DESCRIPTION

The AM50N03 is available in PDFN8(3.3x3.3) package.

BVDSS	RDSON	ID
30V	7mΩ	50A

FEATURE

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

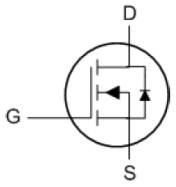
APPLICATION

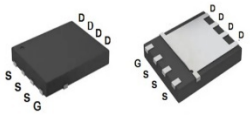
- High frequency switching mode power supply

ORDERING INFORMATION

Package Type	Part Number	
PDFN8 (3.3x3.3) SPQ: 5,000pcs/Reel	PJ8S	AM50N03PJ8SR
		AM50N03PJ8SVR
Note	R: Tape & Reel V: Halogen free Package	
AiT provides all RoHS products		

PIN DESCRIPTION





PDFN8(3.3x3.3)

Pin#	Symbol	Function
4	G	Gate
5,6,7,8	D	Drain
1,2,3	S	Source

ABSOLUTE MAXIMUM RATINGS

V_{DS}, Drain-Source Voltage		30V
V_{GS}, Gate-Source Voltage		±20V
I_D, Continuous Drain Current, V_{GS} @ 10V (1)	T_C=25℃	50A
I_D, Continuous Drain Current, V_{GS} @ 10V (1)	T_C=100℃	30A
I_{DM}, Pulsed Drain Current (2)		120A
E_{AS}, Single Pulse Avalanche Energy (3)		39mJ
I_{AS}, Avalanche Current		50A
P_D, Total Power Dissipation (4)	T_C=25℃	18W
T_{STG}, Storage Temperature Range		-55℃~+150℃
T_J, Operating Junction Temperature Range		-55℃~+150℃
$R_{\theta JA}$, Thermal Resistance Junction-Ambient (1)		75℃/W
$R_{\theta JC}$, Thermal Resistance Junction-Case (1)		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.

(1) The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
(2) The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
(3) The EAS data shows Max. rating. The test condition is V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=34A.
(4) The power dissipation is limited by 150℃ junction temperature.

ELECTRICAL CHARACTERISTICS

T_J=25℃,unless otherwise noted.

Parameter	Symbol	Conditions	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	30	-	-	V
BVDSS Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to 25℃ , I_D=1mA	-	0.027	-	V/℃
Static Drain-Source On-Resistance (2)	$R_{DS(ON)}$	V_{GS}=10V, I_D=12A	-	7	8.5	mΩ
		V_{GS}=4.5V, I_D=10A	-	10	14	
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS}=V_{DS}, I_D =250μA	1.0	-	2.5	V
$V_{GS\ (th)}$ Temperature Coefficient	$\Delta V_{GS(TH)}$		-	-5.8	-	mV/℃
Drain-Source Leakage Current	I_{DSS}	V_{DS}=24V , V_{GS}=0V , T_J=25℃	-	-	1	μA
		V_{DS}=24V , V_{GS}=0V , T_J=55℃	-	-	5	
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	--	-	±100	nA
Gate Resistance	R_g	V_{DS}=0V, V_{GS}=0V, f=1MHz	-	1.7	-	Ω
Total Gate Charge (4.5V)	Q_g	V_{DS}=20V, V_{GS}=4.5V, I_D=12A	-	12.8	-	nC
Gate-Source Charge	Q_{gs}		-	3.3	-	
Gate-Drain Charge	Q_{gd}		-	6.5	-	
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=12V, V_{GS}=10V , R_G=3.3Ω,I_D=5A	-	4.5	-	ns
Rise Time	T_r		-	10.8	-	
Turn-Off Delay Time	$T_{d(off)}$		-	25.5	-	
Fall Time	T_f		-	9.6	-	
Input Capacitance	C_{iss}	V_{DS}=15V, V_{GS}=0V, f=1MHz	-	1200	-	pF
Output Capacitance	C_{oss}		-	163	-	
Reverse Transfer Capacitance	C_{rss}		-	131	-	
Diode Characteristics						
Continuous Source Current (1)(5)	I_S	V_G=V_D=0V, Force Current	-	-	50	A
Pulsed Source Current (2)(5)	I_{SM}		-	-	120	A
Diode Forward Voltage (2)	V_{SD}	V_{GS}=0V , I_S=1A , T_J=25℃	-	-	1.2	V

(1) The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.

(2) The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.

(5) The data is theoretically the same as I_D and I_{DM}, in real applications , should be limited by total power dissipation.

TYPICAL PERFORMANCE CHARACTERISTICS

Fig 1. Typical Output Characteristics

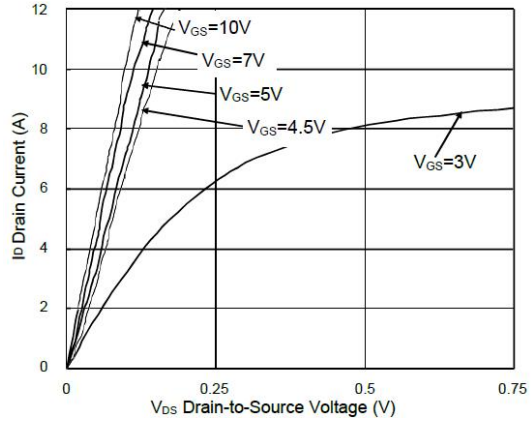


Fig 2. On-Resistance vs. G-S Voltage

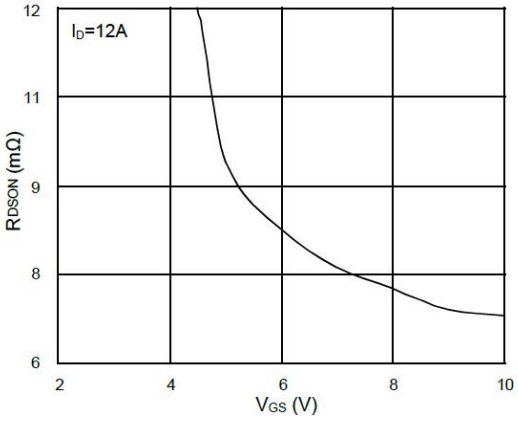


Fig 3. Forward Characteristics of Reverse

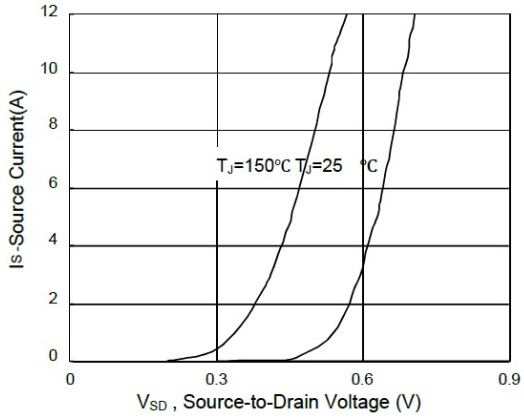


Fig 4. Gate-Charge Characteristics

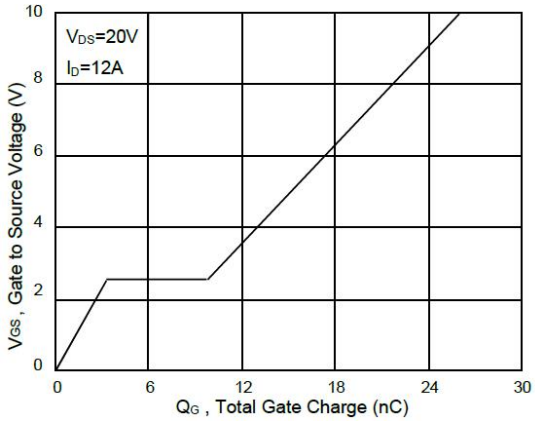


Fig 5. Normalized $V_{GS\,(th)}$ vs. T_J

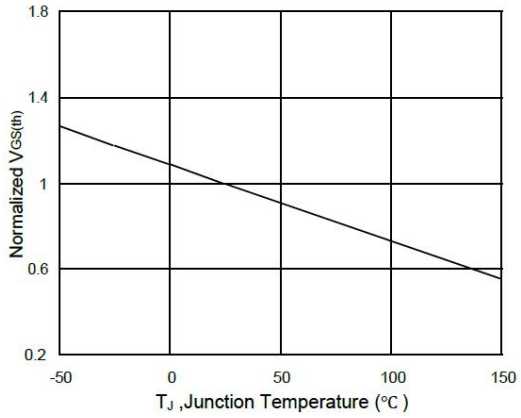


Fig 6. Normalized R_{DSON} vs.T_J

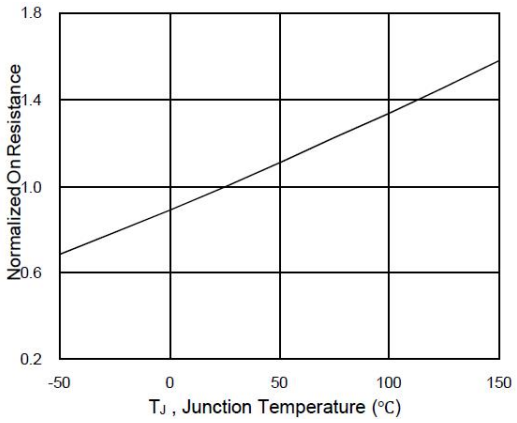


Fig 7. Capacitance

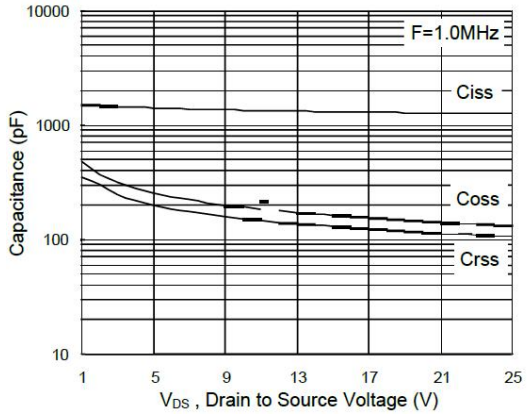


Fig 8. Safe Operating Area

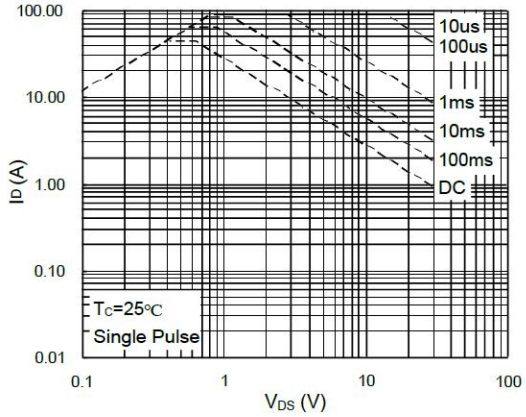


Fig 9. Switching Time Waveform

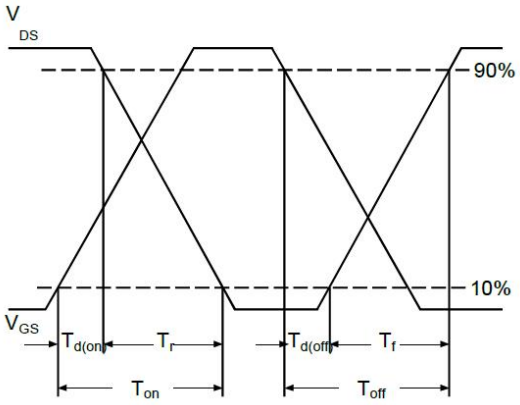


Fig 10. Unclamped Inductive Switching Waveform

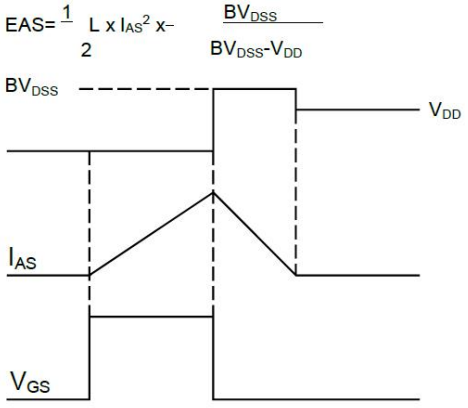
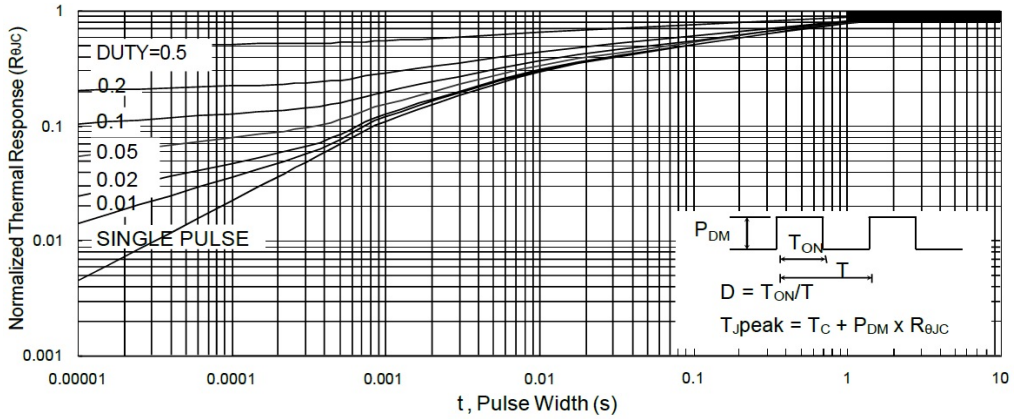
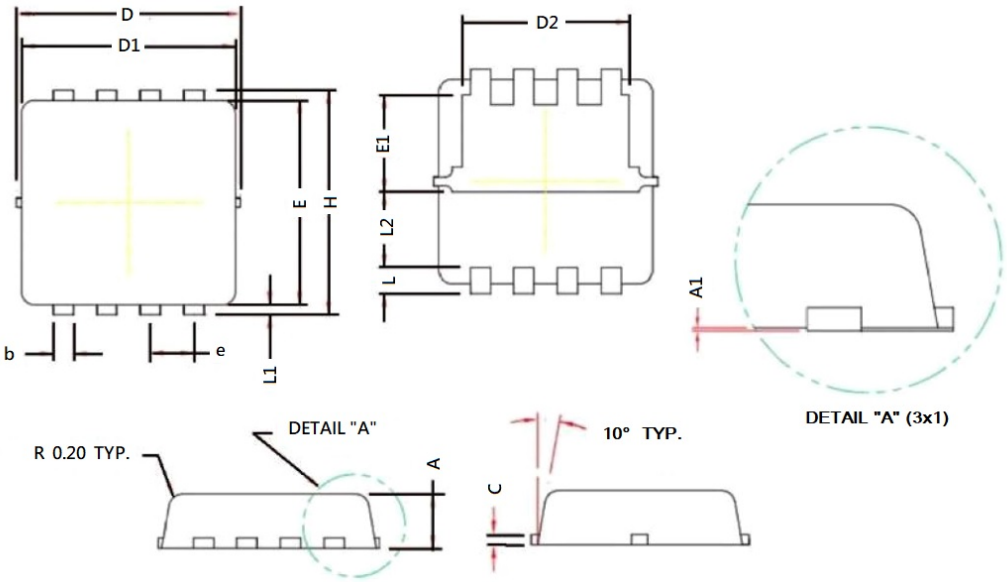


Fig 11. Normalized Maximum Transient Thermal Impedance



PACKAGE INFORMATION

Dimension in PDFN8(3.3x3.3) (Unit: mm)



Symbol	Min	Max
A	0.700	0.900
A1	0.000	0.050
b	0.240	0.350
C	0.100	0.200
D	3.250	3.400
D1	3.050	3.250
D2	2.400	2.600
E	3.000	3.200
E1	1.350	1.550
e	0.650 BSC	
H	3.200	3.400
L	0.300	0.500
L1	0.100	0.200
L2	1.130 REF	

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