AP5P10SI

-100V P-Channel Enhancement Mode MOSFET

Description

The AP5P10SI 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 =-5.8A

$R_{DS(ON)}$ < 290mΩ @ V_{GS}=-10V （**Type：235mΩ**）

Application

Brushless motor

Load switch

Uninterruptible power supply

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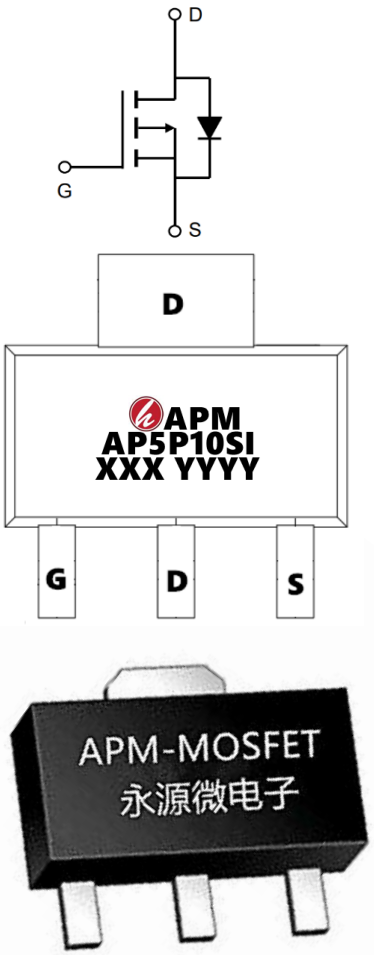


Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP5P10SI	SOT89-3L	AP5P10SI 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_C=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	-5.8	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1]	-3.5	A
I_{DM}	Pulsed Drain Current[2]	-14.8	A
EAS	Single Pulse Avalanche Energy[3]	58	mJ
P_D@T_C=25℃	Total Power Dissipation[4]	2.13	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]	62.5	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	5.4	℃/W

100V N+P-Channel Enhancement Mode MOSFET

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

Symbol	Parameter	Test Condition	Min.	Typ	Max.	Units
BVDSS	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = -250μA	-100	117	-	V
IDSS	Zero Gate Voltage Drain Current	V_{DS} = -100V, V_{GS} = 0V	-	-	1	μA
IGSS	Gate to Body Leakage Current	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = -250μA	-1.2	-1.85	-2.5	V
RDS(on)	Static Drain-Source On-Resistance note1	V_{GS} = -10V, I_D = -5A	-	250	300	mΩ
		V_{GS} = -4.5V, I_D = -3A	-	260	340	
Ciss	Input Capacitance	V_{DS} = -50V, V_{GS} = 0V, f = 1.0MHz	-	760	-	pF
Coss	Output Capacitance		-	25	-	pF
Crss	Reverse Transfer Capacitance		-	12	-	pF
Q_g	Total Gate Charge	V_{DD} = -50V, I_D = -5A, V_{GS} = -10V	-	11.5	-	nC
Q_{gs}	Gate-Source Charge		-	1.3	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	2.9	-	nC
td(on)	Turn-On Delay Time	V_{DS} = -50V, I_D = -5A R_G=4.5Ω, R_L=25Ω V_{GEN} = - 10 V	-	12	-	ns
t_r	Turn-On Rise Time		-	5	-	ns
td(off)	Turn-Off Delay Time		-	35	-	ns
t_f	Turn-Off Fall Time		-	20	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	-12.8	A
VSD	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S =-1A	-	-	-1.3	V
t_{rr}	Reverse Recovery Time	V_{GS} = 0V, I_{sd}= -3A, di/dt =100A/μs	-	25	-	nS
Q_{rr}	Reverse Recovery Charge		-	20	-	nC

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 .The EAS data shows Max. rating .

3、The power dissipation is limited by 175℃ 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

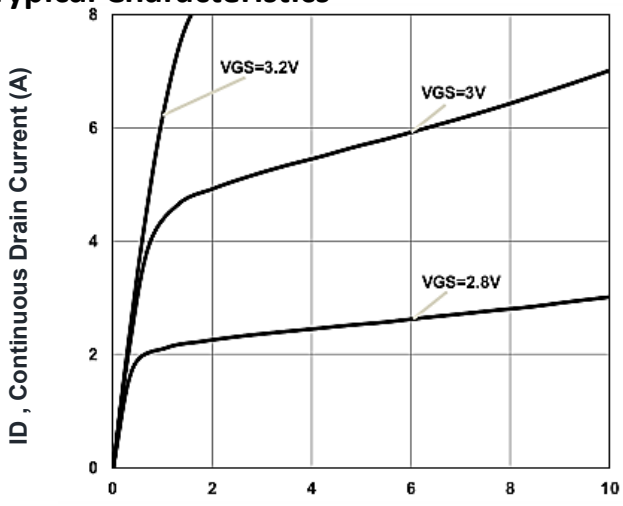


Figure 1. Typical Output Characteristics

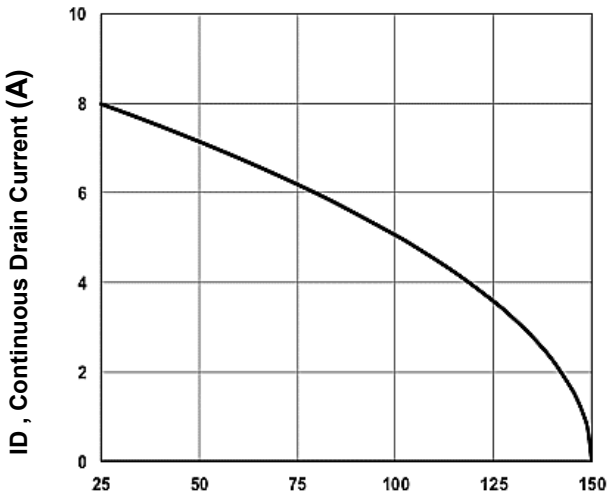


Figure 2. Continuous Drain Current vs. TC

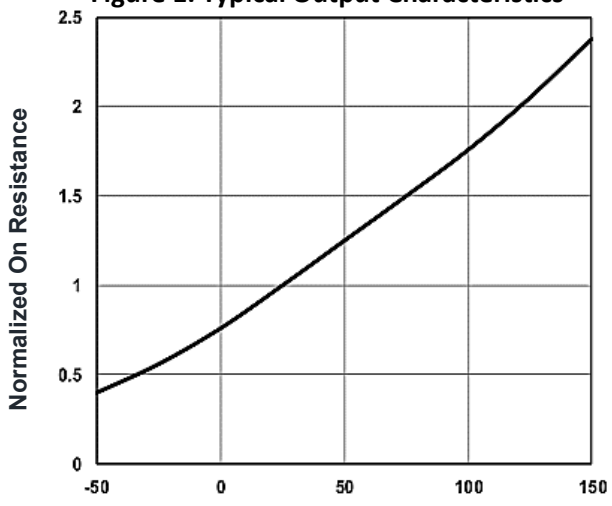


Figure 3.Normalized RDSON vs. TJ

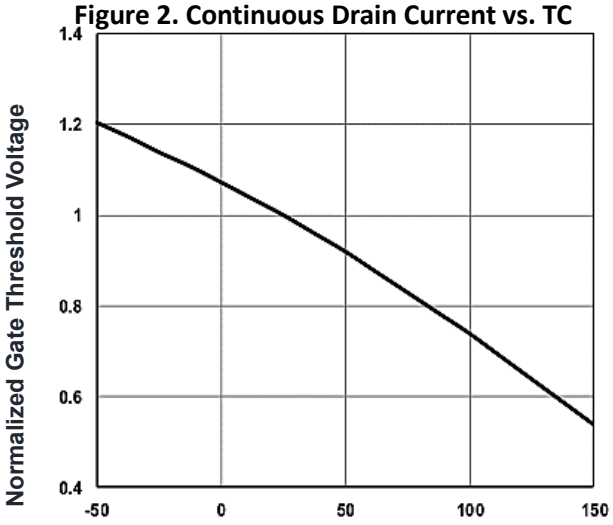


Figure 5.Normalized V th vs. T

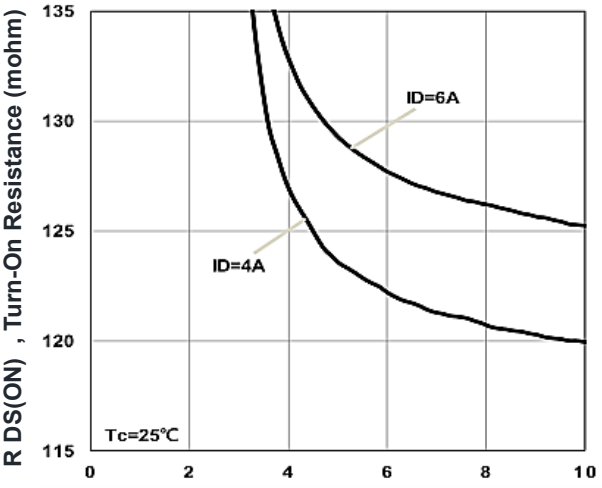


Figure 6. Turn-On Resistance vs. VGS

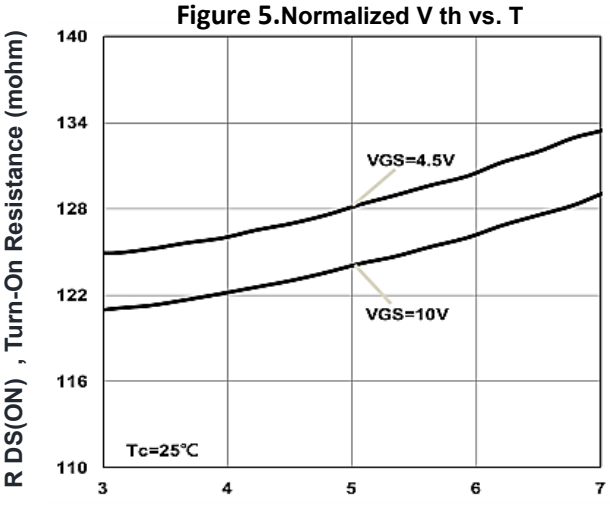


Figure 7.Turn-On Resistance vs. I D

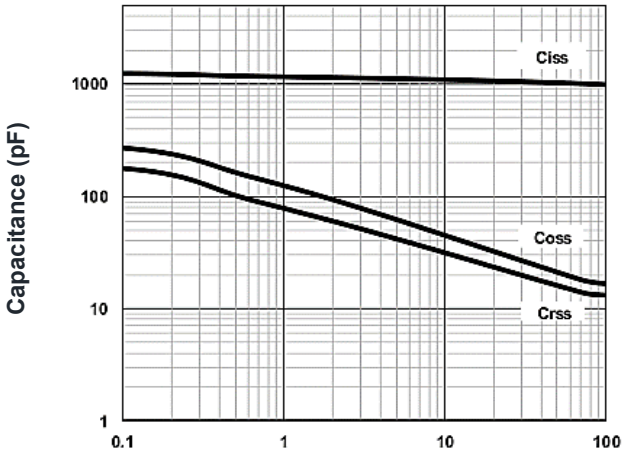


Figure 8.Capacitance Characteristics

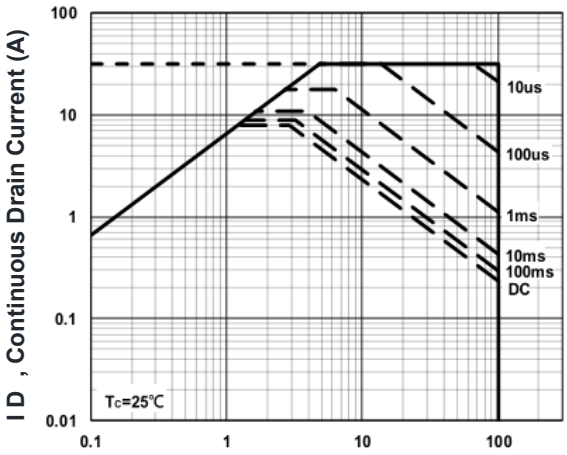


Figure 9.Maximum Safe Operation Area

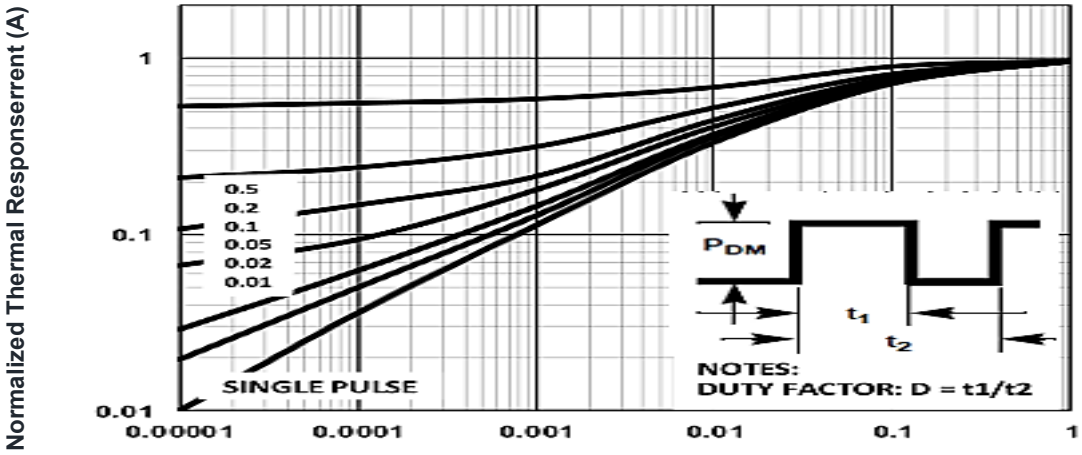


Figure 10.Normalized Transient Impedance

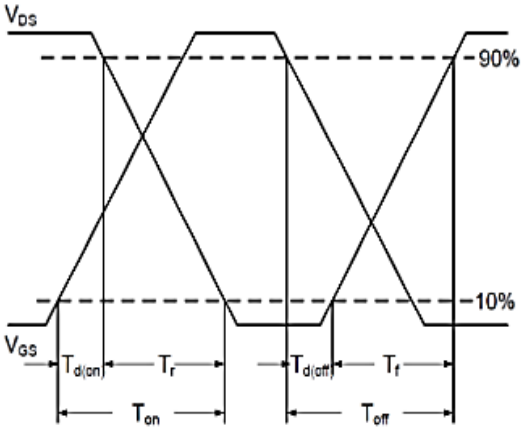


Figure 10. Switching Time Waveform

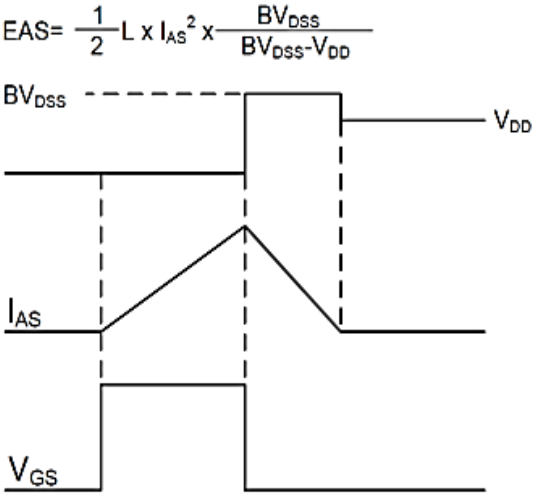
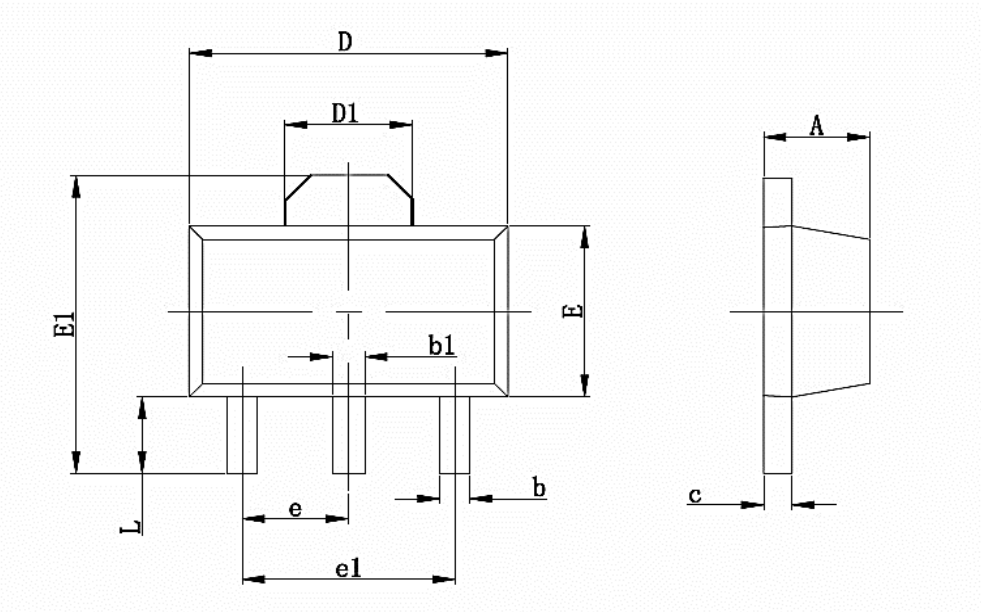


Figure 11. Unclamped Inductive Switching Waveform

Package Mechanical Data:SOT89-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.350	0.520	0.013	0.197
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF		0.061 REF	
E	2.350	2.550	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP		0.060TYP	
e1	3.000 TYP		0.118TYP	
L	0.900	1.100	0.035	0.047

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-100V P-Channel Enhancement Mode MOSFET

Edition	Date	Change
Rve1.0	2022/3/10	Initial release