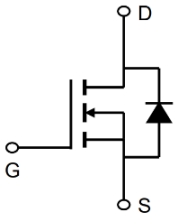
AP220N06MP

60V N-Channel Enhancement Mode MOSFET

Description

The AP220N06MP uses advanced APM-SGT I 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 =220A

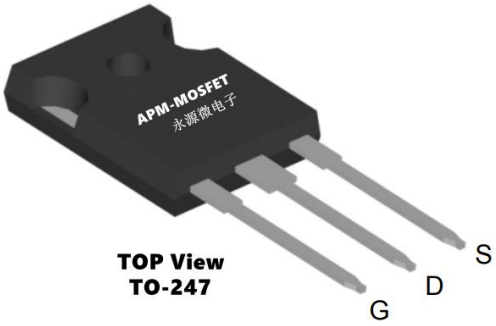
$R_{DS(ON)}$ < 3mΩ @ V_{GS}=10V （**Type：2.4mΩ**）

Application

Battery protection

Load switch

Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP220N06MP	TO-247-3L	AP220N06MP XXX YYYY	300

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

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	60	V
VGS	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current[1,6]	220	A
I_D@T_C=100℃	Continuous Drain Current[1,6]	136	A
IDM	Pulsed Drain Current[2]	660	A
EAS	Single Pulse Avalanche Energy[3]	101	mJ
IAS	Avalanche Current	130	A
P_D@T_C=25℃	Total Power Dissipation[4]	168	W
TSTG	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1]	40	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	1.5	℃/W

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}= 0V, I_D=250μA	60	67		V
IDSS	Zero Gate Voltage Drain Current	V_{DS}=60V,V_{GS}=0V			1	μA
IGSS	Gate-Body Leakage Current	V_{GS}= ±20V, V_{DS}=0V			±100	nA
VGS(th)	Gate Threshold Voltage	V_{DS}= V_{GS}, I_D=250μA	2.0	2.6	4.0	V
RDS(ON)	Static Drain-Source On-Resistance	V_{GS}= 10V, I_D=20A		2.4	3.0	mΩ
		V_{GS}= 6V, I_D=15A		4.2	5.0	
C_{iss}	Input Capacitance	V_{DS}=25V,V_{GS}=0V,f=100KHZ		5950		pF
C_{oss}	Output Capacitance			1250		
C_{rss}	Reverse Transfer Capacitance			85		
Q_g	Total Gate Charge	V_{GS}=10V,V_{DS}=50V,I_D=50A		93		nC
Q_{gs}	Gate-Source Charge			17		
Q_{gd}	Gate-Drain Charge			14		
Q_{rr}	Reverse Recovery Chrage	I_F=25A, di/dt=100A/us		73		
t_{rr}	Reverse Recovery Time			68		ns
td(on)	Turn-on Delay Time	V_{GS}=10V,V_{DD}=30V,I_D=25A R_{GEN}=2Ω		22.5		
t_r	Turn-on Rise Time			6.7		
td(off)	Turn-off Delay Time			80.3		
t_f	Turn-off fall Time			26.9		
V_{SD}	Diode Forward Voltage	I_S=20A,V_{GS}=0V			1.2	V
I_S	Maximum Body-Diode Continuous Current				200	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 VDD=48V,VGS=10V, L=0.1mH IAS=130A

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

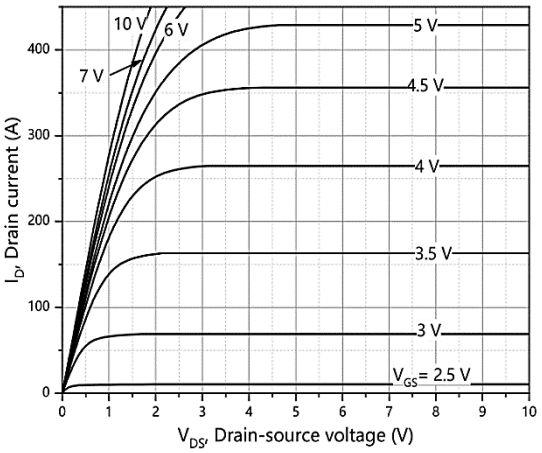


Figure 1. Typ. output characteristics

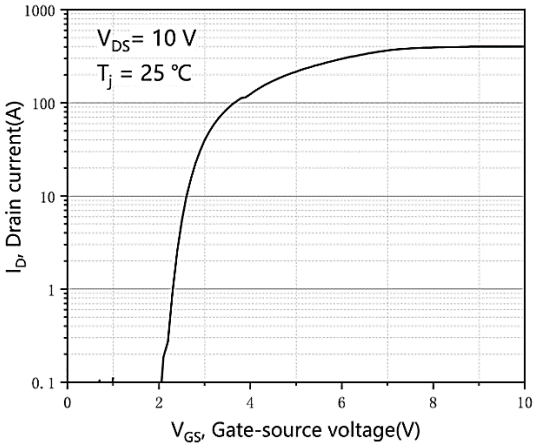


Figure 2. Typ. transfer characteristics

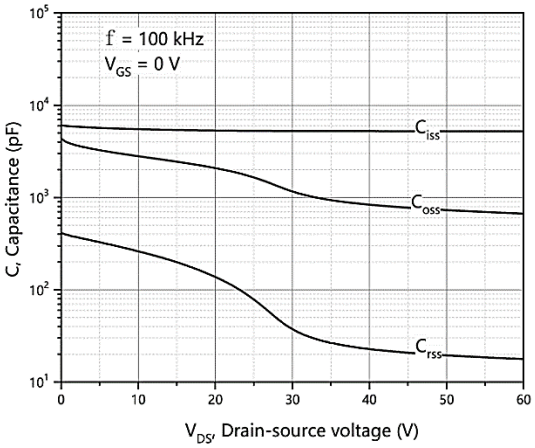


Figure 3. Typ. capacitances

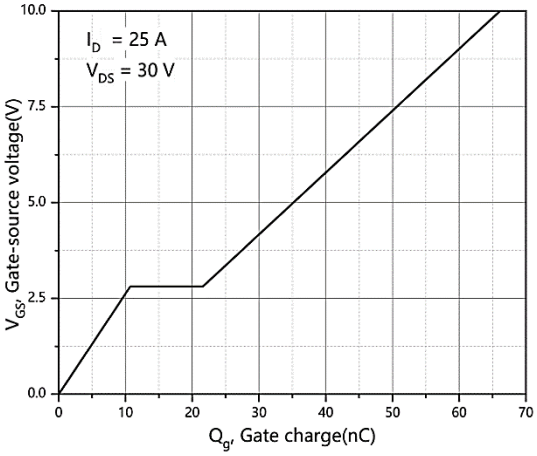


Figure 4. Typ. gate charge

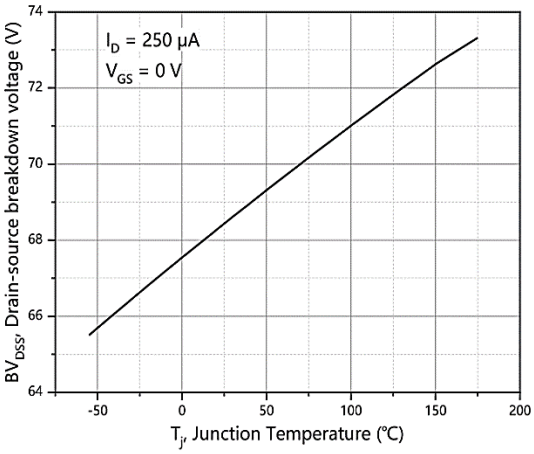


Figure 5. Drain-source breakdown voltage

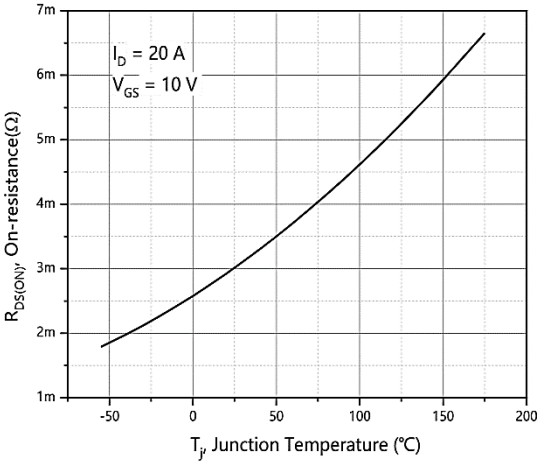


Figure 6. Drain-source on-state resistance

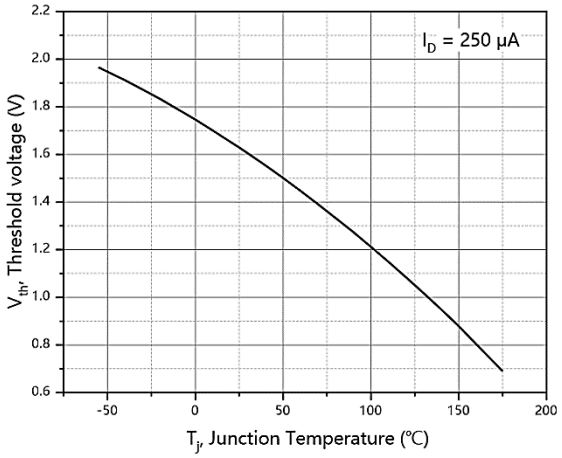


Figure 7. Threshold voltage

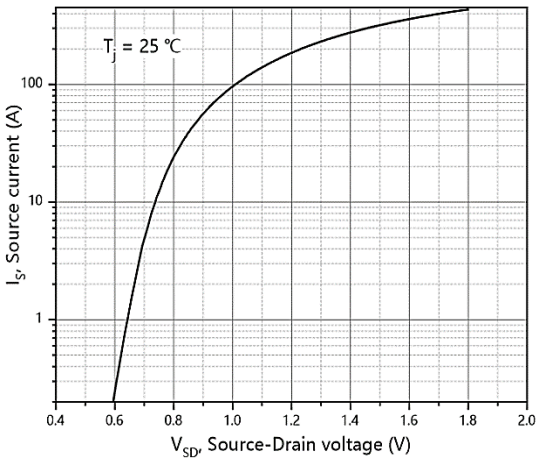


Figure 8. Forward characteristic of body diode

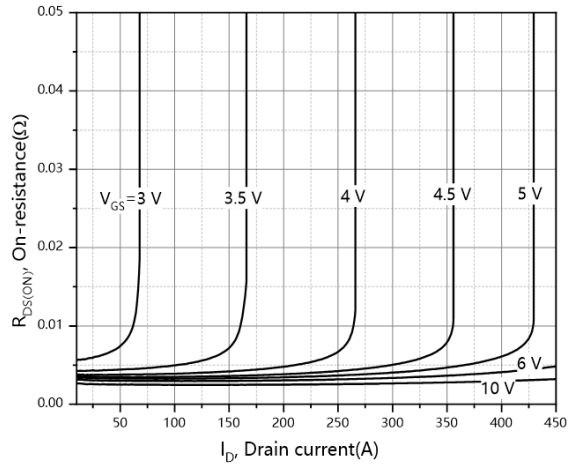


Figure 9. Drain-source on-state resistance

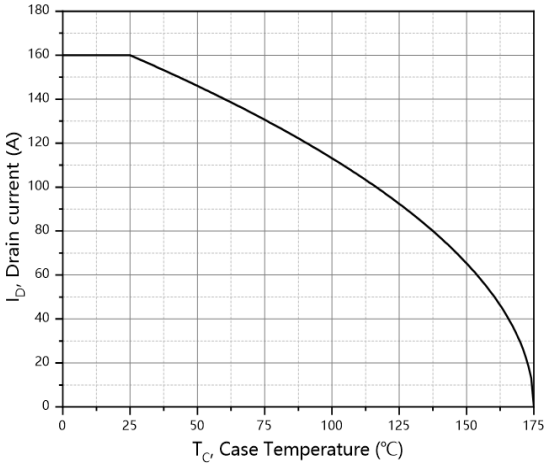


Figure 10. Drain current

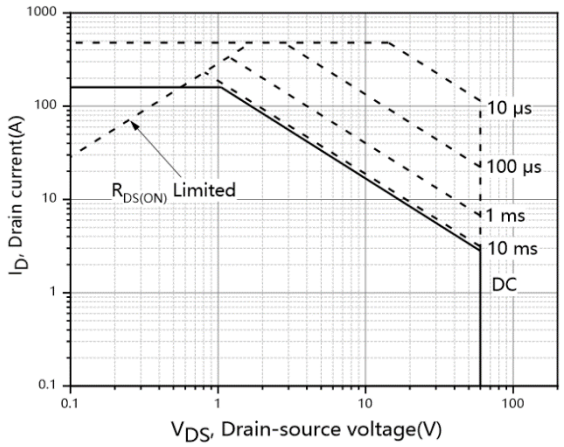


Figure 11. Safe operation area T_C=25 °C

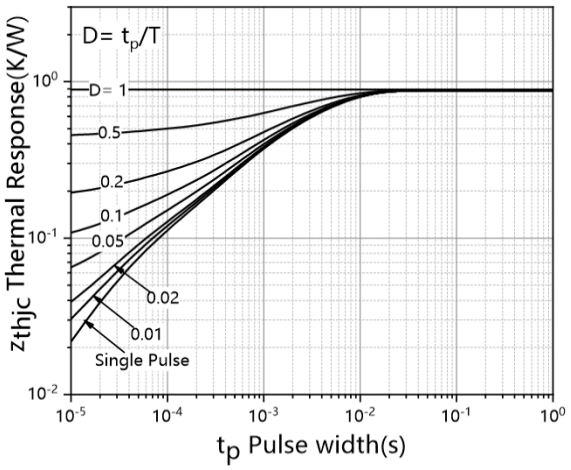
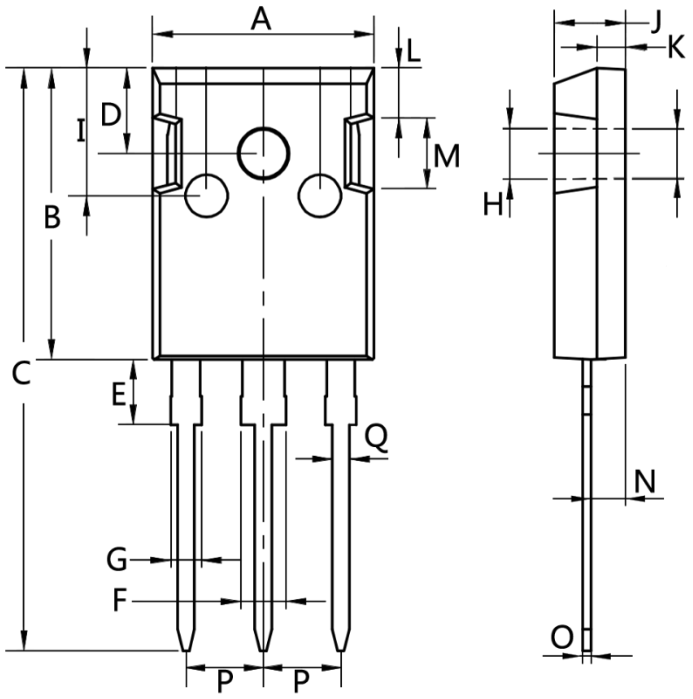


Figure 12. Max. transient thermal impedance

Package Mechanical Data-TO-247-3L



Dim.	Min.	Max.
A	15.0	16. 0
B	20.0	21.0
C	41.0	42.0
D	5.0	6.0
E	4.0	5.0
F	2.5	3.5
G	1.75	2.5
H	3.0	3.5
I	8.0	10.0
J	4.9	5.1
K	1.9	2.1
L	3.5	4.0
M	4.75	5.25
N	2.0	3.0
O	0.55	0.75
P	Typ 5.08	
Q	1.2	1.3

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Edition	Date	Change
Rve1.0	2021/1/31	Initial release