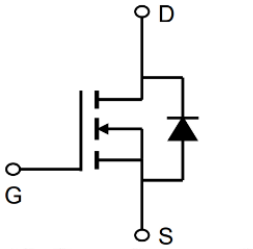
AP70N20MP

200V N-Channel Enhancement Mode MOSFET

Description

The AP70N20MP is silicon N-channel Enhanced VDMOSFETs, is obtained by the self-aligned planar Technology which reduce the conduction loss, improve switching performance and enhance the avalanche energy. The transistor can be used in various power switching circuit for system miniaturization and higher efficiency.



General Features

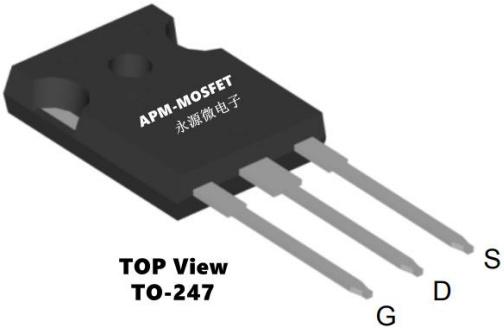
V_{DS} = 200V I_D =70A

$R_{DS(ON)}$ < 38mΩ @ V_{GS}=10V （**Type：30mΩ**）

Application

Uninterruptible Power Supply(UPS)

Power Factor Correction (PFC)



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP70N20MP	TO-247-3L	AP70N20MP	500

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

Symbol	Parameter	Value	Unit
		TO-247-3L	
VDSS	Drain-Source Voltage (V_{GS} = 0V)	200	V
ID	Continuous Drain Current	70	A
IDM	Pulsed Drain Current (note1)	280	A
VGS	Gate-Source Voltage	±20	V
E_{AS}	Single Pulse Avalanche Energy (note2)	1800	mJ
IAR	Avalanche Current (note1)	25	A
E_{AR}	Repetitive Avalanche Energy note1)	20	mJ
P_D	Power Dissipation (T_C = 25ºC)	367	W
TJ, Tstg	Operating Junction and Storage Temperature Range	-55~+150	ºC
RthJC	Thermal Resistance, Junction-to-Case	1.5	ºC/W
RthJA	Thermal Resistance, Junction-to-Ambient	40	ºC/W

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	200	220	--	V
IDSS	Zero Gate Voltage Drain Current	V_{DS} = 200V, V_{GS} = 0V, T_J = 25ºC	--	--	5	μA
		V_{DS} = 160V, V_{GS} = 0V, T_J = 125ºC	--	--	100	
IGSS	Gate-Source Leakage	V_{GS} = ±20V	--	--	±100	nA
VGS(th)	Gate-Source Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	2.0	3.0	4.0	V
RDS(on)	Drain-Source On-Resistance (Note3)	V_{GS} = 10V, I_D = 9A	--	30	38	mΩ
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS}=25V, f=1.0MHz	--	3538	--	pF
C_{oss}	Output Capacitance		--	657	--	
C_{rss}	Reverse Transfer Capacitance		--	280	--	
Q_g	Total Gate Charge	V_{DD} = 160V, I_D = 50A, V_{GS} = 10V	--	244	--	nC
Q_{gs}	Gate-Source Charge		--	16	--	
Q_{gd}	Gate-Drain Charge		--	144	--	
td(on)	Turn-on Delay Time	V_{DD}=100V, I_D=50A, R_G=25 Ω	--	53	--	ns
t_r	Turn-on Rise Time		--	65	--	
td(off)	Turn-off Delay Time		--	689	--	
t_f	Turn-off Fall Time		--	230	--	
I_S	Continuous Body Diode Current	T_C = 25 ºC	--	--	50	A
ISM	Pulsed Diode Forward Current		--	--	200	
V_{SD}	Body Diode Voltage	T_J = 25ºC, I_{SD} = 50A, V_{GS} = 0V	--	--	1.4	V
t_{rr}	Reverse Recovery Time	V_{GS} = 0V,I_S = 50A, di_F/dt =100A /μs	--	208	--	ns
Q_{rr}	Reverse Recovery Charge		--	2.04	--	μC

Note :

1、The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.

2、The EAS data shows Max. rating . IAS = 25A, VDD = 50V, RG = 25 Ω, Starting TJ = 25 ºC

3、The test condition is Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 1%

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

5、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Typical Characteristics

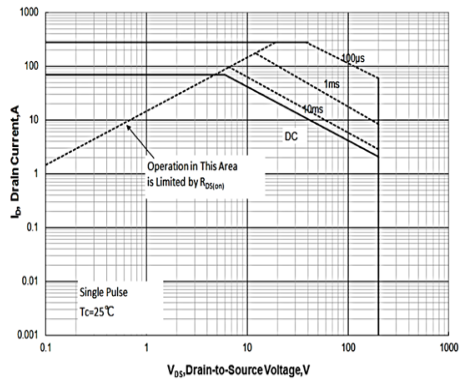


Figure 1 Maximum Forward Bias Safe Operating Area

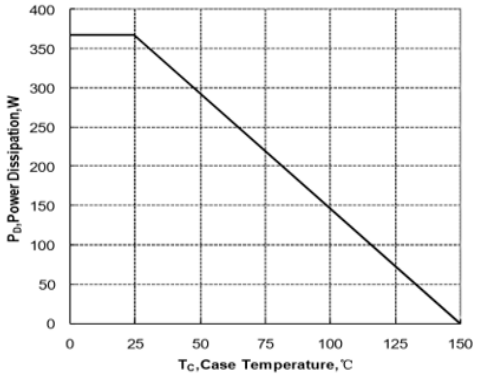


Figure 2 Maximum Power dissipation vs Case Temperature

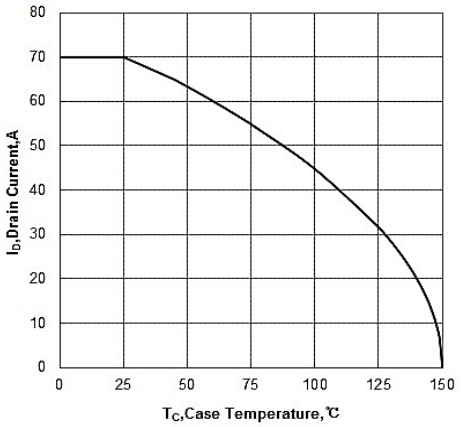


Figure 3 Maximum Continuous Drain Current vs Case Temperature

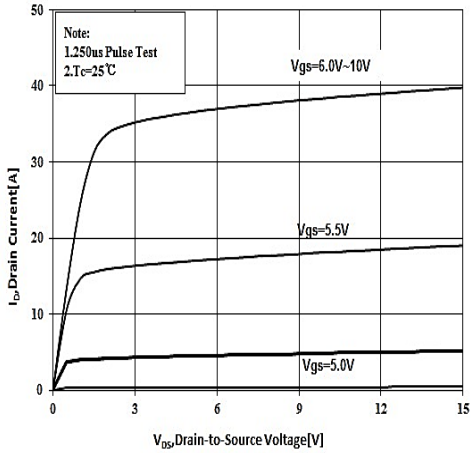


Figure 4 Typical Output Characteristics

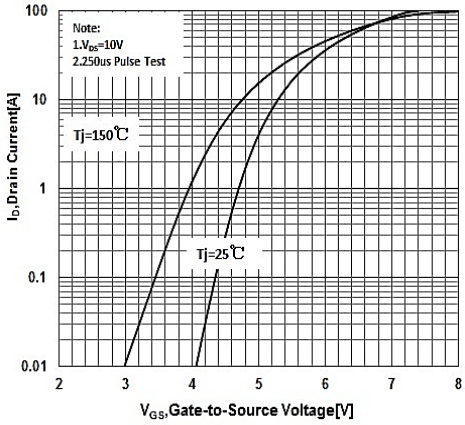


Figure5:Typical Transfer Characteristics

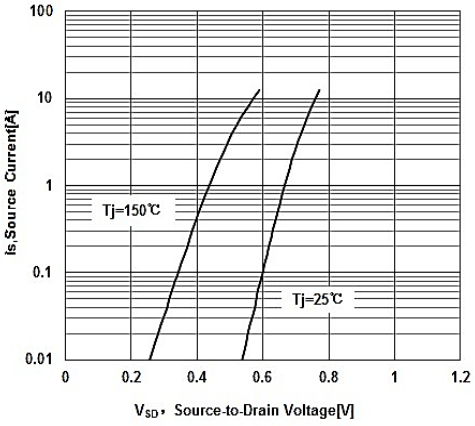


Figure6:Typical Body Diode Transfer Characteristics

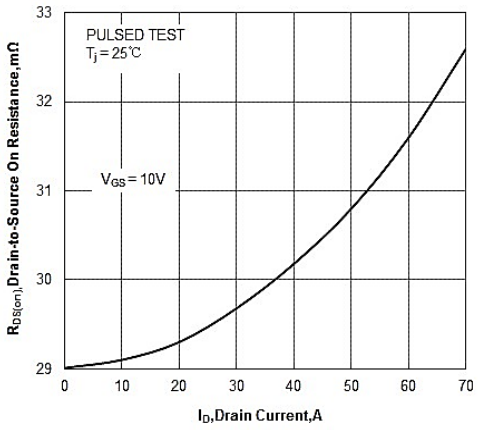


Figure7:Source ON Resistance vs Drain Current

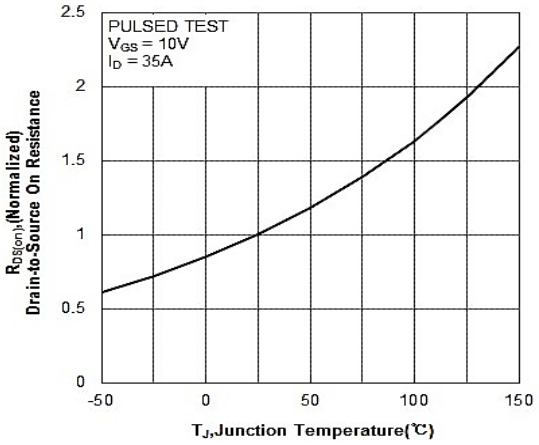


Figure8:Source on Resistance vs Junction Temperature

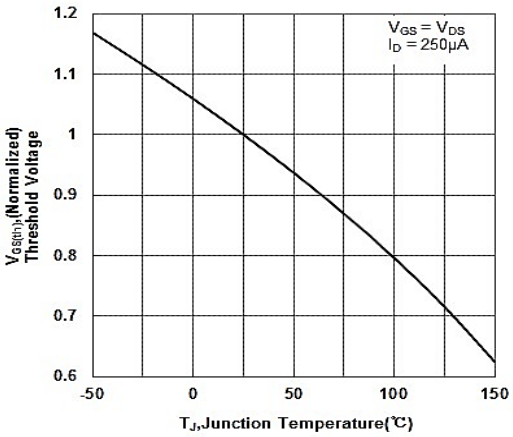


Figure 9 Typical Theshold Voltage vs Junction Temperature

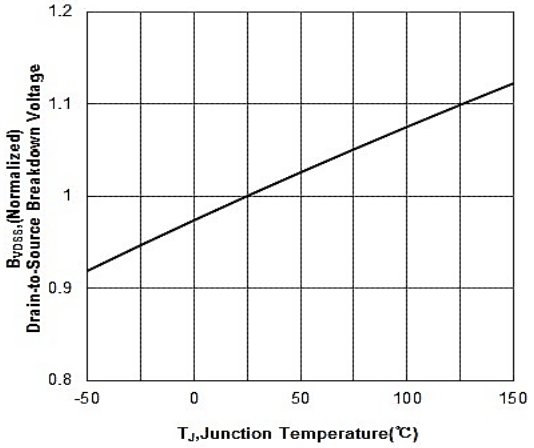


Figure 10 Typical Breakdown Voltage vs Junction Temperature

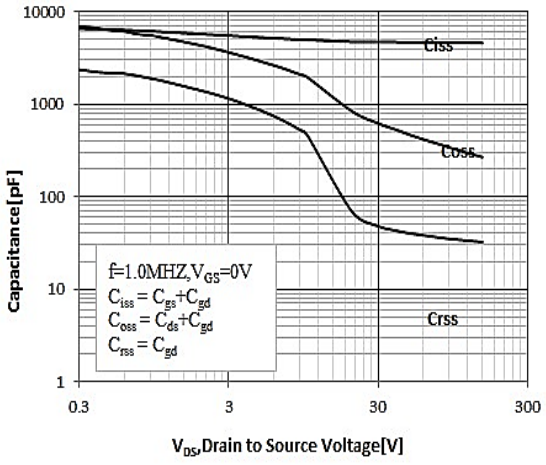


Figure 11 Typical Capacitance vs Drain to Source Voltag

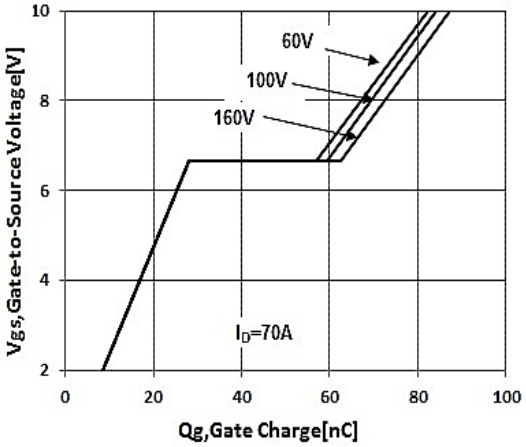
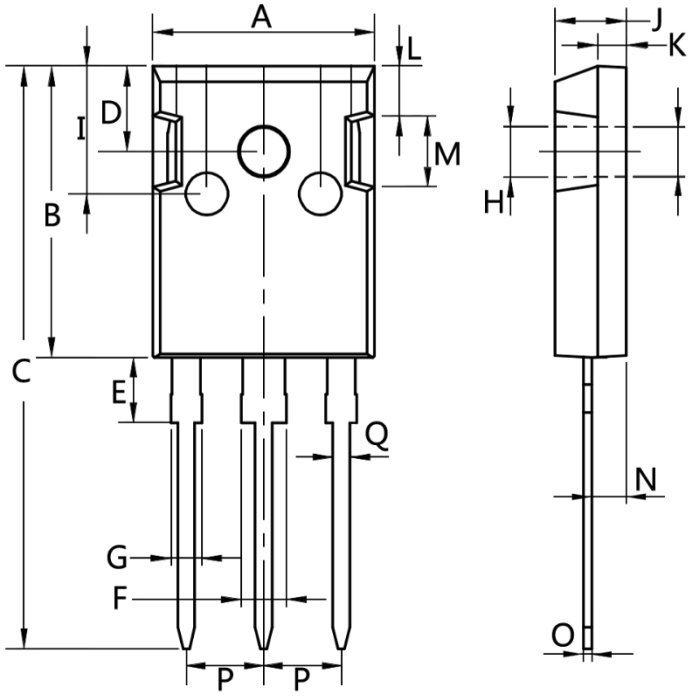


Figure 12 Typical Gate Charge vs Gate to Source Voltage

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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200V N-Channel Enhancement Mode MOSFET

Edition	Date	Change
Rve1.0	2019/1/31	Initial release
Rve1.1	2021/9/26	Change of specification forma