

500V N-Channel Enhancement Mode MOSFET

Description

The AP1N50MI is silicon N-channel Enhanced VDMOSFETs, is obtained by the self-aligned planar Technology which reduce the conduction loss, improve switching performance and enhance the avalanche energy. The transistor can be used in various power switching circuit for system miniaturization and higher efficiency.

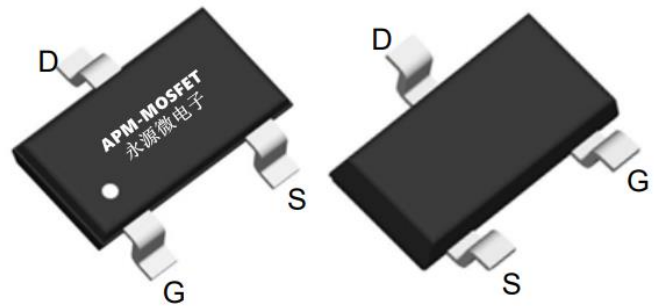
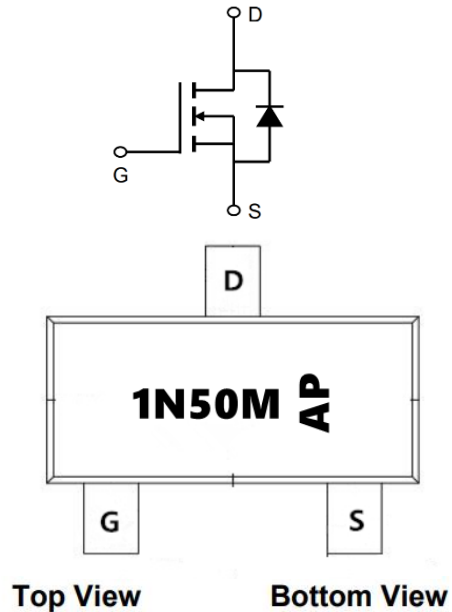
General Features

$V_{DS} = 500V$ $I_D = 1A$

$R_{DS(ON)} < 15\Omega$ @ $V_{GS}=10V$ (Type: 9Ω)

Application

LED



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP1N50MI	SOT23-3L	1N50M-AP	3000

Absolute Maximum Ratings ($T_C=25^{\circ}C$ unless otherwise noted)

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-Source Voltage ($V_{GS} = 0V$)	500	V
I_D	Continuous Drain Current	1	A
I_{DM}	Pulsed Drain Current (note1)	4	A
V_{GS}	Gate-Source Voltage	± 30	V
E_{AS}	Single Pulse Avalanche Energy (note2)	4.8	mJ
P_D	Power Dissipation ($T_C = 25^{\circ}C$)	3	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range	$-55 \sim +150$	$^{\circ}C$
R_{thJC}	Thermal Resistance, Junction-to-Case	5	$^{\circ}C/W$
R_{thJA}	Thermal Resistance, Junction-to-Ambient	125	$^{\circ}C/W$

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250μA	500	550	--	V
VGS(th)	Gate-Source Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	2.0	3.0	4.0	V
RDS(on)	Drain-Source On-Resistance	V _{GS} = 10V, I _D = 1.5A	--	9.0	15	Ω
IDSS	Zero Gate Voltage Drain Current	V _{DS} = 300V, V _{GS} = 0V, T _J = 25°C	--	--	1	μA
		V _{DS} = 240V, V _{GS} = 0V, T _J = 125°C	--	--	100	
IGSS	Gate-Source Leakage	V _{GS} = ±25V	--	--	±100	nA
Ciss	Input Capacitance	V _{GS} = 0V, V _{DS} =25V, f=1.0MHz	--	74	--	pF
Coss	Output Capacitance		--	38	--	
Crss	Reverse Transfer Capacitance		--	3	--	
Qg	Total Gate Charge	V _{DD} =400V, I _D =1.0A, V _{GS} = 10V	--	4.9	--	nC
Qgs	Gate-Source Charge		--	1.1	--	
Qgd	Gate-Drain Charge		--	2.9	--	
td(on)	Turn-on Delay Time	V _{DD} = 150V, I _D = 3.0A, R _G = 25 Ω	--	7.7	--	ns
t _r	Turn-on Rise Time		--	9.7	--	
td(off)	Turn-off Delay Time		--	25.4	--	
t _f	Turn-off Fall Time		--	14.4	--	
I _S	Continuous Body Diode Current	T _C = 25 °C	--	--	1	A
ISM	Pulsed Diode Forward Current		--	--	4	
t _{rr}	Reverse Recovery Time	V _{GS} = 0V, I _S = 3A, di _F /dt = 100A/μs	--	190	--	ns
Q _{rr}	Reverse Recovery Charge		--	0.53	--	μC
VSD	Body Diode Voltage	T _J = 25°C, I _{SD} = 3A, V _{GS} = 0V	--	--	1.4	V

Note :

- 1、The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2、The test condition is Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 1%
- 3、The power dissipation is limited by 150°C junction temperature
- 4、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Typical Characteristics

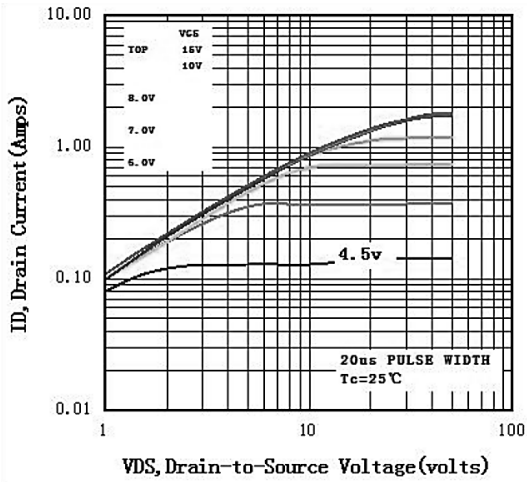


Figure1: Typical Output Characteristics (Tc=25°C)

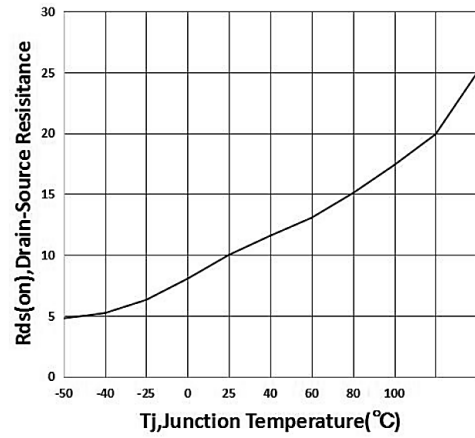


Figure2: On-Resistance Vs. Temperature

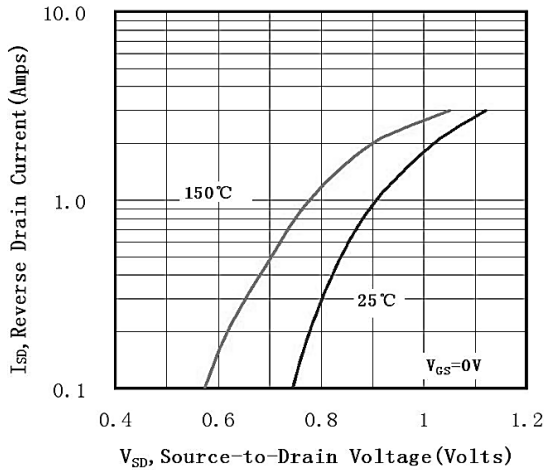


Figure3: Source-Drain Diode Forward Voltage

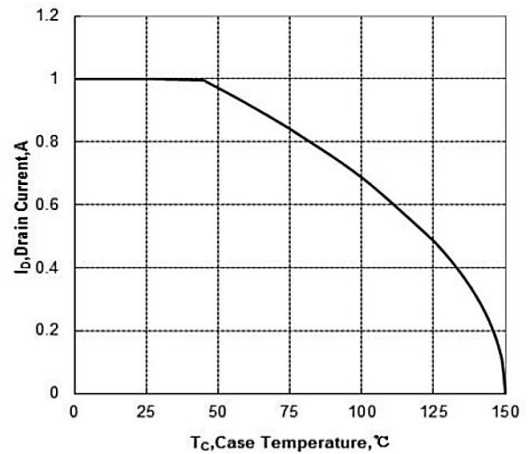


Figure4: Maximum Drain Current Vs. Case Temperature

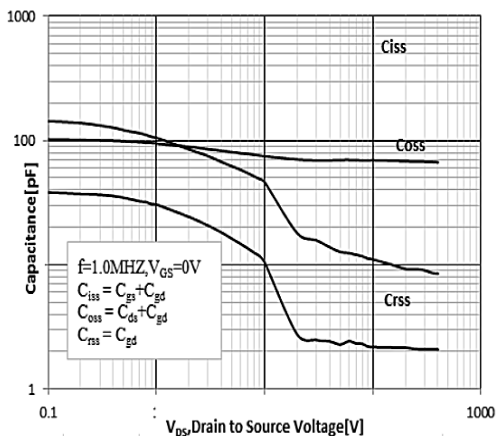


Figure5: Capacitance vs Drain to Source Voltage

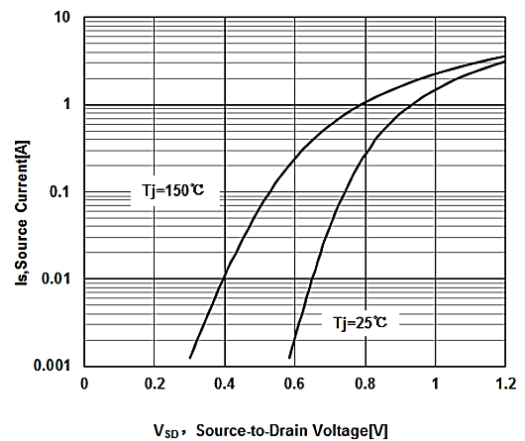


Figure6: Body Diode Transfer Characteristics

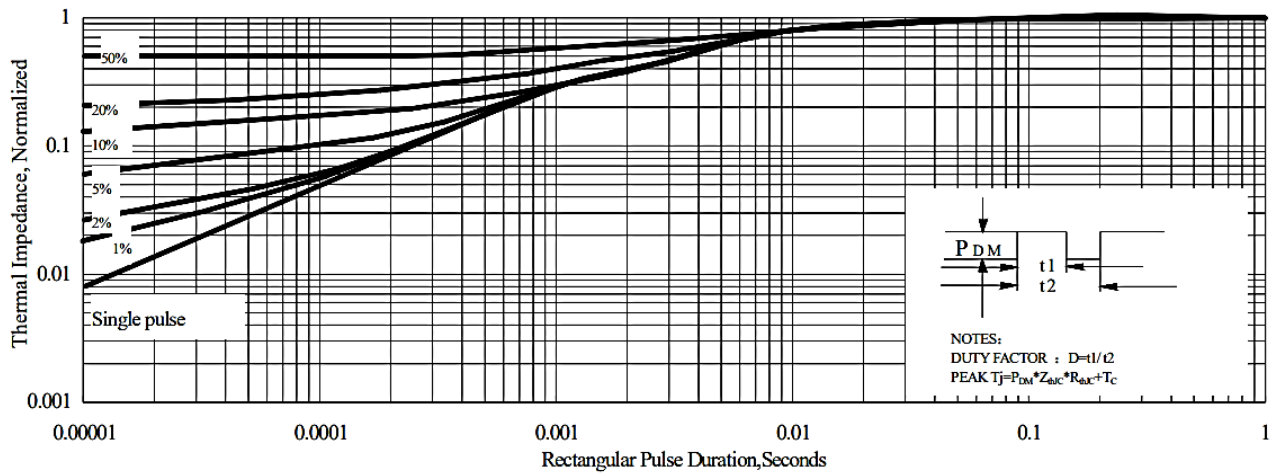
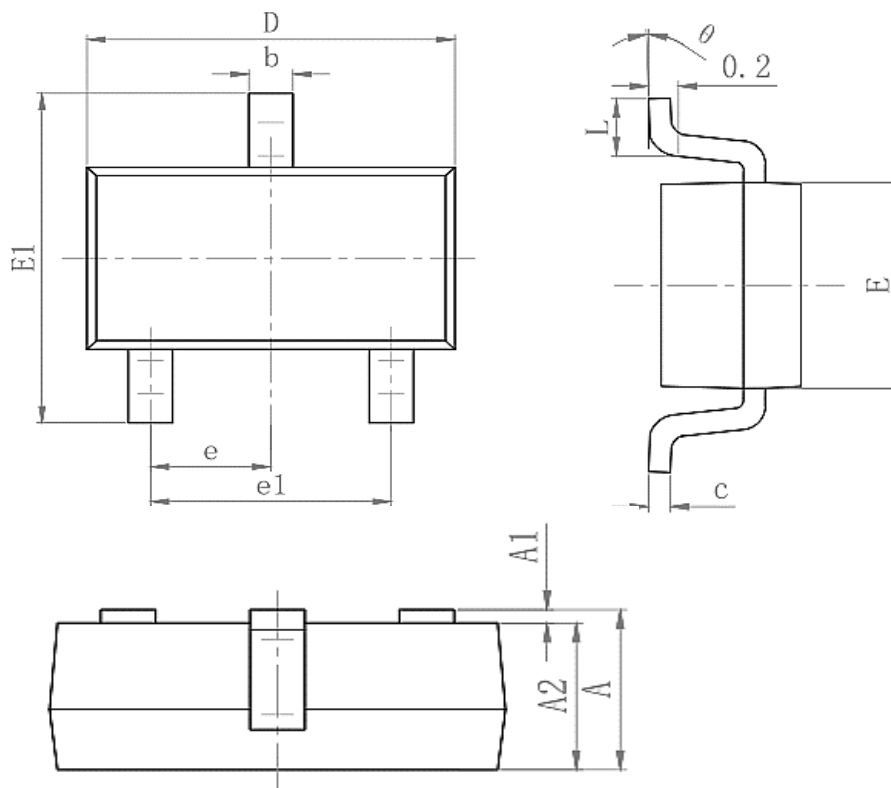


Figure7:Maximum Effective Thermal Impedance , Junction to Ambient

Package Mechanical Data-SOT23-3-XC-Single



Symbol	Dimensions In Millimeters	
	Min.	Max.
A	1.050	1.250
A1	0.000	0.100
A2	1.050	1.150
b	0.25	0.45
c	0.100	0.200
D	2.820	3.020
E	1.5	1.7
E1	2.650	2.950
e	0.950(BSC)	
e1	1.800	2.000
L	0.300	0.500
θ	0°	8°

500V N-Channel Enhancement Mode MOSFET**Attention**

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Edition	Date	Change
REV1.0	2023/3/29	Initial release

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