

**DESCRIPTION**

The AM087NS20HT is available in TO-220 Package.

BVDSS	RDSON	ID
200V	8.7mΩ	120A

APPLICATION

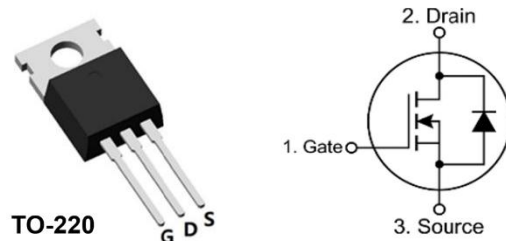
- High Speed Power switching
- DC-DC Converter
- Power Management

ORDERING INFORMATION

Package Type	Part Number	
TO-220	T	AM087NS20HT
Note	SPQ: 50pcs/Tube	
AiT provides all RoHS products		

FEATURE

- Fast Switching
- Low Gate Charge and $R_{ds(on)}$
- $R_{DS(ON)}$, Typ = 8.7mΩ @ $V_{GS}=10V$
- 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}	200	V
Gate-to-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	120	A
Continuous Drain Current $T_C = 100^\circ\text{C}$		80	A
Pulsed Drain Current	I_{DM}	480	A
Single Pulse Avalanche Energy ¹	E_{AS}	1156	mJ
Power Dissipation	P_D	280	W
Power Dissipation $T_C = 100^\circ\text{C}$		112	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ\text{C}$
Thermal Resistance Junction to Case	$R_{\theta JC}$	0.45	$^\circ\text{C/W}$

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	200	-	-	V
Drain to Source Leakage Current	I _{DSS}	V _{DS} =160V, 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	2.6	3.0	3.4	V
Drain-to-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =20A	-	8.7	11	mΩ
Gate Resistance	R _G	V _{DS} =100V, f = 1.0MHz	-	3.5	-	Ω
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =100V, V _{GS} = 0V, f = 1.0MHz	-	5300	-	pF
Output Capacitance	C _{oss}		-	410	-	
Reverse Transfer Capacitance	C _{rss}		-	27	-	
Total Gate Charge	Q _g	V _{DS} =100V, I _D =20A, V _{GS} = 10V	-	78	-	nC
Gate to Source Charge	Q _{gs}		-	28	-	
Gate to Drain Charge	Q _{gd}		-	17	-	
Gate Plateau Voltage	V _{plateau}		-	5.0	-	
Switching Characteristics						
Turn-on Delay Time	t _{d(on)}	V _{GS} =10V, V _{DD} =100V, I _D =20A, R _G =6.0Ω	-	23	-	ns
Rise Time	t _r		-	48	-	
Turn-Off Delay Time	t _{d(off)}		-	63	-	
Fall Time	t _f		-	19	-	
Drain-Source Body Diode Characteristics						
Maximum Pulsed Current (Body Diode)	I _{SM}		-	-	120	A
Diode Forward Voltage	V _{SD}	I _S =1A, V _{GS} =0V	-	-	1.2	V
Reverse Recovery Time	T _{rr}	I _S =50A, di/dt=100A/us	-	128	-	ns
Reverse Recovery Charge	Q _{rr}		-	643	-	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

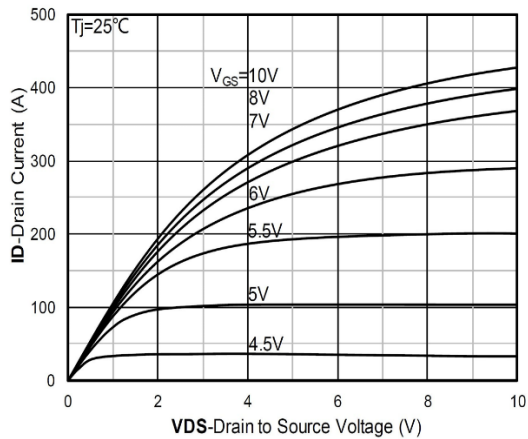


Fig 2. Typical Transfer Characteristics

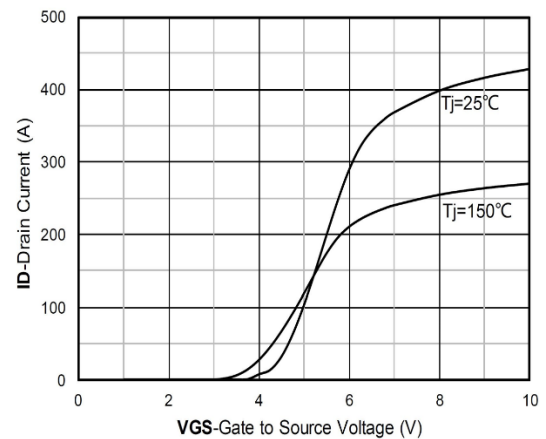


Fig 3. Typical Capacitance Characteristics

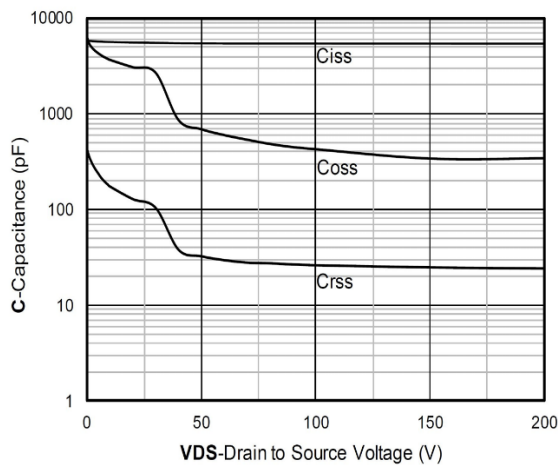


Fig 4. VGS vs. Gate Charge

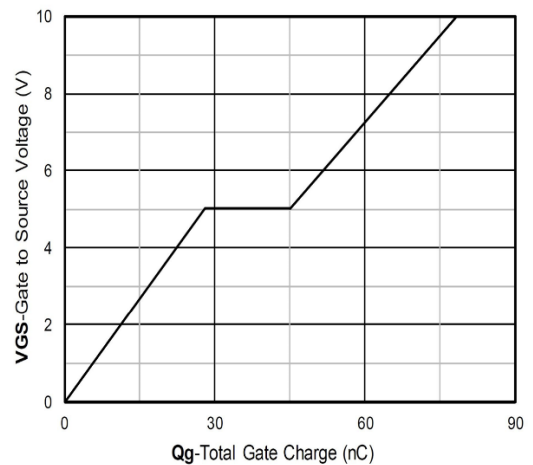


Fig 5. Current dissipation

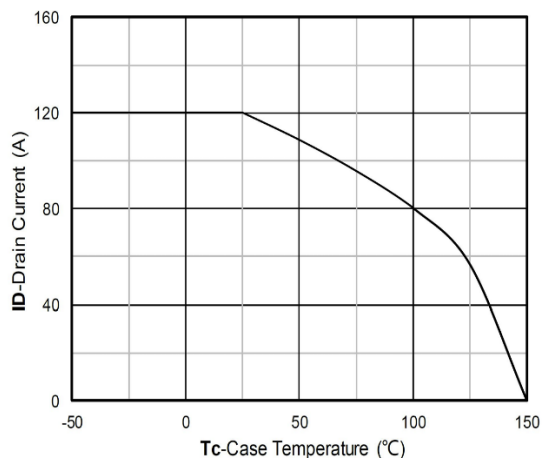


Fig 6. Power dissipation

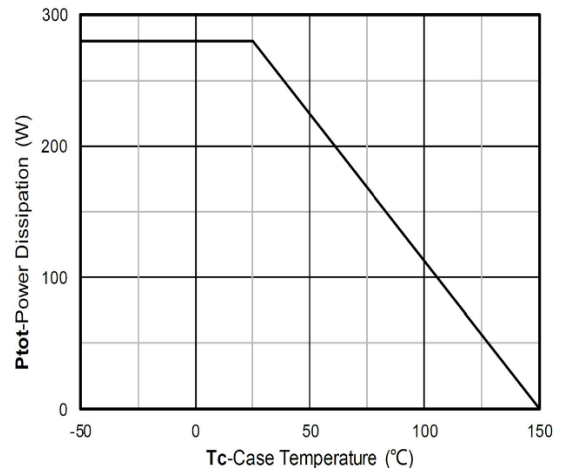




Fig 7. $R_{DS(on)}$ vs. Drain Current

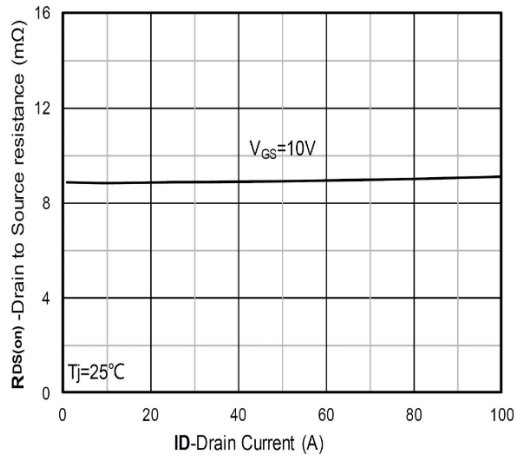


Fig 8. Forward characteristics of reverse diode

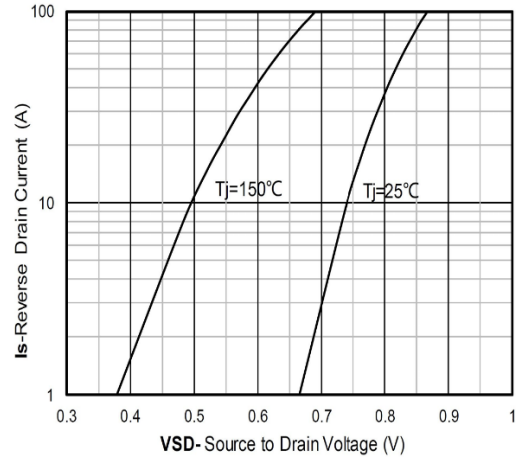


Fig 9. Normalized breakdown voltage

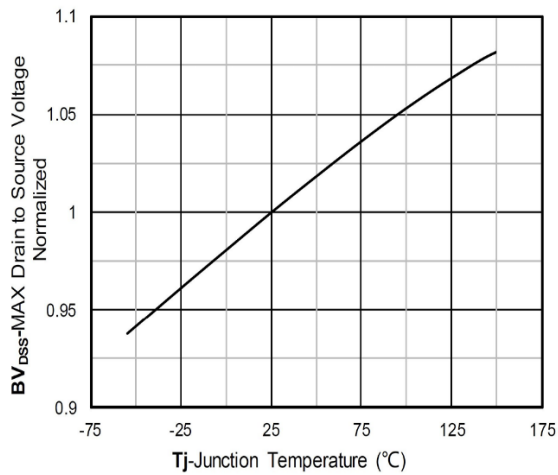


Fig 10. Normalized Threshold voltage

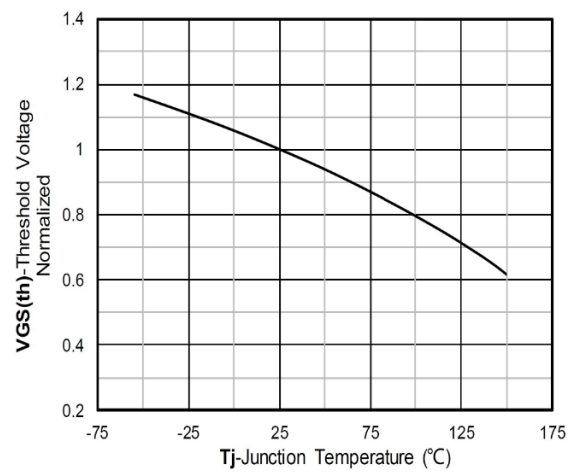


Fig 11. Safe Operation Area

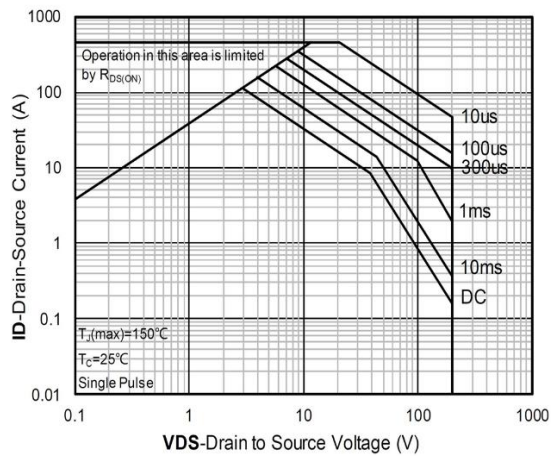
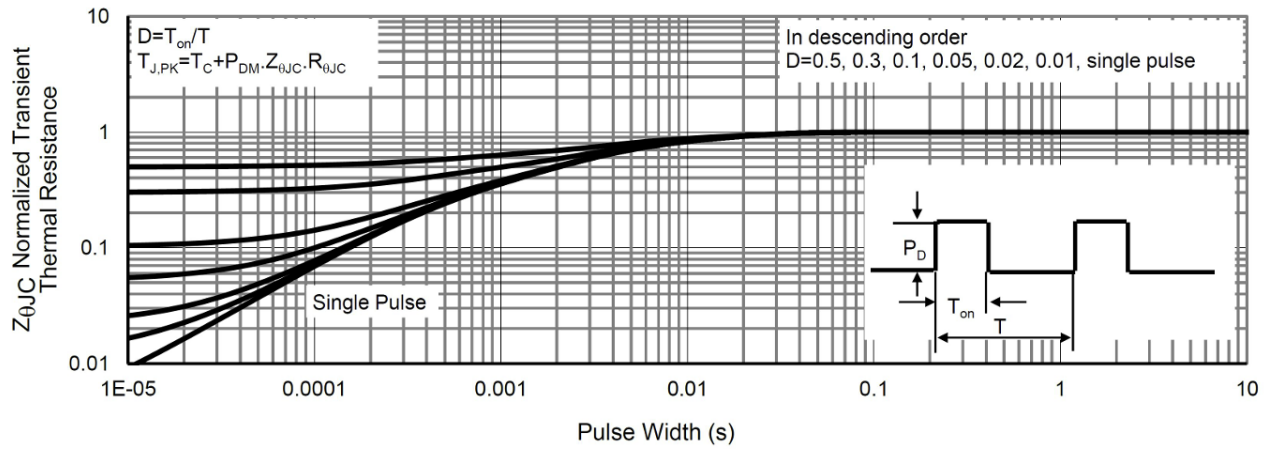




Fig 11. Normalized Maximum Transient Thermal Impedance





TEST CIRCUIT AND WAVEFORM

Fig 12. Gate Charge Test Circuit & Waveform

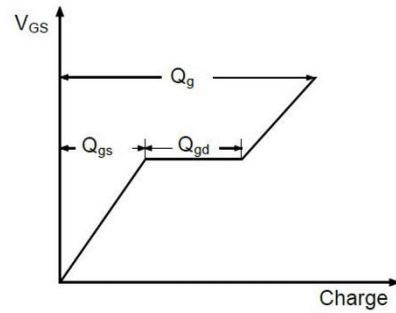
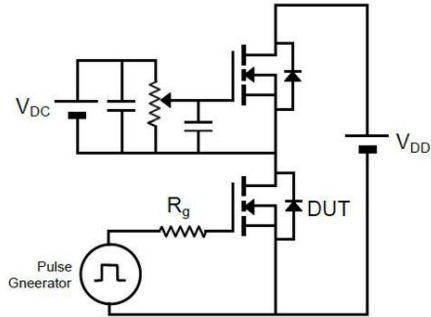


Fig 13. Resistive Switching Test Circuit & Waveform

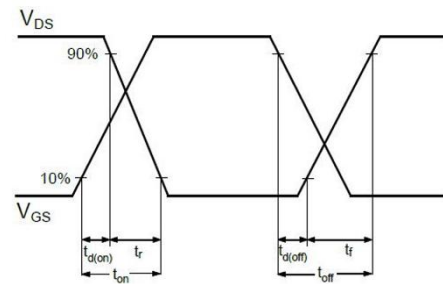
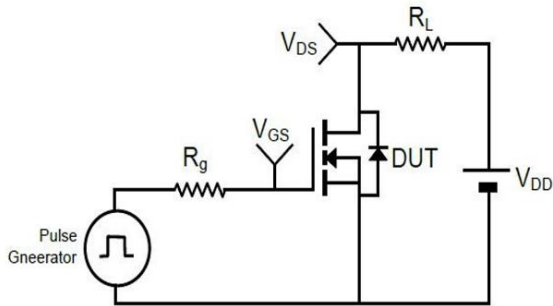


Fig 14. Un-clamped Inductive Load Switching Test Circuit & Waveform

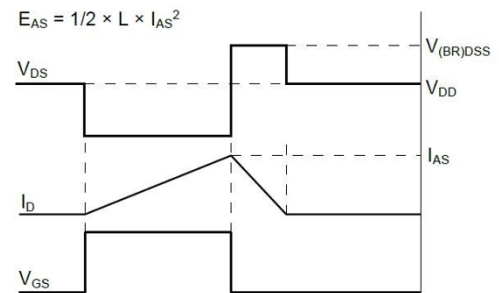
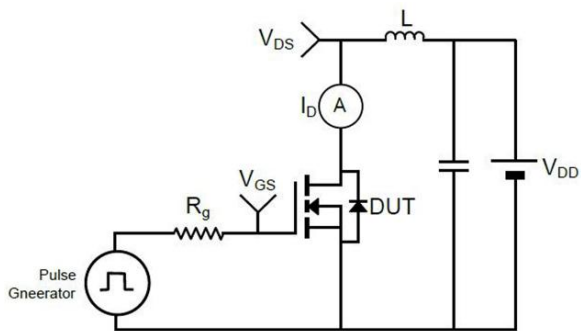
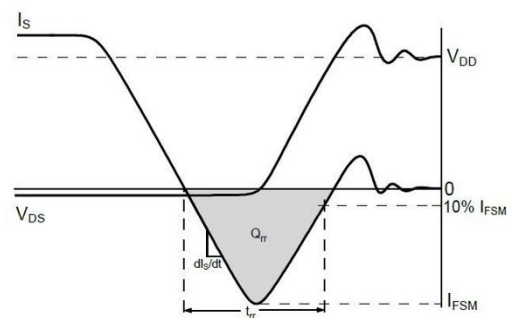
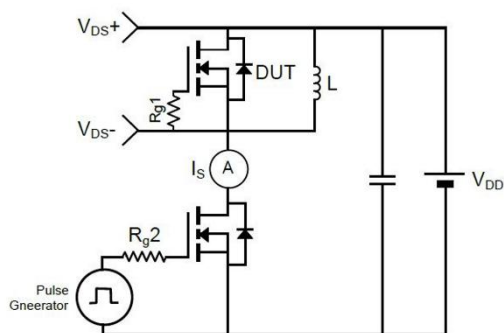


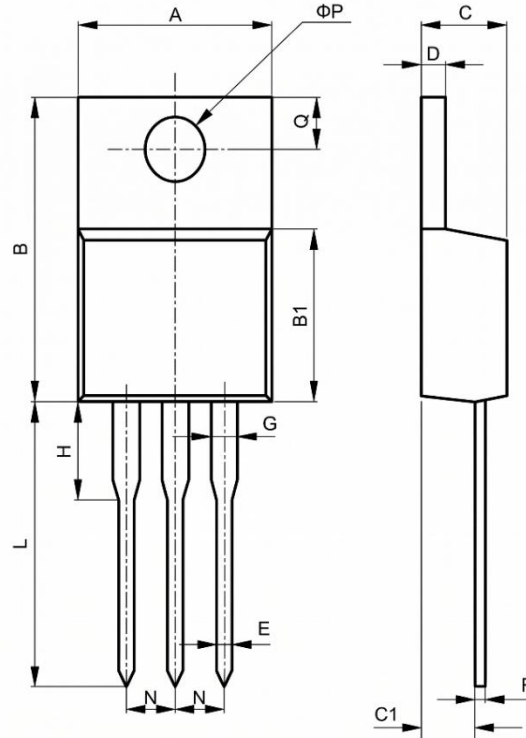
Fig 15. Diode Reverse Recovery Test Circuit & Waveforms





PACKAGE INFORMATION

Dimension in TO-220 (Unit: mm)



Symbol	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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