AP10P10SI
-100V P-Channel Enhancement Mode MOSFET

Description

The AP10P10SI 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 =-10A
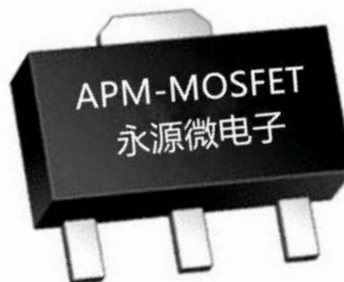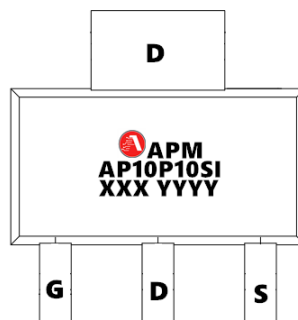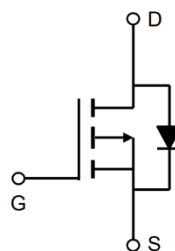
$R_{DS(ON)}$ <100mΩ @ V_{GS}=10V **(Type：85mΩ)**

Application

Brushless motor

Load switch

Uninterruptible power supply

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP10P10SI	SOT89-3L	AP10P10SI XXX YYYY	3000

Absolute Maximum Ratings (T$_C$=25℃unless otherwise noted)

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	-100	V
VGS	Gate-Source Voltage	±20	V
I_D@T$_C$=25℃	Continuous Drain Current, V_{GS} @ -10V[1]	-10	A
I_D@T$_C$=100℃	Continuous Drain Current, V_{GS} @ -10V[1]	-6.8	A
IDM	Pulsed Drain Current[2]	-60	A
EAS	Single Pulse Avalanche Energy[3]	80	mJ
IAS	Avalanche Current	-20	A
P$_D$@T$_C$=25℃	Total Power Dissipation[4]	3.1	W
TSTG	Storage Temperature Range	-55 to 150	℃
T$_J$	Operating Junction Temperature Range	-55 to 150	℃
R$_θ$JA	Thermal Resistance Junction-Ambient [1]	85	℃/W
R$_θ$JC	Thermal Resistance Junction-Case[1]	2.6	℃/W

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

| Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	VGS=0V, ID=-250µA	-100	-110	-	V
IGSS	Gate-body Leakage current	VDS=0V, VGS=±20V	-	-	±100	nA
IDSS TJ=25°C	Zero Gate Voltage Drain Current	VDS=-100V, VGS = 0V	-	-	-1	µA
IDSS TJ=100°C			-	-	-100	
VGS(th)	Gate-Threshold Voltage	VDS = VGS, ID = -250µA	-1.2	-1.6	-2.5	V
RDS(on)	Drain-Source On-Resistance4	VGS = -10V, ID = -10A	-	85	100	mΩ
		VGS = -4.5V, ID = -6A		90	120	
gfs	Forward Transconductance4	VDS = -10V, ID = -10A	-	30	-	S
Ciss	Input Capacitance	VDS = -50V, VGS = 0V, f = 1MHz	-	3985	-	pF
Coss	Output Capacitance		-	85	-	
Crss	Reverse Transfer Capacitance		-	71	-	
Rg	Gate Resistance	f = 1MHz	-	4	-	Ω
Qg	Total Gate Charge	VGS = -10V, VDS = -50V, ID= -10A	-	65	-	nC
Qgs	Gate-Source Charge		-	10.2	-	
Qgd	Gate-Drain Charge		-	13	-	
td(on)	Turn-On Delay Time	VGS = -10V, VDD = -50V, RG = 3Ω, ID= -10A	-	12.8	-	ns
tr	Rise Time		-	30	-	
td(off)	Turn-Off Delay Time		-	82	-	
tf	Fall Time		-	61	-	
trr	Body Diode Reverse Recovery Time	IF = -10A,dI/dt= 100A/µs	-	62	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	56	-	nC
VSD	Diode Forward Voltage4	IS = -10A, VGS = 0V	-	-	-1.2	V
IS	Continuous Source Current TC= 25°C	-	-	-	-18	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 EAS data shows Max. rating . The test condition is V DD =-72V,VGS =-10V,L=0.1mH,IAS =-17A

4、The power dissipation is limited by 150℃ junction temperature

5、The data is theoretically the same as I D and I DM , in real applications , should be limited by total power dissipation.
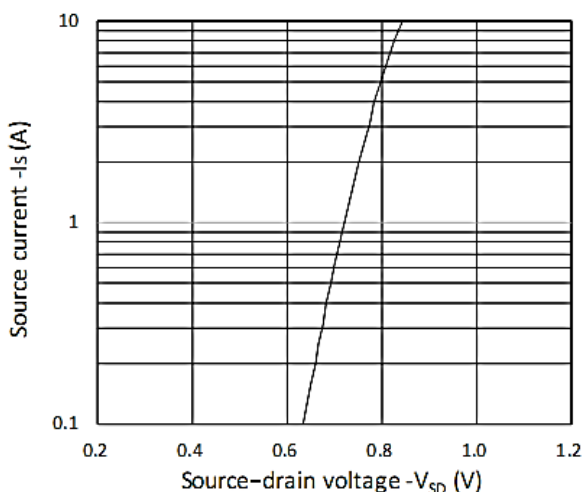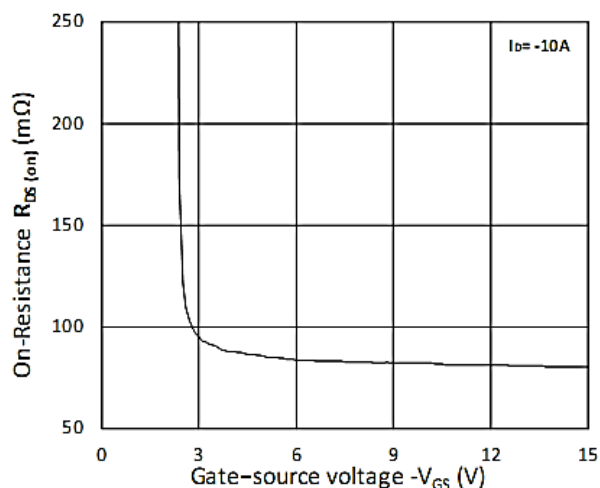
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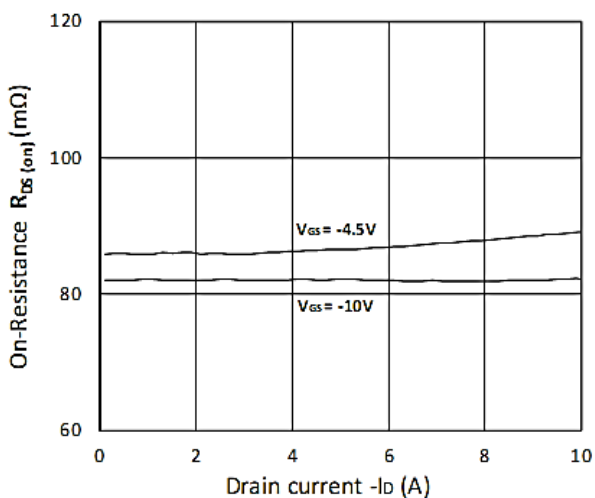## Typical Characteristics
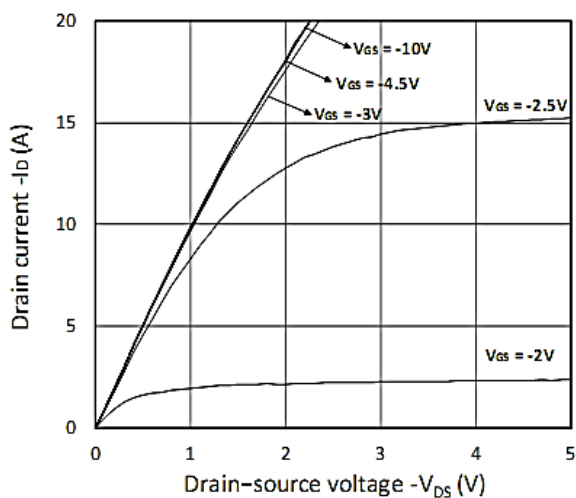
Figure 1. Output Characteristics
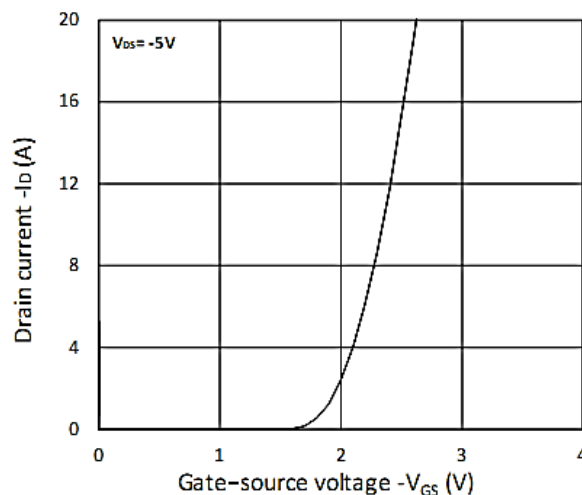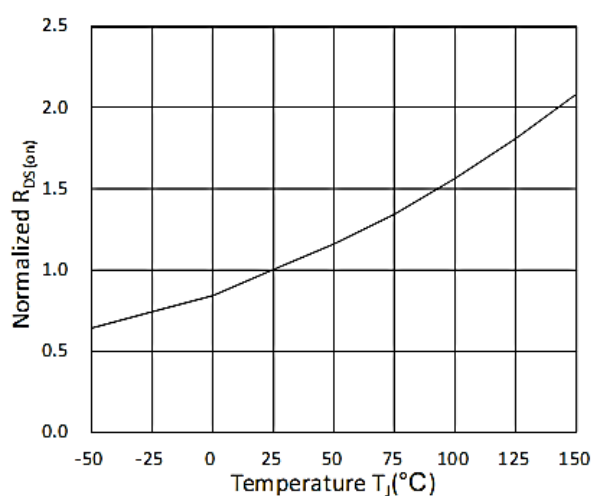

Figure 2. Transfer Characteristics

Figure 3. Forward Characteristics of Reverse

Figure 4. RDS(ON) vs. VGS

Figure 5. RDS(ON) vs. ID
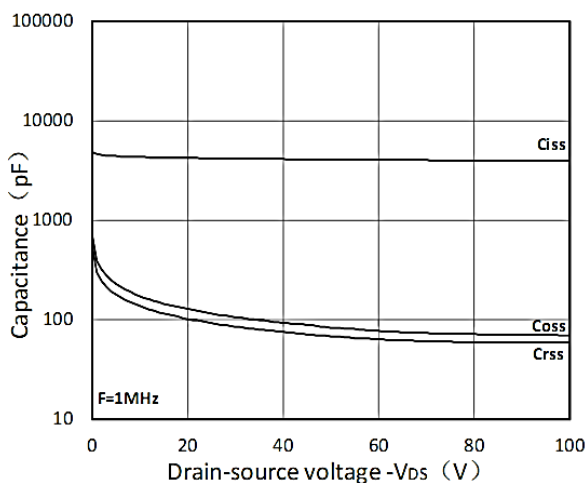

Figure 6. Normalized RDS(on) vs. Temperature
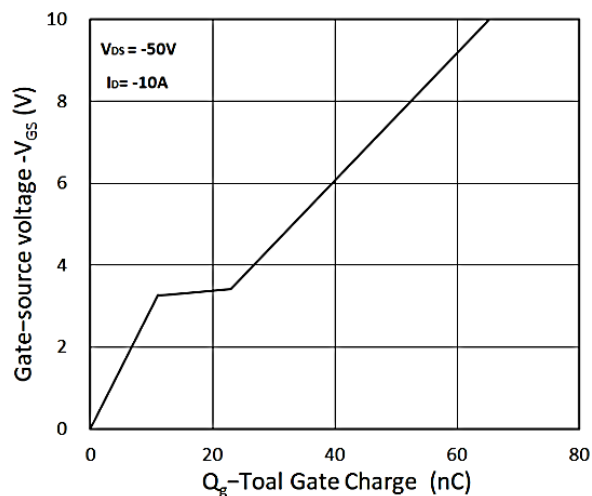
Figure 7. Capacitance Characteristics
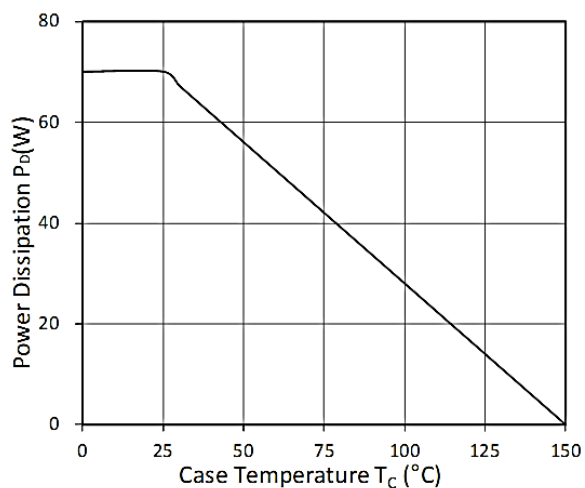

Figure 8. Gate Charge Characteristics

Figure 9. Power Dissipation
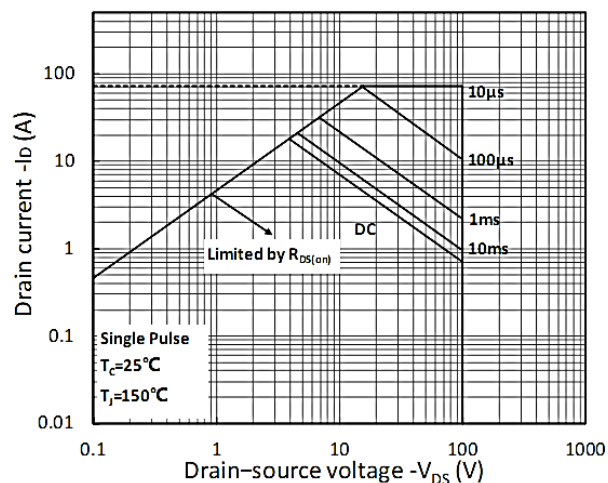
Figure10. Safe Operating Area
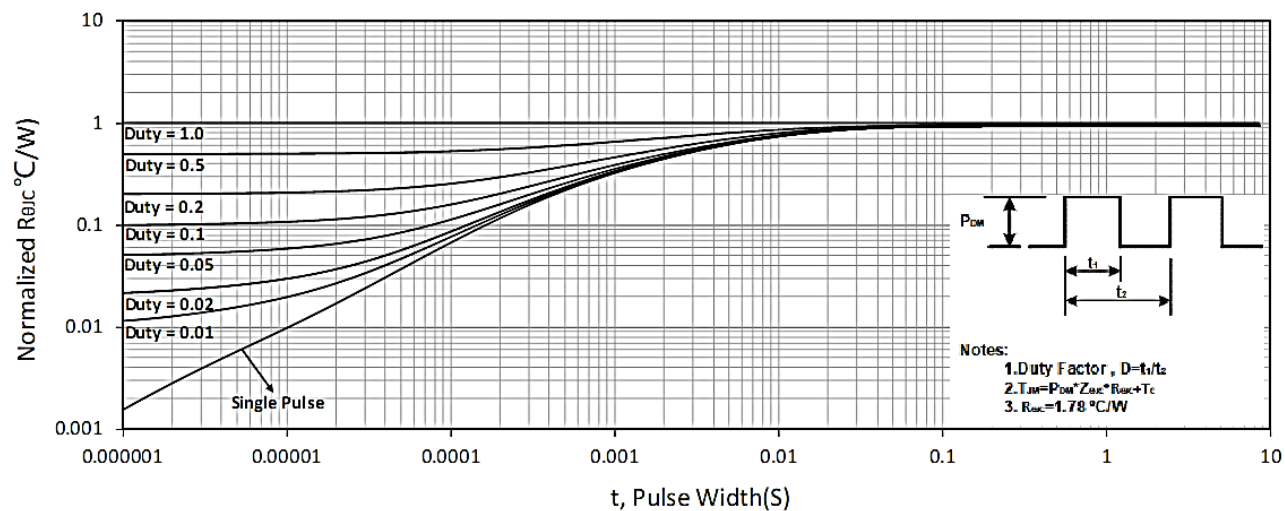
Figure 11. Normalized Maximum Transient Thermal Impedance

Package Mechanical Data:SOT89-3L
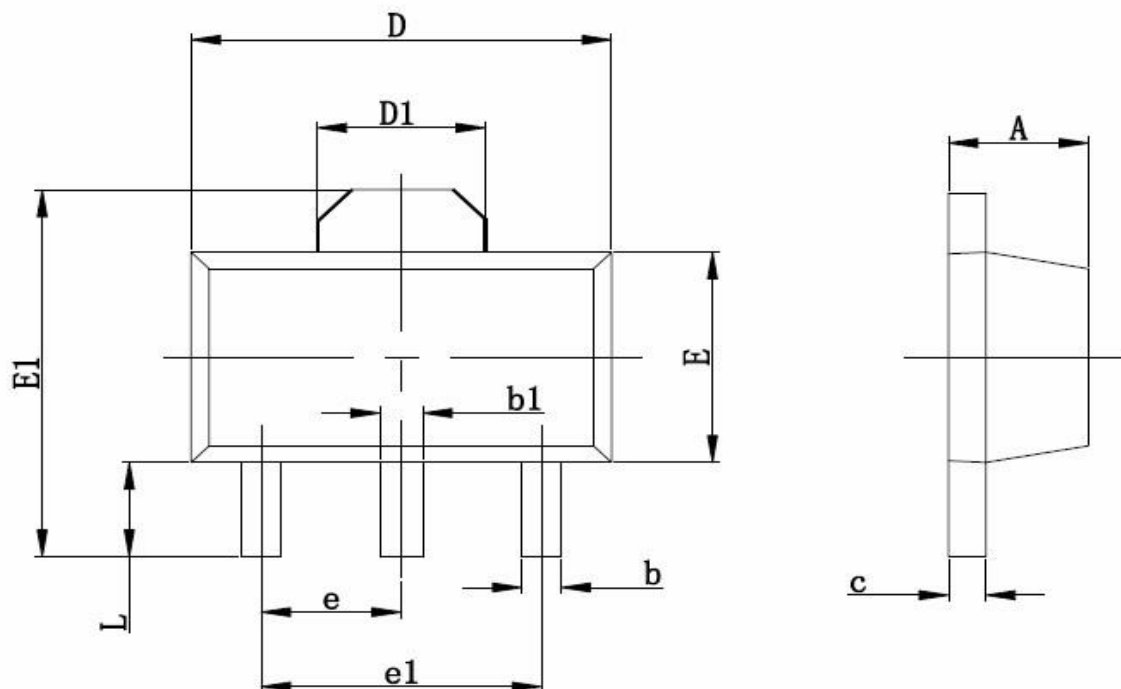
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.350	0.520	0.013	0.197
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF		0.061 REF	
E	2.350	2.550	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP		0.060TYP	
e1	3.000 TYP		0.118TYP	
L	0.900	1.100	0.035	0.047

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Edition	Date	Change
REV1.0	2024/10/13	Initial release

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