AP8V06S

-60V P+P-Channel Enhancement Mode MOSFET

Description

The AP8V06S 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.
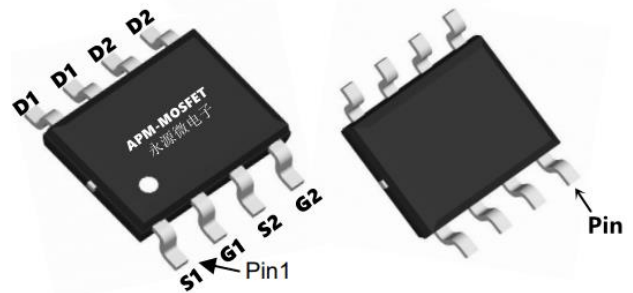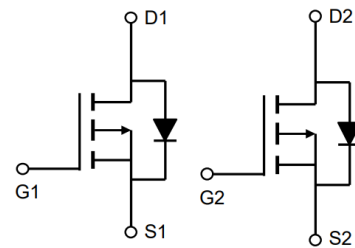
General Features

$V_{DS} = -60V$ $I_D = -8A$

$R_{DS(ON)} < 80m\Omega$ @ $V_{GS}=10V$ **(Type：60mΩ)**

Application

Brushless motor

Load switch

Uninterruptible power supply

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP8V06S	SOP-8	AP8V06S XXXX YYYY	3000

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_A=25℃	Continuous Drain Current, V_{GS} @ -10V[1]	-8	A
I_D@T_A=70℃	Continuous Drain Current, V_{GS} @ -10V[1]	-3	A
I_{DM}	Pulsed Drain Current[2]	-30	A
P_D@T_A=25℃	Total Power Dissipation[4]	1.5	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]	70	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	36	℃/W

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Electrical Characteristics (T$_A$=25℃unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V$_{GS}$=0V , I$_D$=-250uA	-60	---	---	V
△BVDSS /△Tj	BV$_{DSS}$ Temperature Coefficient	Reference to 25℃ , I$_D$=-1mA	---	-0.03	---	V/℃
RDS(ON)	Static Drain-Source On-Resistance	V$_{GS}$=-10V , I$_D$=-12A	---	60	80	mΩ
		V$_{GS}$=-4.5V , I$_D$=-8A	---	64	105	
VGS(th)	Gate Threshold Voltage	V$_{GS}$=V$_{DS}$, I$_D$ =-250uA	-1.2	1.5	-2.5	V
△V$_{GS(th)}$	V$_{GS(th)}$ Temperature Coefficient		---	4.56	---	mV/℃
IDSS	Drain-Source Leakage Current	V$_{DS}$=-48V , V$_{GS}$=0V , T$_J$=25℃	---	---	1	uA
		V$_{DS}$=-48V , V$_{GS}$=0V , T$_J$=55℃	---	---	5	
IGSS	Gate-Source Leakage Current	V$_{GS}$=±20V , V$_{DS}$=0V	---	---	±100	nA
gfs	Forward Transconductance	V$_{DS}$=-5V , I$_D$=-12A	---	15.4	---	S
R$_g$	Gate Resistance	V$_{DS}$=0V , V$_{GS}$=0V , f=1MHz	---	13.5	---	Ω
Q$_g$	Total Gate Charge (-4.5V)	V$_{DS}$=-48V , V$_{GS}$=-4.5V , I$_D$=-10A	---	9.86	---	nC
Q$_{gs}$	Gate-Source Charge		---	3.08	---	
Q$_{gd}$	Gate-Drain Charge		---	2.95	---	
Td(on)	Turn-On Delay Time	V$_{DD}$=-15V , V$_{GS}$=-10V , R$_G$=3.3□, I$_D$=-1A	---	28.8	---	ns
T$_r$	Rise Time		---	19.8	---	
Td(off)	Turn-Off Delay Time		---	60.8	---	
T$_f$	Fall Time		---	7.2	---	
C$_{iss}$	Input Capacitance	V$_{DS}$=-15V , V$_{GS}$=0V , f=1MHz	---	1447	---	pF
Coss	Output Capacitance		---	97.3	---	
Crss	Reverse Transfer Capacitance		---	70	---	
I$_S$	Continuous Source Current[1,5]	V$_G$=V$_D$=0V , Force Current	---	---	-18	A
ISM	Pulsed Source Current[2,5]		---	---	-36	A
VSD	Diode Forward Voltage[2]	V$_{GS}$=0V , I$_S$=-1A , T$_J$=25℃	---	---	-1.2	V

Note :

1、The data tested by surface mounted on a 1 inch2 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 ID and IDM , in real applications , should be limited by total power dissipation.

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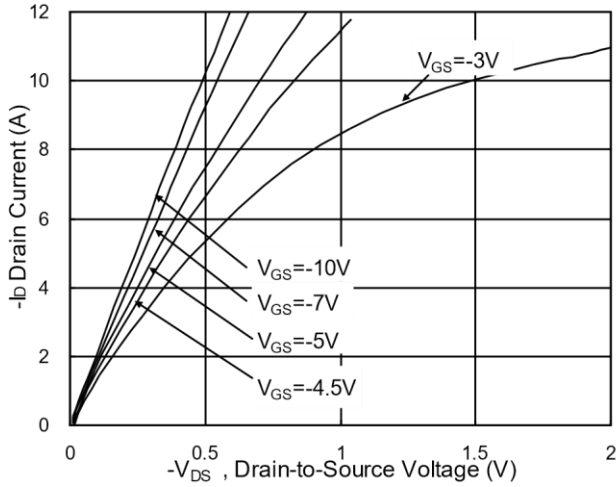
Typical Characteristics
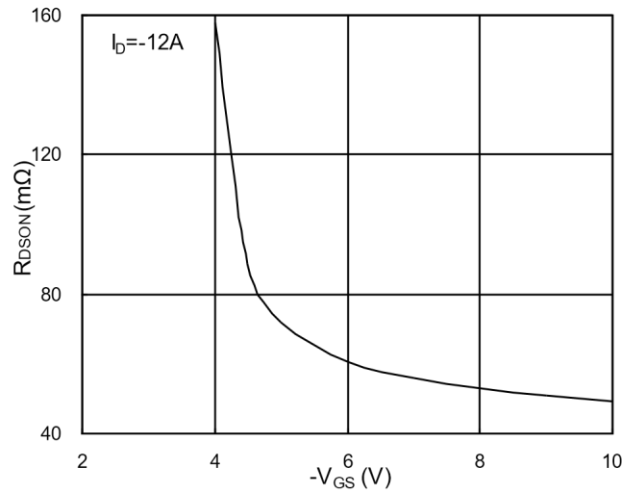
Fig.1 Typical Output Characteristics
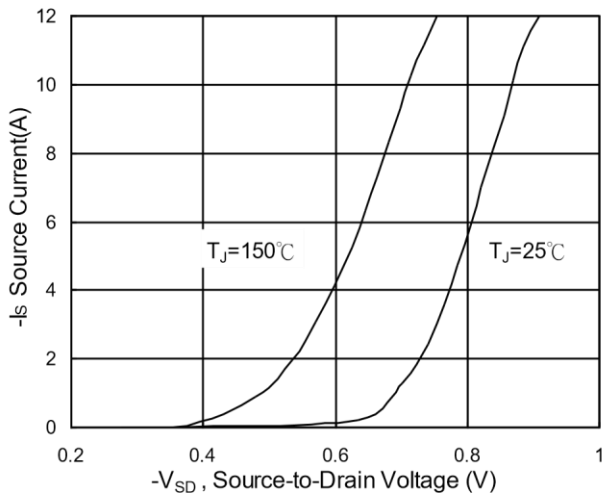
Fig.2 On-Resistance v.s Gate-Source

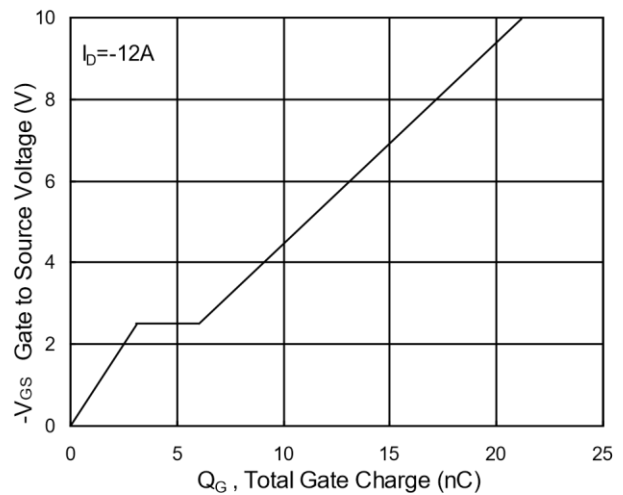Fig.3 Forward Characteristics of Reverse

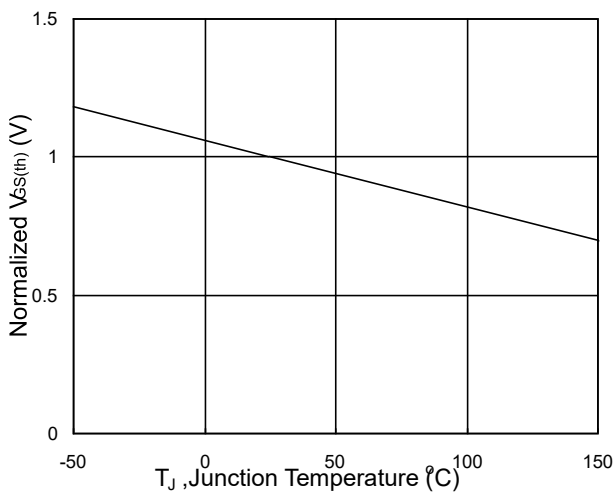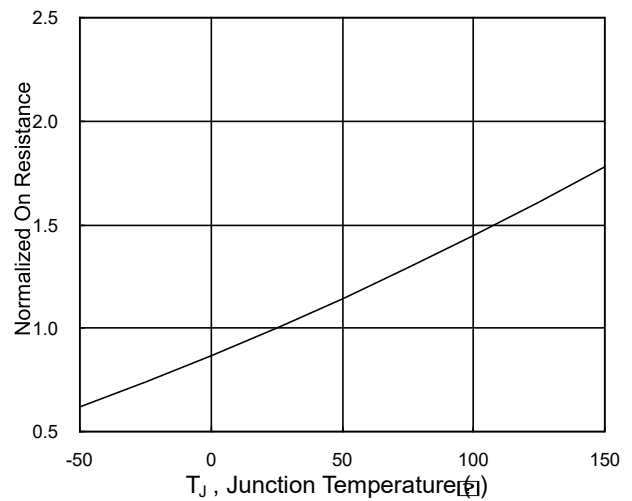Fig.4 Gate-Charge Characteristics

Fig.5 Normalized $V_{GS(th)}$ v.s T_J

Fig.6 Normalized R_{DSON} v.s T_J
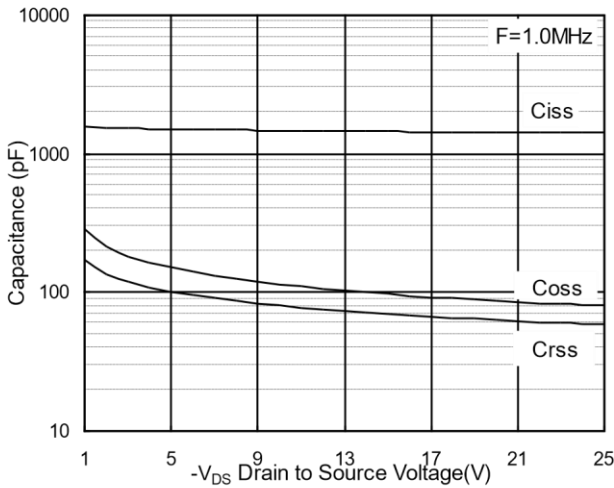
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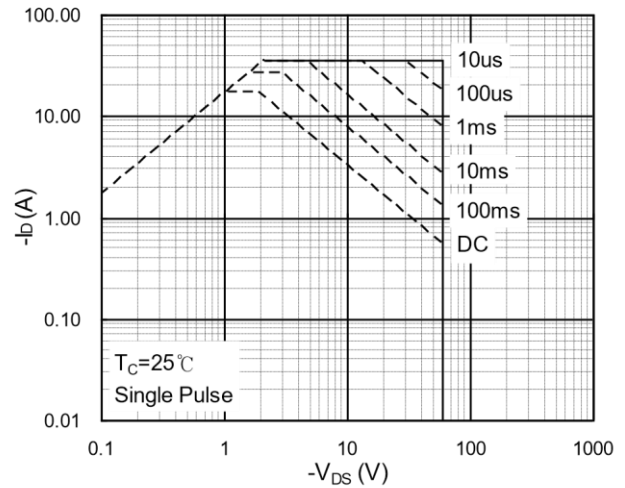## -60V P+P-Channel Enhancement Mode MOSFET

Fig.7 Capacitance

Fig.8 Safe Operating Area

$$D = T_{ON}/T$$
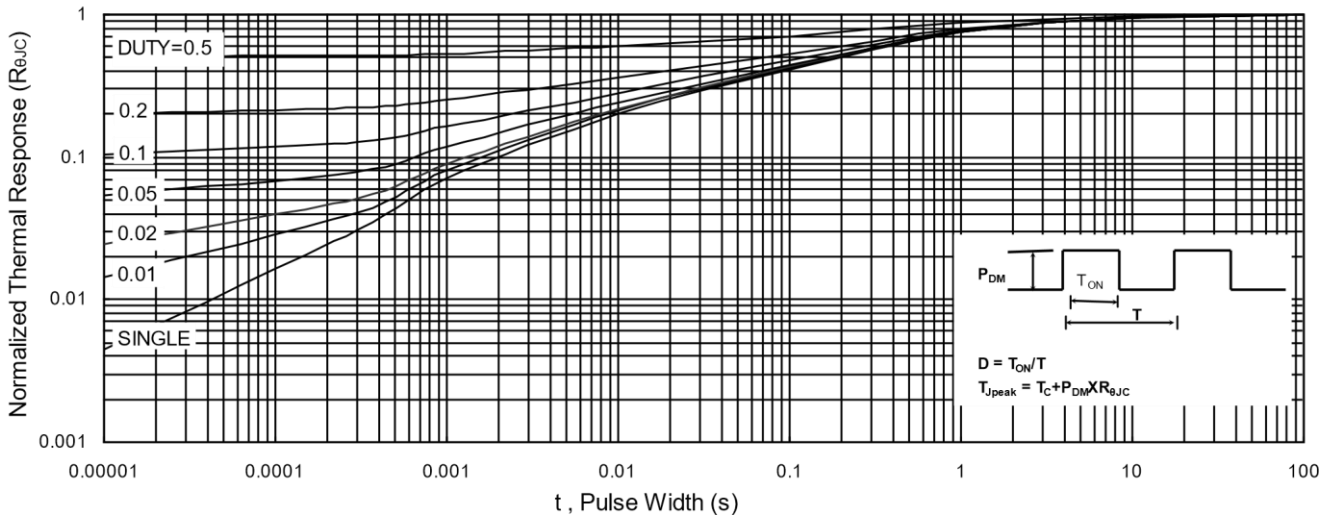$$T_{Jpeak} = T_C + P_{DM}XR_{\theta JC}$$

Fig.9 Normalized Maximum Transient Thermal Impedance
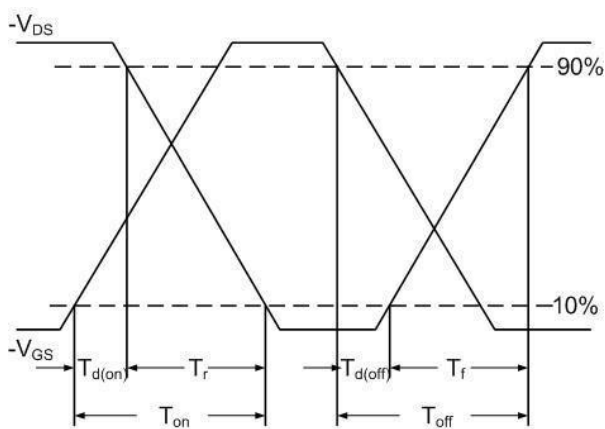
Fig.10 Switching Time Waveform

$$EAS = \frac{1}{2} L \times (-I_{AS}^2) \times \frac{-BV_{DSS}}{-BV_{DSS}-(-V_{DD})}$$

Fig.11 Unclamped Inductive Waveform

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Package Mechanical Data-SOP-8L

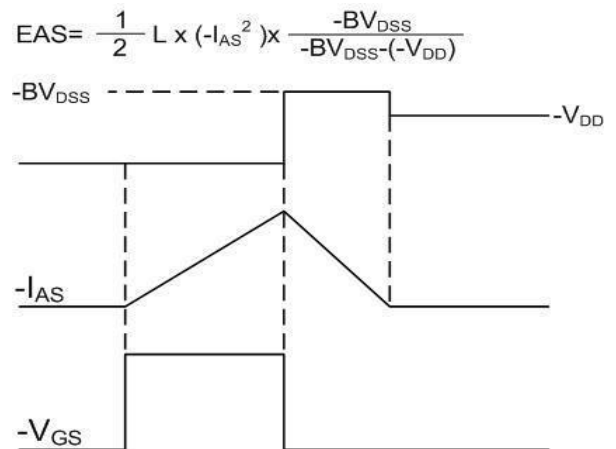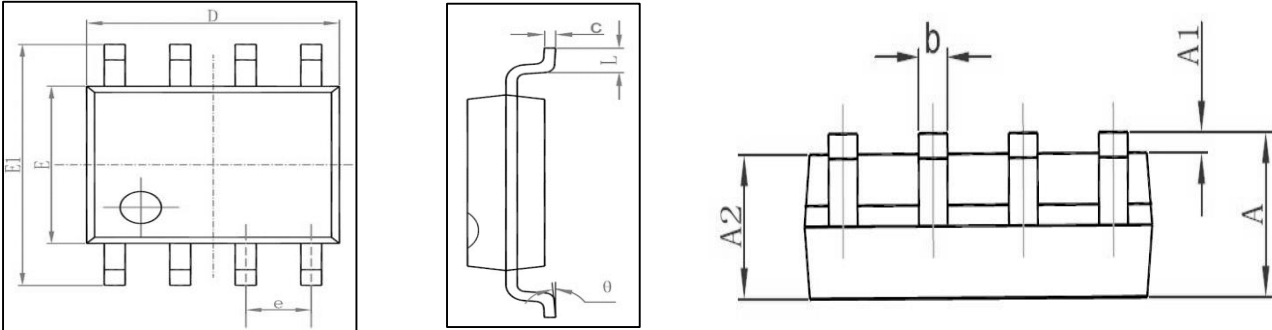| Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°
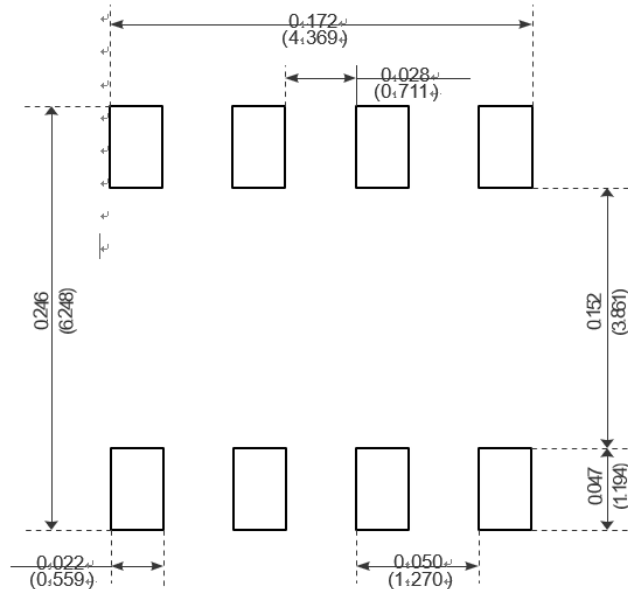
Recommended Minimum Pads

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Edition	Date	Change
Rve1.0	2021/11/31	Initial release

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