AP4N10MSI

100V N-Channel Enhancement Mode MOSFET

Description

The AP4N10MSI uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

V_{DS} = 100V I_D =4.0A

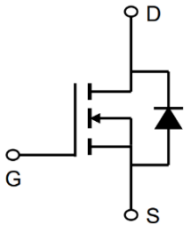
$R_{DS(ON)}$ < 250mΩ @ V_{GS}=10V **(Type：200mΩ)**

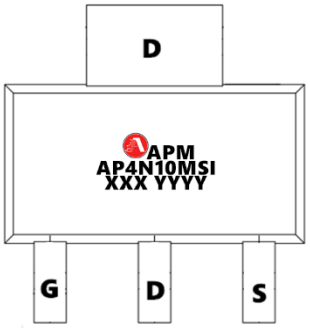
Application

LED

Load switch

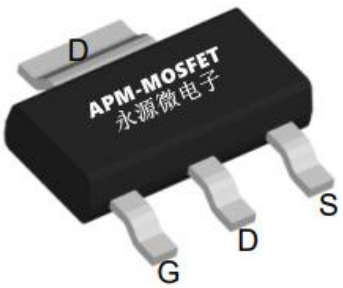
Uninterruptible power supply

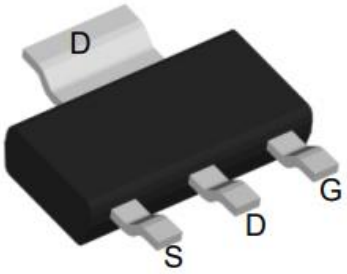




Top View

Bottom View





Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP4N10MSI	SOT223-3L	AP4N10MSI XXX YYYY	3000

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_A=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	4.0	A
I_D@T_A=100℃	Continuous Drain Current, V_{GS} @ 10V[1]	2.0	A
I_{DM}	Pulsed Drain Current[2]	8	A
P_D@T_A=25℃	Total Power Dissipation[3]	3.75	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]	85	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	30	℃/W

Electrical Characteristics (T_J=25℃, unless otherwise noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	VGS = 0 V, ID = 250μA	100	111	-	V
IGSS	Gate Leakage Current	VGS = ±20V, VDS = 0V	-	-	±100	nA
IDSS	Drain Cut-off Current	VDS = 100V, VGS = 0V	-	-	1	μA
VGS(th)	Gate Threshold Voltage	VGS = VDS, ID = 250μA	1.2	1.6	2.5	V
RDS(on)	Drain-Source on-state Resistance3	VGS = 10V, ID = 2A	-	200	250	mΩ
		VGS = 4.5V, ID = 1.5A	-	220	280	
Ciss	Input Capacitance	VGS = 0V, VDS = 50V, f = 1MHz	-	440	-	pF
Coss	Output Capacitance		-	14	-	pF
Crss	Reverse Transfer Capacitance		-	10	-	pF
Qg	Total gate charge	VGS = 10V, VDS = 50V, ID = 2A	-	5.3	-	nC
Qgs	Gate-source charge		-	1.4	-	nC
Qgd	Gate-drain charge		-	1.8	-	nC
td(on)	Turn-on Time	VGS = 10V, VDD = 50V, RG = 1Ω, ID = 2A	-	14	-	ns
tf	Rise time		-	54	-	ns
td(off)	Turn-off Time		-	18	-	ns
tf	Fall time		-	11	-	ns
VSD	Body Diode Voltage3	IS= 1A, VGS = 0V	-	-	1.2	V
IS	Continuous Source Current		-	-	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℃ 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

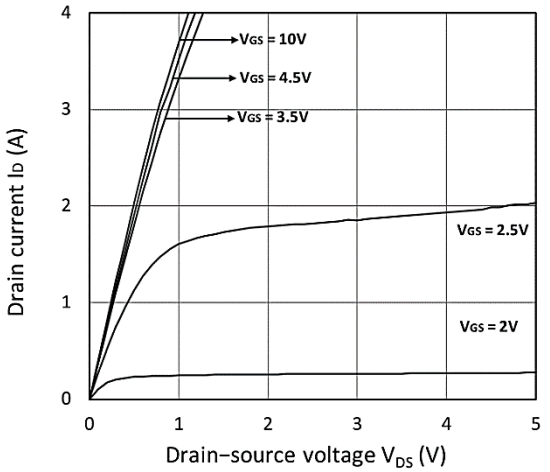


Figure 1. Output Characteristics

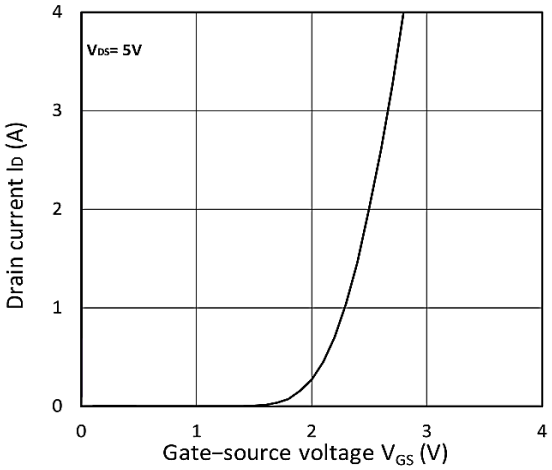


Figure 2. Transfer Characteristics

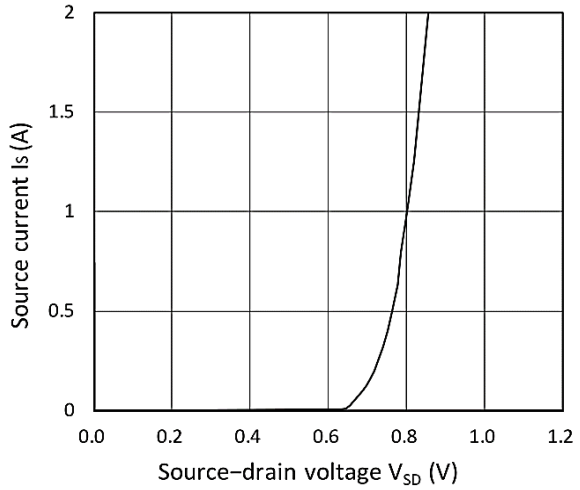


Figure 3. Forward Characteristics of Reverse

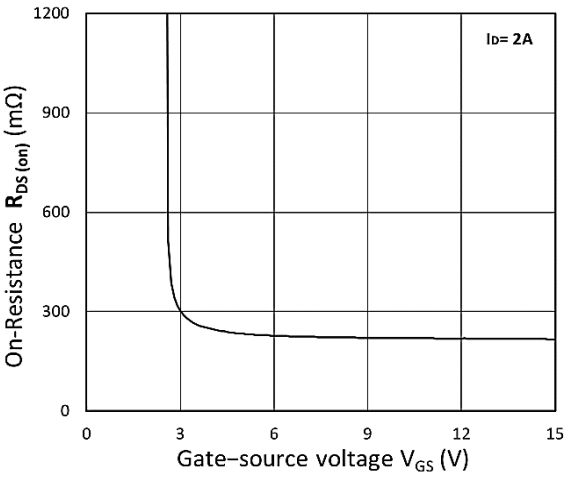


Figure 4. RDS(ON) vs. VGS

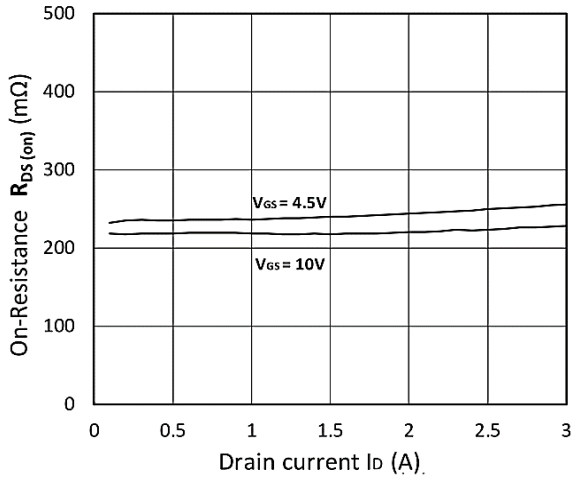


Figure 5. RDS(ON) vs. ID

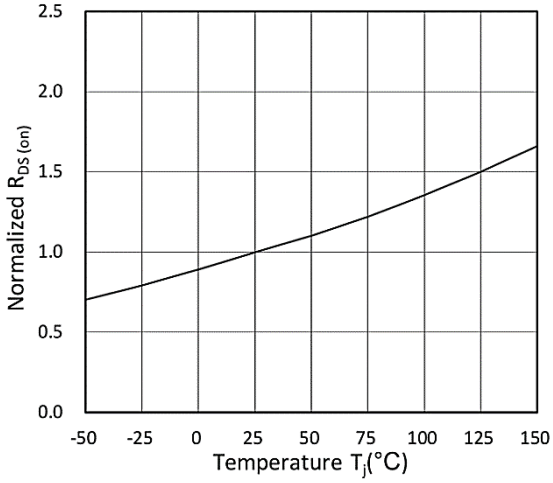


Figure 6. Normalized R DS(on) vs. Temperature

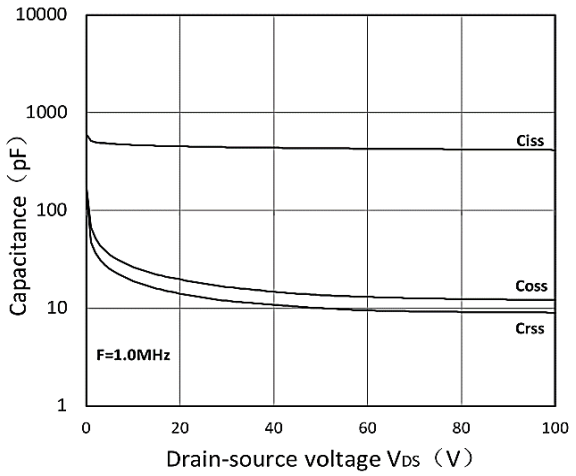


Figure 7. Capacitance Characteristics

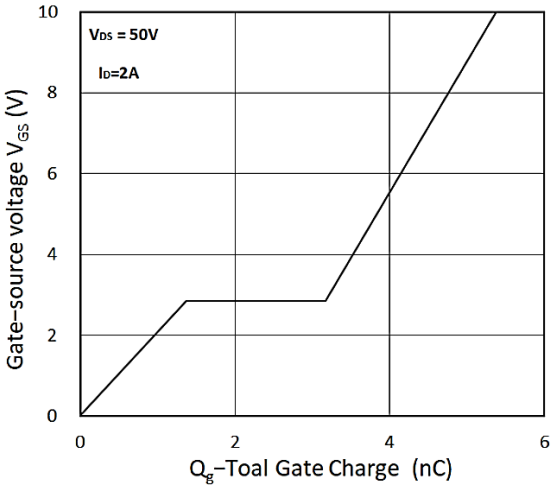


Figure 8. Gate Charge Characteristics

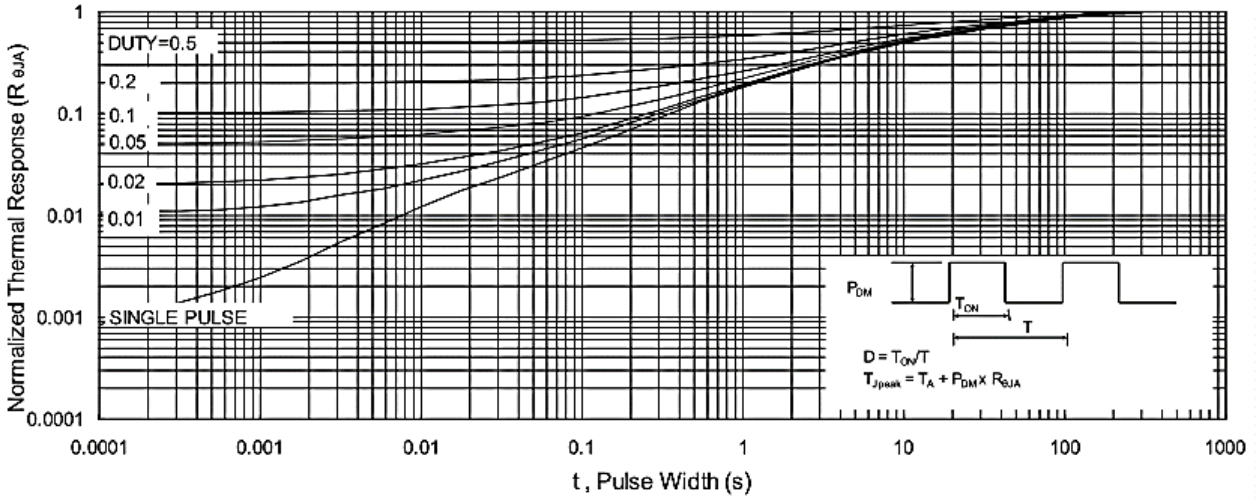


Fig.9 Normalized Maximum Transient Thermal Impedance

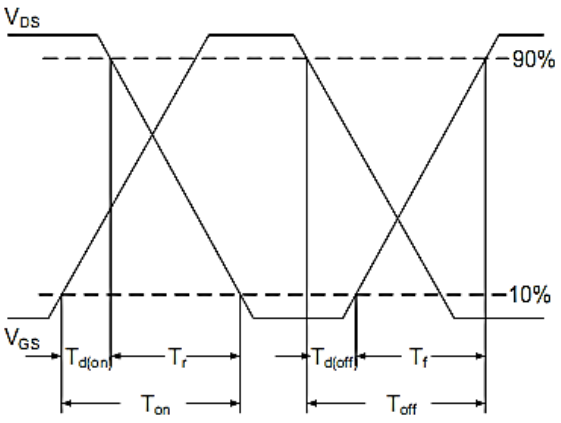


Fig.10 Switching Time Waveform

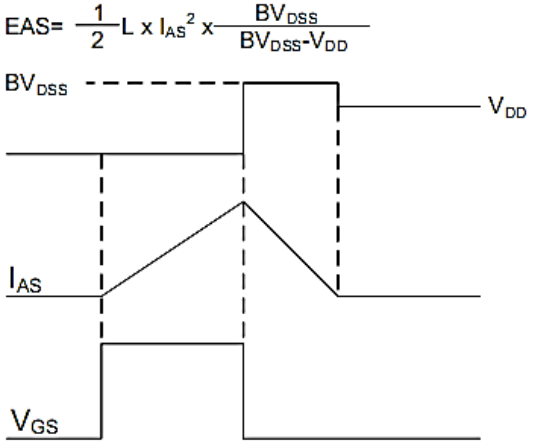
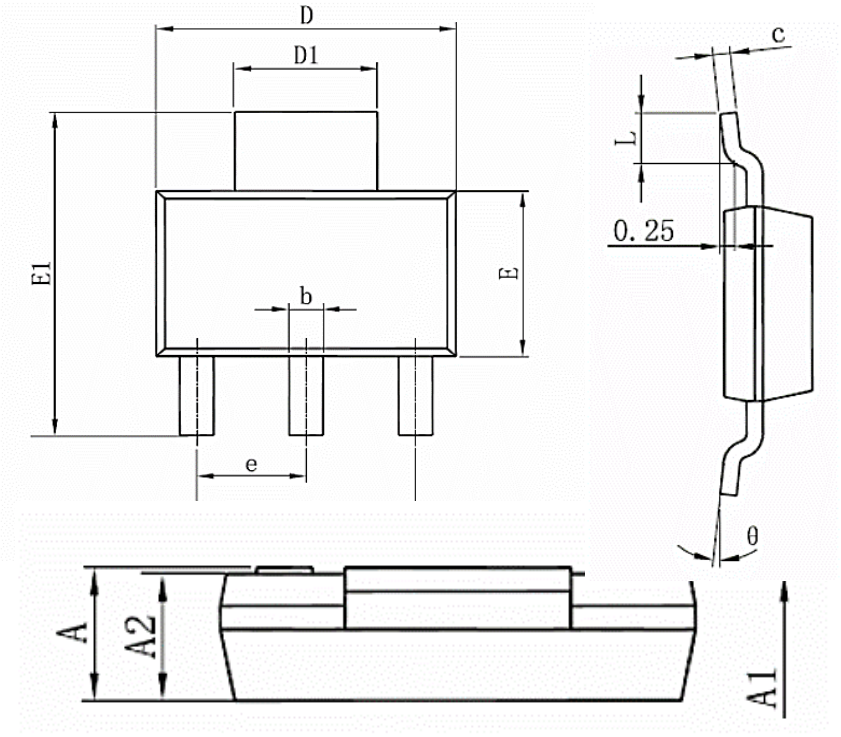


Fig.11 Unclamped Inductive Switching Waveform

Package Mechanical Data:SOT223-3L



Symbol	Dimensions In Millimeters	
	Min.	Max.
A	1.52	1.8
A1	0.000	0.100
A2	1.5	1.7
b	0.66	0.82
c	0.25	0.35
D	6.2	6.4
D1	2.9	3.1
E	3.3	3.7
E1	6.83	7.07
e	2.300(BSC)	
e1	4.500	4.700
L	0.900	1.15
θ	0°	10°

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100V N-Channel Enhancement Mode MOSFET

Edition	Date	Change
REV1.0	2023/10/1	Initial release