

-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

$V_{DS} = -100V$ $I_D = -5.8A$

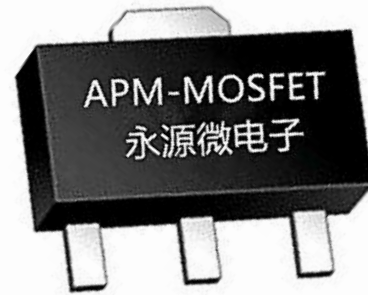
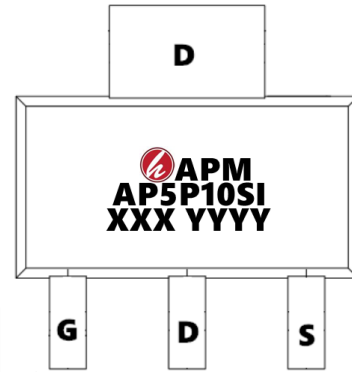
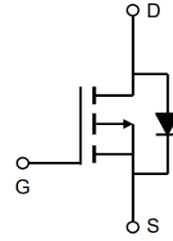
$R_{DS(ON)} < 290m\Omega$ @ $V_{GS} = -10V$ (Type: 235m Ω)

Application

Brushless motor

Load switch

Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP5P10SI	SOT89-3L	AP5P10SI XXX YYYY	3000

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	-5.8	A
$I_D @ T_C = 100^\circ C$	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
$P_D @ T_C = 25^\circ C$	Total Power Dissipation ⁴	21.3	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	62.5	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	5.4	$^\circ C/W$

100V N+P-Channel Enhancement Mode MOSFET

Electrical Characteristics (T_J=25°C, 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 20Z copper.
- 2、The data tested by pulsed , pulse width .The EAS data shows Max. rating .
- 3、The power dissipation is limited by 175°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

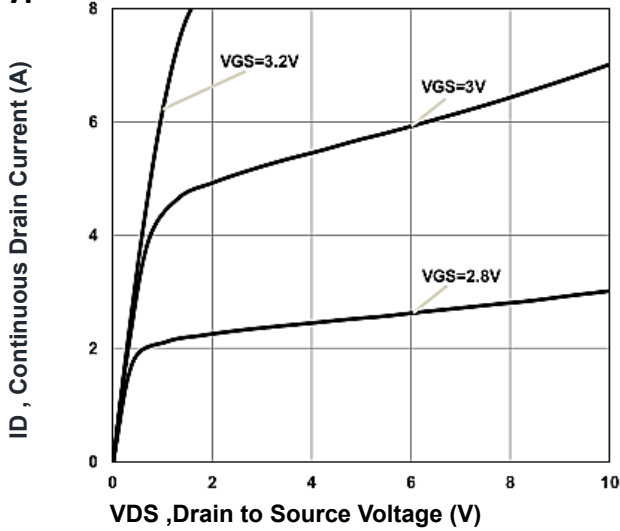


Figure 1. Typical Output Characteristics

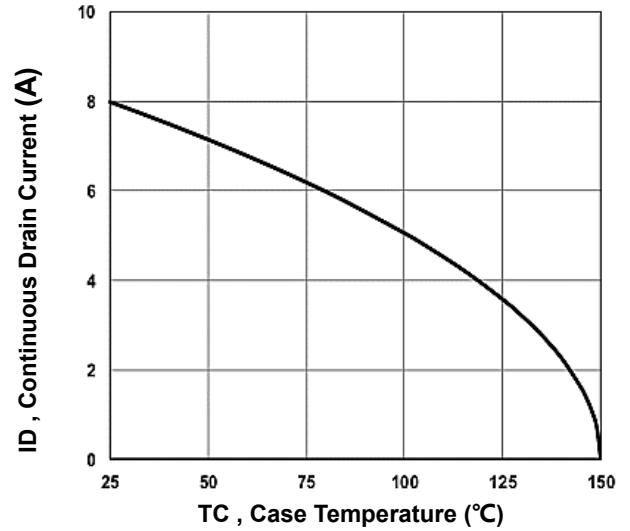


Figure 2. Continuous Drain Current vs. T_C

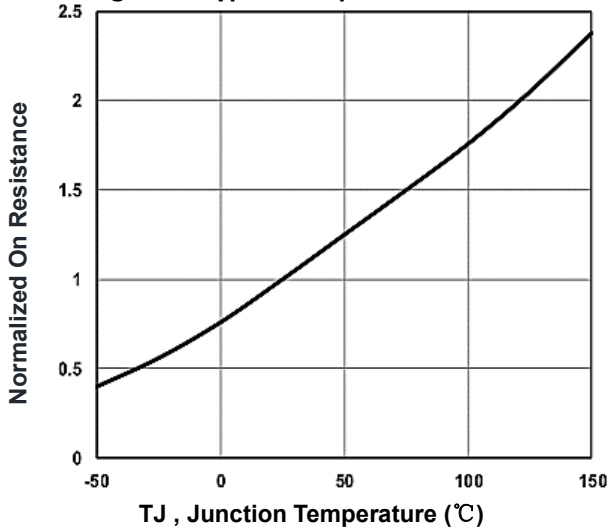


Figure 3. Normalized $R_{DS(on)}$ vs. T_J

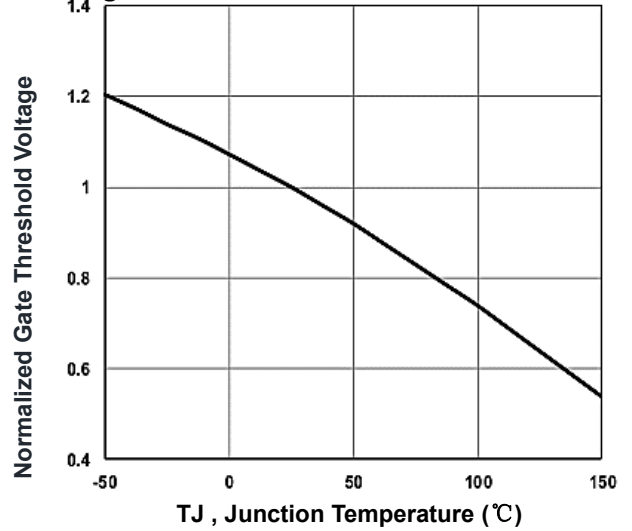


Figure 5. Normalized V_{th} vs. T_J

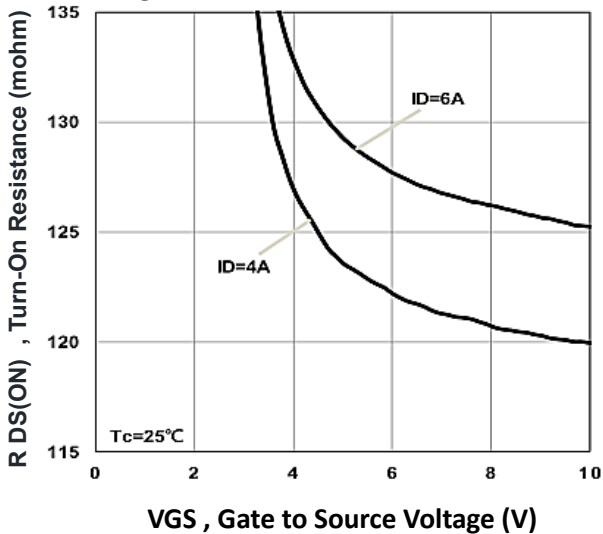


Figure 6. Turn-On Resistance vs. V_{GS}

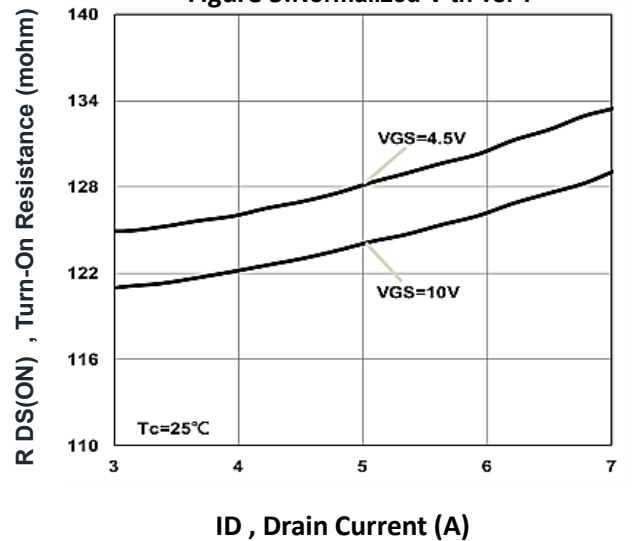


Figure 7. Turn-On Resistance vs. I_D

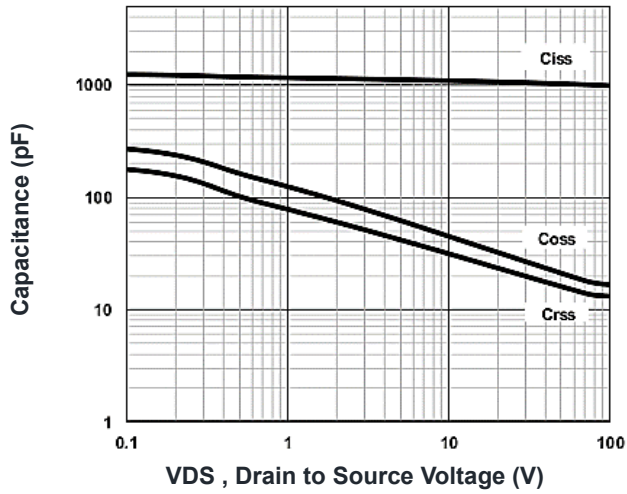


Figure 8. Capacitance Characteristics

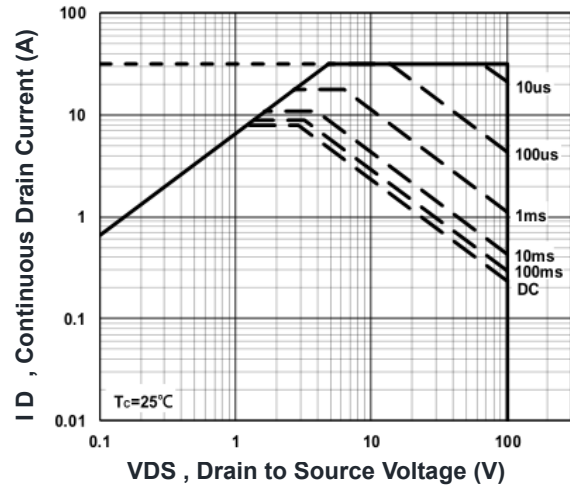


Figure 9. Maximum Safe Operation Area

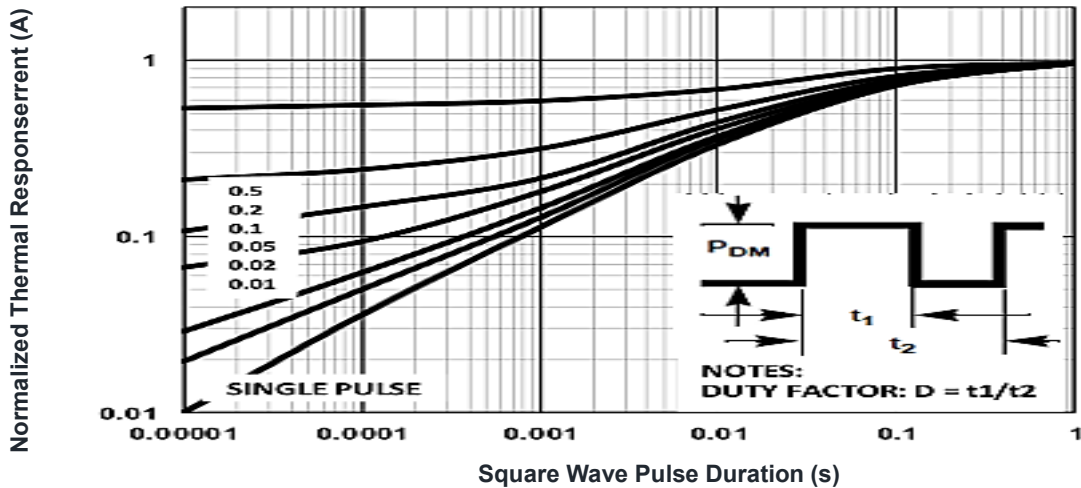


Figure 10. Normalized Transient Impedance

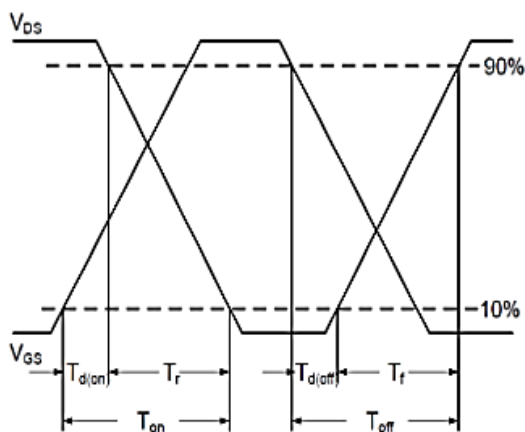


Figure 10. Switching Time Waveform

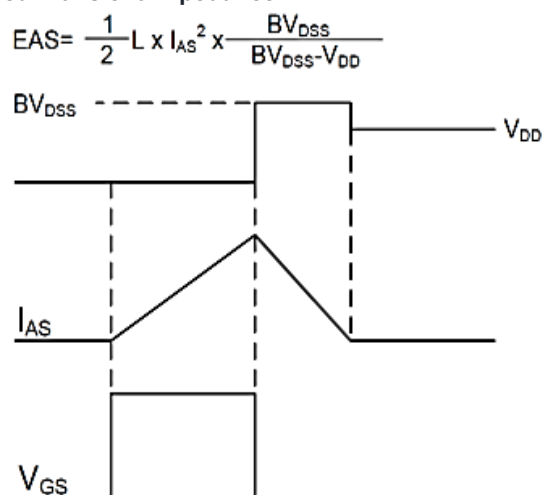
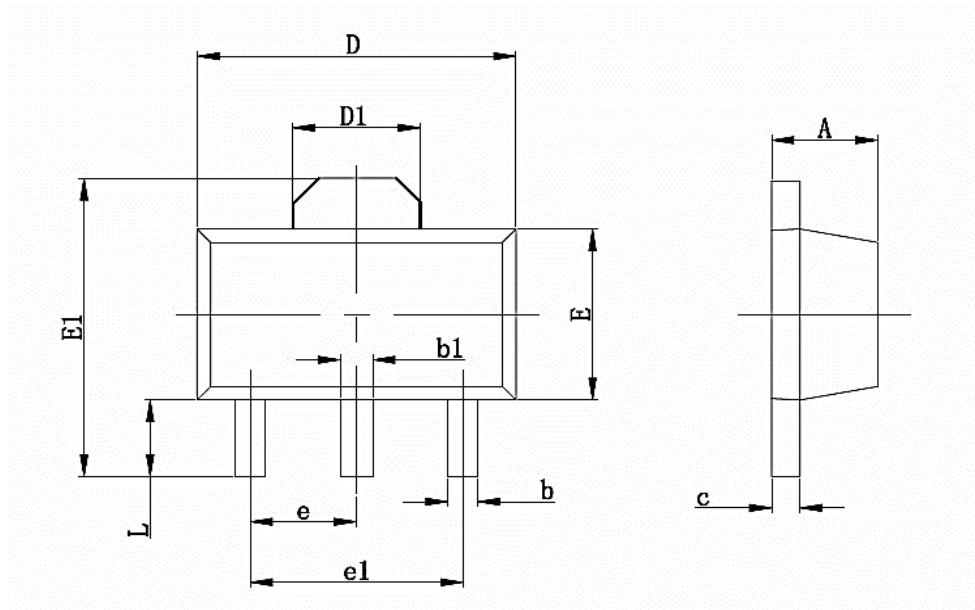


Figure 11. Unclamped Inductive Switching Waveform

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

100V N+P-Channel Enhancement Mode MOSFET**Attention**

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

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