

**DESCRIPTION**

The AM30N50 is available in TO-3PN and TO-247 packages

BVDSS	R _{DS(on)}	ID
500V	0.088Ω	30A

APPLICATIONS

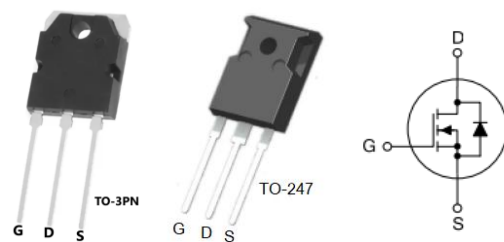
- High Frequency Switching Mode Power Supply

ORDERING INFORMATION

Package Type	Part Number	
TO-3PN SPQ: 30pcs/Tube	TX	AM30N50TXVU
TO-247 SPQ: 25pcs/Tube	TL3F	AM30N50TL3FVU
Note	V: Halogen free Package U: Tube	
AiT provides all RoHS products		

FEATURE

- Fast Switching
- Low C_{rss} (Typical 30pF)
- 100% avalanche tested
- Improved dv/dt capability

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	500V
I _D , Continuous Drain Current	30A
I _D , Continuous Drain Current T _C = 100 °C	19A
I _{DM} , Pulsed Drain Current ⁽¹⁾	120A
V _{GS} , Gate-to-Source Voltage	±30V
E _{AS} , Single Pulse Avalanche Energy ⁽²⁾	3200mJ
dv/dt, Peak Diode Recovery dv/dt ⁽³⁾	5V/ns
P _D , Power Dissipation	TO-3PN, TO-247 320W
P _D , Derating Factor above 25°C	TO-3PN, TO-247 2.63W/°C
T _J , Operating Junction Temperature Range	150°C
T _{STG} , Storage Temperature Range	-55°C~+150°C
T _L , Maximum Temperature for Soldering	300°C
R _{θJA} , Junction-to-Ambient	40°C/W
R _{θJC} , Junction-to-Case	0.38°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.

(1) Pulse width limited by maximum junction temperature

(2) L=10mH, V_{DS}=50V, Start T_J=25°C

(3) I_{SD} =30A, di/dt ≤100A/us, V_{DD} ≤B_{VDS}, Start T_J=25°C



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	500	-	-	V
BV _{DSS} Temperature Coefficient	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	I _D =250μA Reference 25°C	-	0.6	-	V/°C
Drain to Source Leakage Current	I _{DSS}	V _{DS} =500V, V _{GS} =0V, T _J =25°C	-	-	10	μA
		V _{DS} =400V, V _{GS} =0V, T _J =125°C	-	-	100	
Gate to Source Forward Leakage	I _{GSS(F)}	V _{GS} =+30V	-	-	100	nA
Gate to Source Reverse Leakage	I _{GSS(R)}	V _{GS} =-30V	-	-	-100	nA
ON Characteristics						
Drain-to-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =15A *	-	0.088	0.12	Ω
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} = V _{GS} , I _D =250μA*	2.0	-	4.0	V
Forward Transconductance	g _{fs}	V _{DS} =20V, I _D =15A *	-	12	-	S
Dynamic Characteristics						
Gate Resistance	R _g	f=1.0MHz	-	1.15	-	Ω
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =25V, f=1MHz	-	7850	-	pF
Output Capacitance	C _{oss}		-	750	-	
Reverse Transfer Capacitance	C _{rss}		-	30	-	
Switching Characteristics						
Turn-on Delay Time	t _{d (ON)}	I _D =30A, V _{DD} =250V, V _{GS} =10V, R _G =20Ω	-	60	-	ns
Rise Time	t _r		-	130	-	
Turn-Off Delay Time	t _{d (OFF)}		-	100	-	
Fall Time	t _f		-	91	-	
Total Gate Charge	Q _g	I _D =30A, V _{DD} =400V, V _{GS} =10V	-	150	-	nC
Gate to Source Charge	Q _{gs}		-	36	-	
Gate to Drain ("Miller") Charge	Q _{gd}		-	56	-	
Source-Drain Diode Characteristics						
Continuous Source Current (Body Diode)	I _s	T _c =25°C	-	-	30	A
Maximum Pulsed Current (Body Diode)	I _{SM}		-	-	120	A
Diode Forward Voltage	V _{SD}	I _S =30A, V _{GS} =0V *	-	-	0.9	V
Reverse Recovery Time	T _{rr}	I _S =30A, T _J =25°C	-	500	-	ns
Reverse Recovery Charge	Q _{rr}	dIF/dt =100A/μs, V _{GS} =0V	-	8320	-	nC
Reverse Recovery Current	I _{rrm}		-	33.3	-	A

* Pulse width tp≤300μs, δ≤2%



TYPICAL PERFORMANCE CHARACTERISTICS

Fig 1. Typical Output Characteristics

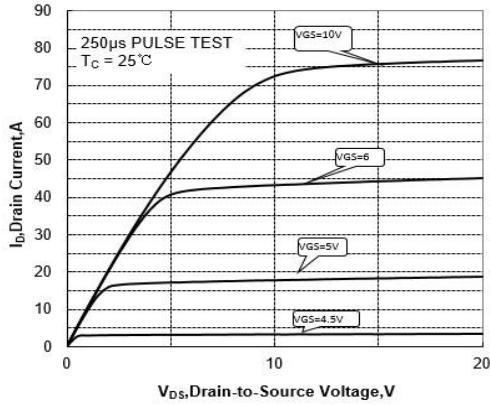


Fig 2. Typical Transfer Characteristics

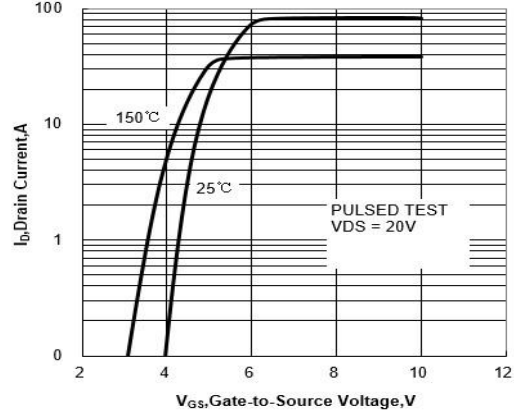


Fig 3. Typical Drain to Source ON Resistance vs. Drain Current

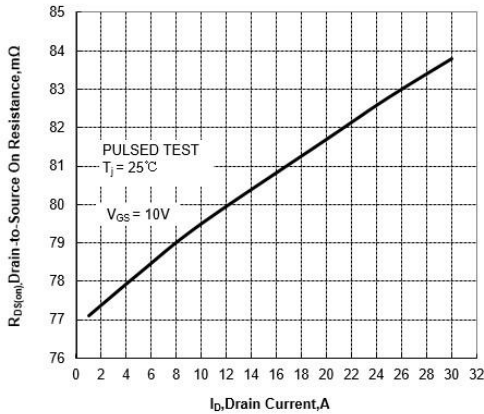


Fig 4. Typical Drain to Source on Resistance vs. Junction Temperature

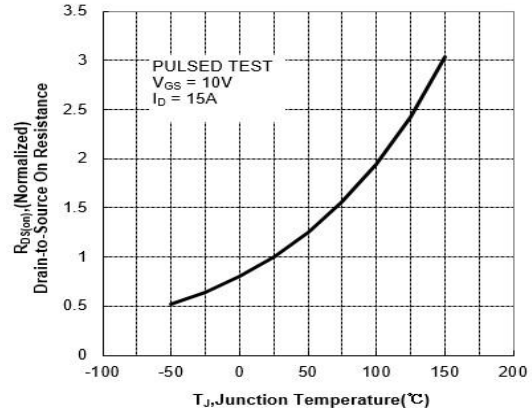


Fig 5. Typical Threshold Voltage vs. Junction Temperature

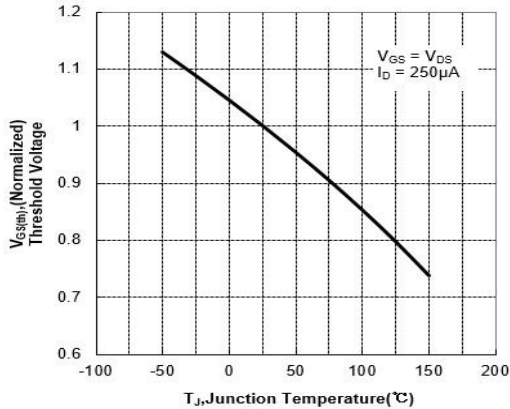


Fig 6. Typical Breakdown Voltage vs. Junction Temperature

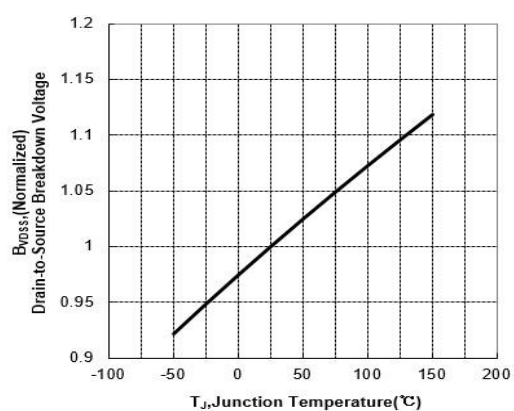




Fig 7. Typical Threshold Voltage vs. Junction Temperature

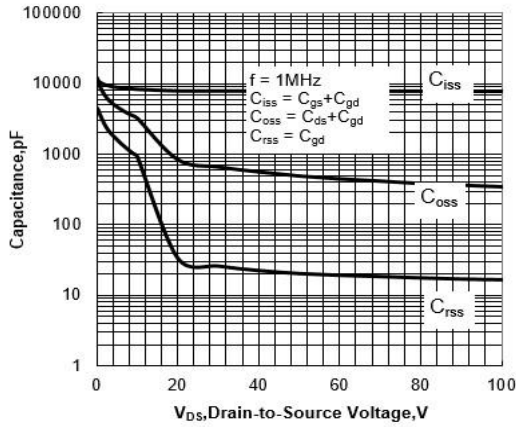


Fig 8. Typical Breakdown Voltage vs. Junction Temperature

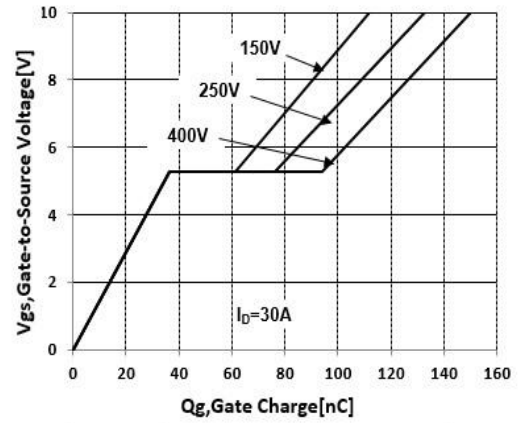


Fig 9. Gate Charge Test Circuit

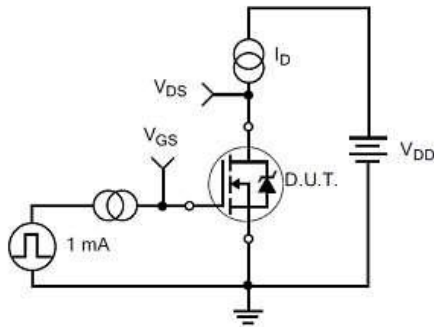


Fig 10. Gate Charge Waveforms

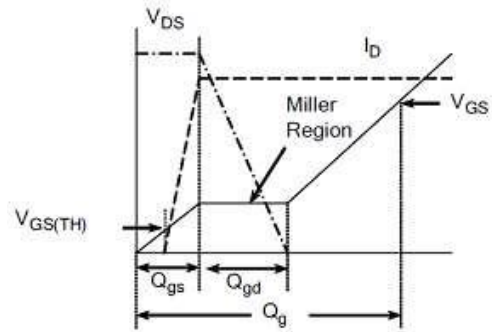


Fig 11. Resistive Switching Test Circuit

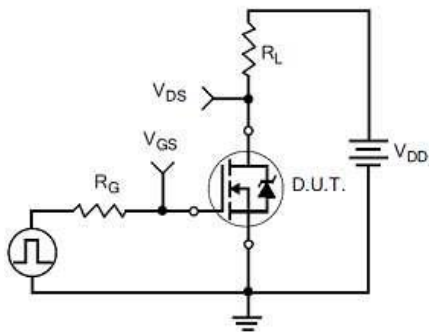


Fig 12. Resistive Switching Waveforms

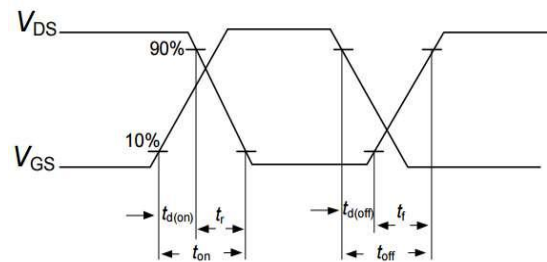




Fig 13. Diode Reverse Recovery Test Circuit

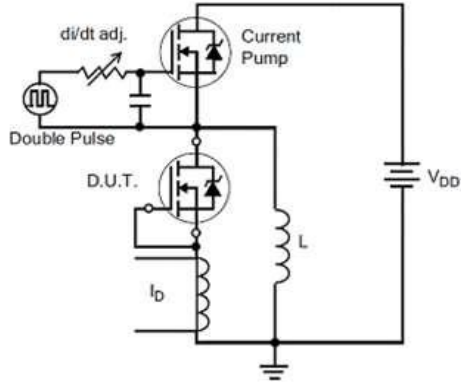


Fig 14. Diode Reverse Recovery Waveform

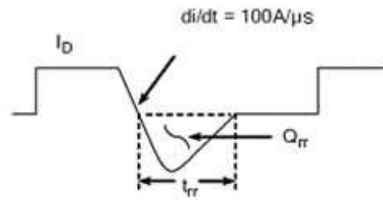


Fig 15. Unclamped Inductive Switching Test Circuit

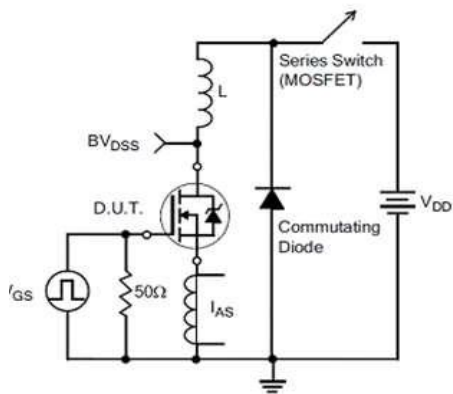
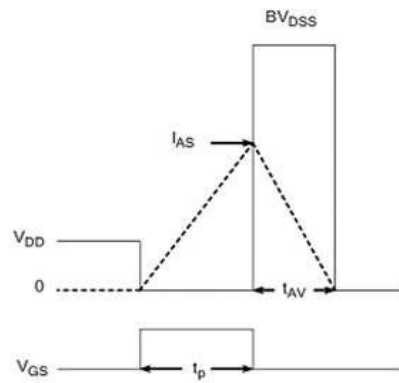


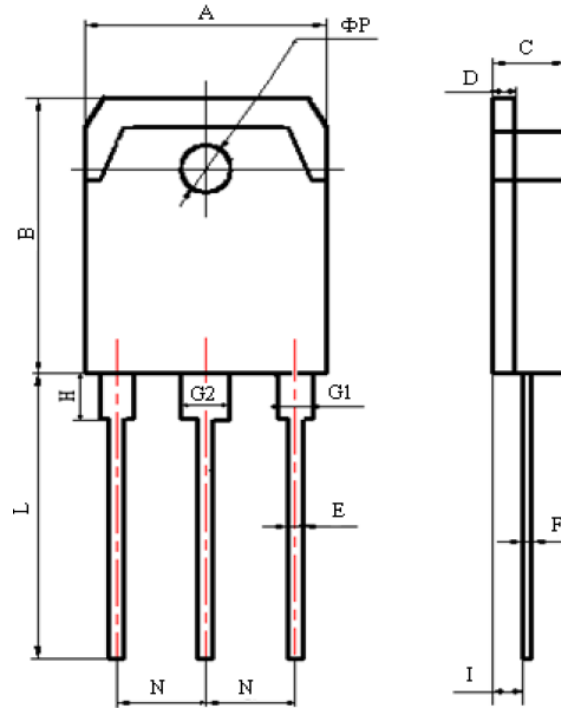
Fig 16. Unclamped Inductive Switching Waveform





PACKAGE INFORMATION

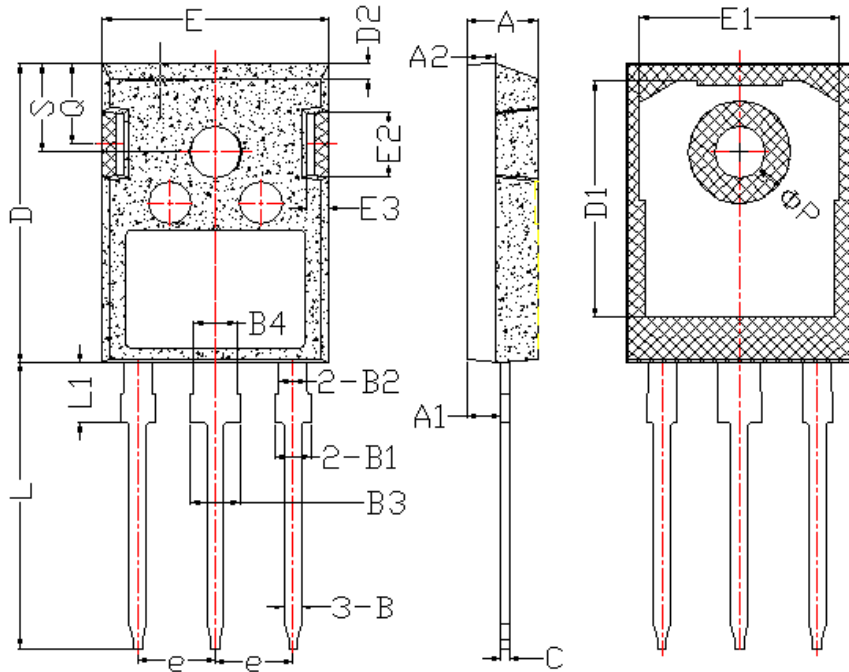
Dimension in TO-3PN (Unit: mm)



Symbol	Min.	Max.
A	15.000	16.000
B	19.200	20.600
C	4.600	5.000
D	1.400	1.600
E	0.900	1.100
F	0.500	0.700
G1	2.000	2.200
G2	3.000	3.200
H	3.000	3.700
I	1.200	2.900
L	19.000	21.000
N	5.250	5.650
ΦP	3.100	3.300



Dimension in TO-247 (Unit: mm)



Symbol	Min.	Max.
A	4.600	5.200
A1	2.200	2.600
B	0.900	1.400
B1	1.750	2.350
B2	1.750	2.150
B3	2.800	3.350
B4	2.800	3.150
C	0.500	0.700
D	20.600	21.300
D1	16.000	18.000
E	15.500	16.100
E1	13.000	14.700
E2	3.800	5.300
E3	0.800	2.600
e	5.200	5.700
L	19.000	20.500
L1	3.900	4.600
ΦP	3.300	3.700
Q	5.200	6.000
S	5.800	6.600



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