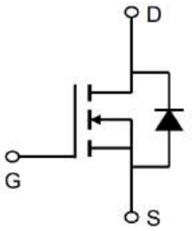
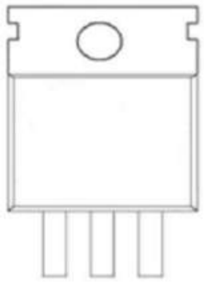
200V N-Channel Enhancement Mode MOSFET

Description



The 34N20 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.

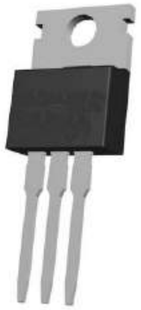


General Features

VDS =200V,ID =34A

RDS(ON) <85mΩ@ VGS=10V

Application



Power amplifier

motor drive

Absolute Maximum Ratings T_C = 25ºC, 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 TC=25℃	Power Dissipation	158	W
TJ，TSTG	Operating and Storage Temperature Range	-55～+150	℃
TL	Maximum Lead Temperature for Soldering Purposes	300	℃
Rth(j-c)	Thermal Resistance, Junction to Case	0.79	℃/W
Rth(j-A)	Thermal Resistance, Junction to Ambient	62.5	℃/W

Electrical Characteristics Diagrams

Symbol	Parameter	Tests conditions	Min	Typ	Max	Units
BV_{DSS}	Drain-Source Voltage	I_D=250μA, V_{GS}=0V	200	-	-	V
ΔBVDSS /ΔTJ	Breakdown Voltage Temperature Coefficient	I_D=250μA, referenced to 25℃	-	0.19	-	V/℃
IDSS	Zero Gate Voltage Drain Current	V_{DS}=200V, V_{GS}=0V, T_C=25℃	-	-	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
VGS(th)	Gate Threshold Voltage	V_{DS} = V_{GS} , I_D=250μA	2.0	-	4.0	V
RDS(ON)	Static Drain-Source On-Resistance	V_{GS} =10V , I_D=14.0A	-	60	85	mΩ
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=25Ω 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_g	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
IS	Maximum Continuous Drain-Source Diode Forward Current		-	-	28	A
ISM	Maximum Pulsed Drain-Source Diode Forward Current		-	-	112	A
VSD	Maximum Continuous Drain-Source Diode Forward Current	V_{GS}=0V, I_S=28A	-		1.4	V
trr	Reverse recovery time	V_{GS}=0V, I_S=28A dI_F/dt=100A/μs (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 Ω,Starting T_J=25℃

3：I_{SD} ≤28A,di/dt ≤200A/μs, VDD≤BV_{DSS}, Starting T_J=25℃

4：Pulse Test：Pulse Width ≤300μs, Duty Cycle≤2％

5：Essentially independent of operating temperature

Electrical Characteristics Diagrams

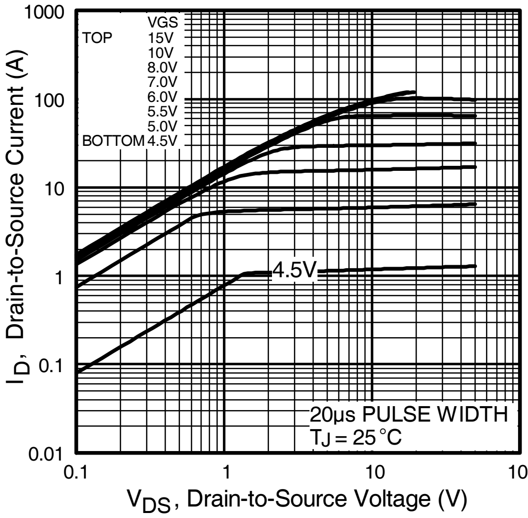


Fig 1. Typical Output Characteristics

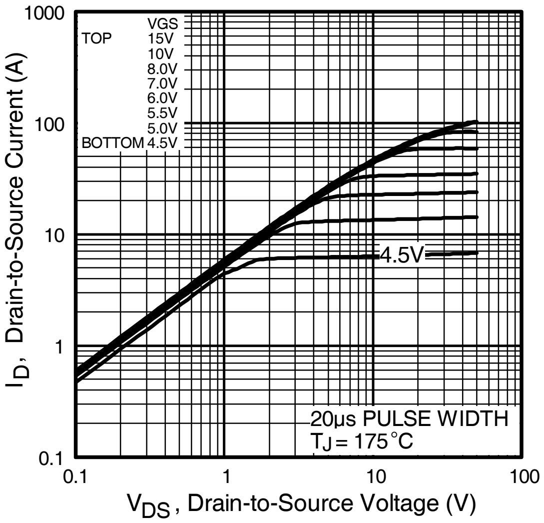


Fig 2. Typical Output Characteristics

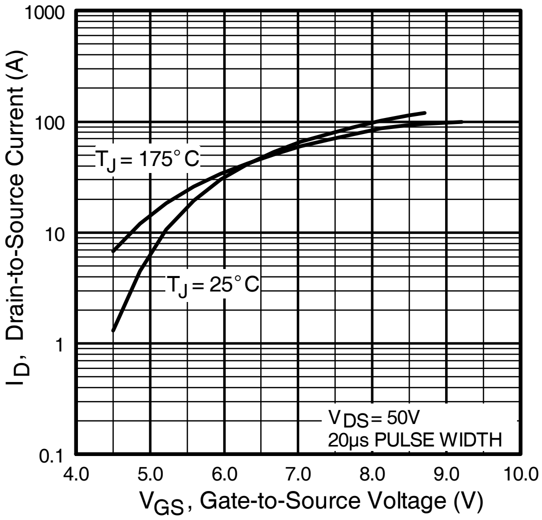


Fig 3. Typical Transfer Characteristics

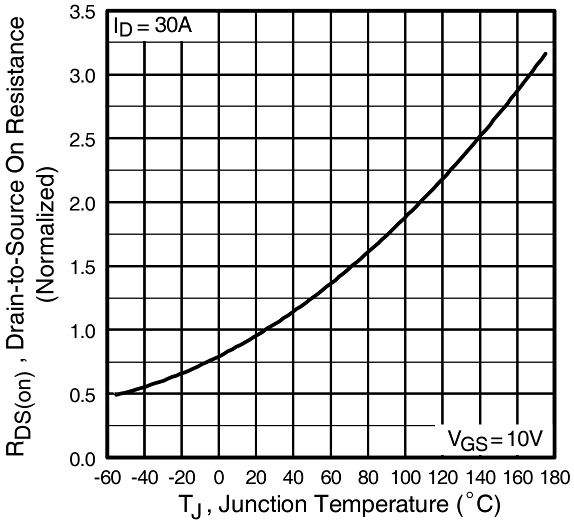


Fig 4. Normalized On-Resistance
Vs. Temperature

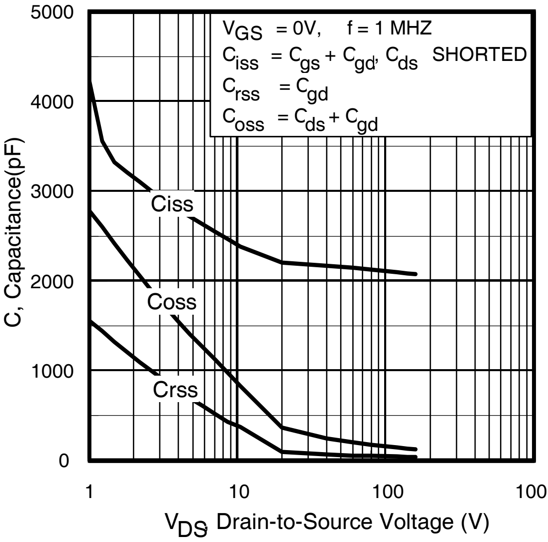


Fig 5. Typical Capacitance Vs.
Drain-to-Source Voltage

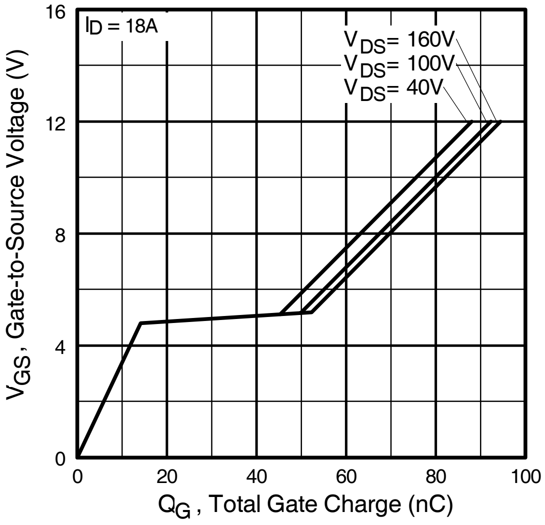


Fig 6. Typical Gate Charge Vs.
Gate-to-Source Voltage

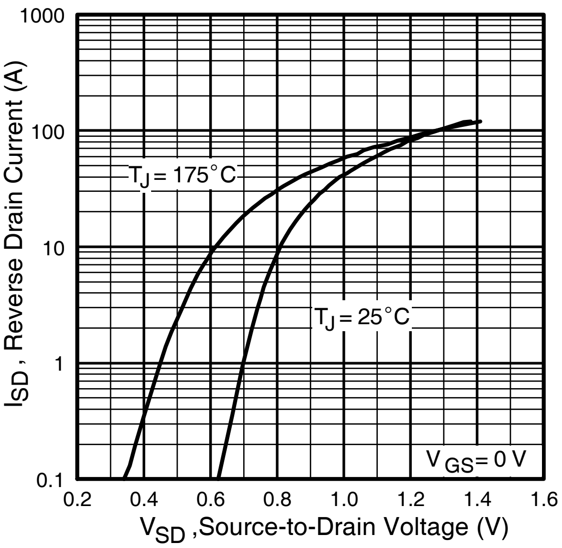


Fig 7. Typical Source-Drain Diode Forward Voltage

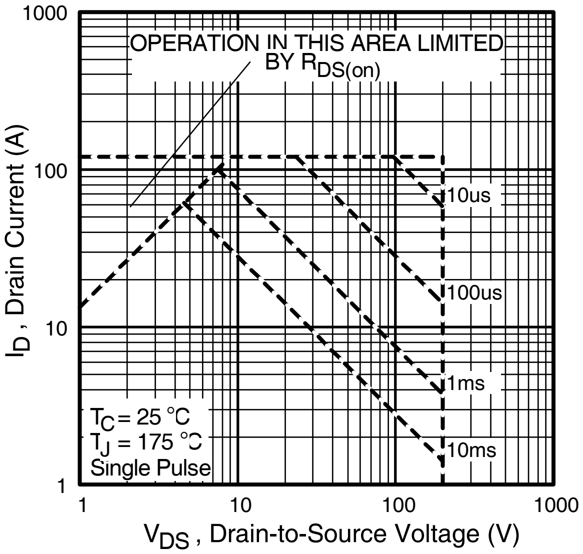
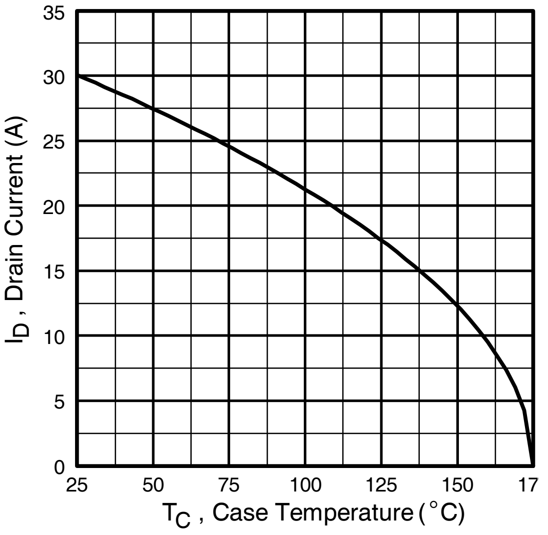


Fig 8. Maximum Safe Operating Area



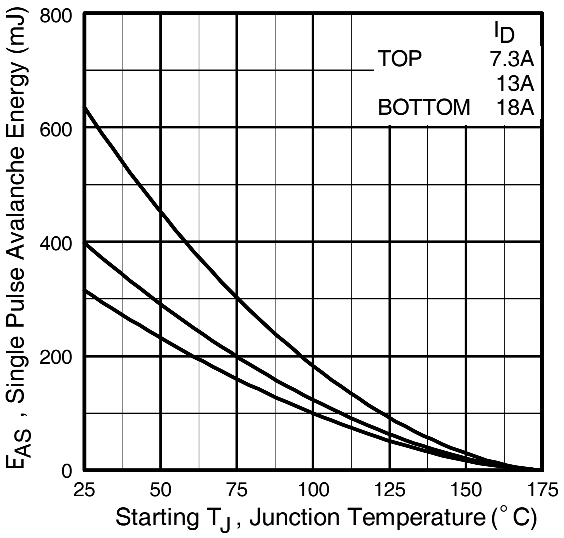


Fig 9. Maximum Drain Current Vs. Case Temperature

Fig 12c. Maximum Avalanche Energy Vs. Drain Current

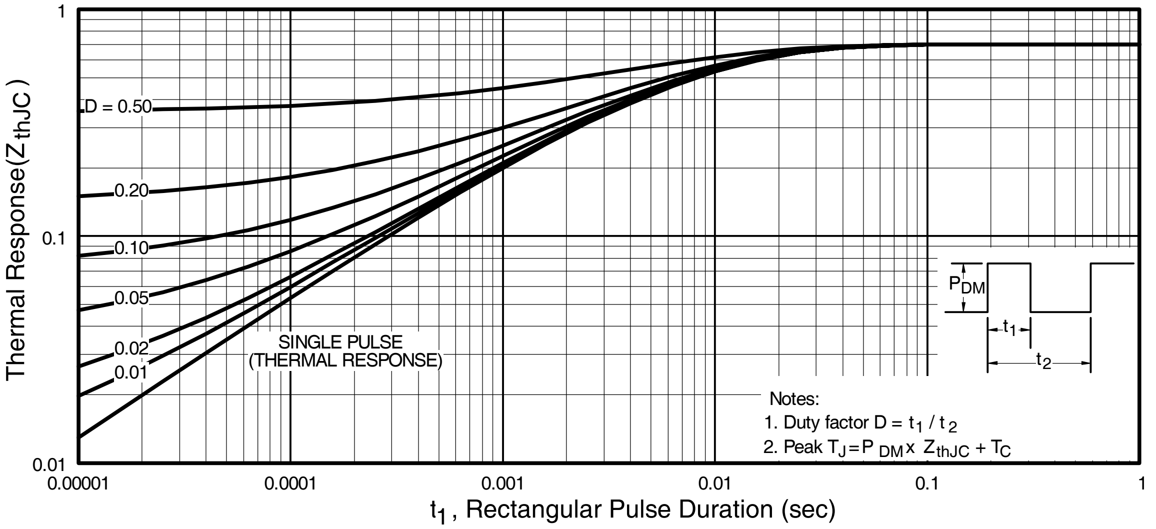
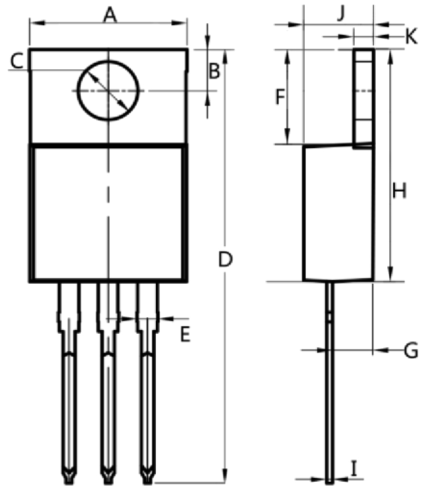


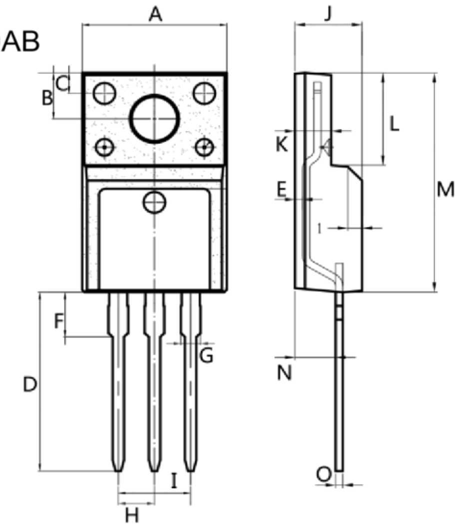
Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case

TO-220AB



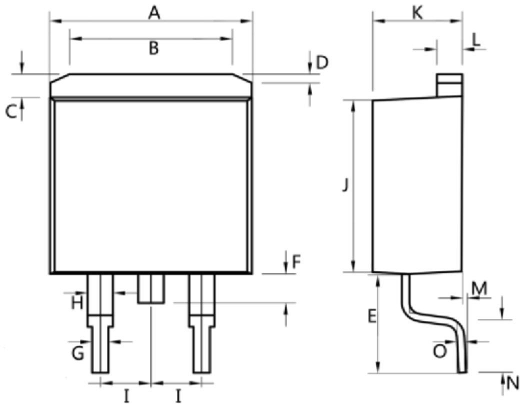
Dim.	Min.	Max.
A	10.0	10.4
B	2.5	3.0
C	3.5	4.0
D	28.0	30.0
E	1.1	1.5
F	6.2	6.6
G	2.9	3.3
H	15.0	16.0
I	0.35	0.45
J	4.3	4.7
K	1.2	1.4
All Dimensions in millimeter		

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		