

**DESCRIPTION**

The AM200N04T is available in TO-220 Package.

BVDSS	RDSON	ID
40V	1.8mΩ	200A

APPLICATION

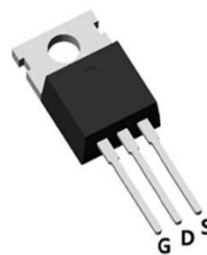
- Power switching application
- DC-DC Converter
- Power Management

ORDERING INFORMATION

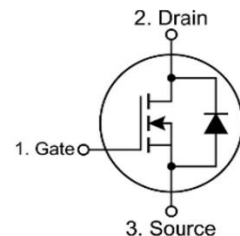
Package Type	Part Number	
TO-220 SPQ: 50pcs/Tube	T3	AM200N04T3U
Note	U: Tube	
AiT provides all RoHS products		

FEATURE

- Fast Switching
- Low Gate Charge and Rds(on)
- $R_{DS(ON)}$, Typ= 1.8mΩ @ $V_{GS}=10V$
- 100% Single Pulse avalanche energy Test

PIN DESCRIPTION

TO-220



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}	40	V
Gate-to-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	200	A
Continuous Drain Current $T_C = 100^\circ\text{C}$		133	A
Pulsed Drain Current ⁽¹⁾	I_{DM}	800	A
Single Pulse Avalanche Energy ⁽²⁾	E_{AS}	1588	mJ
Power Dissipation	P_D	298	W
Power Dissipation $T_C = 100^\circ\text{C}$		119	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ\text{C}$
Thermal Resistance Junction to Case	$R_{\theta JC}$	0.42	$^\circ\text{C/W}$

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	40	-	-	V
Drain to Source Leakage Current	I _{DSS}	V _{DS} =32V, V _{GS} =0V, T _J =25°C	-	-	1	μA
Gate to Source Leakage Current	I _{GSS}	V _{GS} = ±20V	-	-	±100	nA
Drain-to-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =20A	-	1.8	2.75	mΩ
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} = V _{GS} , I _D = 250μA	2.4	2.8	3.4	V
Gate Resistance	R _g	V _{DS} =20V, f = 1.0MHz	-	0.9	-	Ω
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = 20V f = 1.0MHz	-	8088	-	pF
Output Capacitance	C _{oss}		-	626	-	
Reverse Transfer Capacitance	C _{rss}		-	518	-	
Total Gate Charge	Q _g	I _D =100A, V _{DS} =20V V _{GS} = 10V	-	132	-	nC
Gate to Source Charge	Q _{gs}		-	30	-	
Gate to Drain Charge	Q _{gd}		-	25	-	
Gate Plateau Voltage	V _{plateau}		-	5.1	-	
Switching Characteristics						
Turn-on Delay Time	t _{d(on)}	V _{GS} =10V, V _{DD} =20V, I _D =30A, R _G =2.7Ω	-	25	-	ns
Rise Time	t _r		-	28	-	
Turn-Off Delay Time	t _{d(off)}		-	56	-	
Fall Time	t _f		-	18	-	
Drain-Source Body Diode Characteristics						
Maximum Pulsed Current (Body Diode)	I _{SM}		-	-	200	A
Diode Forward Voltage	V _{SD}	I _S =1A, V _{GS} =0V	-	-	1.2	V
Reverse Recovery Time	T _{rr}	I _S =100A, T _J = 25°C, di/dt=100A/us	-	50	-	ns
Reverse Recovery Charge	Q _{rr}		-	26	-	nC

Note:

1. The test condition is V_{DD}=20V, V_{GS}=10V, L=0.5mH, R_G=25Ω



TYPICAL PERFORMANCE CHARACTERISTICS

Fig1. Typical Output Characteristics

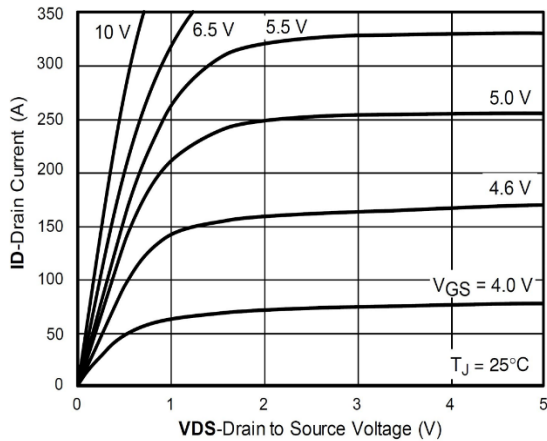


Fig 2. Typical Transfer Characteristics

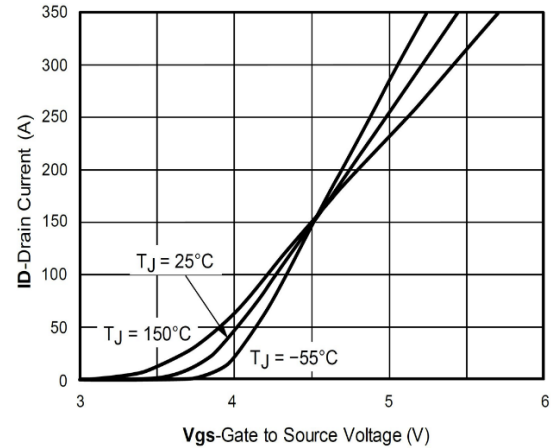


Fig 3. Typical Capacitance Characteristics

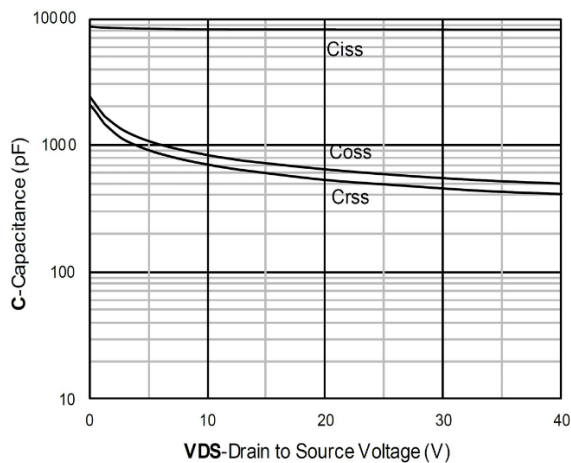


Fig 4. Typical Gate Charge

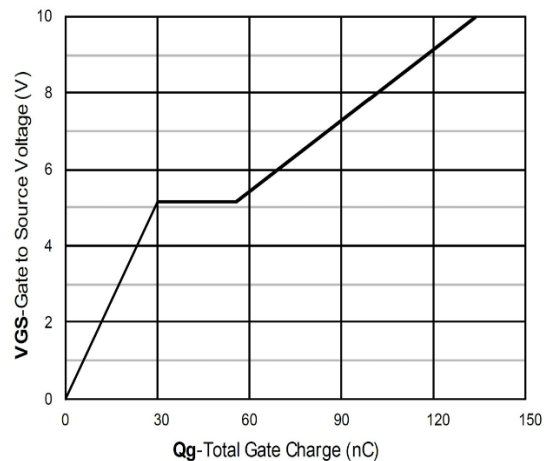


Fig 5. Typical Current Dissipation

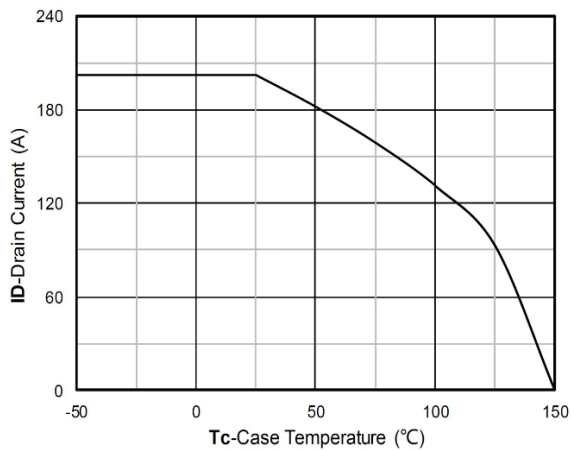


Fig 6. Typical Power Dissipation

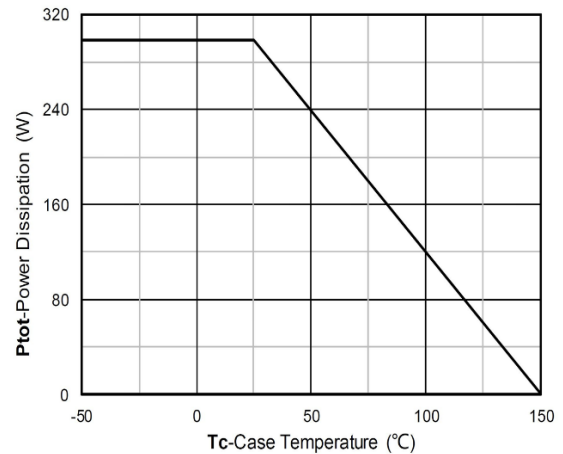




Fig 7. $R_{DS(on)}$ vs. Drain Current

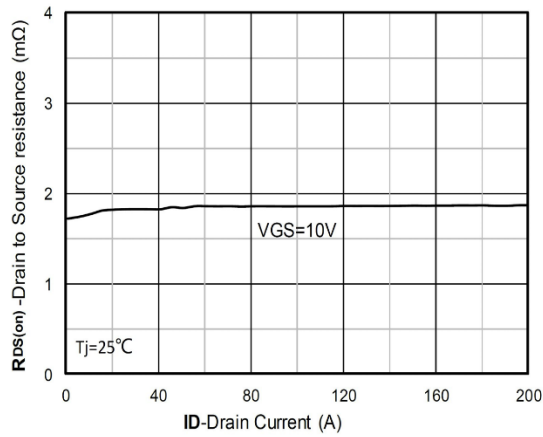


Fig 8. Forward characteristics of reverse diode

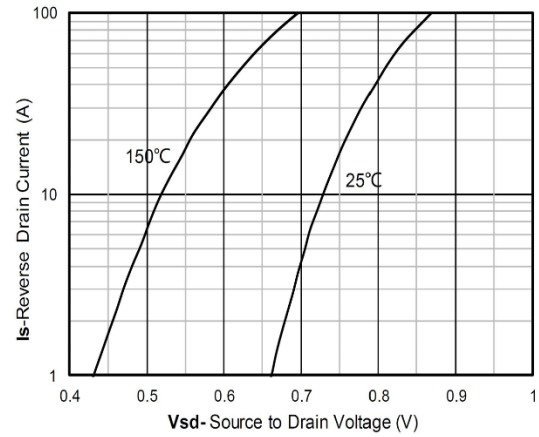


Fig 9. Normalized breakdown voltage

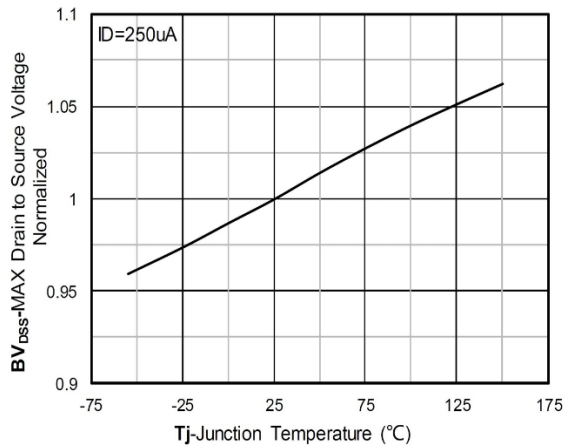


Fig 10. Normalized Threshold voltage

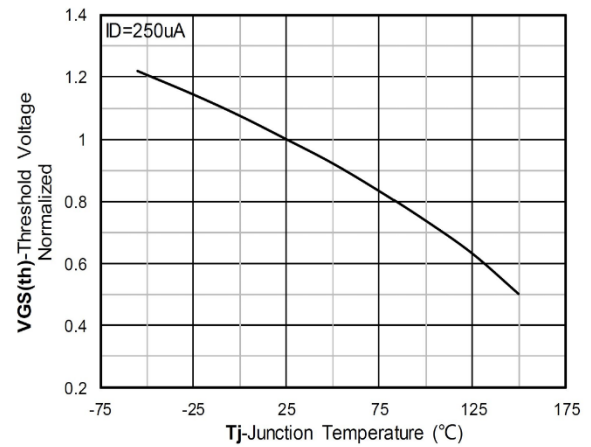


Fig 11. Safe Operation Area

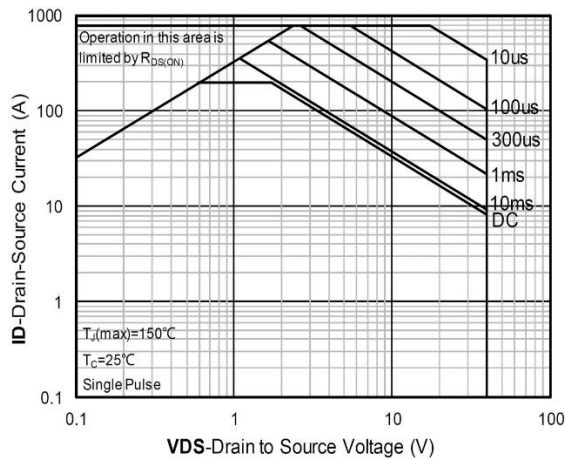
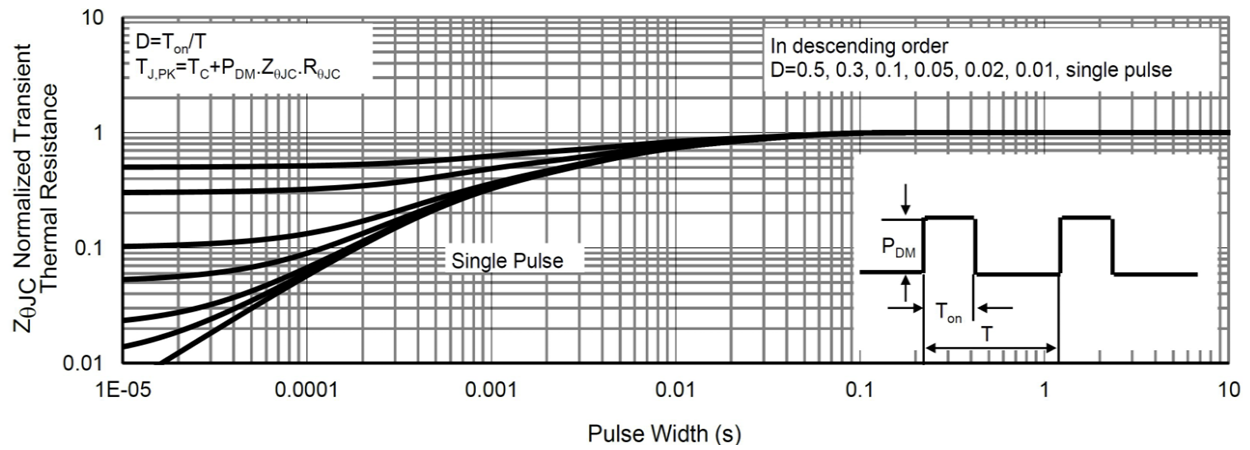




Fig 12. Normalized Maximum Transient Thermal Impedance





TEST CIRCUIT AND WAVEFORM

Fig 13. Gate Charge Test Circuit & Waveform

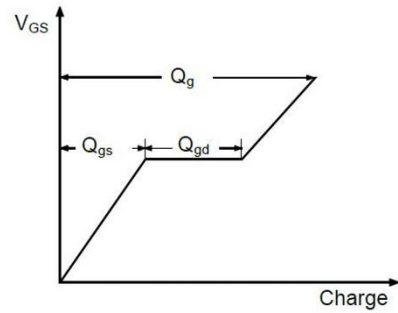
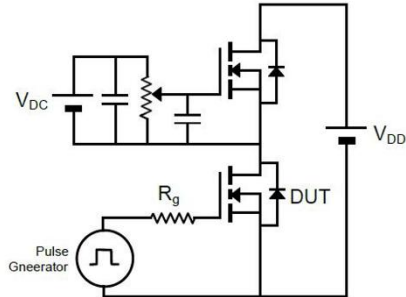


Fig 14. Resistive Switching Test Circuit & Waveform

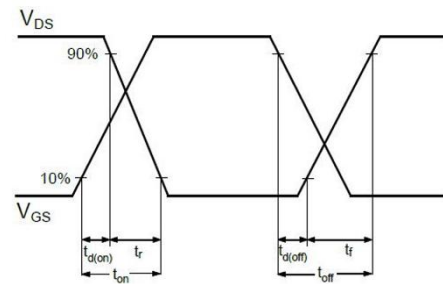
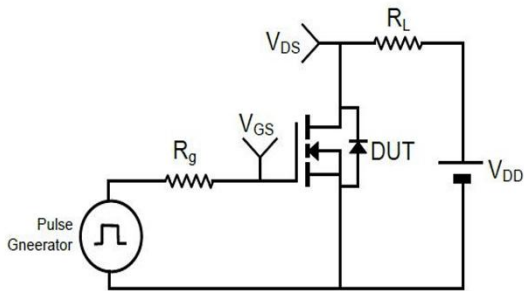


Fig 15. Un-clamped Inductive Load Switching Test Circuit & Waveform

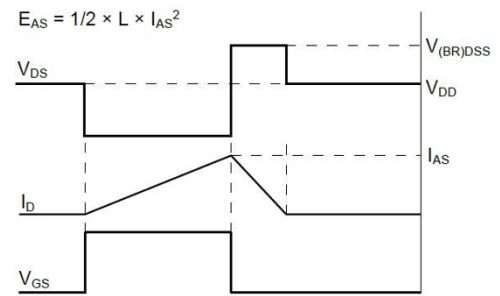
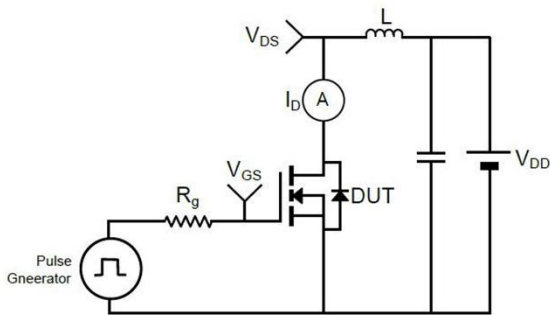
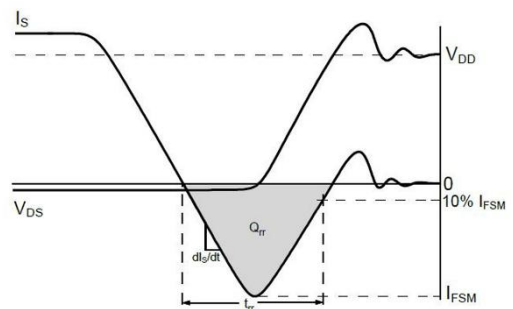
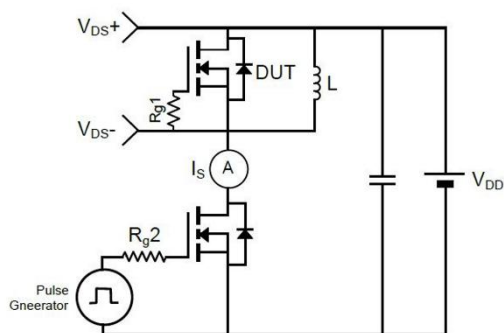


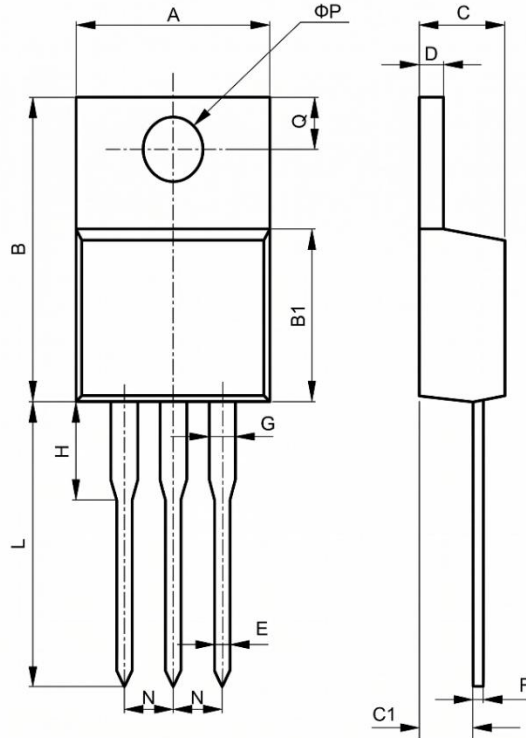
Fig 16. Diode Reverse Recovery Test Circuit & Waveforms





PACKAGE INFORMATION

Dimension in TO-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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