DESCRIPTION

The AM50N04 is available in TO-252 package.

BVDSS	RDSON	ID
40V	11mΩ	50A

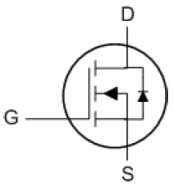
FEATURE

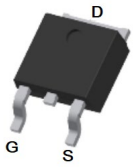
- Green Device Available
- Super Low Gate Charge
- Excellent CdV/dt Effect Decline
- Advanced High Cell Density Trench Technology

APPLICATION

- High frequency switching mode power supply

PIN DESCRIPTION





TO-252

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

ORDERING INFORMATION

Package Type	Part Number	
TO-252 SPQ: 2,500pcs/Reel	D	AM50N04DR
		AM50N04DVR
Note	R: Tape & Reel V: Halogen free Package	
AiT provides all RoHS products		

ABSOLUTE MAXIMUM RATINGS

V_{DS}, Drain-Source Voltage		40V
V_{GS}, Drain-Source Voltage		±20V
I_D, Continuous Drain Current, V_{GS} @ 10V	T_C=25℃	50A
I_D, Continuous Drain Current, V_{GS} @ 10V	T_C=100℃	25A
I_{DM}, Pulsed Drain Current		80A
E_{AS}, Single Pulse Avalanche Energy		19mJ
I_{AS}, Avalanche Current		30A
P_D, Total Power Dissipation	T_C=25℃	20W
T_{STG}, Storage Temperature Range		-55℃~+150℃
T_J, Operating Junction Temperature Range		-55℃~+150℃
$R_{\theta JA}$, Thermal Resistance Junction-Ambient		55℃/W
$R_{\theta JC}$, Thermal Resistance Junction-Case		4.32℃/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℃,unless otherwise noted.

Parameter	Symbol	Conditions	Min	Typ.	Max	Unit
OFF Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	40	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=40V, V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
ON Characteristics						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	1.0	1.5	2.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=8A	-	11	16	mΩ
		V_{GS}=4.5V, I_D=4A	-	18.9	24.0	mΩ
Forward Transconductance	g_{fs}	V_{DS}=5V, I_D=8A	33	-	-	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=20V, f=1MHz	-	964	-	pF
Output Capacitance	C_{oss}		-	109	-	
Reverse Transfer Capacitance	C_{rss}		-	96	-	
Switching Characteristics						
Turn-on Delay Time	$t_{d\ (ON)}$	V_{DD}=20V, R_L=2.5Ω, V_{GS}=10V, R_{GEN}=3Ω	-	5.5	-	ns
Turn-on Rise Time	t_r		-	14	-	
Turn-Off Delay Time	$t_{d\ (OFF)}$		-	24	-	
Turn-Off Fall Time	t_f		-	12	-	
Total Gate Charge	Q_g	I_D=8A, V_{DS}=20V, V_{GS}=10V	-	22.9	-	nC
Gate-Source Charge	Q_{gs}		-	3.5	-	
Gate-Drain Charge	Q_{gd}		-	5.3	-	
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	I_S=9A , V_{GS}=0V	-	0.8	1.2	V

TYPICAL PERFORMANCE CHARACTERISTICS

Fig 1. Switching Test Circuit

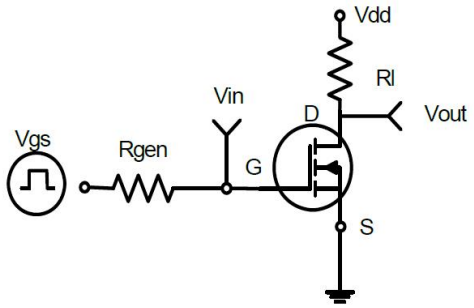


Fig 2. Switching Waveforms

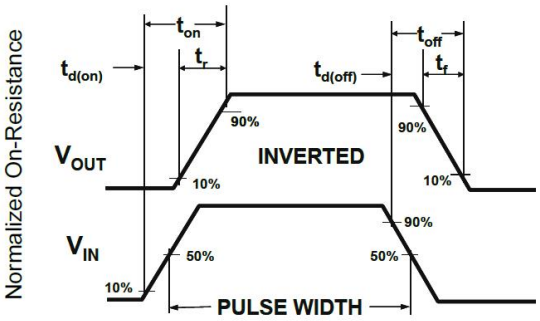


Fig 3. Output Characteristics

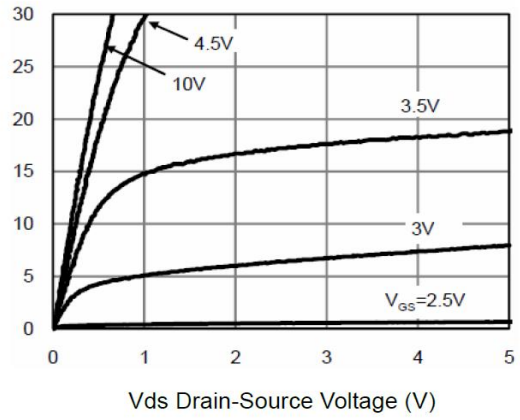


Fig 4. Transfer Characteristics

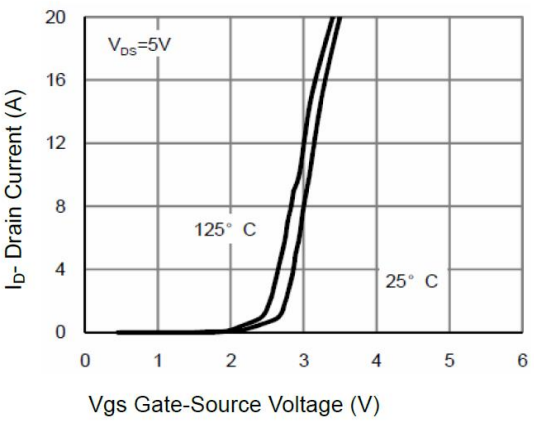


Fig 5. Drain-Source On-Resistance

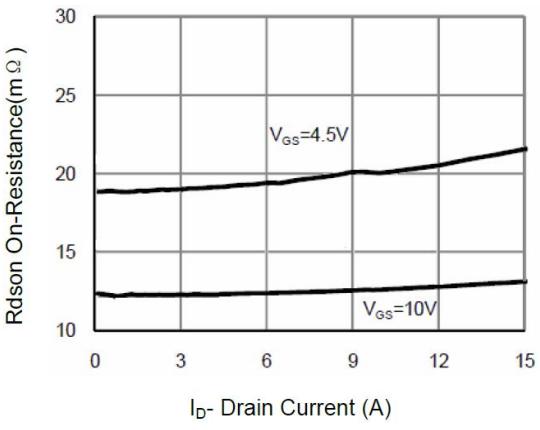


Fig 6. Drain-Source On-Resistance

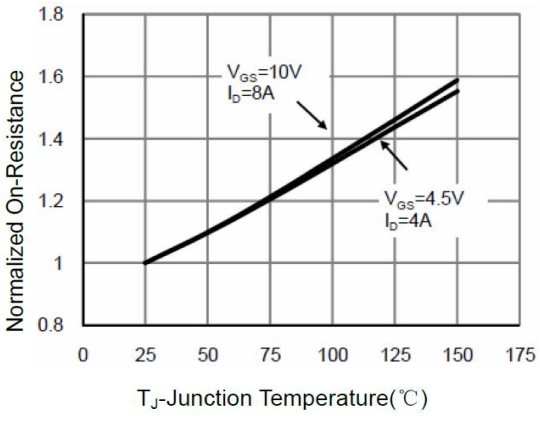


Fig 7. R_{dson} vs. V_{gs}

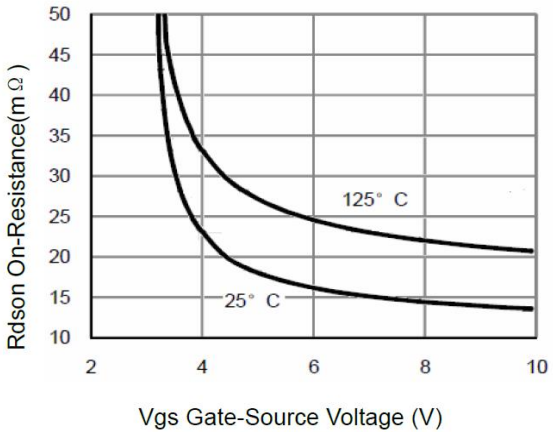


Fig 8. Power Dissipation

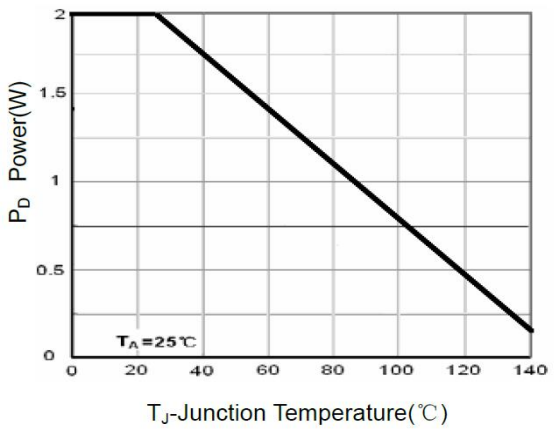


Fig 9. Gate Charge

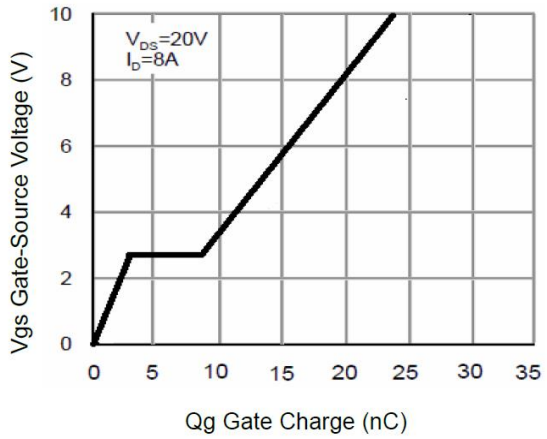


Fig 10. Source- Drain Diode Forward

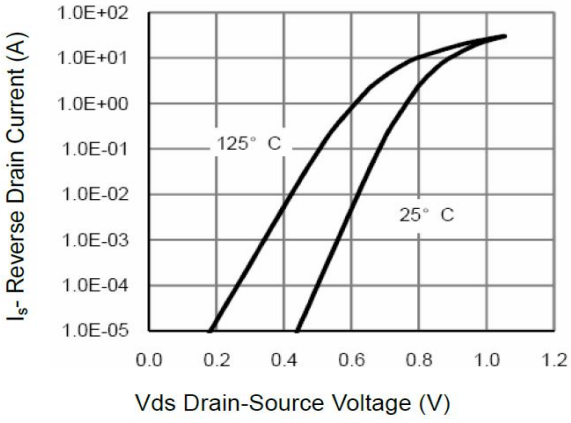


Fig 11. Capacitance vs. V_{ds}

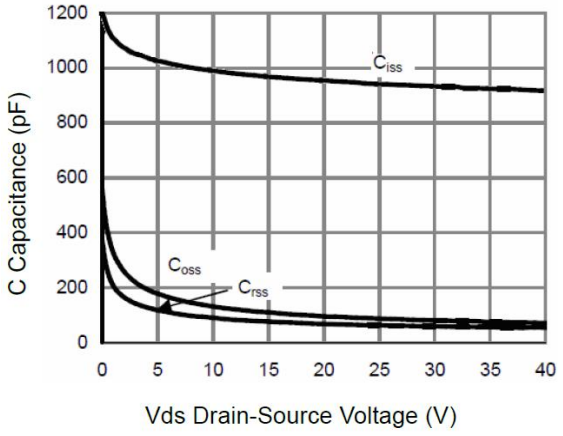
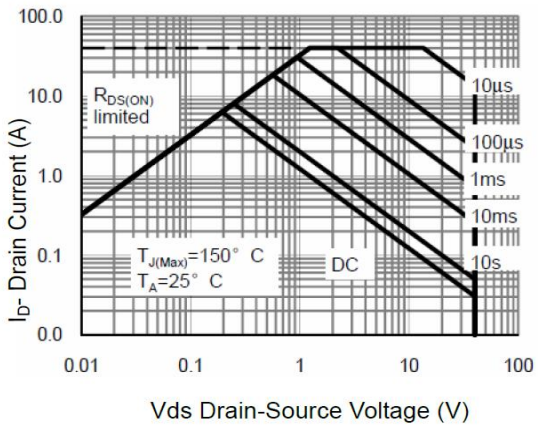
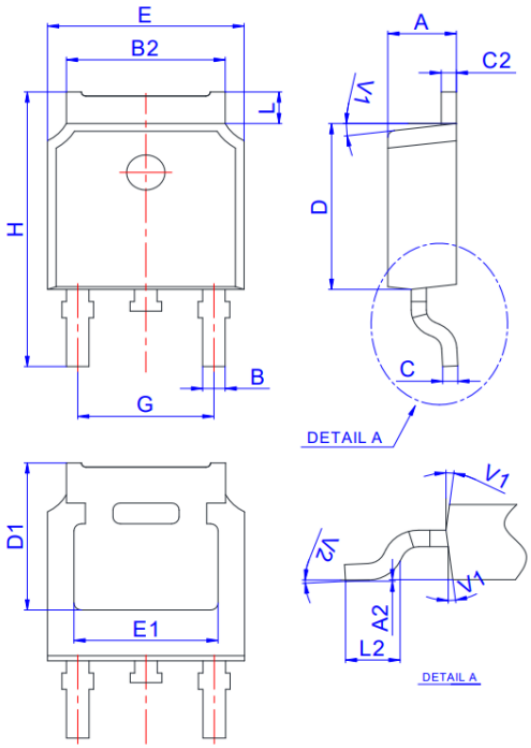


Fig 12. Safe Operation Area



PACKAGE INFORMATION

Dimension in TO-252 (Unit: mm)



Symbol	MILLIMETERS	
	Min.	Max.
A	2.100	2.500
A2	0.000	0.100
B	0.660	0.860
B2	5.180	5.480
C	0.400	0.600
C2	0.440	0.580
D	5.900	6.300
D1	5.300 REF	
E	6.400	6.800
E1	4.630	-
G	4.470	4.670
H	9.500	10.700
L	1.090	1.210
L2	1.350	1.650
V1	7°	
V2	0°	6°

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