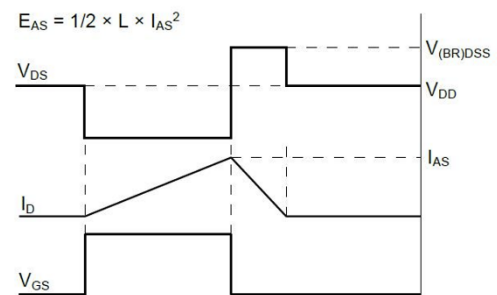
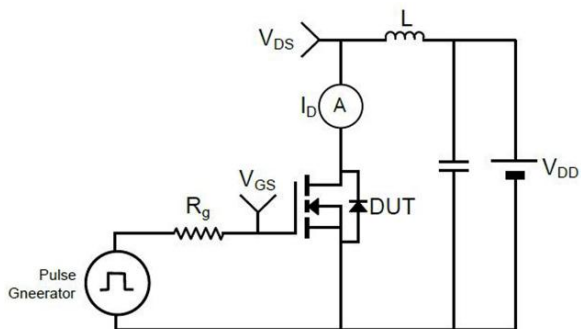
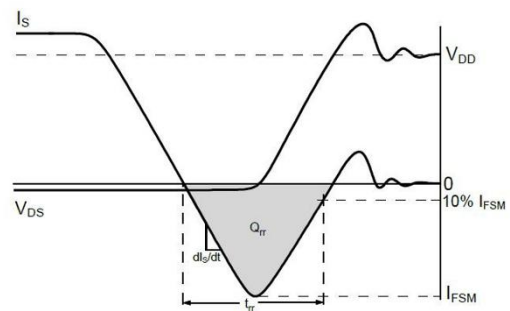
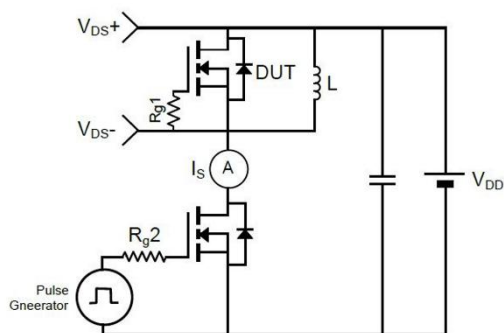


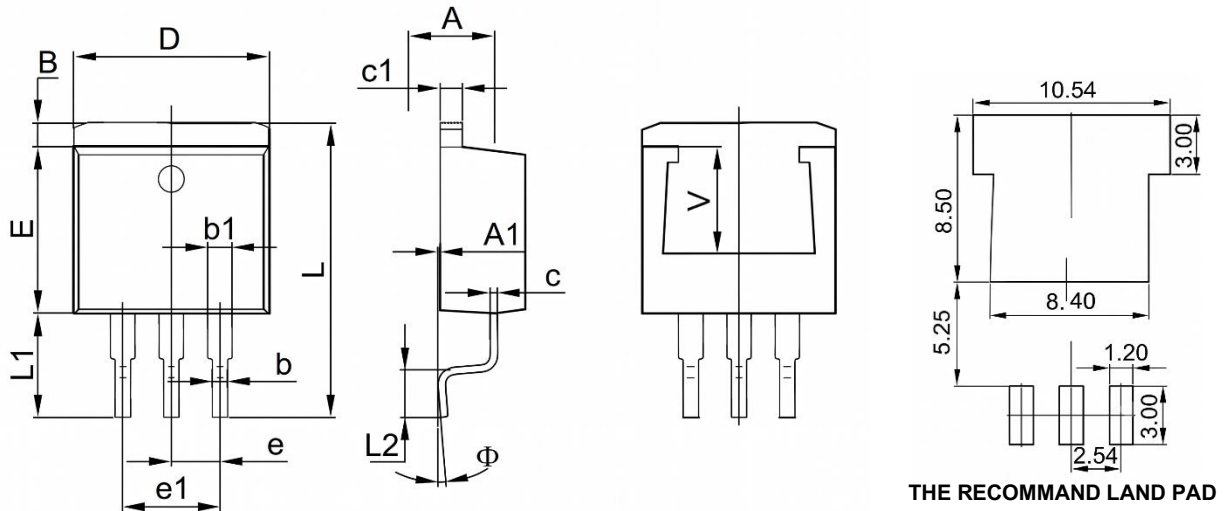
Fig 16. Diode Reverse Recovery Test Circuit & Waveforms





PACKAGE INFORMATION

Dimension in TO-263 (Unit: mm)



Symbol	Millimeters	
	Min	Max
A	4.470	4.670
A1	0.000	0.150
B	1.120	1.420
b	0.710	0.910
b1	1.170	1.370
c	0.310	0.530
c1	1.170	1.370
D	10.010	10.310
E	8.500	8.900
e	2.540 TYP.	
e1	4.980	5.180
L	14.940	15.500
L1	4.950	5.450
L2	2.340	2.740
Φ	0°	8°
V	5.600 REF.	

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