DESCRIPTION

The AM40N10D is available in TO-252 Package.

BVDSS	RDSON	ID
100V	22mΩ	40A

FEATURE

- Low Gate Charge
- Low C_{iss}
- Fast switching
- Improved dv/dt Capability

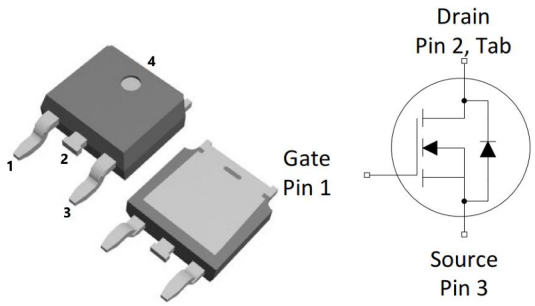
APPLICATIONS

- Power Switching Application
- LED Drive Power
- Power Management for DC/DC

ORDERING INFORMATION

Package Type	Part Number	
TO-252 SPQ: 2,500pcs/Reel	D	AM40N10DVR
Note	R: Tape & Reel V: Halogen free Package	
AiT provides all RoHS products		

PIN DESCRIPTION



TO-252

Pin #	Symbol	Function
1	G	Gate
2,4	D	Drain
3	S	Source

ABSOLUTE MAXIMUM RATINGS

T_C = 25°C, unless otherwise specified.

V_{DSS}, Drain-Source Voltage		100V
V_{GSS}, Gate-Source Voltage		±20V
I_D, Drain Current-Continuous (Package Limited)	T_C = 25°C	40A
	T_C = 100°C	24A
I_{DM}, Pulsed Drain Current *		160A
E_{AS}, Single Pulse Avalanche Energy	L=0.5mH, V_D=50V, T_C=25°C	180mJ
P_D, Maximum Power Dissipation		83W
T_{STG}, Storage Temperature Range		-55°C ~ +150°C
T_J, Operating Junction Temperature Range		-55°C ~ +150°C
TL, Maximum Lead Temperature for Soldering Purposes, 1/8"from Case for 5 Seconds		260°C
$R_{th(ch-c)}$, Thermal Resistance, Channel to Case		1.50°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.

* Repetitive Rating: pulse width limited by maximum junction temperature.

ELECTRICAL CHARACTERISTICS

T_C = 25°C, unless otherwise specified.

Parameter	Symbol	Conditions	Min	Typ.	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	B_{VDSS}	V_{GS}= 0V, I_D = 250μA	100	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=100V, V_{GS}=0V			1	μA
Gate-Body Leakage Current, Forward	I_{GSSF}	V_{GS}=20V, V_{DS}=0V			100	nA
Gate-Body Leakage Current, Reverse	I_{GSSR}	V_{GS}= -20V, V_{DS}=0V			-100	nA
Gate-Source Threshold Voltage	$V_{GS(TH)}$	V_{DS}= V_{GS}, I_D = 250μA	2	-	4	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS} =10V, I_D = 20A	-	18	22	mΩ
Forward Transconductance	g_{fs}	V_{DS} = 5V, I_D = 15A	-	18.8	-	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V, f=1.0MHZ	-	3030	-	pF
Output Capacitance	C_{oss}		-	182	-	
Reverse Transfer Capacitance	C_{rss}		-	152	-	
Turn-On Delay Time	$t_{d(on)}$	V_{DD}=50V, R_G=3Ω, V_{GS}=10V, I_D=30A	-	12	-	ns
Turn-On Rise Time	t_r		-	9	-	
Turn-Off Delay Time	$t_{d(off)}$		-	20	-	
Turn-Off Fall Time	t_f		-	18	-	
Gate charge Characteristics						
Total Gate Charge	Q_g	V_{DS} = 80V , I_D =25V V_{GS}=10V	-	65	-	nC
Gate-Source Charge	Q_{gs}		-	21	-	
Gate-Drain Charge	Q_{gd}		-	20	-	
Reverse Diode						
Continuous Diode Forward Current	I_S	-	-	-	40	A
Pulsed Diode Forward Current	I_{SM}	-	-	-	160	A
Diode Forward Voltage	V_{SD}	I_S=20A, V_{GS}=0V	-	-	1.20	V

* Pulse text: Pulse width ≤ 300μs, Duty Cycle ≤ 2%.

TYPICAL PERFORMANCE CHARACTERISTICS

Fig 1. Typical Output Characteristics

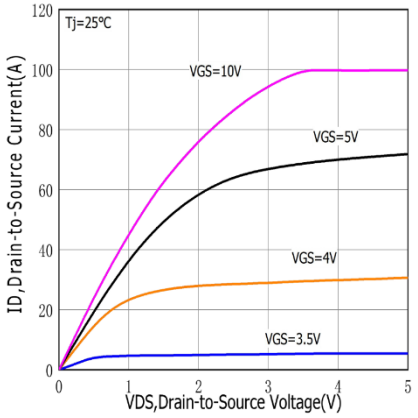


Fig 2. Typical Gate Charge vs. Gate to Source Voltage

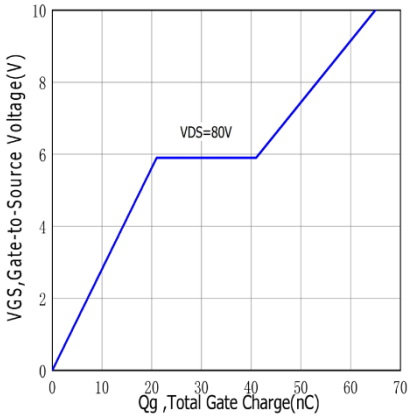


Fig 3. Typical Body Diode Transfer Characteristics

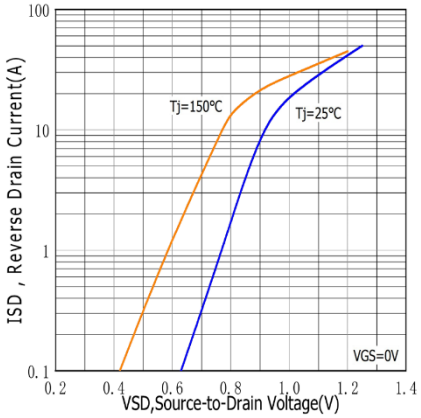


Fig 4. Typical Capacitance vs. Drain to Source Voltage

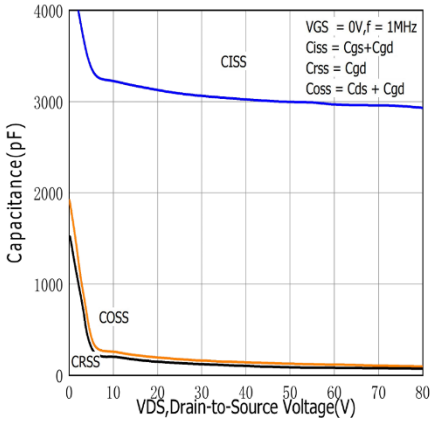


Fig 5. Typical Breakdown Voltage vs. Junction Temperature

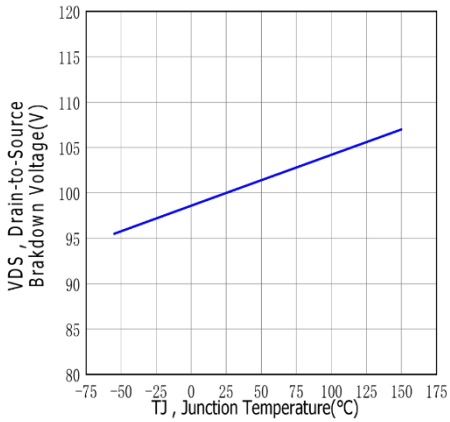


Fig 6. Typical Drain to Source on Resistance vs. Junction Temperature

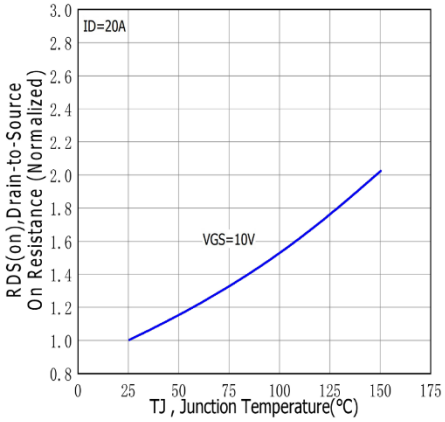


Fig 7. Maximum Forward Bias Safe Operating Area

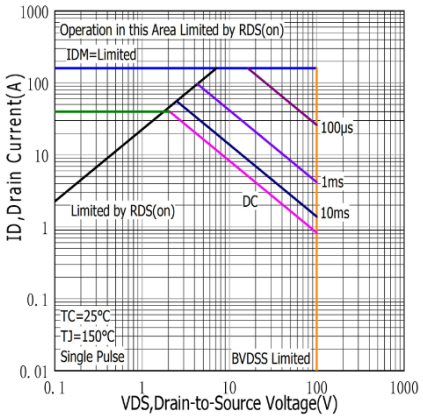


Fig 8. Typical Drain to Source ON Resistance vs. Drain Current

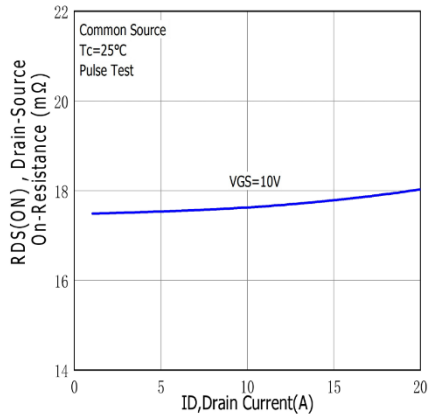


Fig 9. Maximum EAS vs. Channel Temperature

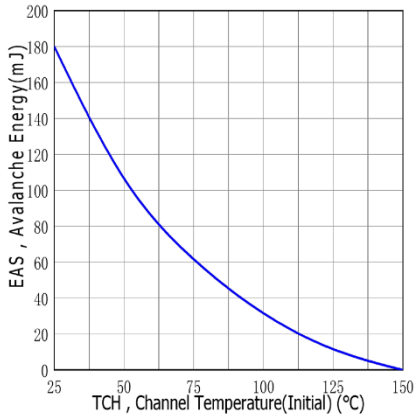


Fig 10. Typical Threshold Voltage vs. Case Temperature

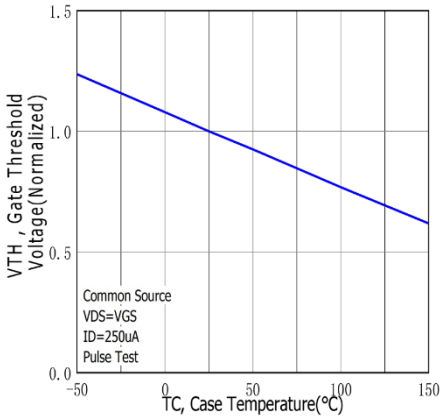


Fig 11. Typical Transfer Characteristics

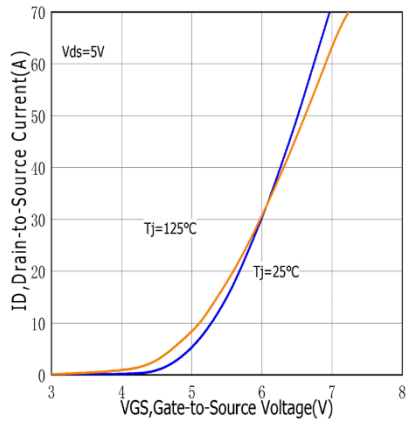


Fig 12. Maximum Power Dissipation vs. Case Temperature

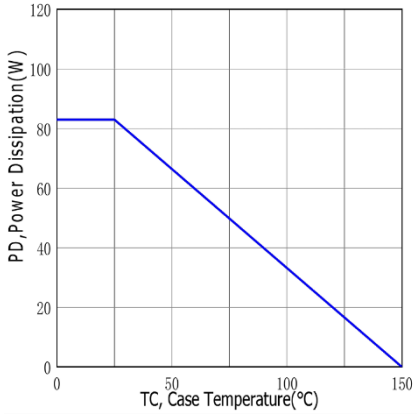


Fig 13. Maximum Effective Thermal Impedance, Junction to Case

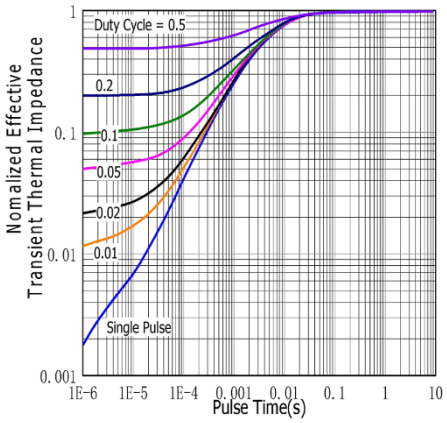


Fig 14. Peak Diode Recovery dv/dt Test Circuit

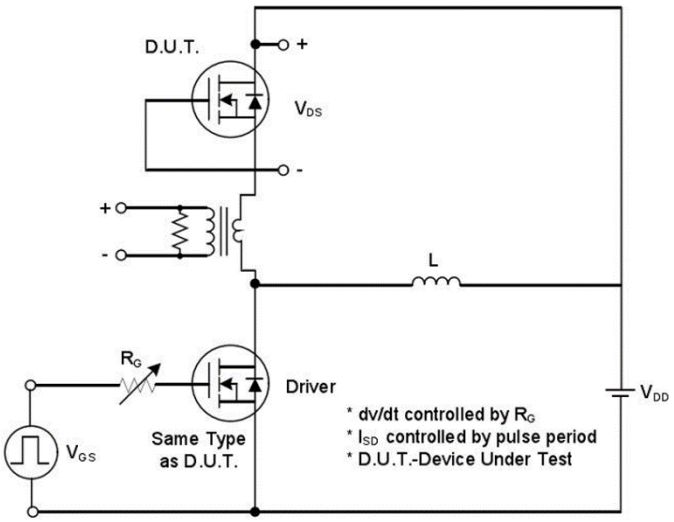


Fig 15. Peak Diode Recovery dv/dt Waveforms

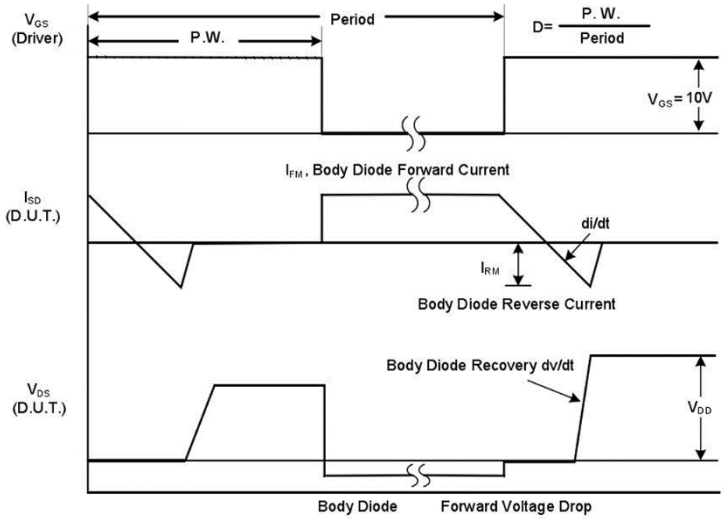


Fig 16. Switching Test Circuit

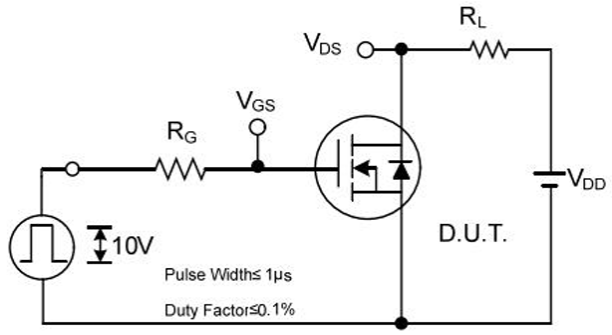


Fig 17. Switching Waveforms

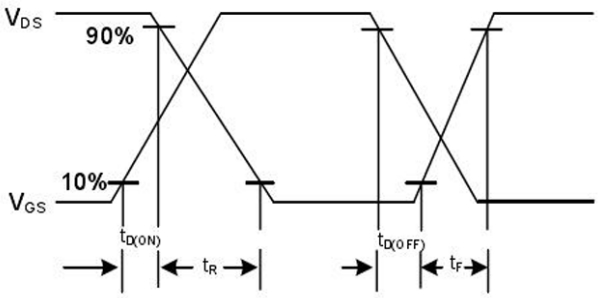


Fig 18. Gate Charge Test Circuit

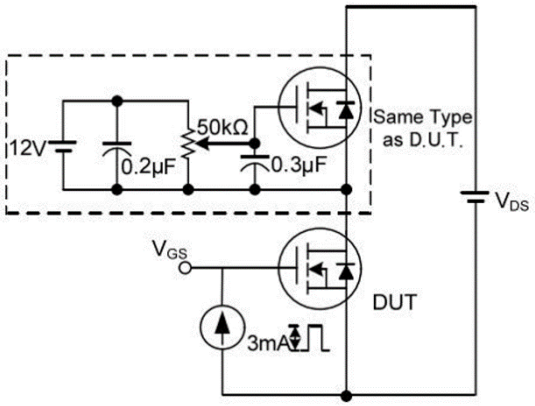


Fig 19. Gate Charge Waveform

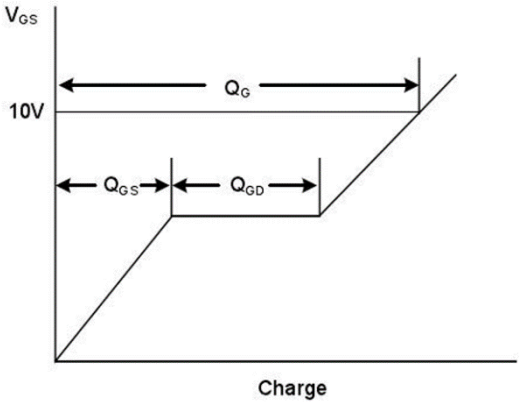


Fig 20. Unclamped Inductive Switching Test Circuit

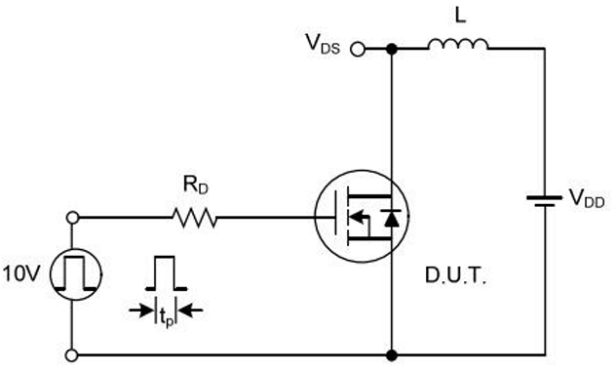
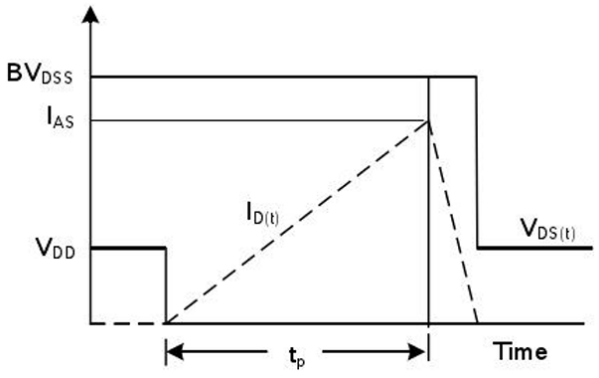
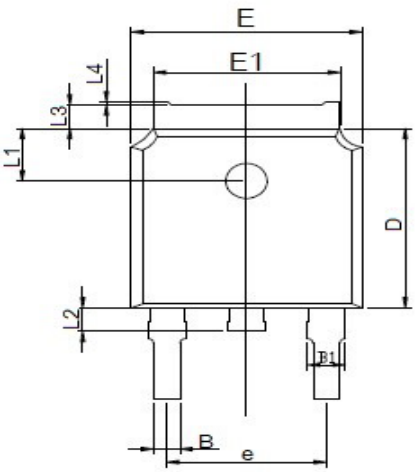


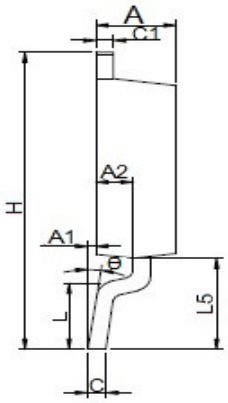
Fig 21. Unclamped Inductive Switching Waveforms

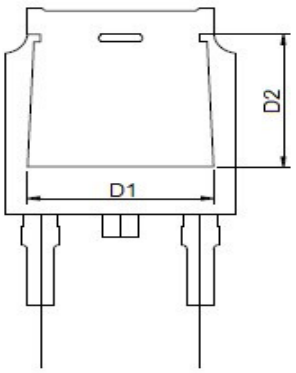


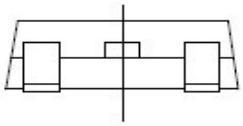
PACKAGE INFORMATION

Dimension in TO-252 (Unit: mm)

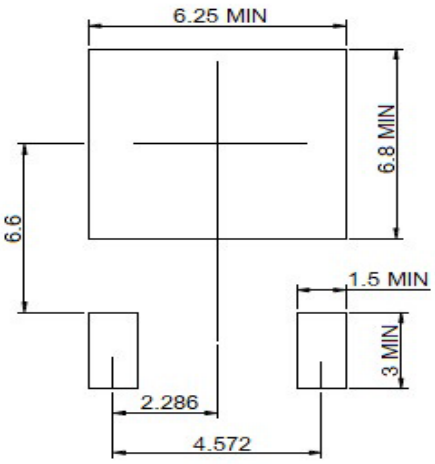








RECOMMENDED LAND PATTERN



Symbol	Millimeter	
	Min.	Max.
A	2.150	2.450
A1	0.050	0.200
A2	0.910	1.220
B	0.660	0.860
B1	0.930	1.230
C	0.400	0.600
C1	0.400	0.600
D	5.950	6.250
D1	4.800	
D2	3.800	
E	6.450	6.750
E1	5.120	5.520
L	1.650	
L1	1.580	1.980
L2	0.600	1.000
L3	0.700	1.000
L4	0.000	0.200
L5	2.800	3.400
H	9.800	10.400
θ	0°	8°
e	4.572 REF	

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