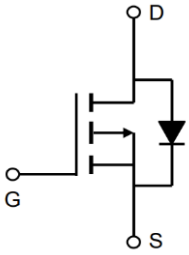
AP6P05SI

-55V P-Channel Enhancement Mode MOSFET

Description

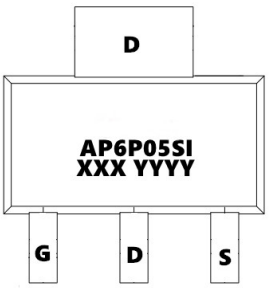
The AP6P05SI uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.



General Features

V_{DS} = -60V I_D =-6.8A

$R_{DS(ON)}$ < 125mΩ @ V_{GS}=-10V **(Type：108mΩ)**

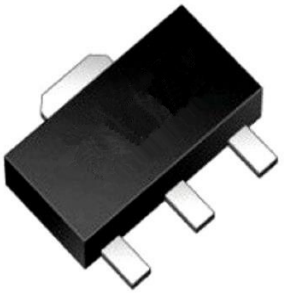


Application

Battery protection

Load switch

Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP6P05SI	SOT-89-3L	AP6P05SI XXX YYYY	3000

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

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	-55	V
VGS	Gate-Source Voltage	±20	V
I_D@T_A=25℃	Continuous Drain Current, V_{GS} @ -10V[1]	-6.8	A
I_D@T_A=70℃	Continuous Drain Current, V_{GS} @ -10V[1]	-4.4	A
IDM	Pulsed Drain Current[2]	-16	A
P_D@T_A=25℃	Total Power Dissipation[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]	125	℃/W
R_{θ}JC	Thermal Resistance Junction-Case[1]	80	℃/W

Electrical Characteristics (TC=25 ℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=-250uA	-55	-58	---	V
△BVDSS/△TJ	BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=-1mA	---	-0.021	---	V/℃
RDS(ON)	Static Drain-Source On-Resistance[2]	V_{GS}=-10V , I_D=-1.5A	---	110	125	mΩ
		V_{GS}=-4.5V , I_D=-1A	---	125	155	mΩ
VGS(th)	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =-250uA	-1.0	1.6	-2.5	V
△$V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	4.08	---	mV/℃
IDSS	Drain-Source Leakage Current	V_{DS}=-48V , V_{GS}=0V , T_J=25℃	---	---	1	uA
IDSS		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=-1.5A	---	5.9	---	S
Q_g	Total Gate Charge (-4.5V)	V_{DS}=-20V , V_{GS}=-4.5V , I_D=-1.5A	---	4.6	---	nC
Qgs	Gate-Source Charge		---	1.4	---	nC
Qgd	Gate-Drain Charge		---	1.62	---	nC
Td(on)	Turn-On Delay Time	V_{DS}=-15V , V_{GS}=-10V , R_G=3.3Ω, I_D=-1A	---	17.4	---	ns
T_r	Rise Time		---	5.4	---	ns
Td(off)	Turn-Off Delay Time		---	37.2	---	ns
T_f	Fall Time		---	2.4	---	ns
Ciss	Input Capacitance	V_{DS}=-15V , V_{GS}=0V , f=1MHz	---	531	---	pF
Coss	Output Capacitance		---	59	---	pF
Crss	Reverse Transfer Capacitance		---	38	---	pF
IS	Continuous Source Current[1,4]	V_G=V_D=0V , Force Current	---	---	-1.7	A
ISM	Pulsed Source Current[2,4]		---	---	-7	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 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.

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Typical Characteristics

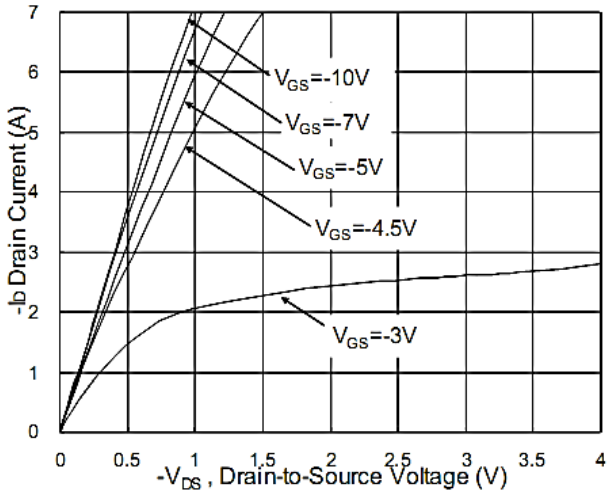

Fig.1 Typical Output Characteristics

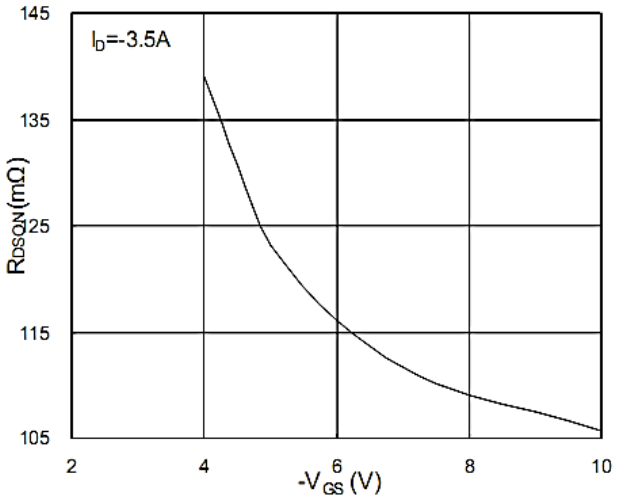

Fig.2 On-Resistance v.s Gate-Source

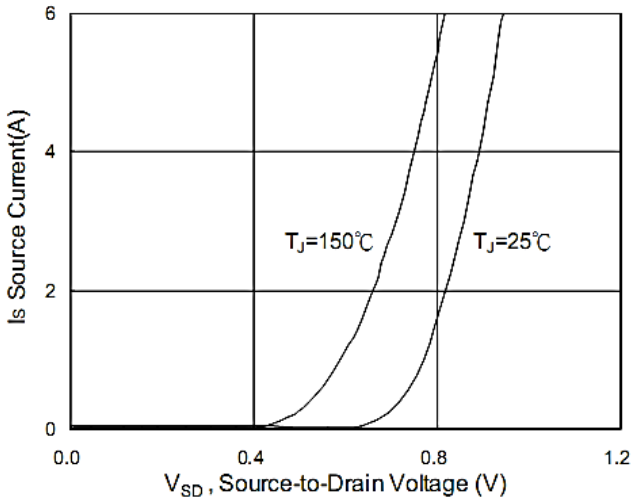

Fig.3 Forward Characteristics Of Reverse

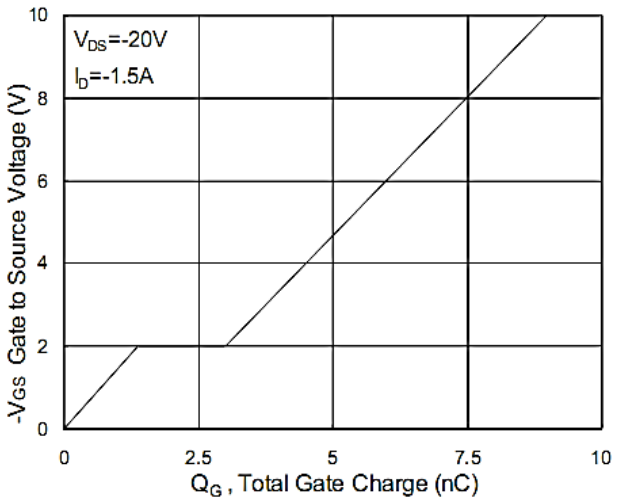

Fig.4 Gate-Charge Characteristics

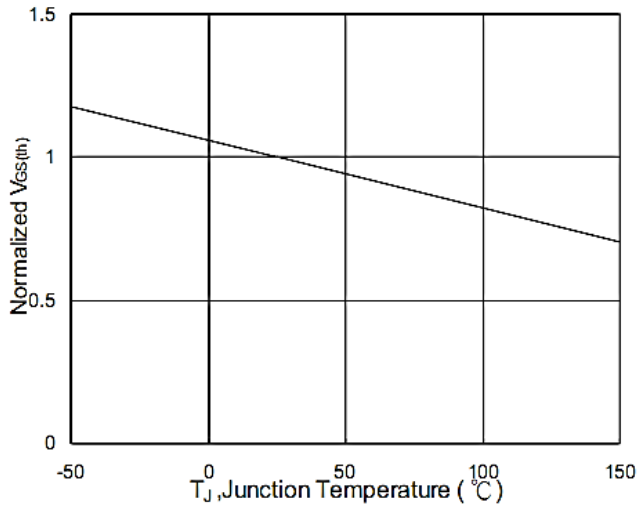

Fig.5 Normalized $V_{GS(th)}$ v.s T_J

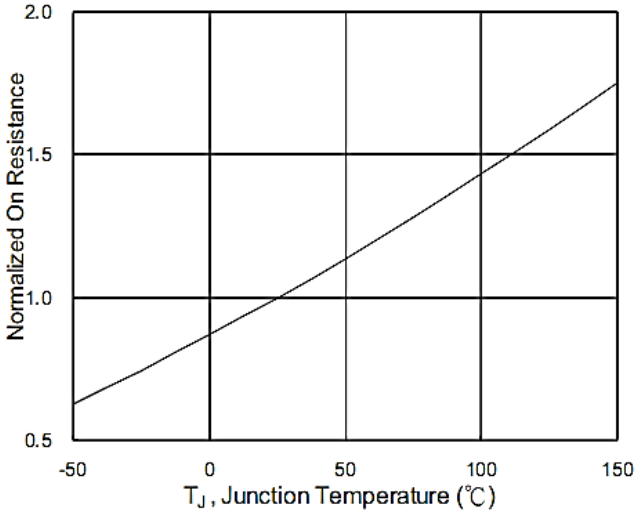

Fig.6 Normalized R_{DSON} v.s T_J

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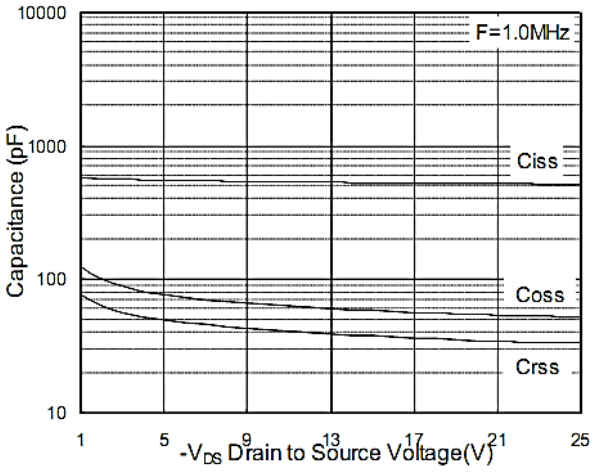


Fig.7 Capacitance

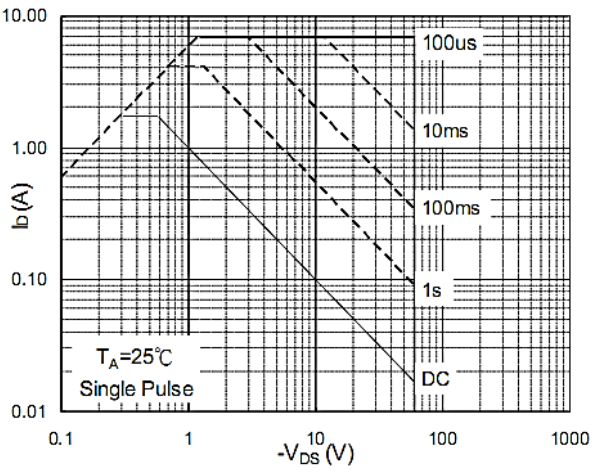


Fig.8 Safe Operating Area

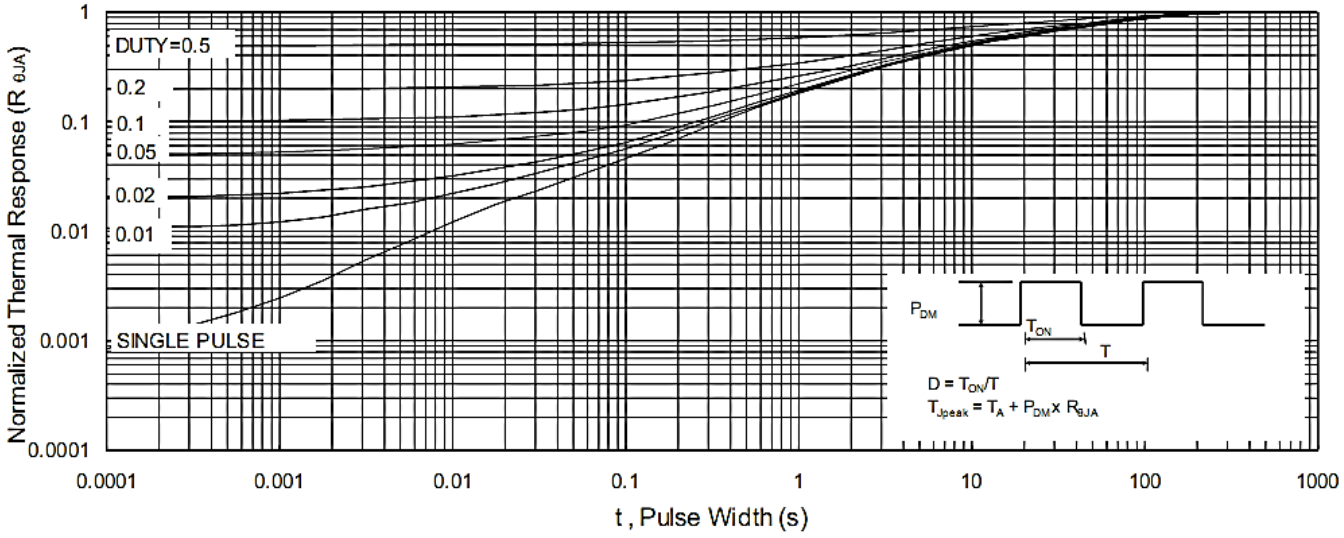


Fig.9 Normalized Maximum Transient Thermal Impedance

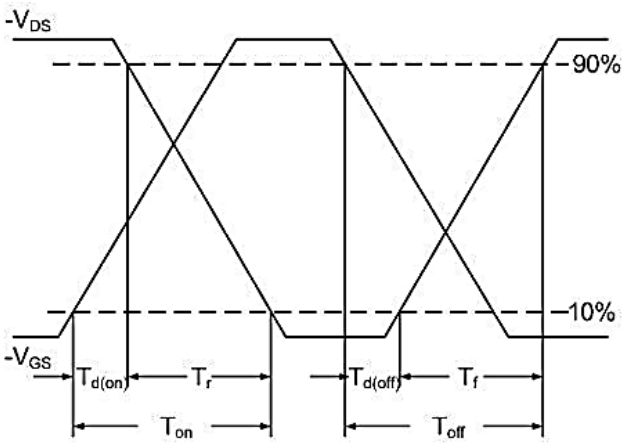


Fig.10 Switching time waveform

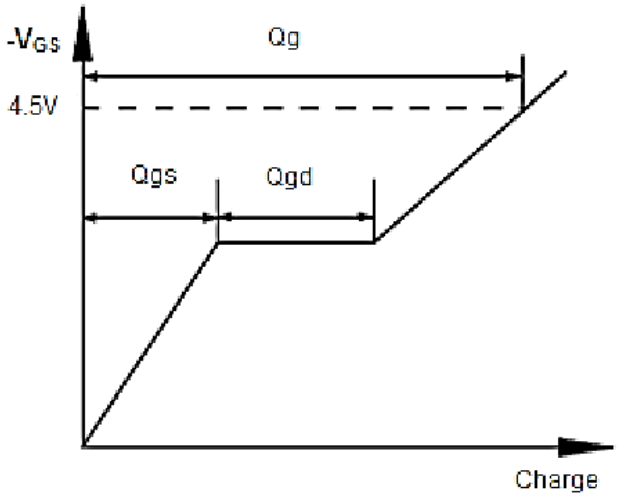
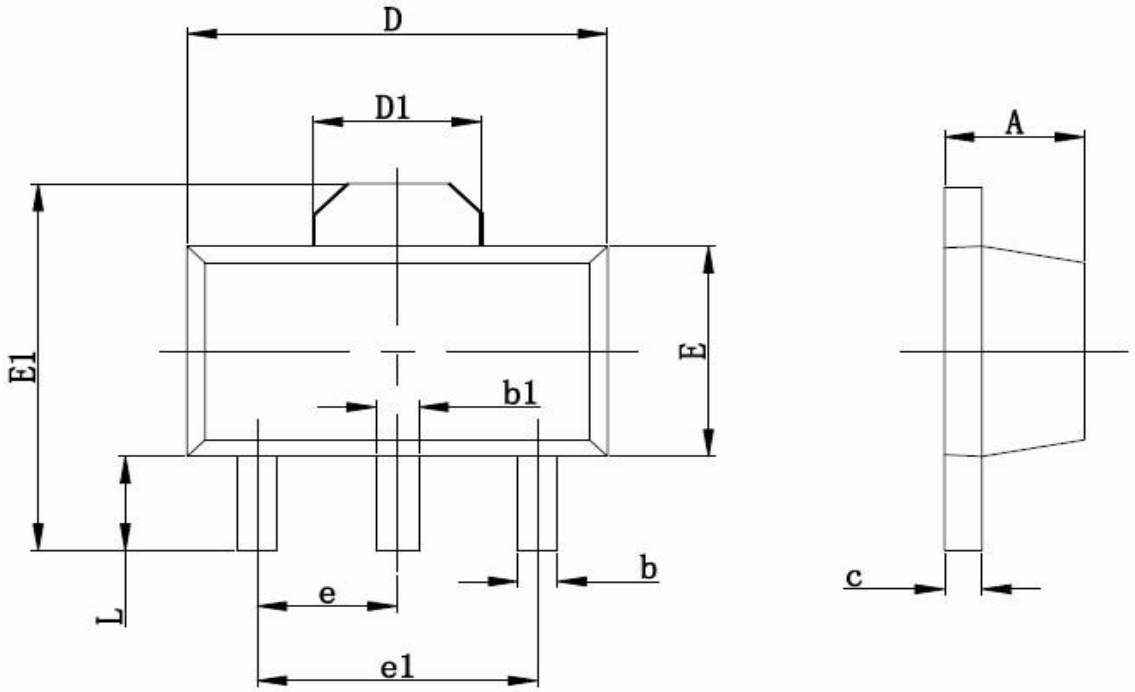


Fig.11 Gate Charge waveform

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