AP5P06MI

-60V P-Channel Enhancement Mode MOSFET

Description

The AP5P06MI 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} = -60V I_D =-5A

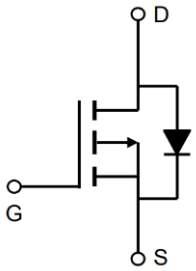
$R_{DS(ON)}$ < 110mΩ @ V_{GS}=10V **(Type：86mΩ)**

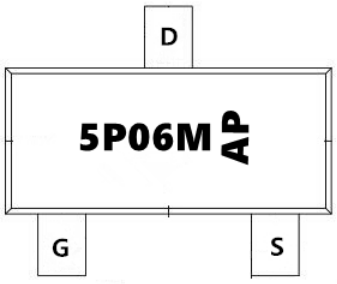
Application

Brushless motor

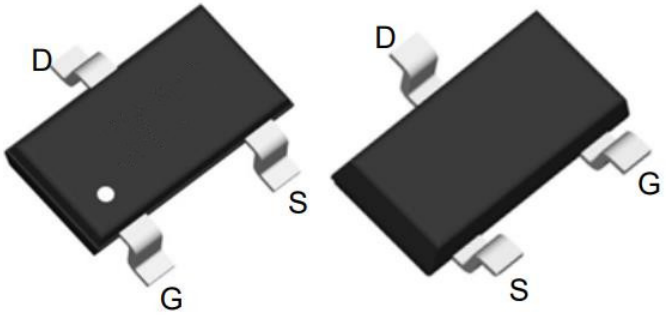
Load switch

Uninterruptible power supply





Top View Bottom View



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP5P06MI	SOT23-3L	5P06MI-AP	2500

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ -10V[1]	-5.0	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ -10V[1]	-3.3	A
I_{DM}	Pulsed Drain Current[2]	-20	A
EAS	Single Pulse Avalanche Energy[3]	24.2	mJ
P_D@T_C=25℃	Total Power Dissipation[4]	30.8	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]	40.5	℃/W

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
VDSS	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = -250μA	-60	-	-	V
IGSS	Gate-body Leakage current	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
IDSS	Zero Gate Voltage Drain Current T_J= 25°C	V_{DS} = -60V, V_{GS} = 0V	-	-	-1	μA
	Zero Gate Voltage Drain Current T_J= 25°C		-	-	-100	
VGS(th)	Gate-Threshold Voltage	V_{DS} = V_{GS}, I_D = -250μA	-1	-1.6	-2.5	V
RDS(on)	Drain-Source On-Resistance[4]	V_{GS} = -10V, I_D = -10A	-	86	110	mΩ
		V_{GS} = -4.5V, I_D = -5A		90	125	
gfs	Forward Transconductance[4]	V_{DS} = -10V, I_D = -10A	-	30	-	S
Ciss	Input Capacitance	V_{DS} = -30V, V_{GS} = 0V, f = 1MHz	-	1022	-	pF
Coss	Output Capacitance		-	47	-	
Crss	Reverse Transfer Capacitance		-	39	-	
R_g	Gate Resistance	f = 1MHz	-	11	-	Ω
Q_g	Total Gate Charge	V_{GS} = -10V, V_{DS} = -30V, I_D= -10A	-	17	-	nC
Qgs	Gate-Source Charge		-	2.9	-	
Qgd	Gate-Drain Charge		-	7.4	-	
td(on)	Turn-On Delay Time	V_{GS} = -10V, V_{DD} = -30V, R_G = 3Ω, I_D= -10A	-	8.5	-	ns
t_r	Rise Time		-	19.9	-	
td(off)	Turn-Off Delay Time		-	44	-	
t_f	Fall Time		-	12.2	-	
VSD	Diode Forward Voltage[4]	I_S = -1A, V_{GS} = 0V	-	-	-1.2	V
IS	Continuous Source Current T_C= 25°C	-	-	-	-13	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

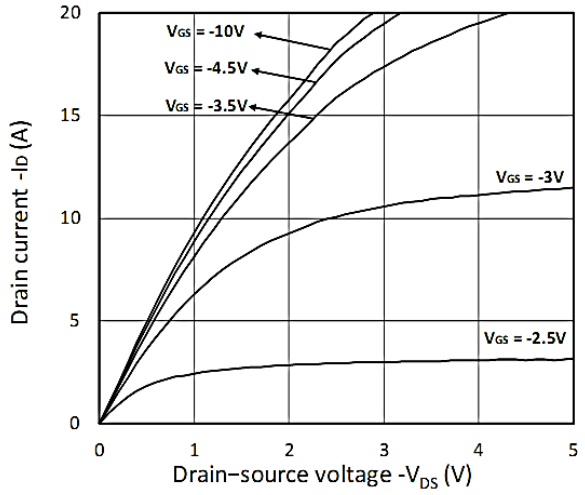


Figure 1. Output Characteristics

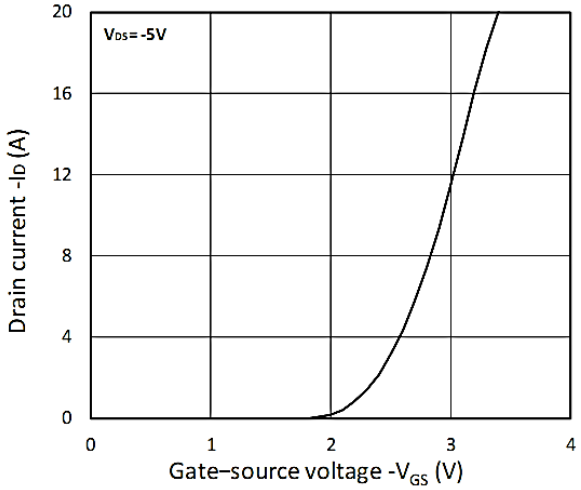


Figure 2. Transfer Characteristics

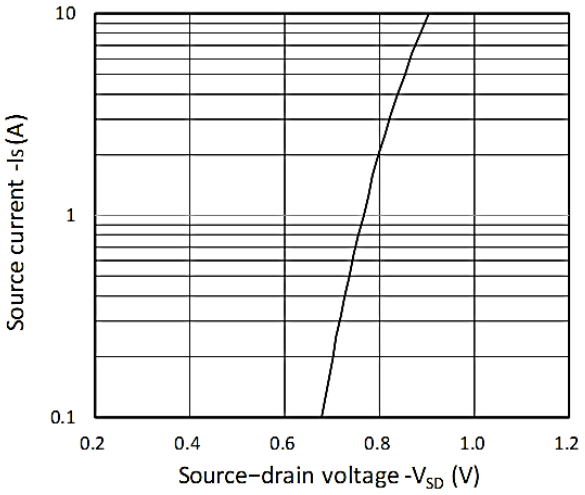


Figure 3. Forward Characteristics of Reverse

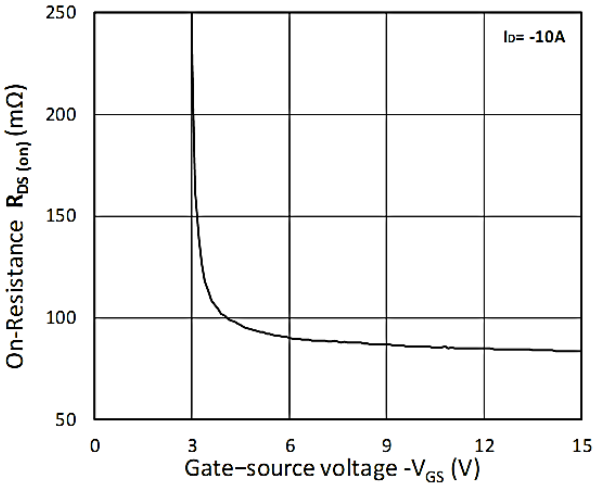


Figure 4. RDS(ON) vs. VGS

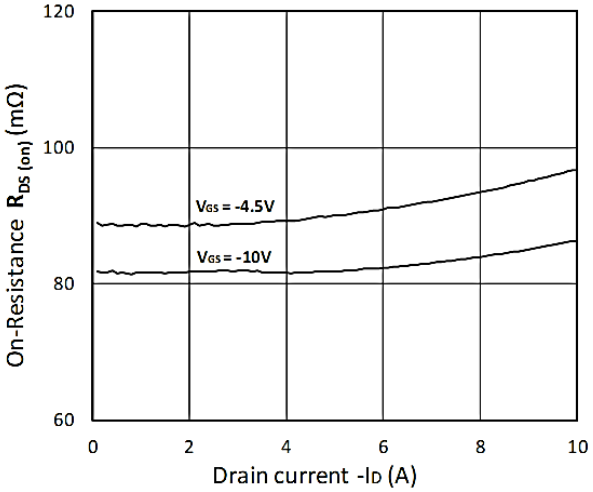


Figure 5. RDS(ON) vs. ID

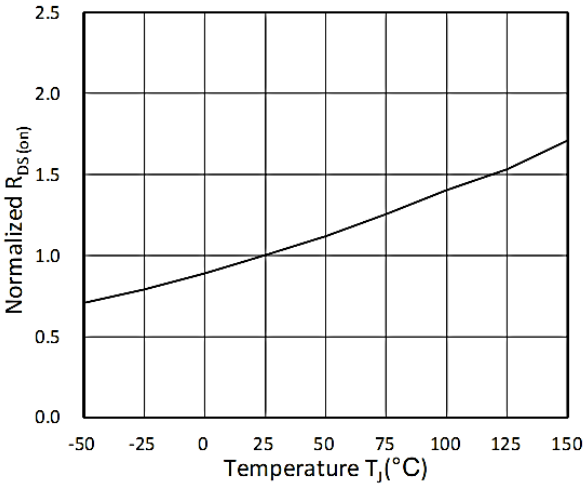


Figure 6. Normalized RDS(on) vs. Temperature

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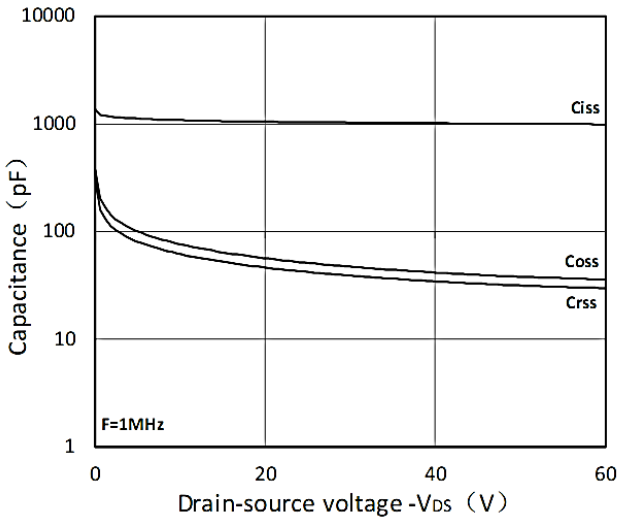


Figure 7. Capacitance Characteristics

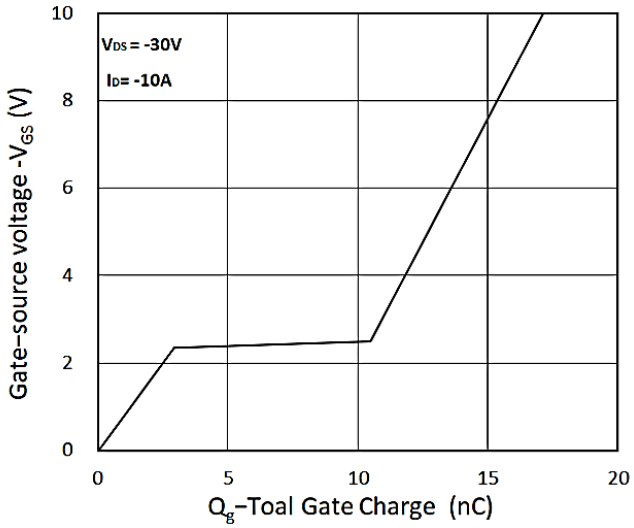


Figure 8. Gate Charge Characteristics

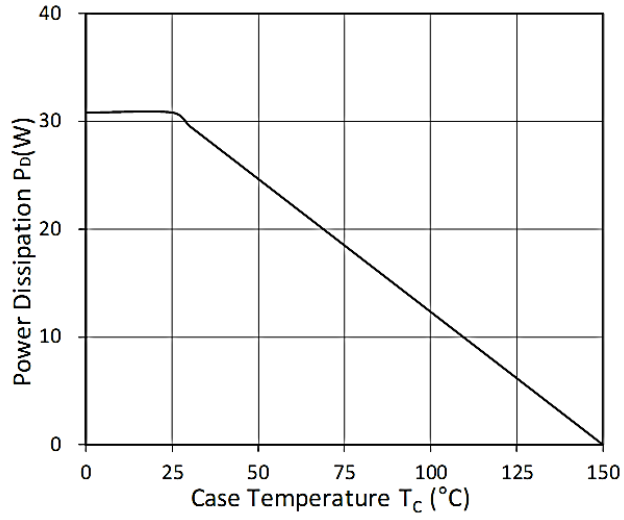


Figure 9. Power Dissipation

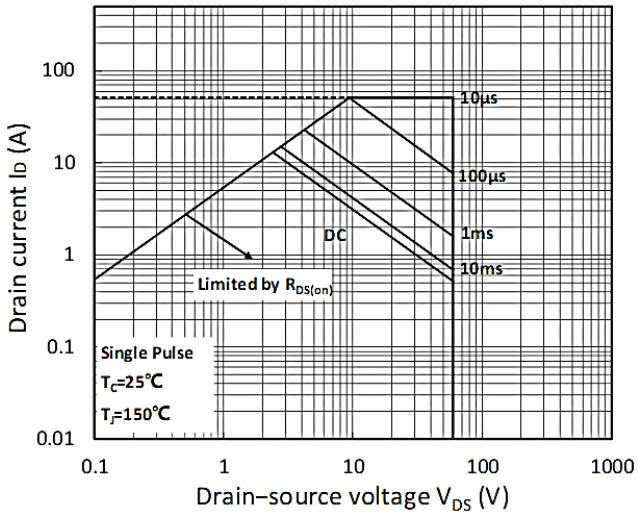


Figure10. Safe Operating Area

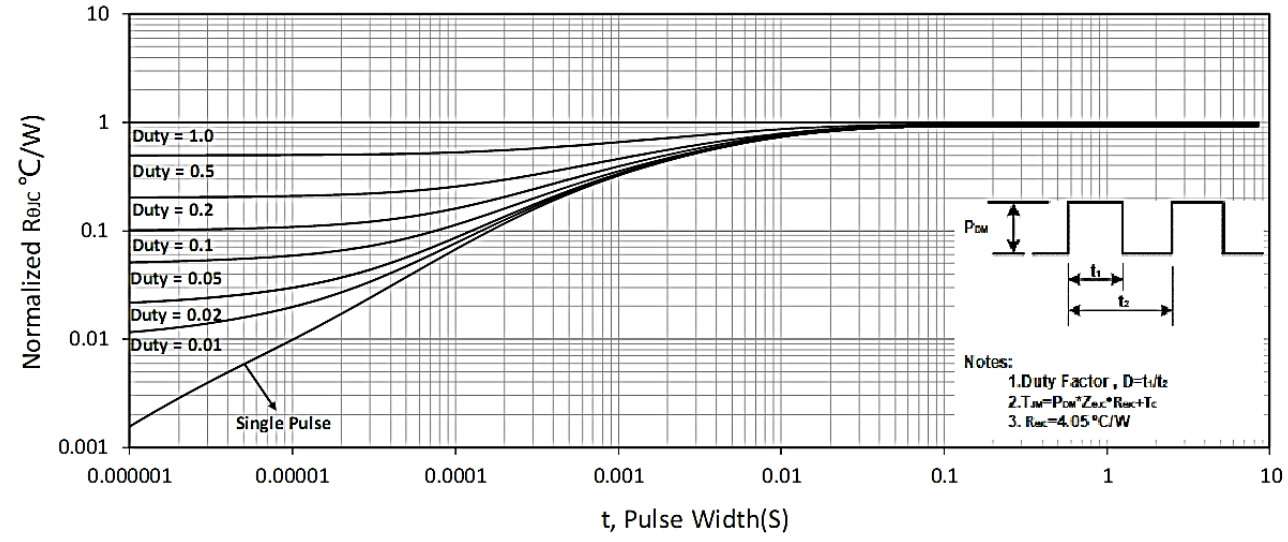
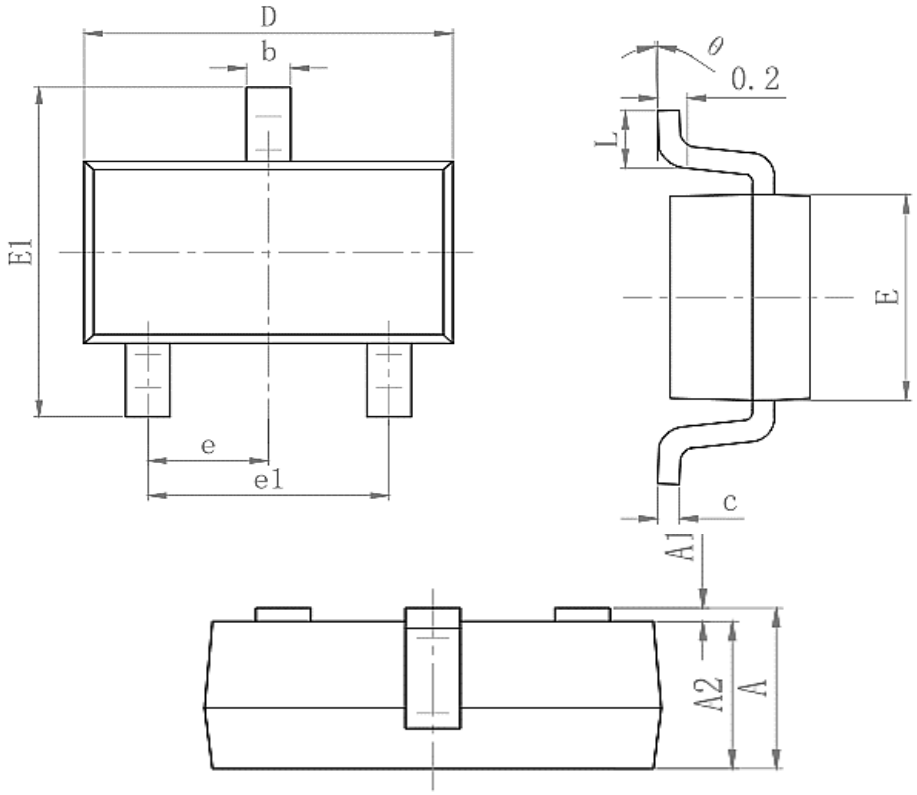


Figure 11 Normalized Maximum Transient Thermal Impedance

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°