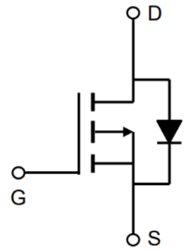
AP80P06P/T

-60V P-Channel Enhancement Mode MOSFET

Description



The AP80P06P/T uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 6V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

V_{DS} = -60V I_D =-82A

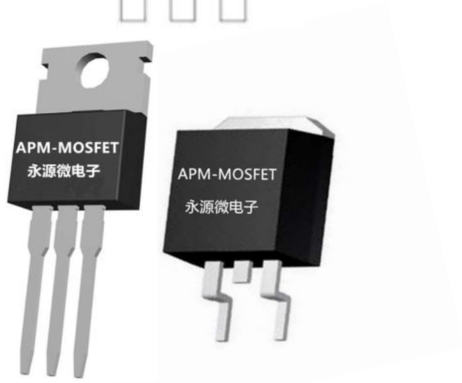
$R_{DS(ON)}$ < -12mΩ @ V_{GS}=-10V (Type：10mΩ)

Application

Lithium battery protection

Switching Mode Power Supply

UPS



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP80P06P	TO-220-3L	AP80P06P XXX YYYY	1000
AP80P06T	TO-263-3L	AP80P06T XXX YYYY	800

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_C=25˚C	Continuous Drain Current, -V_{GS} @ -10V[1]	-82	A
I_D@T_C=100˚C	Continuous Drain Current, -V_{GS} @ -10V[1]	-52	A
I_{DM}	Pulsed Drain Current[2]	-328	A
EAS	Single Pulse Avalanche Energy[3]	450	mJ
I_{AS}	Avalanche Current	52	A
P_D@T_C=25˚C	Total Power Dissipation[4]	110	W
T_{STG}	Storage Temperature Range	-55 to 150	˚C
T_J	Operating Junction Temperature Range	-55 to 150	˚C
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1]	0.70	˚C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	60	˚C/W

Electrical Characteristics (T_C=25℃unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=-250uA	-60	-68	---	V
△BVDSS/△TJ	BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=-1mA	---	-0.035	---	V/℃
RDS(ON)	Static Drain-Source On-Resistance[2]	V_{GS}=-10V , I_D=-20A	---	10	12	mΩ
		V_{GS}=-4.5V , I_D=-15A	---	13	16	
VGS(th)	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =-250uA	-1.0	-2.1	-3.0	V
△$V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	4.28	---	mV/℃
IDSS	Drain-Source Leakage Current	V_{DS}=-60V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=-60V , 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=-20A	---	50	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	2.0	---	Ω
Q_g	Total Gate Charge (-4.5V)	V_{DS}=-30V , V_{GS}=-10V , I_D=-20A	---	56	---	nC
Q_{gs}	Gate-Source Charge		---	11	---	
Q_{gd}	Gate-Drain Charge		---	9	---	
Td(on)	Turn-On Delay Time	V_{DD}=-30V , V_{GS}=-10V , R_G=3Ω, I_D=-20A	---	4.5	---	ns
T_r	Rise Time		---	2.5	---	
Td(off)	Turn-Off Delay Time		---	14.5	---	
T_f	Fall Time		---	3.8	---	
C_{iss}	Input Capacitance	V_{DS}=-15V , V_{GS}=0V , f=1MHz	---	3500	---	pF
Coss	Output Capacitance		---	600	---	
Crss	Reverse Transfer Capacitance		---	25	---	
I_S	Continuous Source Current[1,5]	V_G=V_D=0V , Force Current	---	---	-80	A
ISM	Pulsed Source Current[2,5]		---	---	-240	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 EAS data shows Max. rating . The test condition is VDD =-48V，VGS =-10V，L=0.1mH，IAS =-52A

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.

Typical Characteristics

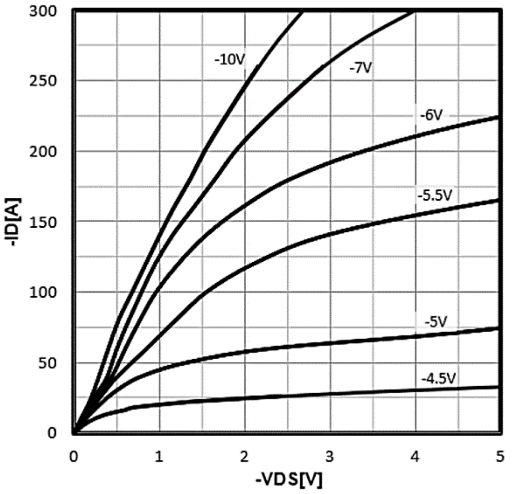


Figure 1. Type. Output Characteristics (Tj=25 ℃)

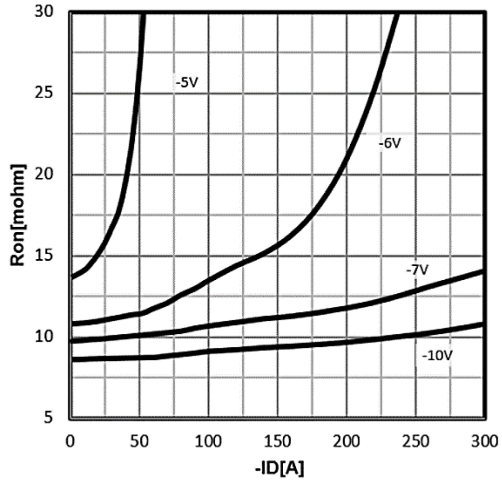


Figure 2. Type. drain-source on resistance

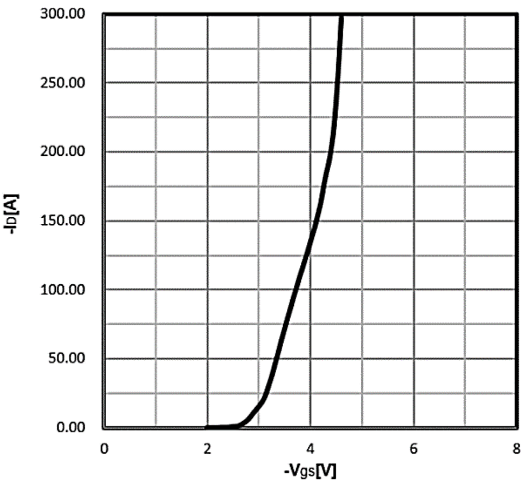


Figure 3. Type. transfer characteristics

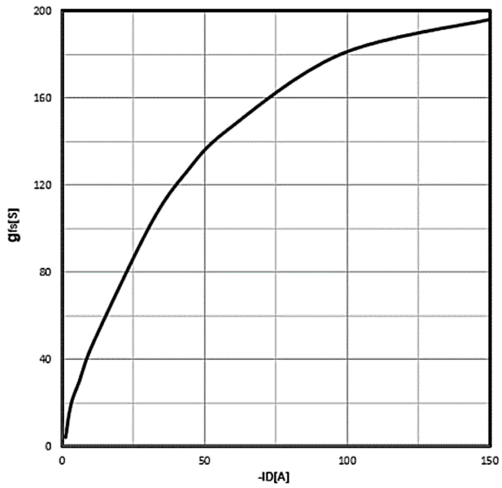


Figure 4. Type. forward transconductance

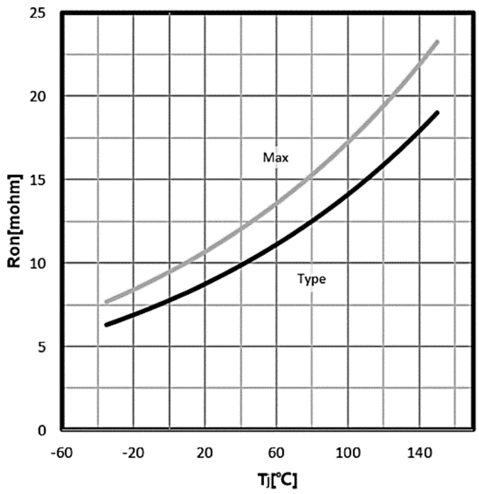


Figure 5. Drain-source on-state resistance
RDS(on) =f(Tj); ID =80A; VGS =10V

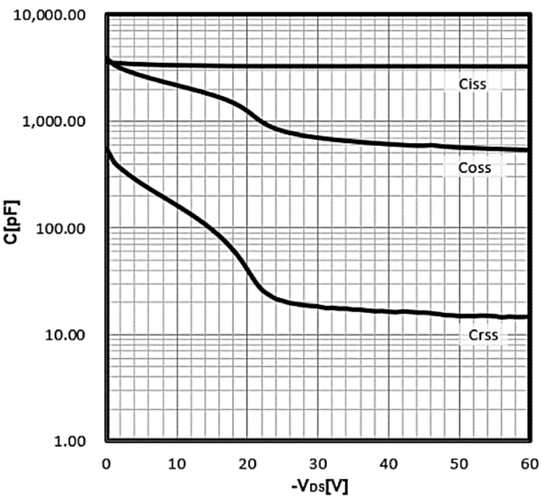


Figure 6 . Body-Diode Characteristics
C=f(VDS); VGS =0V; f=1MHz

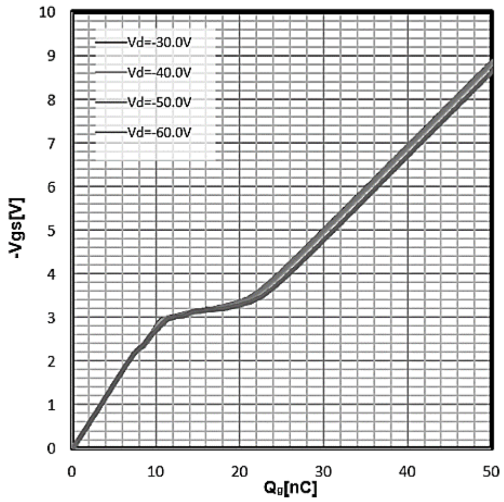


Figure 7. Typ. gate charge
VGS =f(Q gate) ; ID =20A

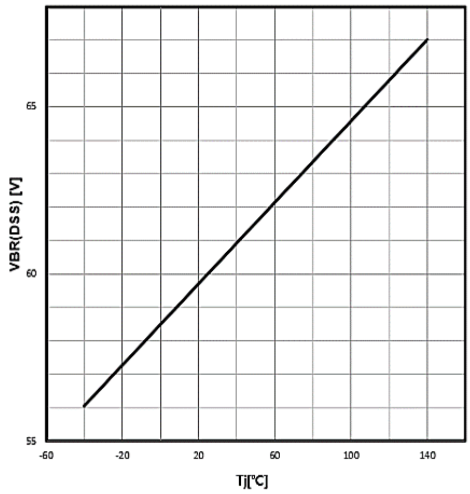


Figure 8. Drain Current Derating
VBR(DSS) =f(T j); I D =250uA

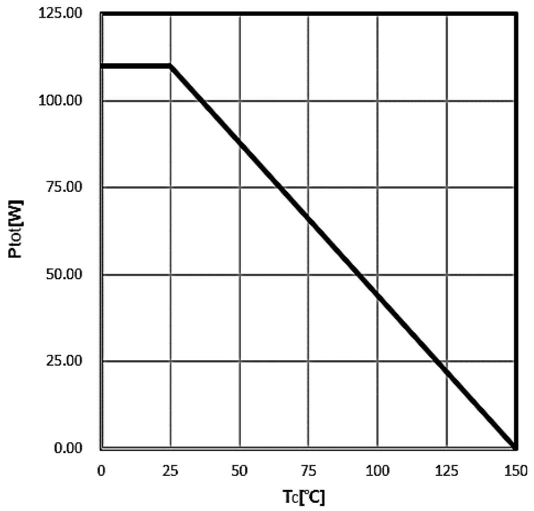


Figure 7. Power Dissipation

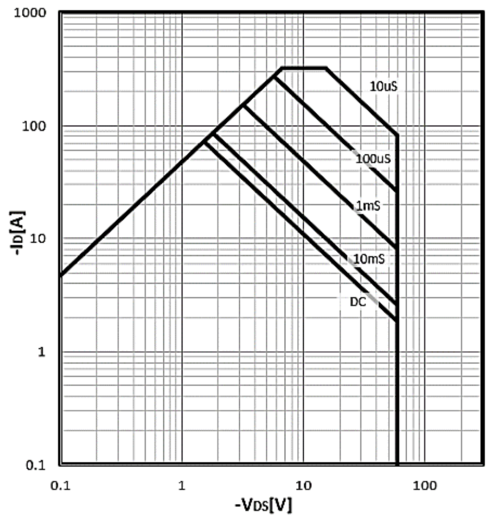


Figure 8. Safe operating area

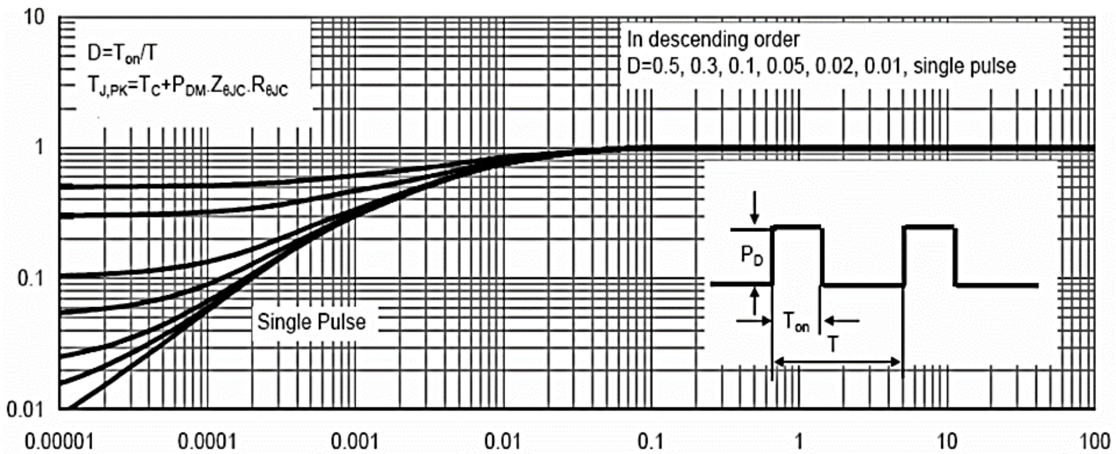
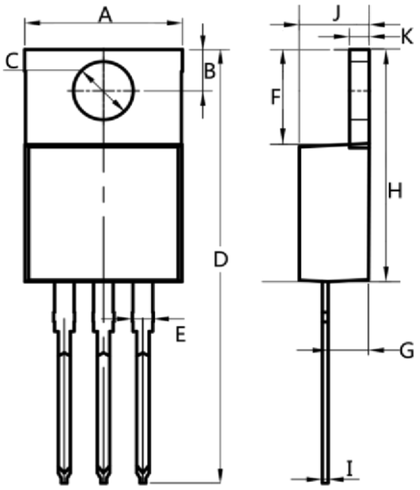


Figure 10. Max. transient thermal impedance

ZthJC =f(tp)

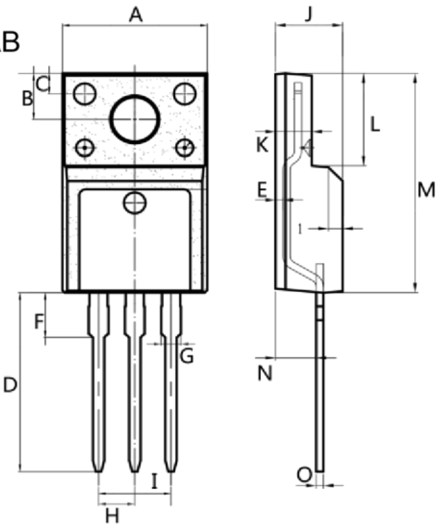
-60V P-Channel Enhancement Mode MOSFET

TO-220AB



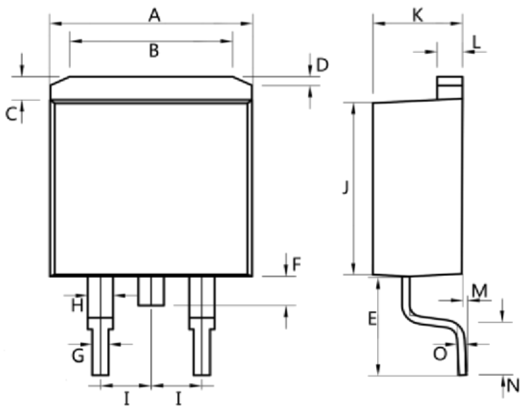
Dim.	Min.	Max.
A	10.0	10.4
B	2.5	3.0
C	3.5	4.0
D	28.0	30.0
E	1.1	1.5
F	6.2	6.6
G	2.9	3.3
H	15.0	16.0
I	0.35	0.45
J	4.3	4.7
K	1.2	1.4
All Dimensions in millimeter		

ITO-220AB



Dim.	Min.	Max.
A	9.9	10.3
B	2.9	3.5
C	1.15	1.45
D	12.75	13.25
E	0.55	0.75
F	3.1	3.5
G	1.25	1.45
H	Typ 2.54	
I	Typ 5.08	
J	4.55	4.75
K	2.4	2. 7
L	6.35	6.75
M	15.0	16.0
N	2.75	3.15
O	0.45	0.60
All Dimensions in millimeter		

TO-263



Dim.	Min.	Max.
A	10.0	10. 5
B	7.25	7.75
C	1.3	1.5
D	0.55	0.75
E	5.0	6.0
F	1.4	1.6
G	0.75	0.95
H	1.15	1.35
I	Typ 2.54	
J	8.4	8.6
K	4.4	4.6
L	1.25	1.45
M	0.02	0.1
N	2.4	2.8
O	0.35	0.45
All Dimensions in millimeter		

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Edition	Date	Change
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