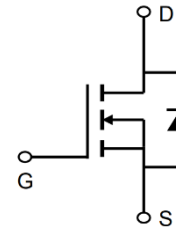


200V N-Channel Enhancement Mode MOSFET

Description

The AP34N20P 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

$V_{DS} = 200V, I_D = 34A$

$R_{DS(ON)} < 85m\Omega @ V_{GS} = 10V$

Application

Power amplifier

motor drive

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP34N20P	TO-220-3L	AP34N20P XXX YYYY	1000

Absolute Maximum Ratings $T_C = 25^\circ C$, unless otherwise noted

Symbol	Parameter	Value	Unit
VDSS	Drain-Source Voltage	200	V
ID	Drain Current -continuous	34	A
IDM	Drain Current -pulse	112	A
VGSS	Gate-Source Voltage	± 30	V
EAS	Single Pulsed Avalanche Energy	588	mJ
IAR	Avalanche Current	28	A
EAR	Repetitive Avalanche Current	15.8	mJ
dv/dt	Peak Diode Recovery dv/dt	5.5	V/ns
PD $T_C = 25^\circ C$	Power Dissipation	158	W
TJ, TSTG	Operating and Storage Temperature Range	$-55 \sim +150$	$^\circ C$
TL	Maximum Lead Temperature for Soldering Purposes	300	$^\circ C$
Rth(j-c)	Thermal Resistance, Junction to Case	0.79	$^\circ C/W$
Rth(j-A)	Thermal Resistance, Junction to Ambient	62.5	$^\circ C/W$

200V N-Channel Enhancement Mode MOSFET

Electrical Characteristics Diagrams

Symbol	Parameter	Tests conditions	Min	Typ	Max	Units
BV_{DSS}	Drain-Source Voltage	$I_D=250\mu A, V_{GS}=0V$	200	-	-	V
$\Delta BV_{DSS} / \Delta T_J$	Breakdown Voltage Temperature Coefficient	$I_D=250\mu A$, referenced to 25°C	-	0.19	-	V/°C
$IDSS$	Zero Gate Voltage Drain Current	$V_{DS}=200V, V_{GS}=0V, T_C=25^\circ C$	-	-	1	μA
$IGSSF$	Gate-body leakage current, forward	$V_{DS}=0V, V_{GS}=30V$	-	-	100	nA
$IGSSR$	Gate-body leakage current, reverse	$V_{DS}=0V, V_{GS}=-30V$	-	-	-100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D=250\mu A$	2.0	-	4.0	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS} = 10V, I_D=14.0A$	-	60	85	m Ω
g_{fs}	Forward Transconductance	$V_{DS} = 40V, I_D=14.0A$	-	24	-	S
C_{iss}	Input capacitance	$V_{DS}=25V, V_{GS} = 0V, f=1.0MHz$	-	2879	3742	pF
C_{oss}	Output capacitance		-	362	470	pF
C_{rss}	Reverse transfer capacitance		-	81	105	pF
$t_{d(on)}$	Turn-On delay time	$V_{DD}=100V, I_D=28A, R_G=25\Omega, V_{GS}=10V$ (note 4, 5)	-	28	69	ns
t_r	Turn-On rise time		-	251	494	ns
$t_{d(off)}$	Turn-Off delay time		-	309	617	ns
t_f	Turn-Off Fall time		-	220	412	ns
Q_{gi}	Total Gate Charge	$V_{DS} = 160V, I_D=28A$ $V_{GS} = 10V$ (note 4, 5)	-	103	136	nC
Q_{gs}	Gate-Source charge		-	16	-	nC
Q_{gd}	Gate-Drain charge		-	53	-	nC
I_S	Maximum Continuous Drain-Source Diode Forward Current		-	-	28	A
ISM	Maximum Pulsed Drain-Source Diode Forward Current		-	-	112	A
V_{SD}	Maximum Continuous Drain-Source Diode Forward Current	$V_{GS}=0V, I_S=28A$	-		1.4	V
t_{rr}	Reverse recovery time	$V_{GS}=0V, I_S=28A, di_F/dt=100A/\mu s$ (note 4)		218		ns
Q_{rr}	Reverse recovery charge			1.91		μC

Notes:

- 1: Pulse width limited by maximum junction temperature
- 2: $L=1.5mH, I_{AS}=28A, V_{DD}=50V, R_G=25\Omega$, Starting $T_J=25^\circ C$
- 3: $I_{SD} \leq 28A, di/dt \leq 200A/\mu s, V_{DD} \leq BV_{DSS}$, Starting $T_J=25^\circ C$
- 4: Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$
- 5: Essentially independent of operating temperature

200V N-Channel Enhancement Mode MOSFET

Electrical Characteristics Diagrams

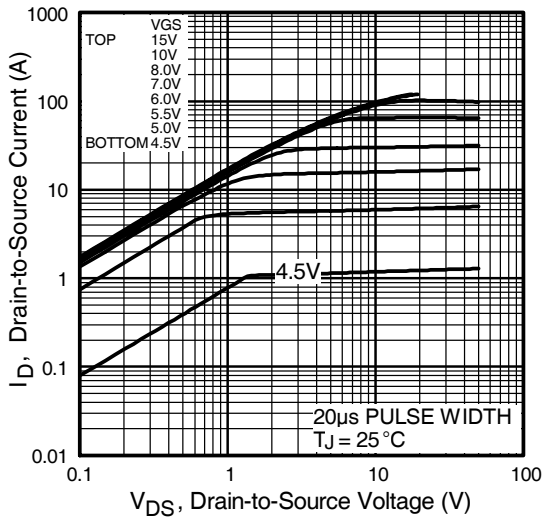


Fig 1. Typical Output Characteristics

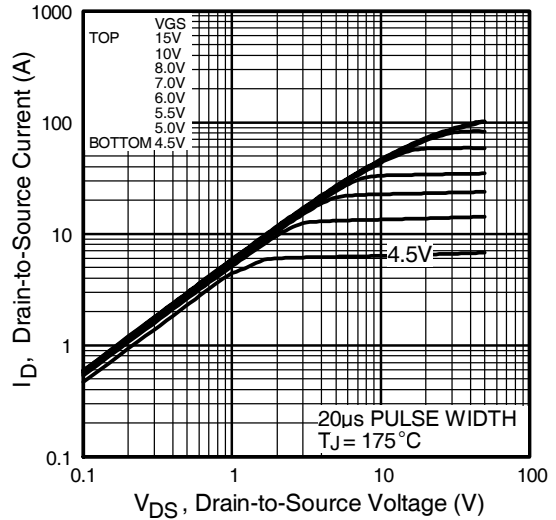


Fig 2. Typical Output Characteristics

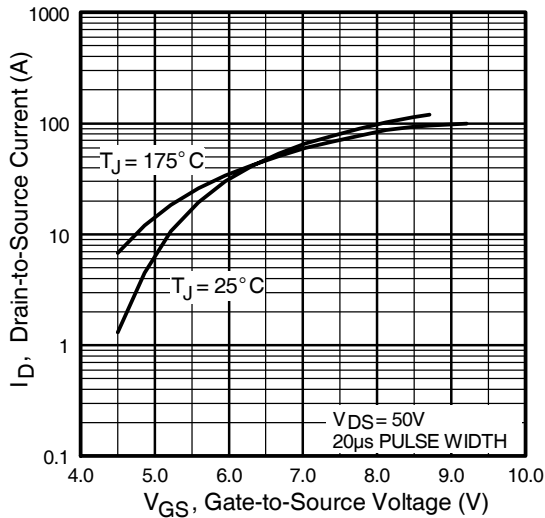


Fig 3. Typical Transfer Characteristics

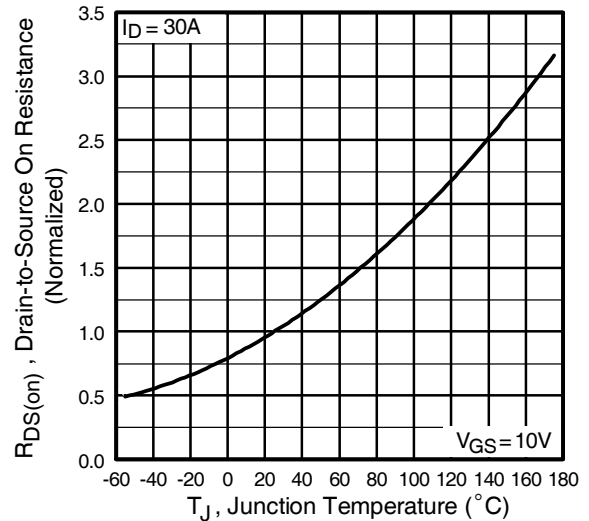


Fig 4. Normalized On-Resistance Vs. Temperature

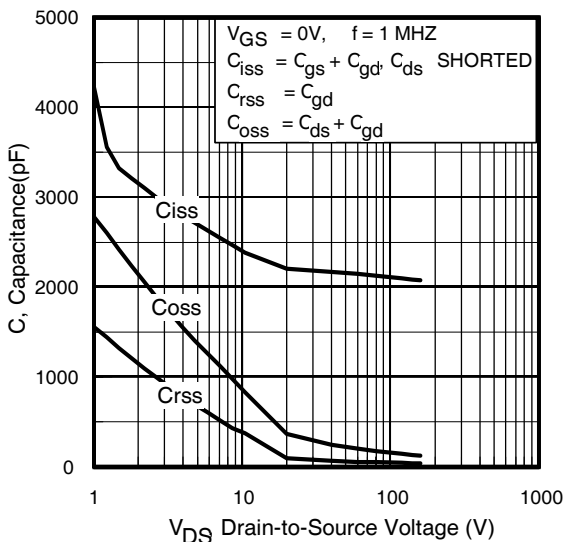


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

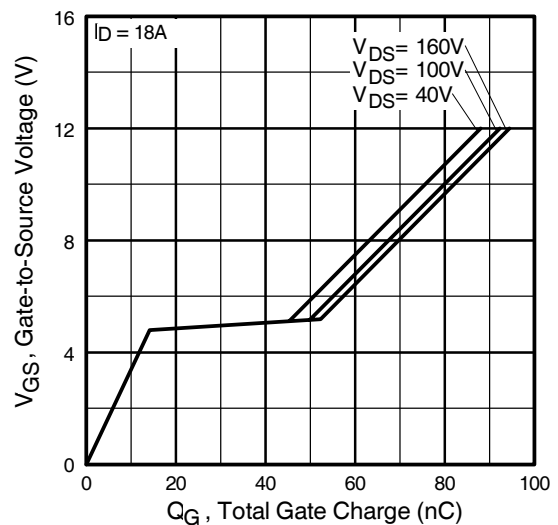


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

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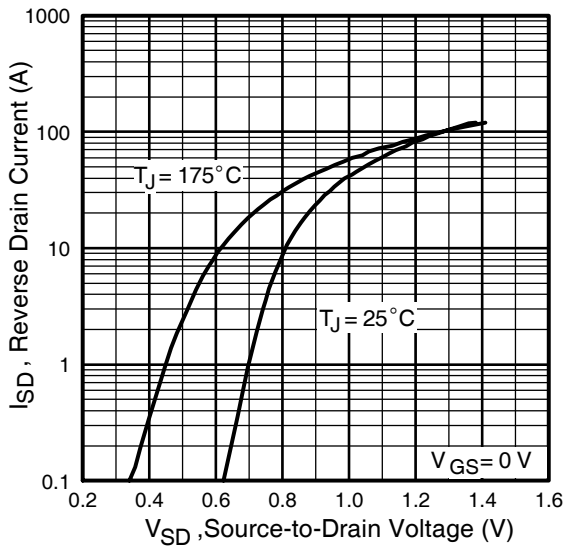


Fig 7. Typical Source-Drain Diode Forward Voltage

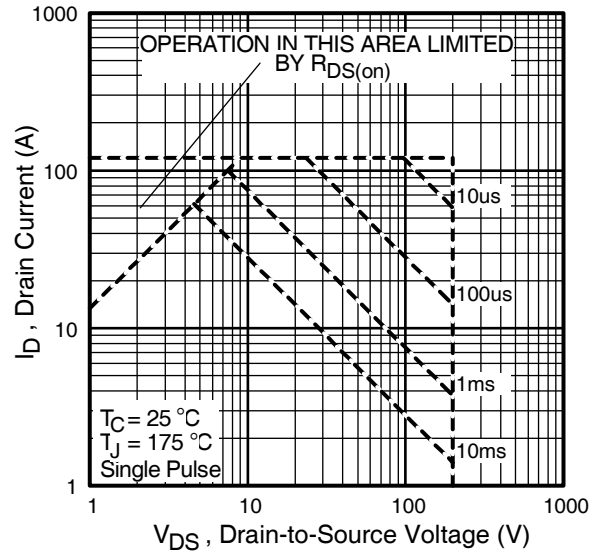


Fig 8. Maximum Safe Operating Area

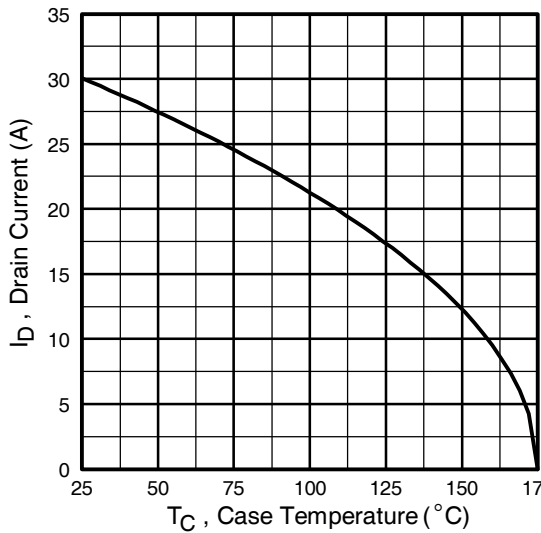


Fig 9. Maximum Drain Current Vs. Case Temperature

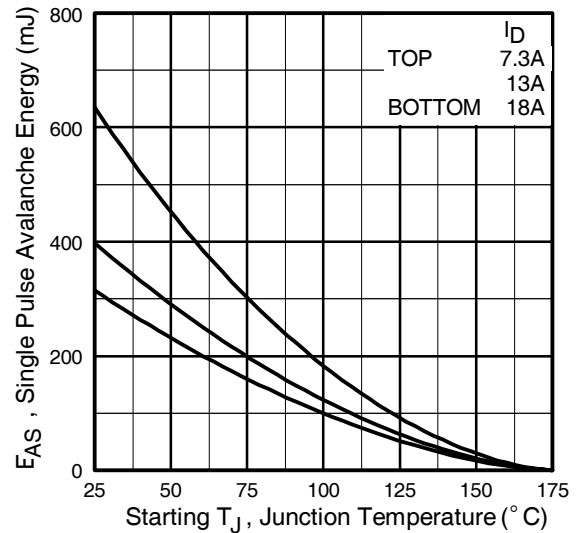


Fig 12c. Maximum Avalanche Energy Vs. Drain Current

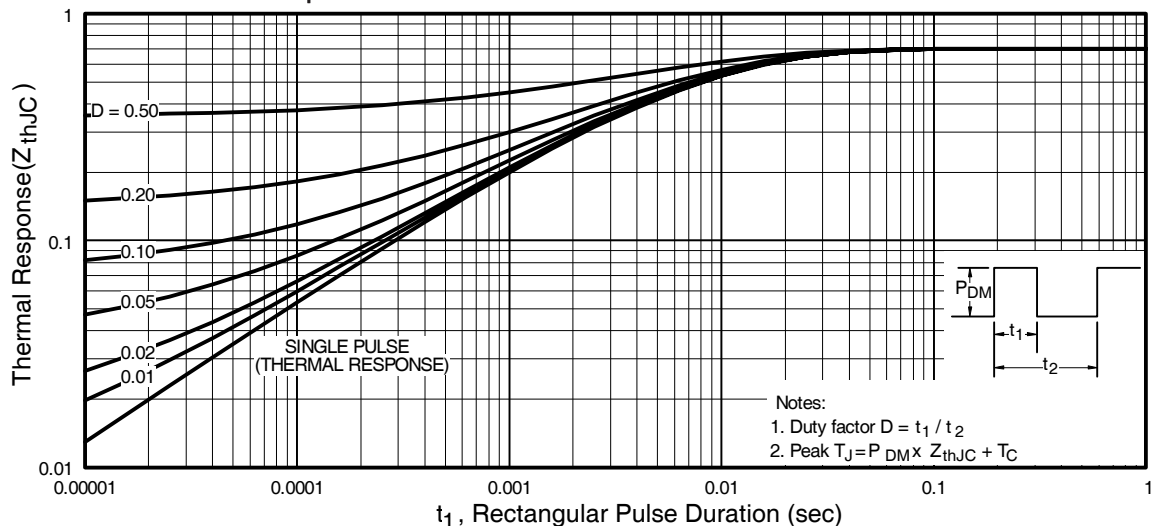
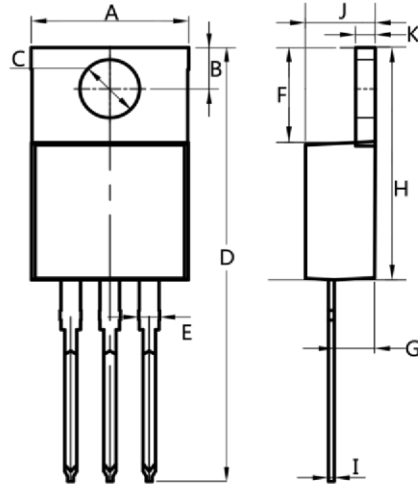


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case



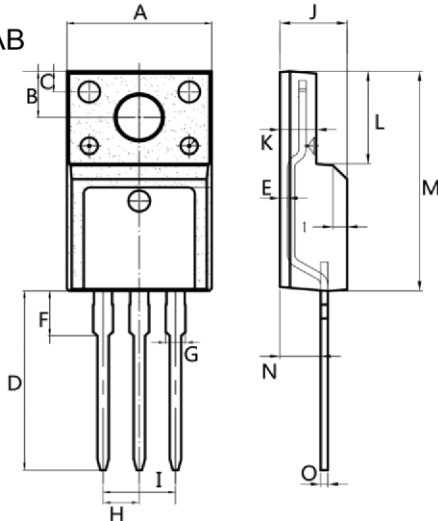
200V N-Channel Enhancement Mode MOSFET

TO-220AB



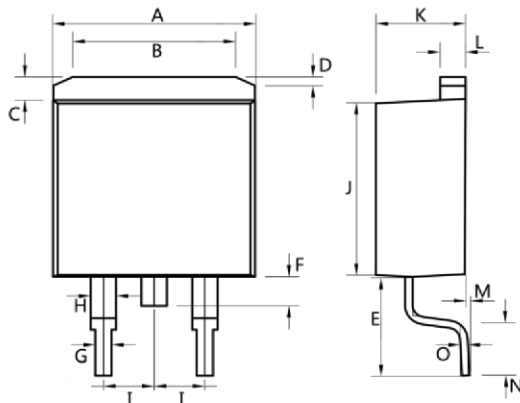
Dim.	Min.	Max.
A	10.0	10.4
B	2.5	3.0
C	3.5	4.0
D	28.0	30.0
E	1.1	1.5
F	6.2	6.6
G	2.9	3.3
H	15.0	16.0
I	0.35	0.45
J	4.3	4.7
K	1.2	1.4
All Dimensions in millimeter		

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		

200V N-Channel Enhancement Mode MOSFET**Attention**

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