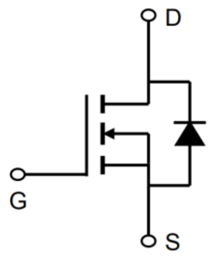
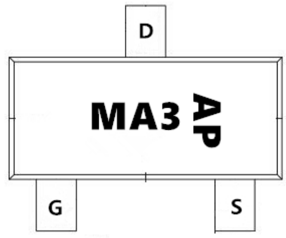
100V N-Channel Enhancement Mode MOSFET

Description

The AP1N10I 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 =1.5A

$R_{DS(ON)}$ < 500mΩ @ V_{GS}=10V

Application

Atomizer

Load switch

Uninterruptible power supply

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP1N10I	SOT23L	MA3-AP	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˚C	Continuous Drain Current, V_{GS} @ 10V[1]	1.5	A
I_D@T_A=100˚C	Continuous Drain Current, V_{GS} @ 10V[1]	1.2	A
I_{DM}	Pulsed Drain Current[2]	6	A
P_D@T_A=25˚C	Total Power Dissipation[3]	1.2	W
T_{STG}	Storage Temperature Range	-55 to 150	˚C
T_J	Operating Junction Temperature Range	-55 to 150	˚C
$R_{\theta JA}$	Thermal Resistance Junction-ambient [1]	104	˚C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	75	˚C/W

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	100			V
IDSS	Zero Gate Voltage Drain Current	V_{DS}=100V,V_{GS}=0V			1	μA
IGSS1	Gate-Body Leakage Current	V_{GS}=±20V, V_{DS}=0V			±100	nA
IGSS2		V_{GS}=±10V, V_{DS}=0V			±50	nA
VGS(th)	Gate Threshold Voltage	V_{DS}= V_{GS}, I_D=250μA	1.2	1.8	2.5	V
RDS(ON)	Static Drain-Source On-Resistance	V_{GS}=10V, I_D=1.5A		430	500	mΩ
RDS(ON)		V_{GS}=4.5V, I_D=1A		460	550	
C_{iss}	Input Capacitance	V_{DS}=10V,V_{GS}=0V,f=1MHZ		232		pF
C_{oss}	Output Capacitance			23		pF
C_{rss}	Reverse Transfer Capacitance			24		pF
Q_g	Total Gate Charge	V_{GS}=10V,V_{DS}=50V,I_D=2A		6.47		nC
Q_{gs}	Gate-Source Charge			1.27		nC
Q_{gd}	Gate-Drain Charge			1.29		nC
Q_{rr}	Reverse Recovery Chrage	I_F=2A, di/dt=100A/us		18.1		nC
t_{rr}	Reverse Recovery Time			36.9		ns
tD(on)	Turn-on Delay Time	V_{GS}=10V, V_{DS}=50V, I_D=1.3A R_{GEN}=1Ω		4.6		ns
t_r	Turn-on Rise Time			18		ns
tD(off)	Turn-off Delay Time			16		ns
t_f	Turn-off fall Time			27.4		ns
V_{SD}	Diode Forward Voltage	I_S=1.5A,V_{GS}=0V			1.2	V

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

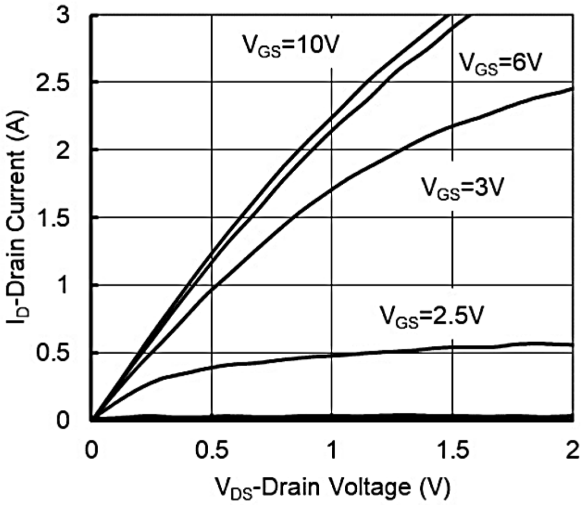


Figure1. Output Characteristics

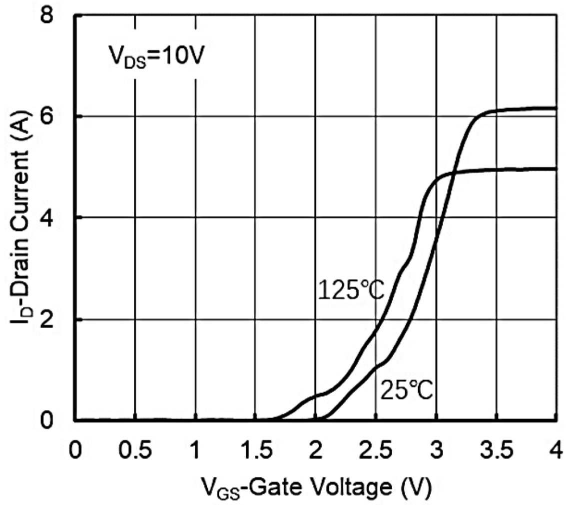


Figure2. Transfer Characteristics

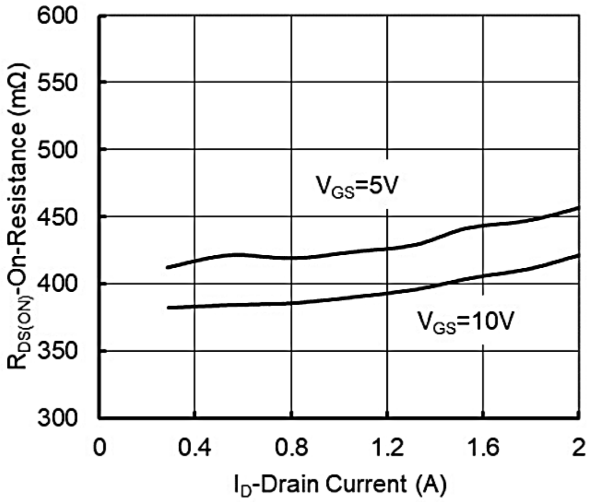


Figure 3: On-Resistance vs. Drain Current

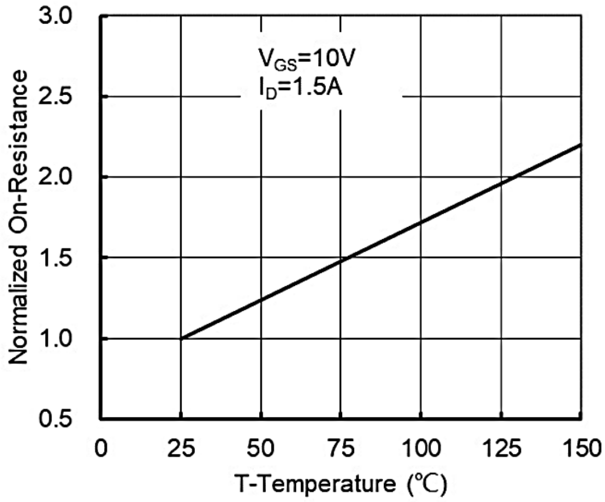


Figure 4: On-Resistance vs. Junction Temperature

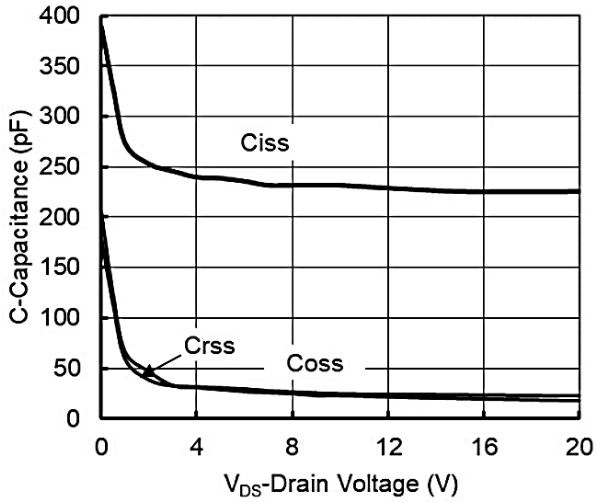


Figure5. Capacitance Characteristics

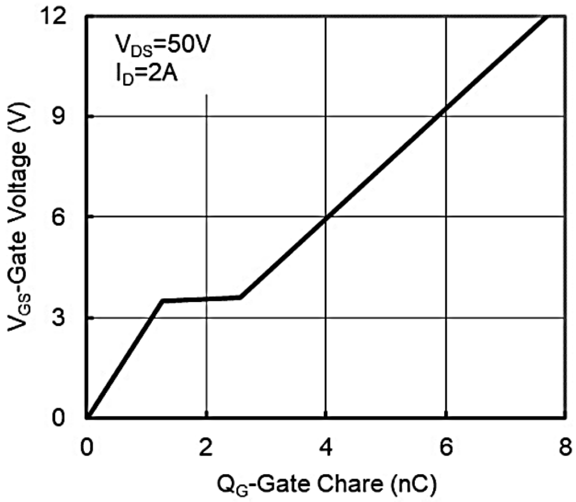


Figure6. Gate Charge

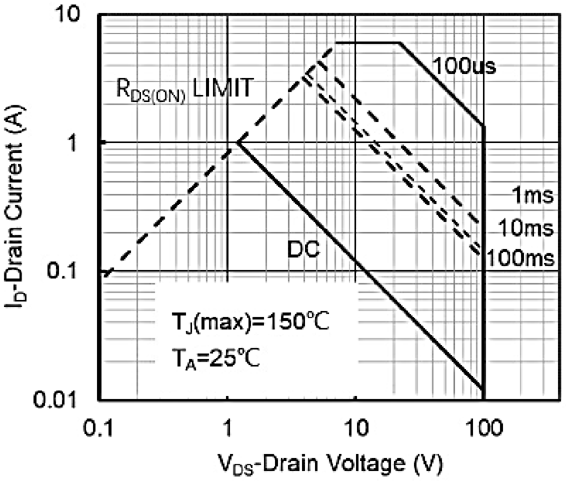


Figure7. Safe Operation Area

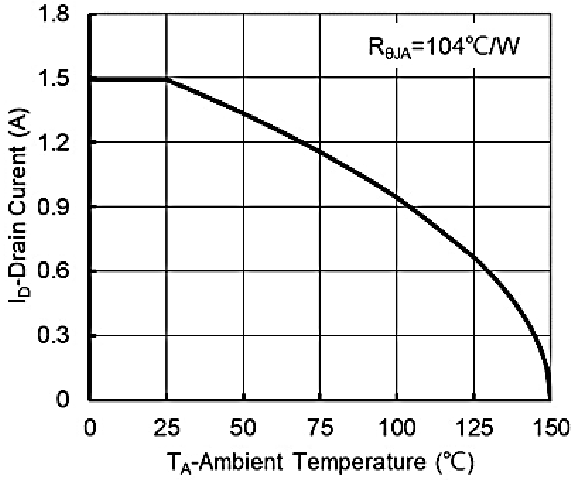


Figure8. Maximum Continuous Drain Current vs Ambient Temperature

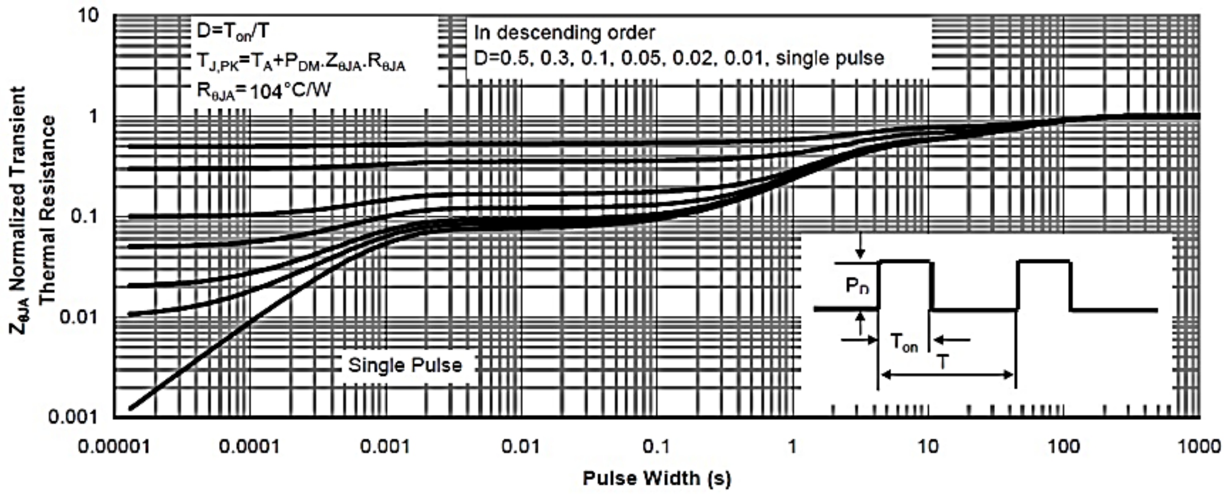
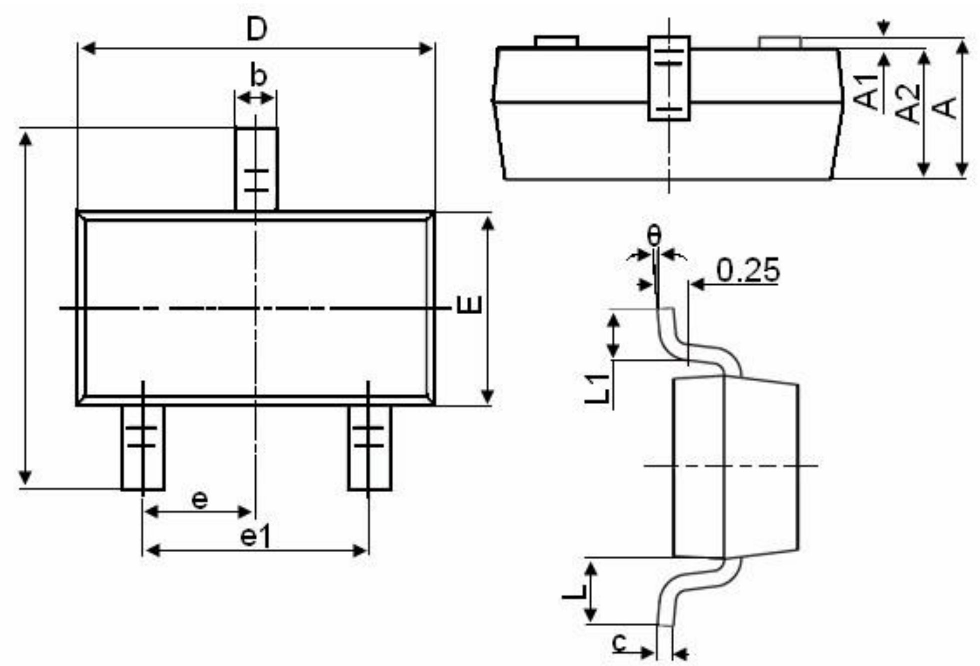


Figure9. Normalized Maximum Transient Thermal Impedance

ackage Mechanical Data-SOT23-XC-Single



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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Edition	Date	Change
Rve1.0	2020/5/1	Initial release