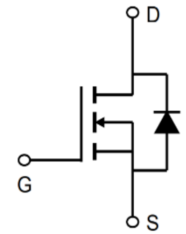
200V N-Channel Enhancement Mode MOSFET

Description

The AP30N20P 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 =30A

$R_{DS(ON)}$ < 130mΩ @ V_{GS}=10V （Type: 100mΩ）

Application

Uninterruptible Power Supply(UPS)

Power Factor Correction (PFC)

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP30N20P	TO-220-3L	AP30N20P XXX YYYY	1000

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

Symbol	Parameter	Value	Unit
VDSS	Drain-Source Voltage (VGS = 0V)	200	V
ID	Continuous Drain Current	30	A
IDM	Pulsed Drain Current	90	A
VGS	Gate-Source Voltage	±20	V
EAS	Single Pulse Avalanche Energy	340	mJ
IAR	Avalanche Current	20	A
EAR	Repetitive Avalanche Energy	8.3	mJ
PD	Power Dissipation (TC = 25ºC)	104	W
TJ, Tstg	Operating Junction and Storage Temperature Range	-55~+150	ºC
RthJC	Thermal Resistance, Junction-to-Case	1.2	ºC/W
RthJA	Thermal Resistance, Junction-to-Ambient	60	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	VGS = 0V, ID = 250μA	200	225	--	V
IDSS	Zero Gate Voltage Drain Current	VDS = 200V, VGS = 0V, TJ = 25ºC	--	--	5	μA
		VDS = 160V, VGS = 0V, TJ = 125ºC	--	--	100	
IGSS	Gate-Source Leakage	VGS = ±20V	--	--	±100	nA
VGS(th)	Gate-Source Threshold Voltage	VDS = VGS, ID = 250μA	2.0	3.0	4.0	V
RDS(on)	Drain-SourceOn-Resistance (Note3)	VGS = 10V, ID = 9A	--	100	130	mΩ
Ciss	Input Capacitance	VGS = 0V, VDS = 25V, f = 1.0MHz	--	1318	--	pF
Coss	Output Capacitance		--	180	--	
Crss	Reverse Transfer Capacitance		--	75	--	
Qg	Total Gate Charge	VDD = 160V, ID = 18A, VGS = 10V	--	41	--	nC
Qgs	Gate-Source Charge		--	5.5	--	
Qgd	Gate-Drain Charge		--	19.5	--	
td(on)	Turn-on Delay Time	VDD = 100V, ID = 18A, RG = 25 Ω	--	24	--	ns
tr	Turn-on Rise Time		--	45	--	
td(off)	Turn-off Delay Time		--	101	--	
tf	Turn-off Fall Time		--	95	--	
IS	Continuous Body Diode Current	TC = 25 ºC	--	--	18	A
ISM	Pulsed Diode Forward Current		--	--	72	
VSD	Body Diode Voltage	TJ = 25ºC, ISD = 18A, VGS = 0V	--	--	1.4	V
trr	Reverse Recovery Time	VGS = 0V,IS = 18A, diF/dt =100A /μs	--	230	--	ns
Qrr	Reverse Recovery Charge		--	1.8	--	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 . I_{AS} =20A, V_{DD} = 50V, R_G = 25 Ω, Starting T_J = 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

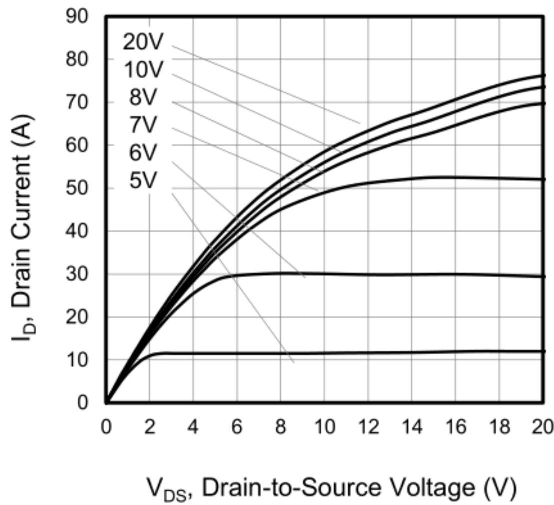


Figure 1. Output Characteristics (T_J = 25ºC)

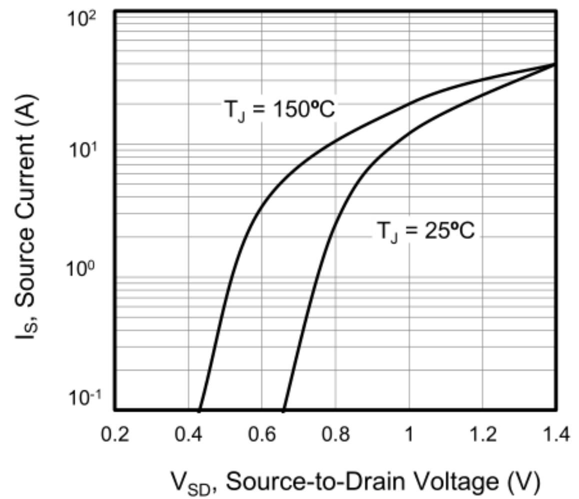


Figure 2. Body Diode Forward Voltage

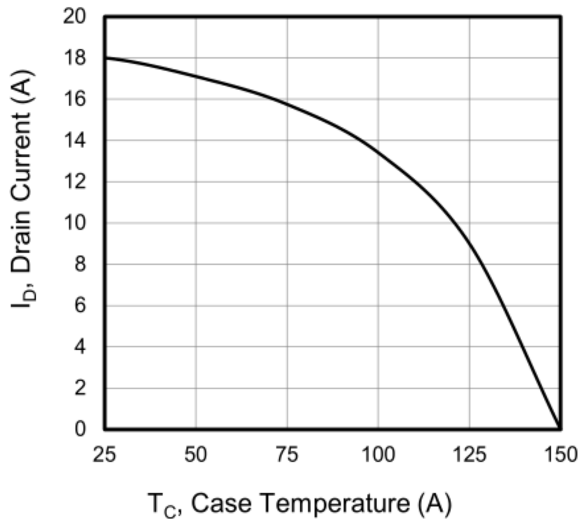


Figure 3. Drain Current vs. Temperature

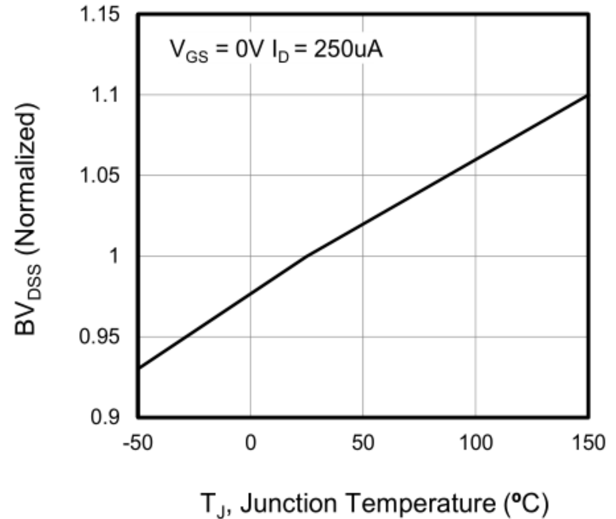


Figure 4. BV_{DSS} Variation vs. Temperature

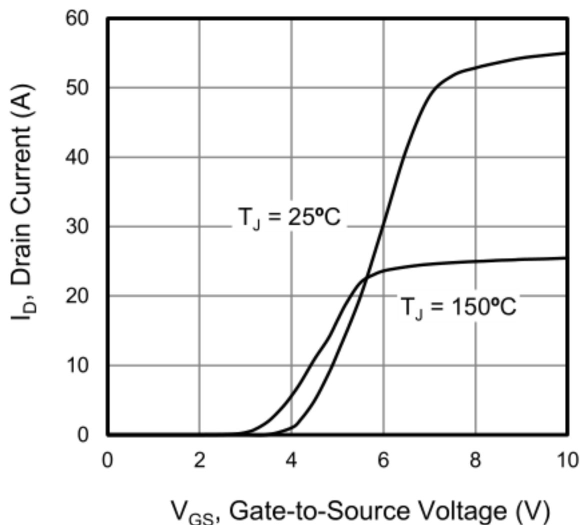


Figure 5. Transfer Characteristics

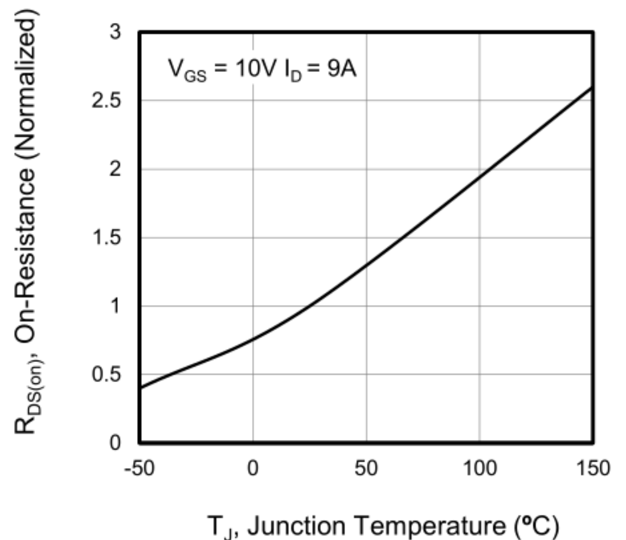


Figure 6. On-Resistance vs. Temperature

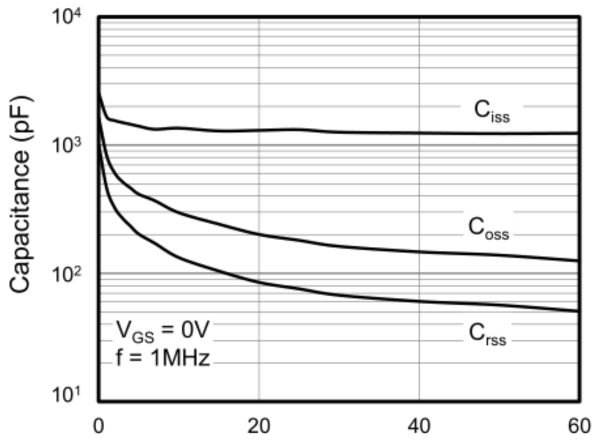


Figure 7. Capacitance

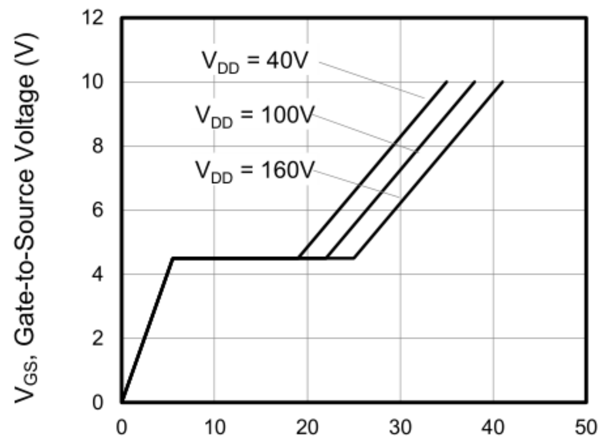


Figure 8. Gate Charge

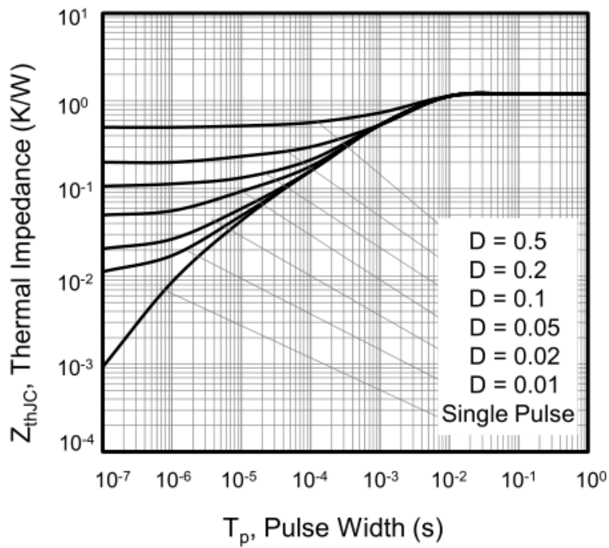


Figure 10. Transient Thermal Impedance

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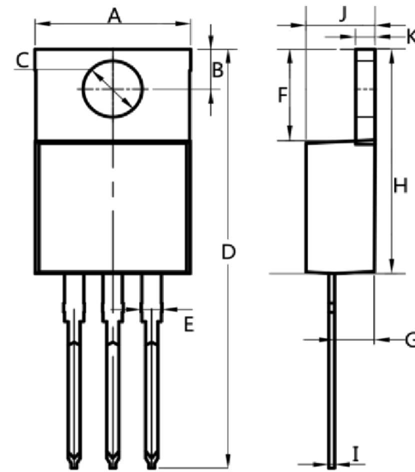

Dim.	Min.	Max.
A	10.0	10.4
B	2.5	3.0
C	3.5	4.0
D	28.0	30.0
E	1.1	1.5
F	6.2	6.6
G	2.9	3.3
H	15.0	16.0
I	0.35	0.45
J	4.3	4.7
K	1.2	1.4
All Dimensions in millimeter		

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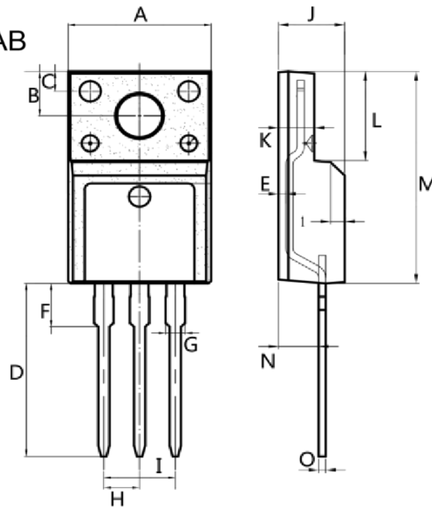

Dim.	Min.	Max.
A	9.9	10.3
B	2.9	3.5
C	1.15	1.45
D	12.75	13.25
E	0.55	0.75
F	3.1	3.5
G	1.25	1.45
H	Typ 2.54	
I	Typ 5.08	
J	4.55	4.75
K	2.4	2. 7
L	6.35	6.75
M	15.0	16.0
N	2.75	3.15
O	0.45	0.60
All Dimensions in millimeter		

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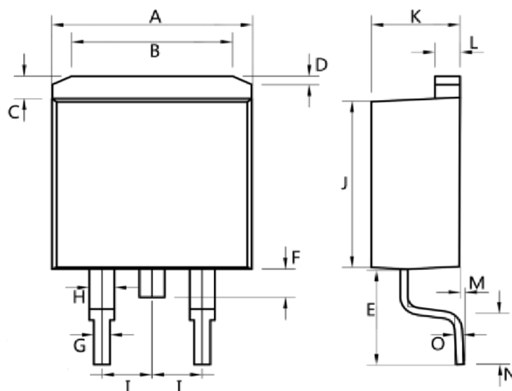

Dim.	Min.	Max.
A	10.0	10. 5
B	7.25	7.75
C	1.3	1.5
D	0.55	0.75
E	5.0	6.0
F	1.4	1.6
G	0.75	0.95
H	1.15	1.35
I	Typ 2.54	
J	8.4	8.6
K	4.4	4.6
L	1.25	1.45
M	0.02	0.1
N	2.4	2.8
O	0.35	0.45
All Dimensions in millimeter		

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Edition	Date	Change
Rve1.0	2021/7/31	Initial release

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