DESCRIPTION

The AM50N06T is available in the TO-220 Package.

VDSS	RDSON	ID
60V	11.3mΩ	50A

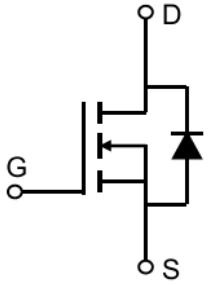
FEATURES

- 60V, 50A
  $R_{DS(ON)}$ Typ. = 11.3mΩ @ V_{GS} = 10V
  $R_{DS(ON)}$ Typ. = 13.7mΩ @ V_{GS} = 4.5V
- Advanced Split Gate Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge

APPLICATIONS

- Load Switch
- PWM Application
- Power Management

PIN DESCRIPTION



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

ORDERING INFORMATION

Package Type	Part Number	
TO-220 SPQ: 50pcs /Tube	T3	AM50N06T3VU
Note	V: Halogen free Package U: Tube Package	
AiT provides all RoHS products		

ABSOLUTE MAXIMUM RATINGS

T_J=25℃, unless otherwise Noted

V_{DS}, Drain-to-Source Voltage		60V
V_{GS}, Gate-to-Source Voltage		±20V
I_D, Continue Drain Current	T_C=25℃	50A
	T_C=100℃	30A
I_{DM}, Pulsed Drain Current (1)		200A
E_{AS}, Single Pulse Avalanche Energy (2)		72mJ
P_D, Power Dissipation	T_C=25℃	75W
$R_{\theta JC}$, Thermal Resistance, Junction to Case		1.67℃/W
T_J, Operating Junction Temperature Range		-55℃~+150℃
T_{STG}, Storage Temperature Range		-55℃~+150℃

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) EAS condition: Starting TJ=25°C, VDD=50V, VG=10V, RG=25ohm, L=0.5mH, IAS=47A

ELECTRICAL CHARACTERISTICS

T_J = 25°C, unless otherwise Noted

Parameter	Symbol	Conditions	Min	Typ.	Max	Unit
Off Characteristic						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250μA	60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}= 60V, V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{DS}= 0V, V_{GS}=±20V	-	-	±100	nA
On Characteristic						
Static Drain-Source ON-Resistance *	$R_{DS(ON)}$	V_{GS}=10V, I_D=30A	-	11.3	14.7	mΩ
		V_{GS}=4.5V, I_D=20A	-	13.7	18	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1	1.5	2	V
Dynamic Characteristic						
Input Capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V, f=1MHz	-	1967	-	pF
Output Capacitance	C_{oss}		-	136	-	
Reverse Transfer Capacitance	C_{rss}		-	117	-	
Total Gate Charge	Q_G	V_{DS}= 30V, I_D=30A, V_{GS}= 0V ~ 10V	-	45	-	nC
Gate-Source charge	Q_{gS}		-	8	-	
Gate-Drain charge	Q_{gd}		-	11	-	
Switching Characteristic						
Turn-On Delay Time	$t_{d(on)}$	V_{DD}= 30V, R_{GEN}=1.8Ω, V_{GS}= 10V, I_D=30A	-	11	-	ns
Rise Time	t_r		-	79	-	
Turn-Off Delay Time	$t_{d(off)}$		-	33		
Fall Time	t_f		-	107	-	
Drain-Source Diode Characteristics and Max Ratings						
Maximum Continuous Drain to Source Diode Forward Current	I_S	-	-	-	50	A
Maximum Pulsed Drain to Source Diode Forward Current	I_{SM}	-	-	-	200	A
Drain to Source Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=30A	-	-	1.20	V
Body Diode Reverse Recovery Time	t_{rr}	I_F=30A, di/dt=100A/μs	-	14	-	ns
Body Diode Reverse Recovery Charge	Q_{rr}		-	10	-	nC

* Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.

TYPICAL PERFORMANCE CHARACTERISTICS

Fig 1. Output Characteristics

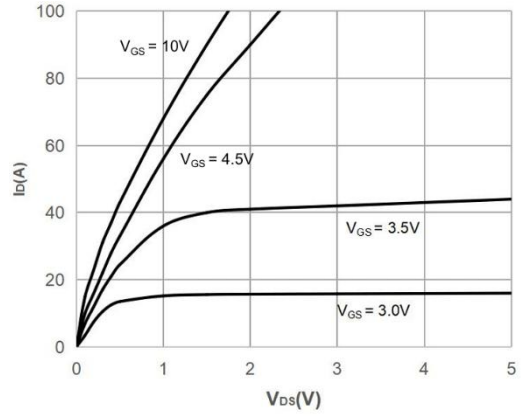


Fig 2. Typical Transfer Characteristics

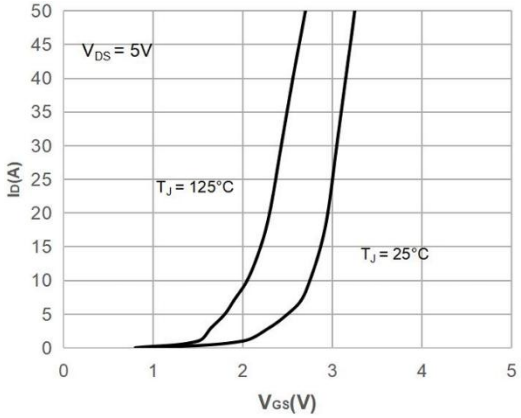


Fig 3. On-Resistance vs. Drain Current

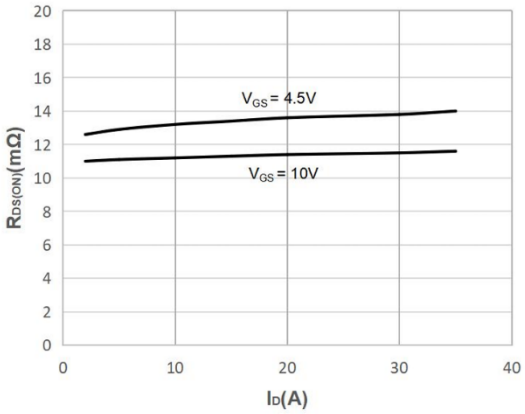


Fig 4. Body Diode Characteristics

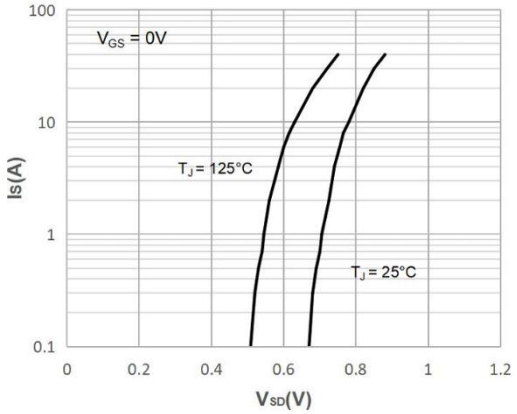


Fig 5. Gate Charge Characteristics

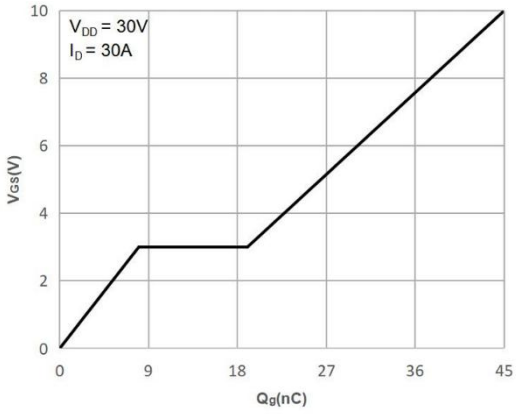


Fig 6. Capacitance Characteristics

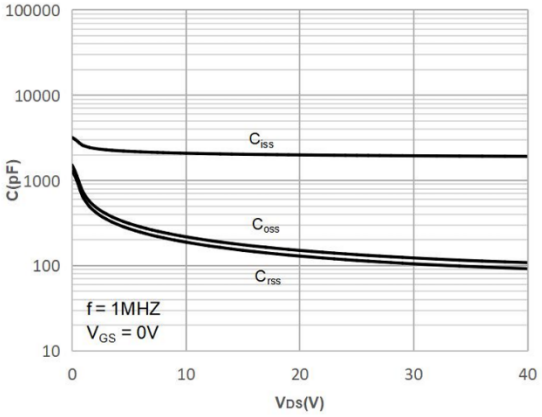


Fig 7. Normalized Breakdown Voltage vs. Junction Temperature

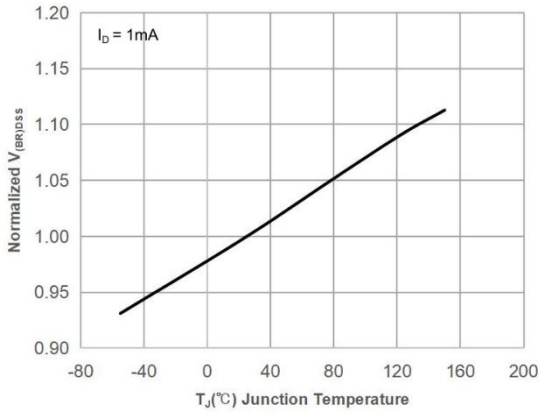


Fig 8. Normalized On-Resistance vs. Junction Temperature

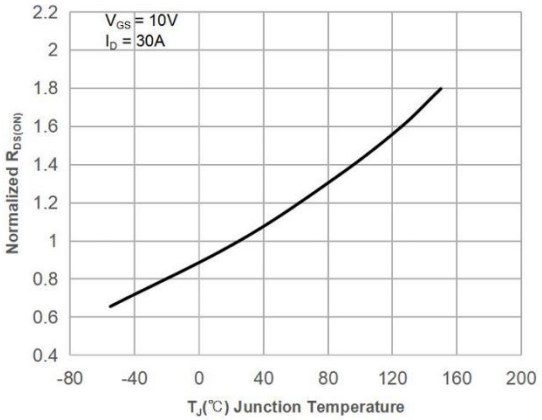


Fig 9. Maximum Safe Operating Area

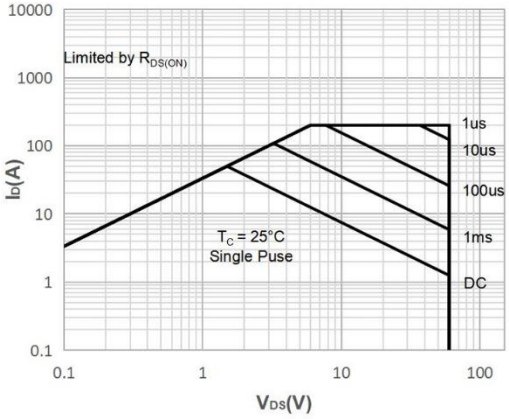


Fig 10. Maximum Continuous Drain Current vs. Case Temperature

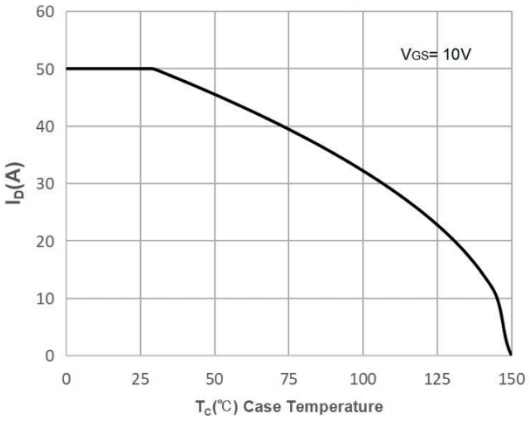


Fig 11. Normalized Maximum Transient Thermal Impedance

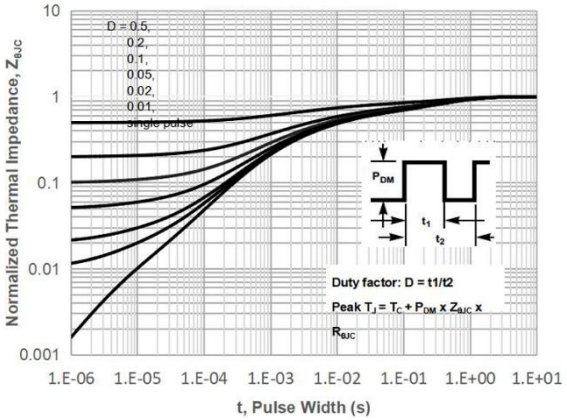


Fig 12. Peak Current Capacity

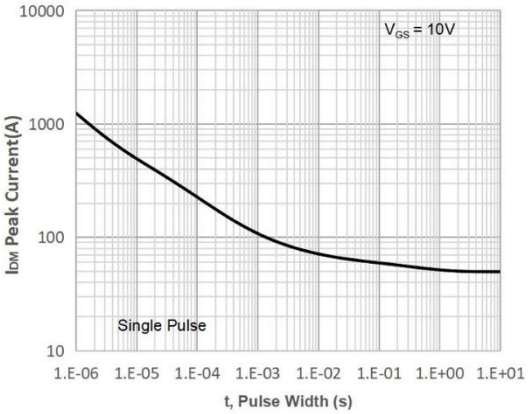


Fig 13. Gate Charge Test Circuit & Waveform

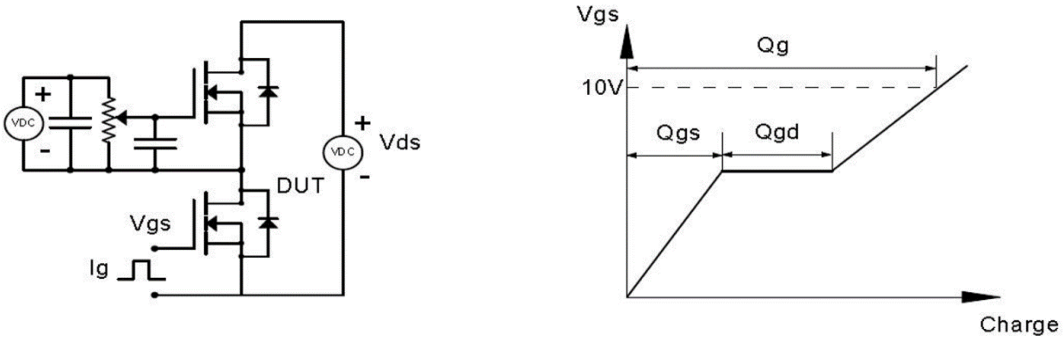


Fig 14. Resistive Switching Test Circuit & Waveforms

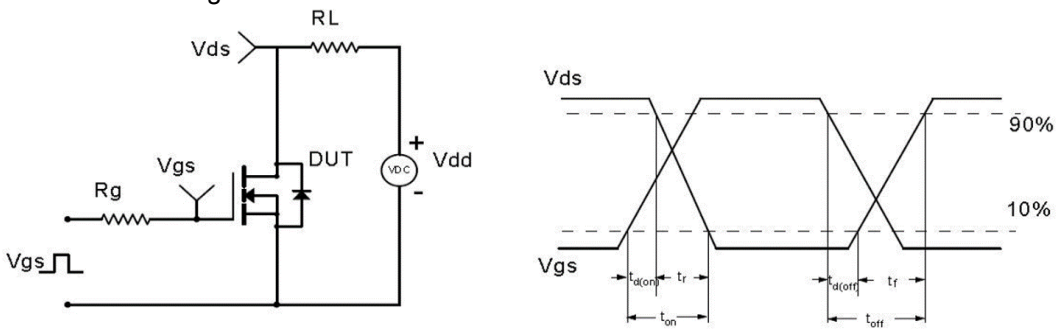


Fig 15. Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

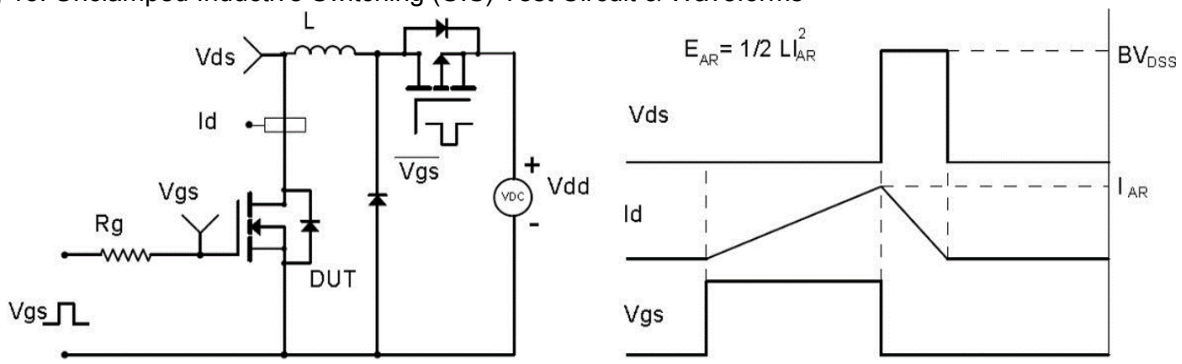
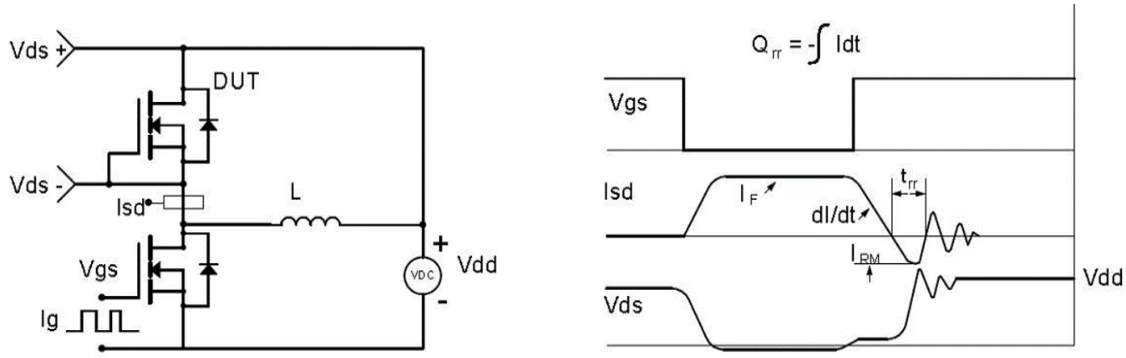
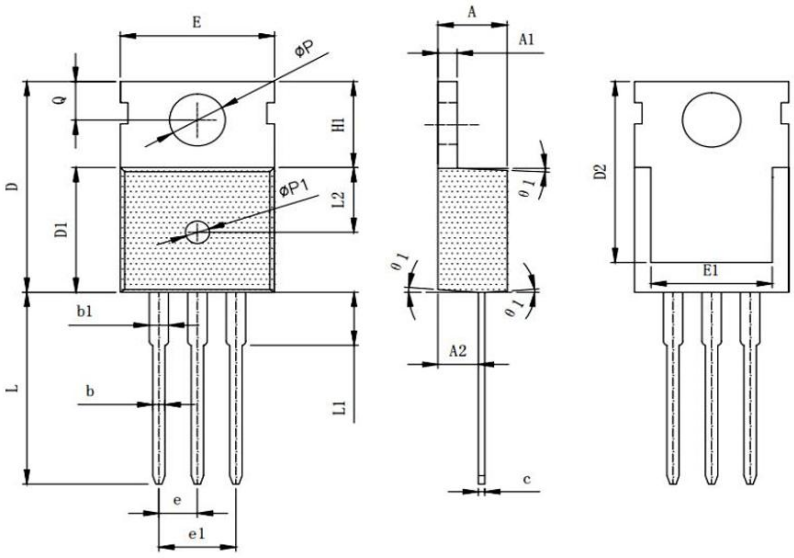


Fig 16. Diode Recovery Test Circuit & Waveforms



PACKAGE INFORMATION

Dimension in TO-220(Unit: mm)



Symbol	Millimeter	
	Min.	Max.
A	4.400	4.600
A1	1.250	1.350
A2	2.300	2.500
b	0.700	0.900
b1	1.250	1.450
c	0.400	0.600
D	15.500	16.100
D1	9.100	9.300
D2	12.730	12.930
e	2.540 BSC.	
e1	5.080 BSC.	
E	9.700	10.200
E1	7.600	8.400
H1	6.300	6.800
L	12.750	13.500
L1	-	3.100
L2	4.300	4.900
Q	2.700	2.900
φP	3. 500	3.700
φP1	1.400	1.600
θ1	2°	6°

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