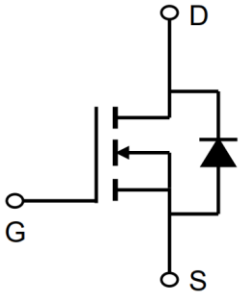
AP4N15MI

150V N-Channel Enhancement Mode MOSFET

Description

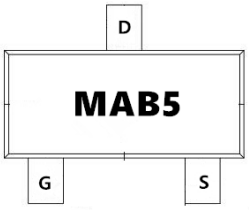
The AP4N15MI uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 6V. This device is suitable for use as a Battery protection or in other Switching application.



General Features

V_{DS} = 150V I_D =4A

$R_{DS(ON)}$ < 300mΩ @ V_{GS}=10V



Application

Battery protection

Load switch

Uninterruptible power supply

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP4N15MI	SOT-23-3L	MAB5	3000

Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	150	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_A=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	4	A
I_D@T_A=100℃	Continuous Drain Current, V_{GS} @ 10V[1]	1.5	A
I_{DM}	Pulsed Drain Current[2]	9	A
P_D@T_A=25℃	Total Power Dissipation[3]	2	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta JA}$	Thermal Resistance Junction-ambient [1]	125	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	80	℃/W

150V N-Channel Enhancement Mode MOSFET

Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V I_D=250μA	150	165	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=150V,V_{GS}=0V	-	-	1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	1.0	1.8	3.0	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=10V, I_D=1.5A	-	220	280	mΩ
		V_{GS}=4.5V, I_D=1.5A		230	300	mΩ
G_{fs}	Forward Transconductance	V_{DS}=15V,I_D=1.5A	-	3	-	S
C_{lss}	Input Capacitance	V_{DS}=25V,V_{GS}=0V, F=1.0MHz	-	235	-	PF
C_{oss}	Output Capacitance		-	36	-	PF
C_{rss}	Reverse Transfer Capacitance		-	20	-	PF
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=75V,I_D=1A,R_L=75Ω V_{GS}=10V,R_G=6Ω	-	8	-	nS
t_r	Turn-on Rise Time		-	10	-	nS
$t_{d(off)}$	Turn-Off Delay Time		-	20	-	nS
t_f	Turn-Off Fall Time		-	15	-	nS
Q_g	Total Gate Charge	V_{DS}=75V,I_D=1.5A, V_{GS}=10V	-	8		nC
Q_{gs}	Gate-Source Charge		-	1.4	-	nC
Q_{gd}	Gate-Drain Charge		-	2.1	-	nC
V_{SD}	Diode Forward Voltage (Note 3)	V_{GS}=0V,I_S=2A	-	-	1.2	V
I_S	Diode Forward Current (Note 2)		-	-	2	A

Note :

1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.

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

3.The power dissipation is limited by 150°C junction temperature

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

Typical Characteristics

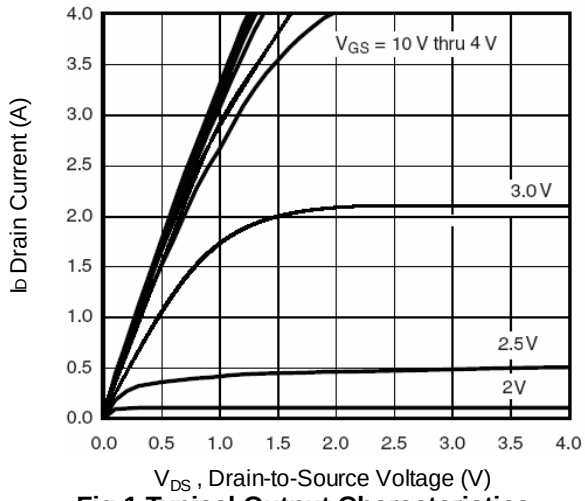


Fig.1 Typical Output Characteristics

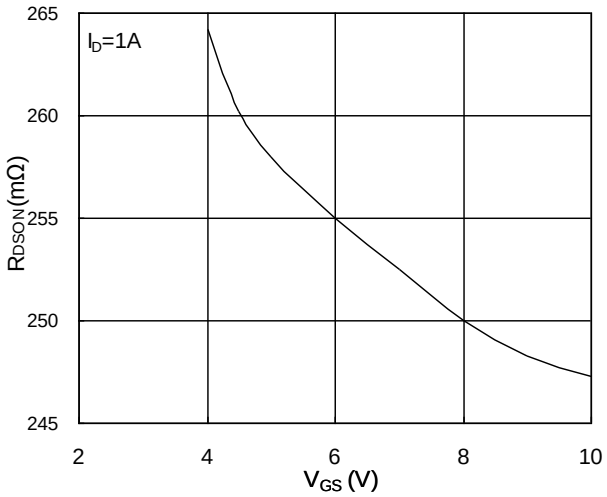


Fig.2 On-Resistance vs. Gate-Source

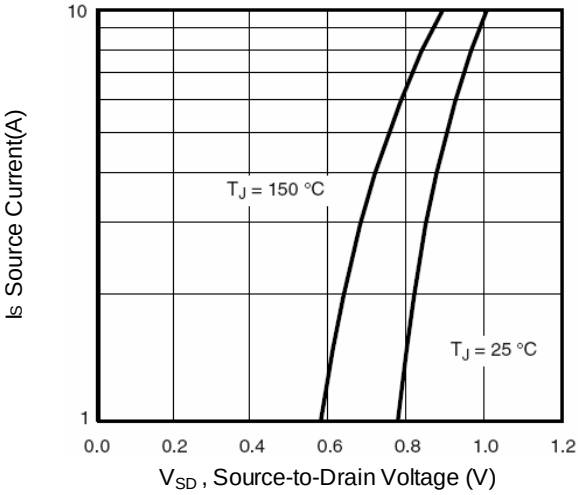


Fig.3 Forward Characteristics of Reverse

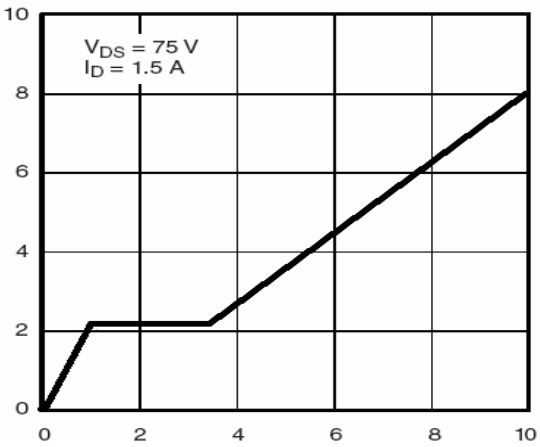


Fig.4 Gate-Charge Characteristics

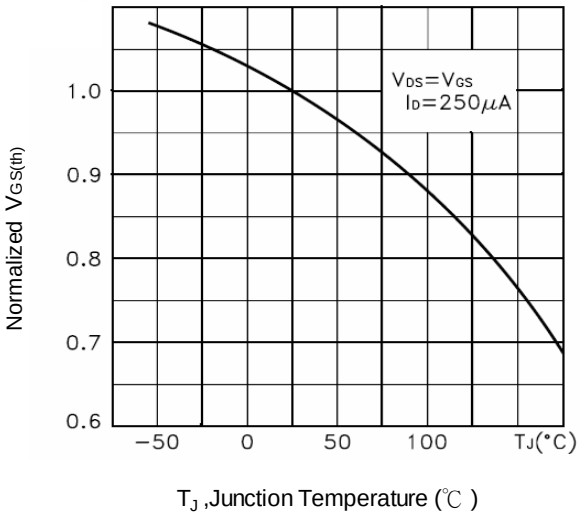


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

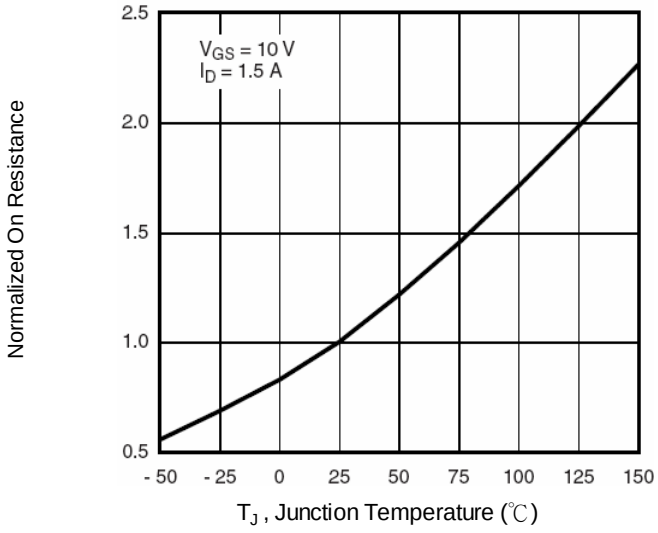


Fig.6 Normalized R_{DSON} vs. T_J

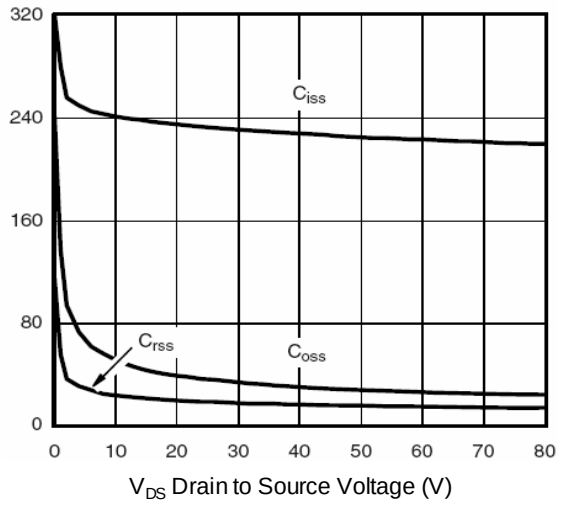


Fig.7 Capacitance

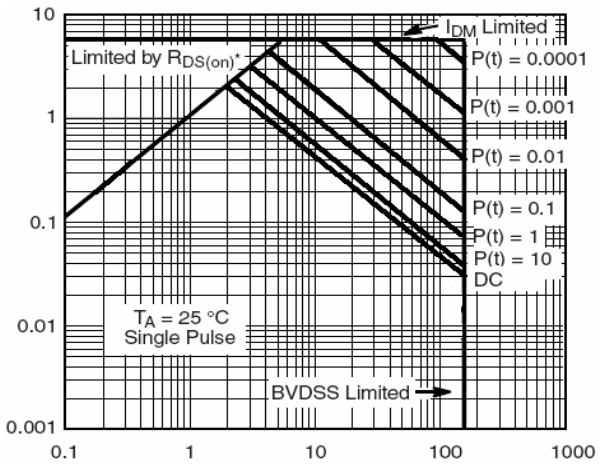


Fig.8 Safe Operating Area

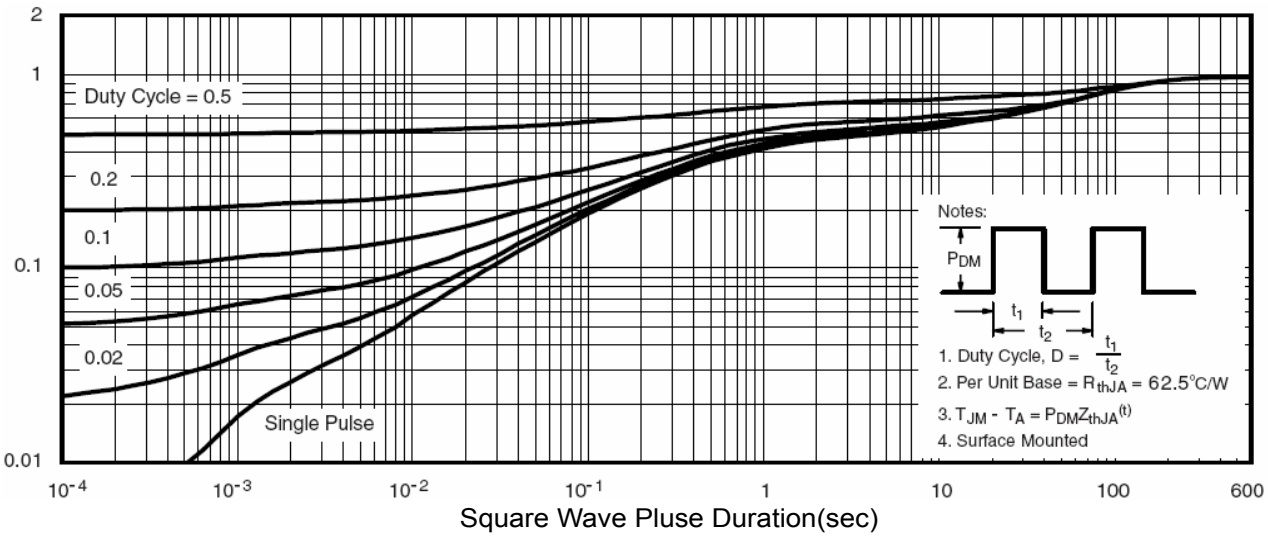


Fig.9 Normalized Maximum Transient Thermal Impedance

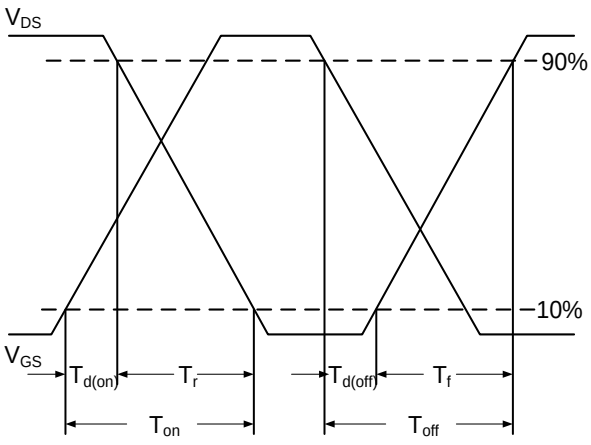


Fig.10 Switching Time Waveform

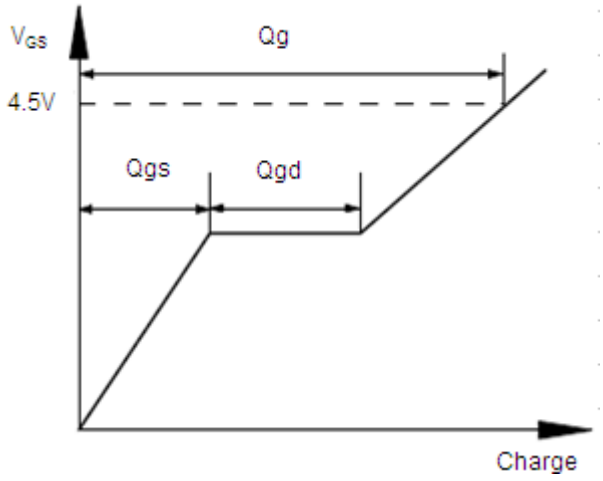
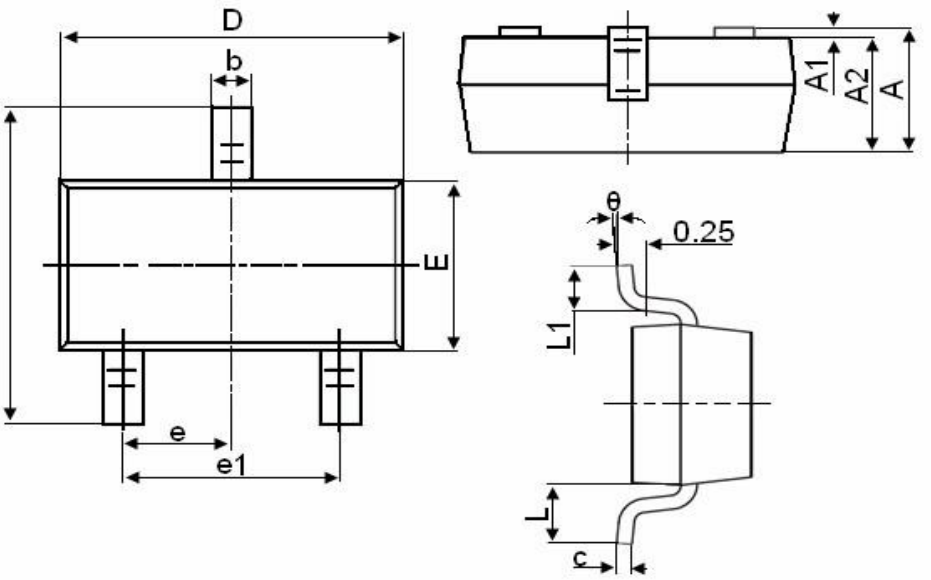


Fig.11 Gate Charge Waveform

Package Mechanical Data：SOT23-3L



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°

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