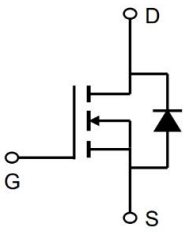
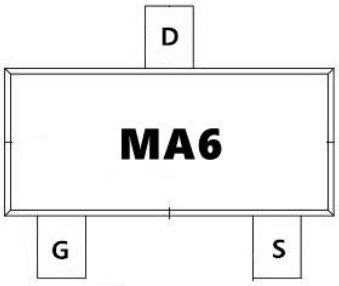
AP5N10BI

100V N-Channel Enhancement Mode MOSFET

Description

The AP5N10BI uses advanced **APM-SGTII** 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.





Top View

General Features

V_{DS} = 100V I_D =5.0A

$R_{DS(ON)}$ < 130mΩ @ V_{GS}=10V **(Type：100mΩ)**

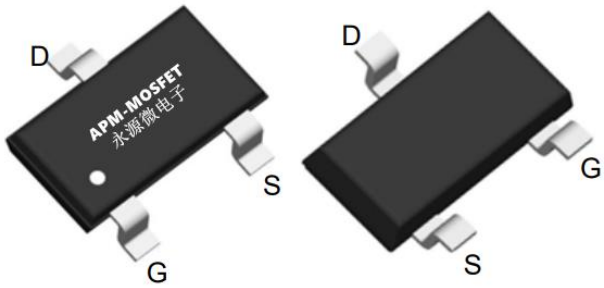
Application

LED

Load switch

Uninterruptible power supply

Bottom View



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP5N10BI	SOT23L	MA6	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]	5	A
I_D@T_A=70℃	Continuous Drain Current, V_{GS} @ 10V[1]	3.2	A
I_{DM}	Pulsed Drain Current[2]	16	A
P_D@T_A=25℃	Total Power Dissipation[3]	3.1	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(steady state)[1]	125	℃/W
$R_{\theta JA}$	Thermal Resistance Junction-ambient(t<10s)[1]	40	℃/W

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	100	-	-	V
IGSS	Gate-body Leakage Current	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
IDSS	Zero Gate Voltage Drain Current	V_{DS} = 100V, V_{GS} = 0V	-	-	1	μA
VGS(th)	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	1	1.65	2.5	V
RDS(on)	Drain-Source On-state Resistance[3]	V_{GS} = 10V, I_D = 3A	-	100	130	mΩ
RDS(on)	Drain-Source On-state Resistance[3]	V_{GS} = 4.5V, I_D = 1A	-	135	190	
Ciss	Input Capacitance	V_{GS} = 0V, V_{DS} = 50V, f = 1MHz	-	200	-	pF
Coss	Output Capacitance		-	30	-	
Crss	Reverse Transfer Capacitance		-	2	-	
Q_g	Total Gate Charge	V_{DS} = 50V, V_{GS} =10V, I_D =3A	-	4	-	nC
Qgs	Gate-Source Charge		-	0.6	-	
Qgd	Gate-Drain Charge		-	1.4	-	
td(on)	Turn-on Delay Time	V_{DD} = 50V, V_{GS} =10V, I_D =3A, R_G=3Ω	-	12.5	-	ns
t_r	Turn-on Rise Time		-	19.5	-	
td(off)	Turn-off Delay Time		-	20	-	
t_f	Turn- off Fall Time		-	29	-	
VSD	Body Diode Voltage[3]	I_S = 3A, V_{GS} = 0V	-	-	1.2	V
IS	Continuous Source Current		-	-	3.3	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

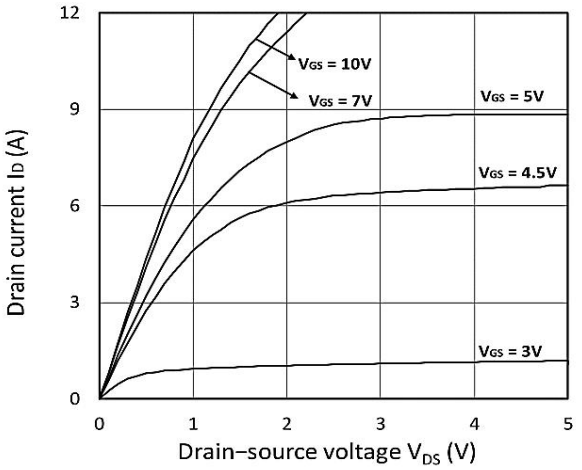


Figure 1. Output Characteristics

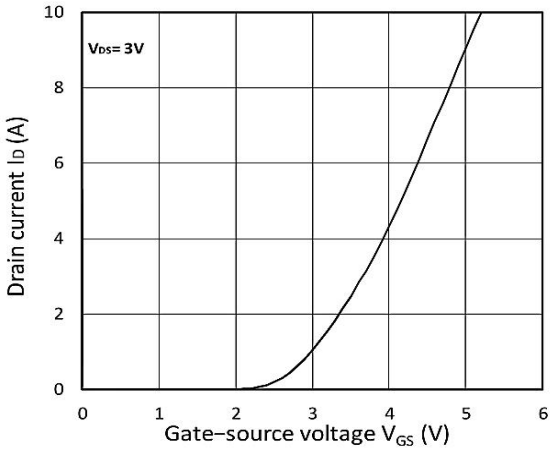


Figure 2. Transfer Characteristics

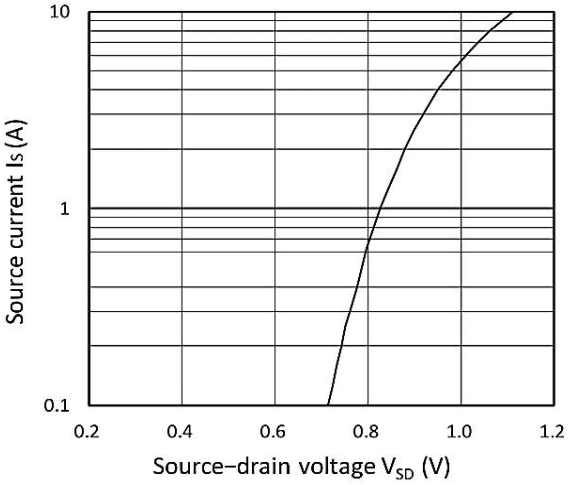


Figure 3. Forward Characteristics of Reverse

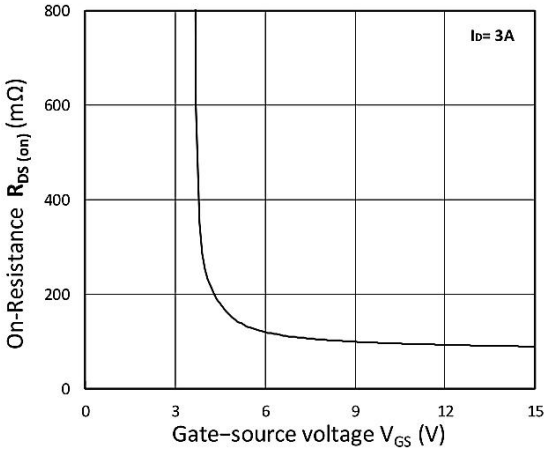


Figure 4. RDS(ON) vs. VGS

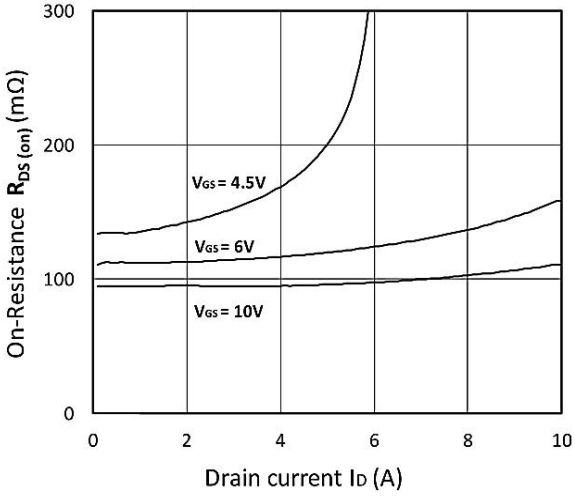


Figure 5. RDS(ON) vs. ID

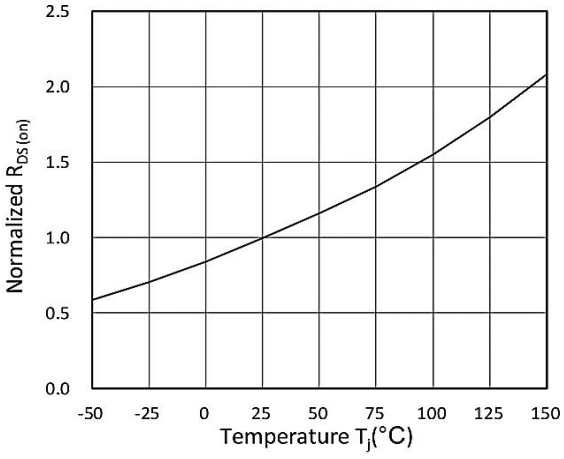


Figure 6. Normalized R DS(on) vs. Temperature

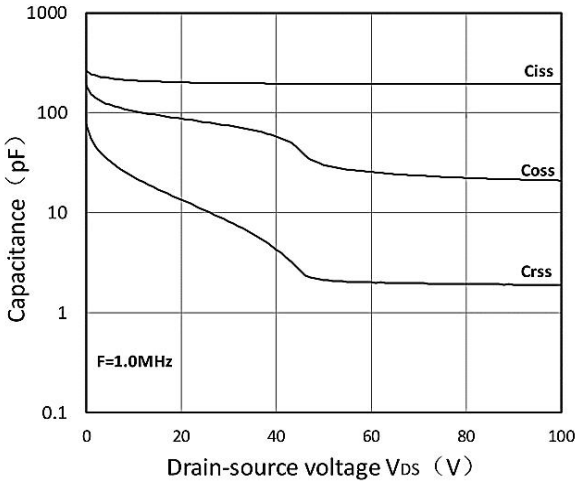


Figure 7. Capacitance Characteristics

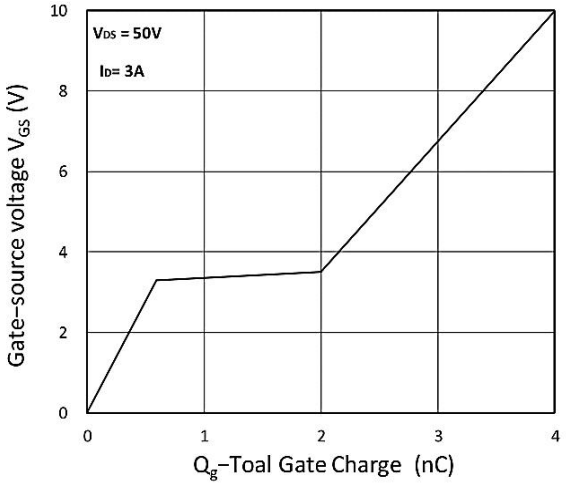


Figure 8. Gate Charge Characteristics

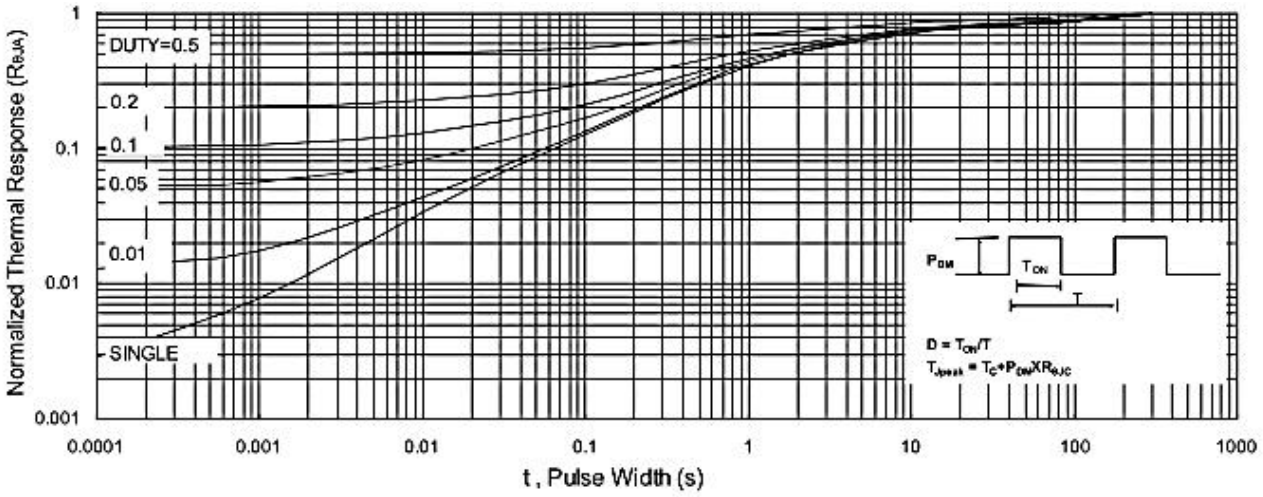


Fig.9 Normalized Maximum Transient Thermal Impedance

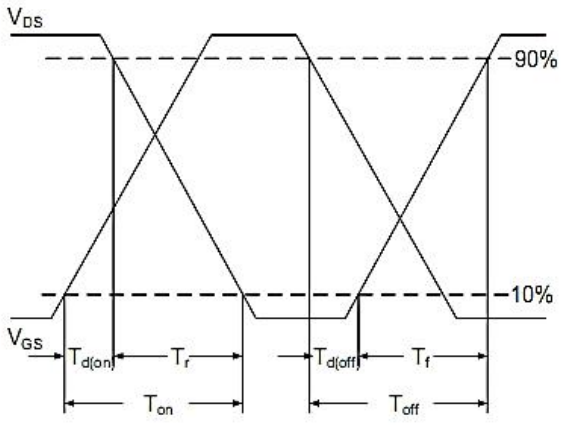


Fig.10 Switching Time Waveform

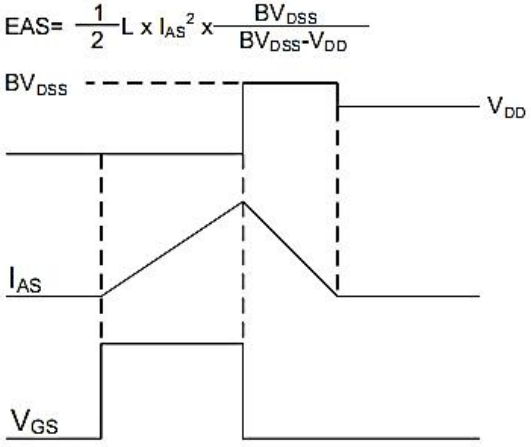
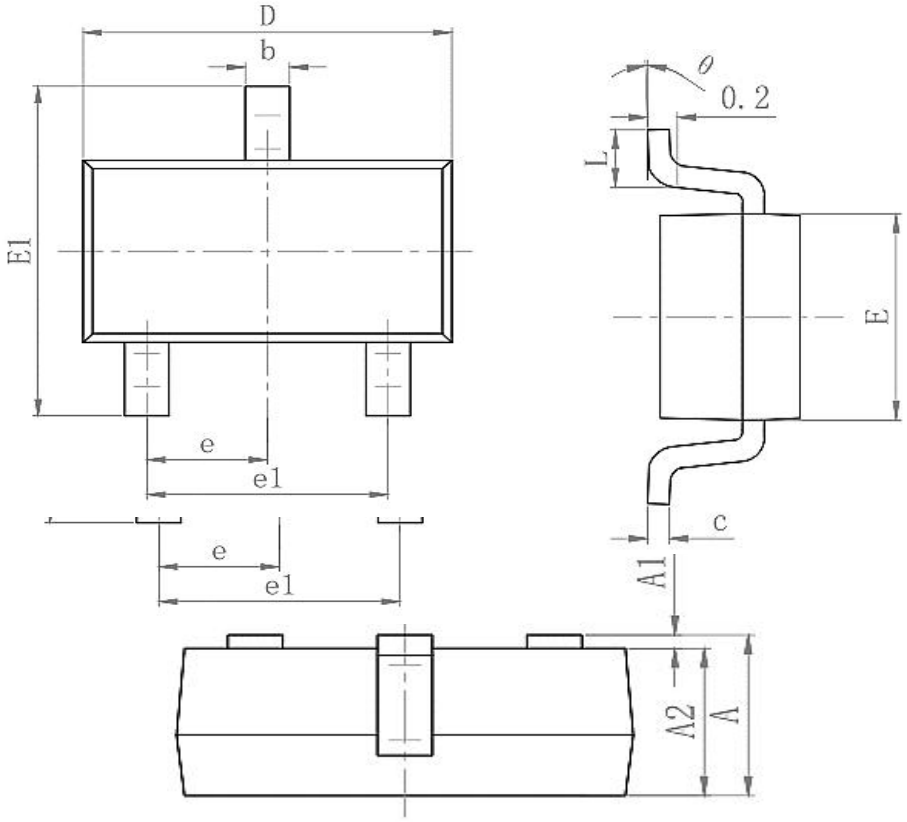


Fig.11 Unclamped Inductive Switching Waveform

Package Mechanical Data-SOT23-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°

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Edition	Date	Change
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Rve1.1	2022/5/5	Conversion 12 inches