DESCRIPTION

The AM50N10 is available in TO-252 Package

BVDSS	RDSON	ID
100V	17mΩ	50A

FEATURE

- $R_{DS(ON),typ.}$=17 Ω@V_{GS}=10V
- $R_{DS(ON),typ.}$=21.5 Ω@V_{GS}=4.5V
- Low $R_{DS(on)}$
- Extremely low switching loss
- Excellent stability and uniformity
- Fast switching and soft recovery

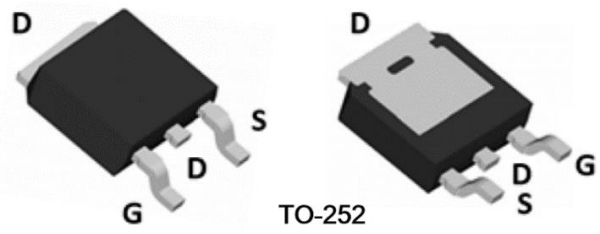
APPLICATION

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

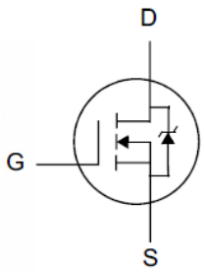
ORDERING INFORMATION

Package Type	Part Number	
TO-252 SPQ: 2,500pcs/Reel	D	AM50N10DR
		AM50N10DVR
Note	V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products		

PIN DESCRIPTION



TO-252



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

ABSOLUTE MAXIMUM RATINGS

T_A = 25°C, unless otherwise specified.

Parameter		Symbol	Value	Unit
Drain-source Voltage		V_{DS}	100	V
Gate-source Voltage		V_{GS}	±20	V
Drain Current	T_A=25℃	I_D	50	A
	T_C=100℃		28.5	
Pulsed Drain Current (1)		I_{DM}	180	A
Avalanche energy (2)		EAS	81	mJ
Total Power Dissipation (3)	T_A=25℃	P_D	72	W
	T_C=100℃		28.8	
Junction and Storage Temperature Range		T_J , T_{STG}	-55 ~ +150	℃

THERMAL RESISTANCE

Parameter		Symbol	Typ.	Max.	Unit
Thermal Resistance Junction-to-Ambient (4)	t≤10S	$R_{\theta JA}$	15	20	℃/W
Thermal Resistance Junction-to-Ambient (4)	Steady-State		40	50	
Thermal Resistance Junction-to-Case	Steady-State	$R_{\theta JC}$	1.35	1.7	

(1) Repetitive rating; pulse width limited by max. junction temperature.

(2) V_{DD}=50V, V_{GS}=10V, L=5mH, I_{AS}=5.7A.

(3) Pd is based on max. junction temperature, using junction-case thermal resistance.

(4) The value of $R_{\theta JA}$ is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C. The Power dissipation PDSM is based on $R_{\theta JA}$ t≤ 10s and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.

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 Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D=250μA	100			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=100, V_{GS}=0V			1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}= ±20V, V_{DS}=0V			±100	nA
Gate Threshold Voltage	$V_{GS\ (th)}$	V_{DS}= V_{GS}, I_D=250μA	1	1.8	3	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}= 10V, I_D=20A		14	17	mΩ
		V_{GS}= 4.5V, I_D=20A		17	21.5	mΩ
Diode Forward Voltage	V_{SD}	I_S=20A, V_{GS}=0V			1.3	V
Maximum Body-Diode Continuous Current	I_S				45	A
Gate resistance	R_G	f= 1 MHz, Open drain		1		Ω
Dynamic CHARACTERISTICS						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=50V, f=1MHz		1135		pF
Output Capacitance	C_{oss}			399		
Reverse Transfer Capacitance	C_{rss}			18		
Switching CHARACTERISTICS						
Total Gate Charge	Qg	V_{GS}=10V, V_{DS}=50V, I_D=25A		16		nC
Gate-Source Charge	Qgs			5.6		
Gate-Drain Charge	Qgd			2.4		
Reverse Recovery Chrage	Qrr	I_F=20A, di/dt=100A/us		42		
Reverse Recovery Time	trr			39.8		ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=10V, V_{DD}=50V, I_D=25A R_{GEN}=2.2Ω		39.2		
Turn-on Rise Time	tr			11		
Turn-off Delay Time	$t_{D(off)}$			53.2		
Turn-off fall Time	tf			15.8		

(1) Repetitive rating; pulse width limited by max. junction temperature.

(2) V_{DD}=50V, V_{GS}=10V, L=5mH, I_{AS}=5.7A.

(3) Pd is based on max. junction temperature, using junction-case thermal resistance.

(4) The value of $R_{\theta JA}$ is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C. The Power dissipation PDSM is based on $R_{\theta JA}$ t≤ 10s and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.

TYPICAL PERFORMANCE CHARACTERISTICS

Fig.1 Output Characteristics

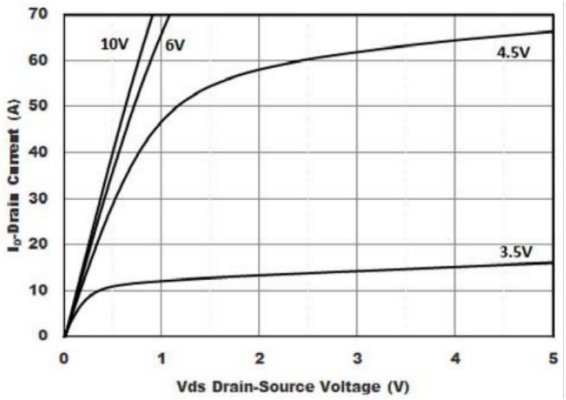


Fig.2 Transfer Characteristics

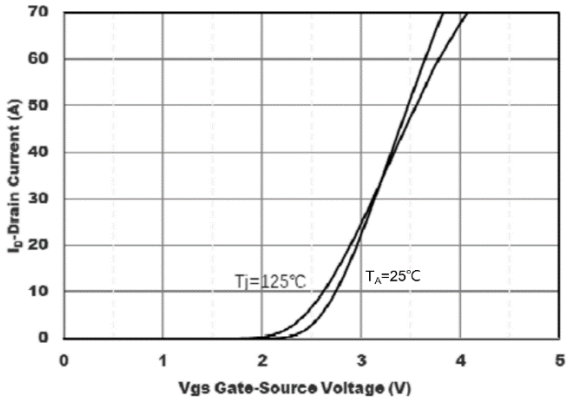


Fig.3 Capacitance Characteristics

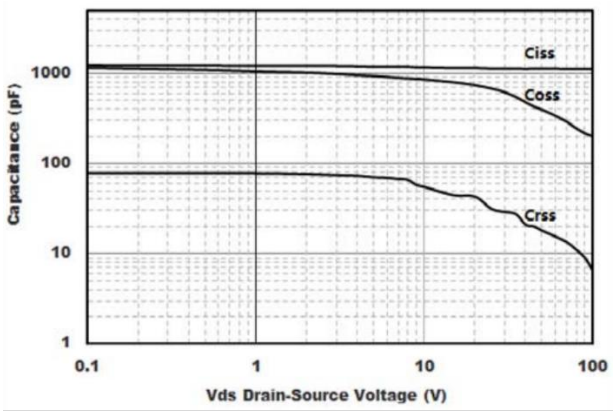


Fig.4 Gate Charge

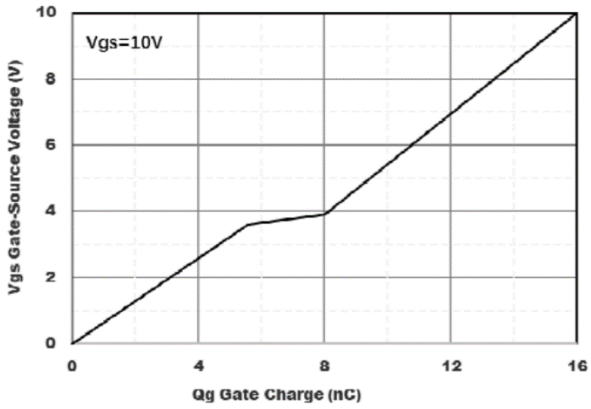


Fig.5 On-Resistance vs. Drain Current and Gate Voltage

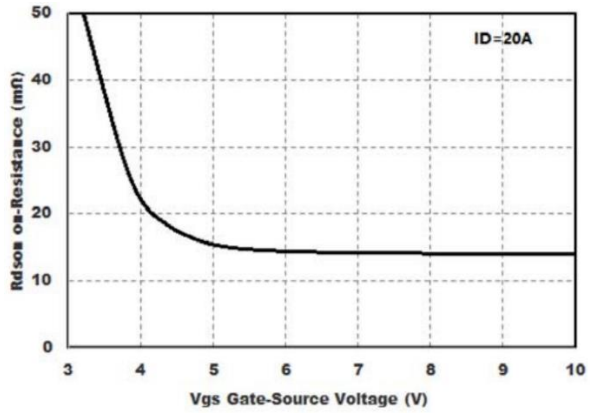


Fig.6 Normalized On-Resistance

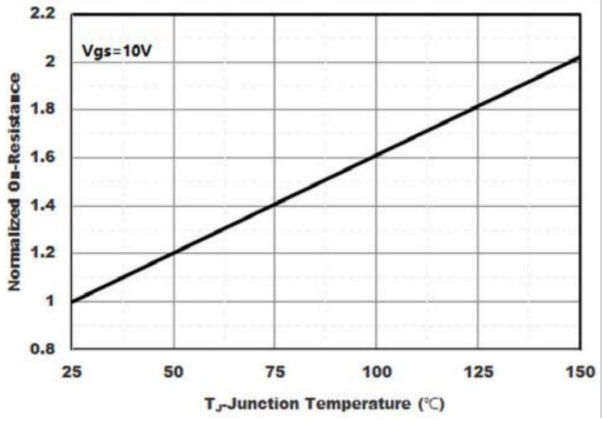


Fig.7 Drain Current

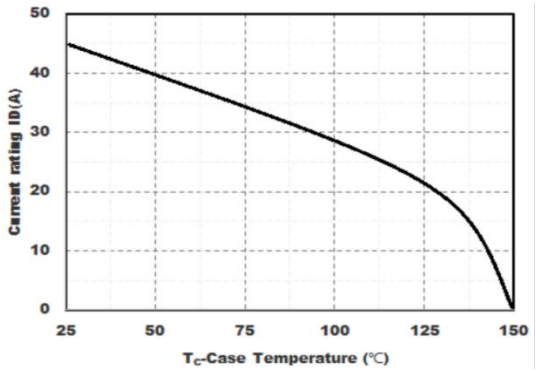


Fig.8 Safe Operation Area

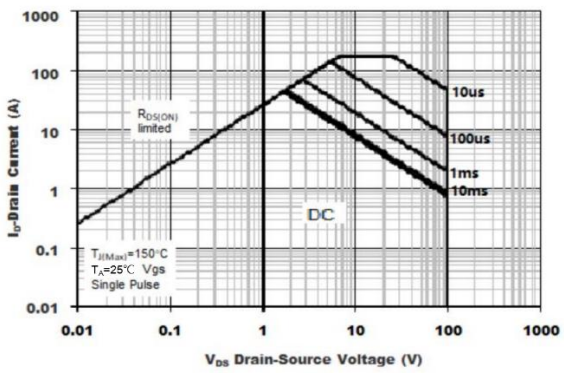
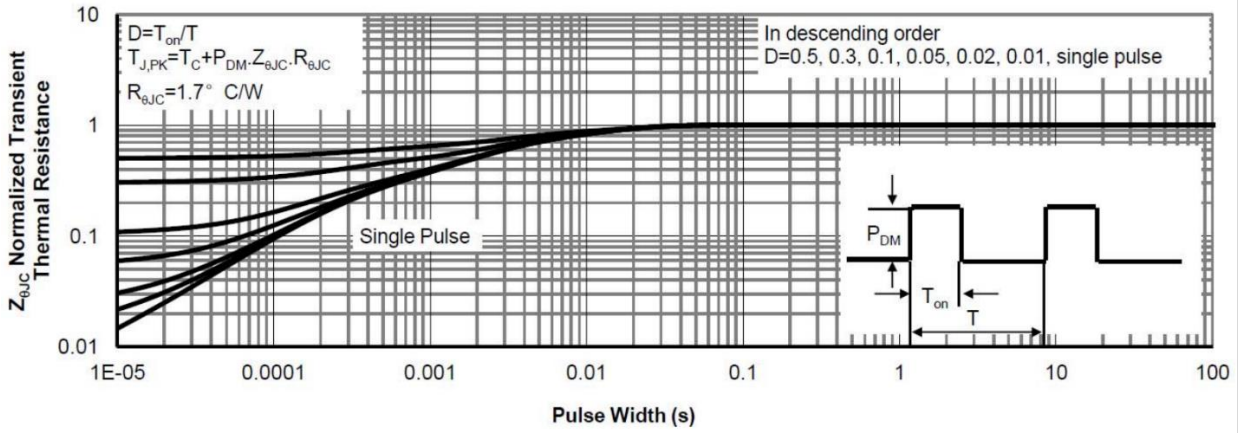
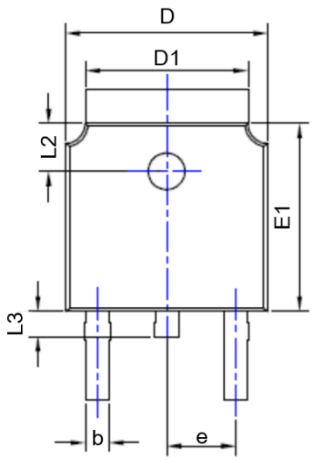


Fig.9 Normalized Maximum Transient Thermal Impedance

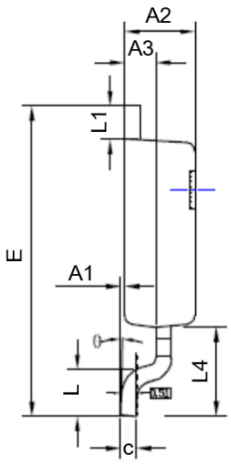


PACKAGE INFORMATION

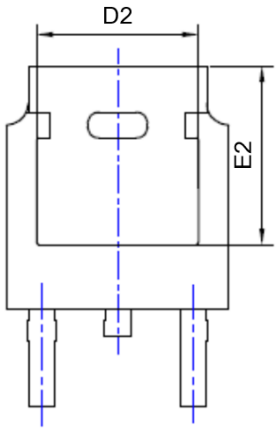
Dimension in TO-252 (Unit: mm)



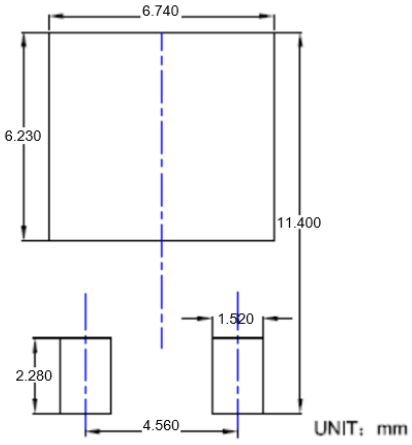
TOP VIEW



SIDE VIEW



BOTTOM VIEW



SUGGESTED SOLDER PAD LAYOUT

Symbol	Min.	Max.
A1	0.000	0.200
A2	2.200	2.400
A3	0.900	1.100
b	0.660	0.860
c	0.460	0.580
D	6.500	6.700
D1	5.150	5.450
D2	4.600	4.950
E	10.100	10.300
E1	6.100	6.200
E2	5.300	5.450
e	2.286BSC	
L	1.250	1.750
L1	0.900	1.270
L2	1.400	1.900
L3	0.600	1.000
L4	2.900REF	
θ	0	10

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