AP18N20

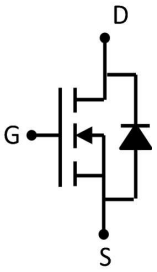
N-Channel Enhancement Mosfet

AllPOWER

DATA SHEET

Feature

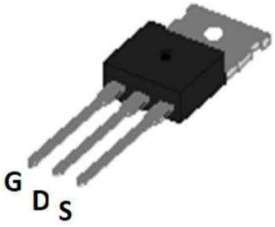
- 200V,18A
  $R_{DS(ON)}$ <150mΩ@V_{GS}=10V TYP:120 mΩ
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability



Schematic Diagram

Application

- Switch Mode Power Supply (SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)



TO-220

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
18N20	AP18N20	TO-220	-	-	1000

ABSOLUTE MAXIMUM RATINGS (T_a=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	200	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	18	A
Pulsed Drain Current (1)	I_{DM}	72	A
Single Pulsed Avalanche Energy (2)	E_{AS}	262.7	mJ
Avalanche Current(1)	I_{AS}	7.3	A
Repetitive Avalanche Energy(1)	E_{AR}	157.62	mJ
Power Dissipation (T_c =25℃)	P_D	104	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	1.2	℃/W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	60	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55~ +150	℃

MOSFET ELECTRICAL CHARACTERISTICS(T_a=25℃ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	200	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS} =200V, V_{GS} = 0V	-	-	1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V	-	-	±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	2	--	4	V
Drain-source on-resistance(3)	$R_{DS(on)}$	V_{GS} =10V, I_D =9A	-	120	150	mΩ
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =25V, V_{GS} =0V, f =100kHz	-	1200	-	pF
Output Capacitance	C_{oss}		-	161	-	
Reverse Transfer Capacitance	C_{rss}		-	70	-	
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	V_{DD}=100V, I_D=18A, R_G=25Ω	-	40	-	ns
Turn-on rise time	t_r		-	33	-	
Turn-off delay time	$t_{d(off)}$		-	166	-	
Turn-off fall time	t_f		-	60	-	
Total Gate Charge	Qg	V_{DS}=160V, I_D=18A, V_{GS}=10V	-	38	-	nC
Gate-Source Charge	Qgs		-	6	-	
Gate-Drain Charge	Qgd		-	16	-	
Source-Drain Diode characteristics						
Diode Forward voltage(3)	V_{DS}	V_{GS} =0V, I_S=9A，VGS=10V	-	-	1.4	V
Diode Forward current(4)	I_S	T_c =25℃	-	-	18	A
Body Diode Reverse Recovery Time	trr	T_J=25℃，IF=18A,di/dt=100A/us		182		ns
Body Diode Reverse Recovery Charge	Qrr	T_J=25℃，IF=18A,di/dt=100A/us		1.29		uc

Notes:

1. Repetitive Rating: pulse width limited by maximum junction temperature
2. IAS = 15A, VDD = 50V, RG = 25 Ω, Starting TJ = 25 ºC
3. Pulse Test: pulse width≤300μs, duty cycle≤1%

Typical Characteristics T_J = 25℃, unless otherwise noted

Figure 1. Output Characteristics (T_J= 25℃)

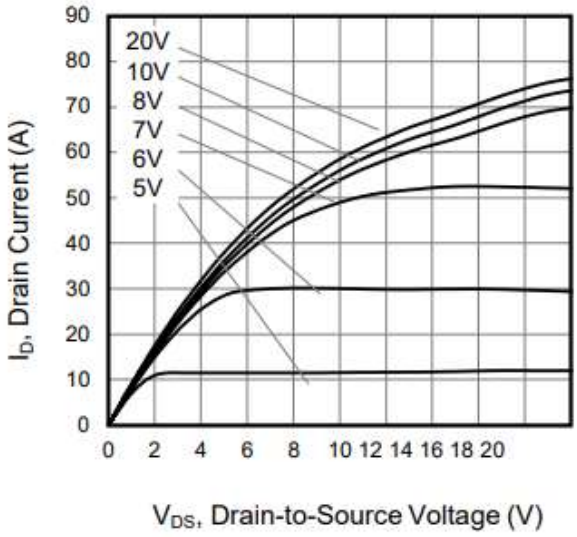


Figure 2. Body Diode Forward Voltage

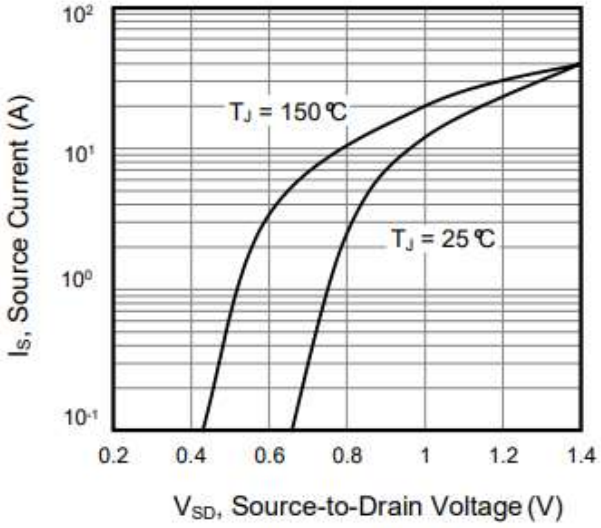


Figure 3. Drain Current vs. Temperature

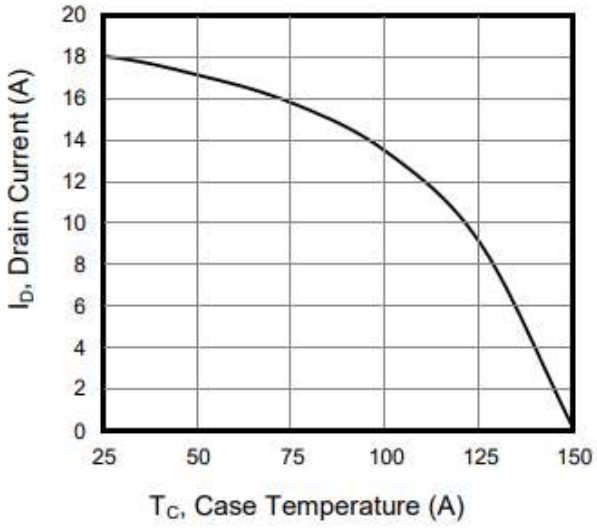


Figure 4. BV_{DSS} Variation vs. Temperature

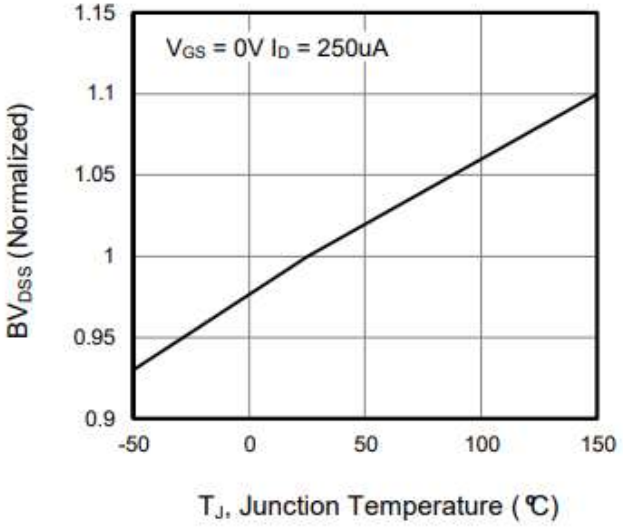


Figure 5. Transfer Characteristics

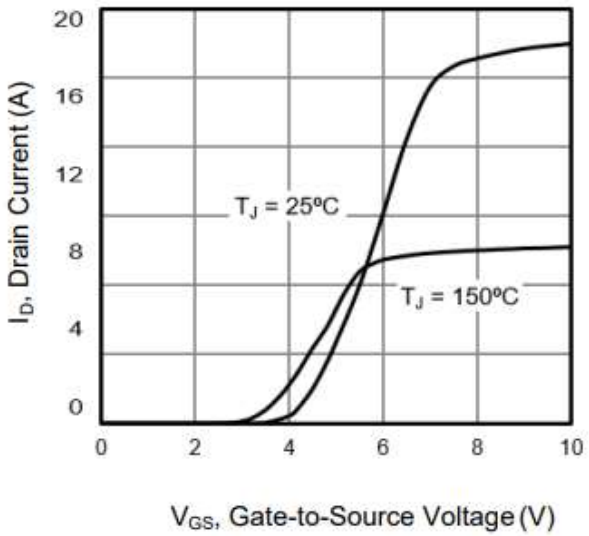
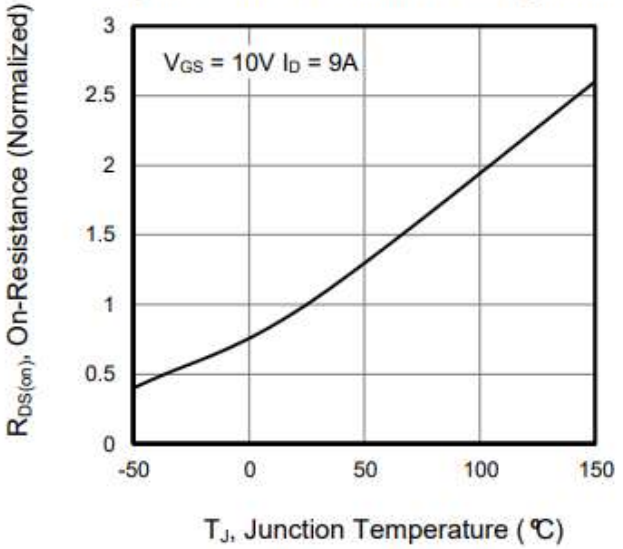


Figure 6. On-Resistance vs. Temperature



Typical Characteristics T_J = 25℃, unless otherwise noted

Figure 7. Capacitance

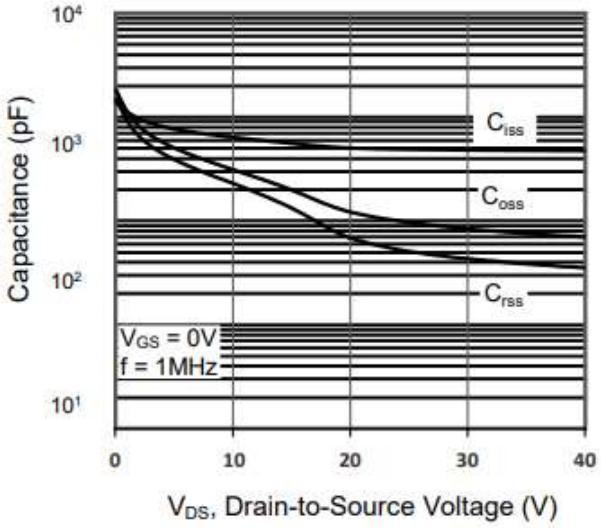


Figure 8. Gate Charge

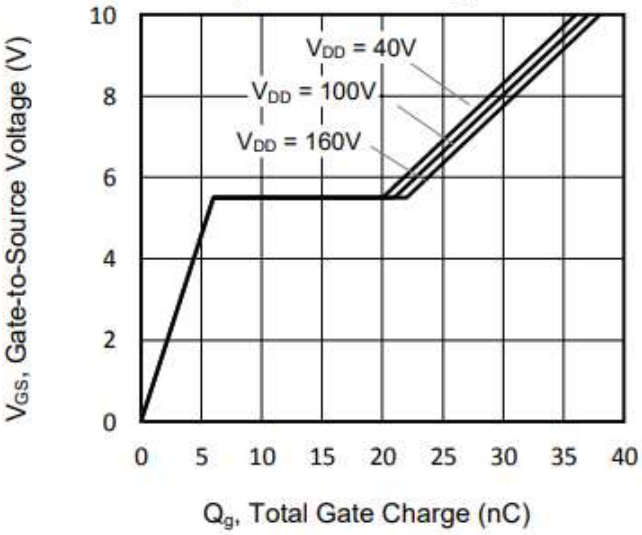


Figure 9. Transient Thermal Impedance TO-220F

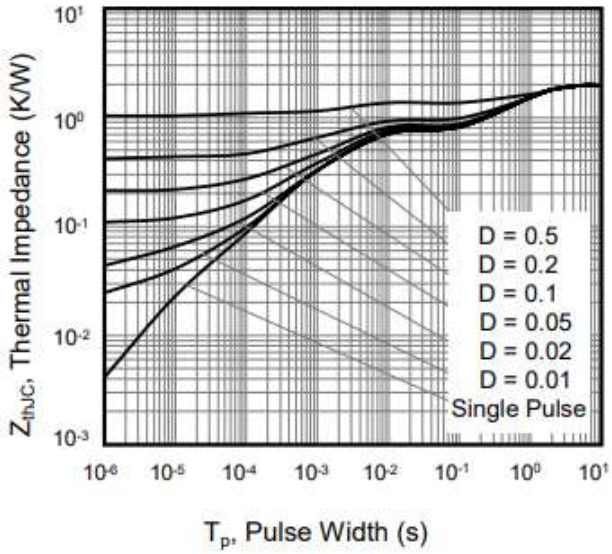
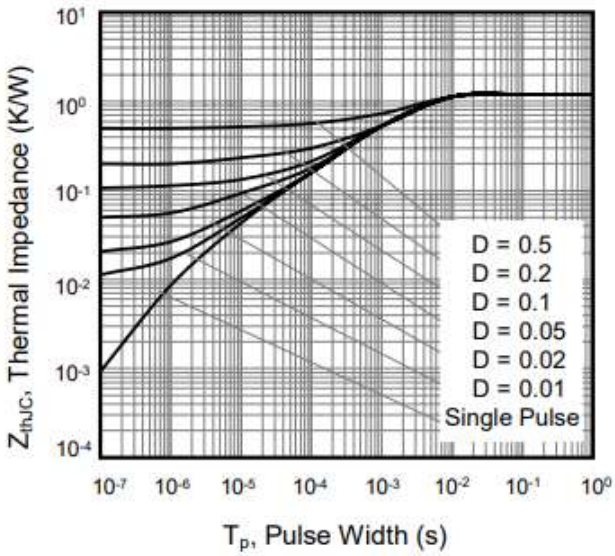
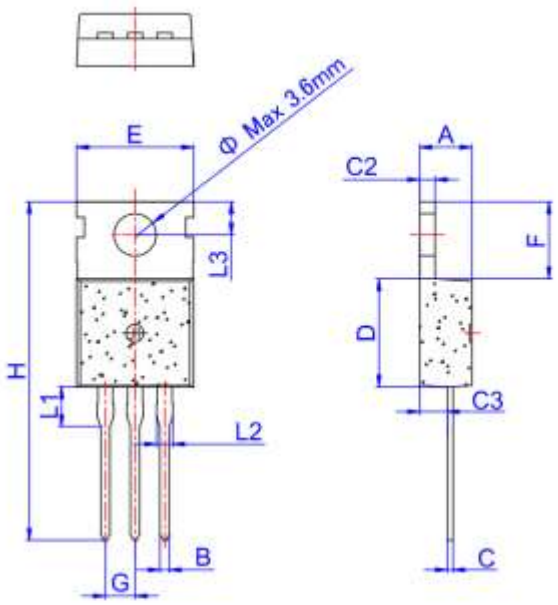


Figure 10. Transient Thermal Impedance TO-220



TO-220 Package Information



TO-220

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40		4.60	0.173		0.181
B	0.70		0.90	0.028		0.035
C	0.45		0.60	0.018		0.024
C2	1.23		1.32	0.048		0.052
C3	2.20		2.60	0.087		0.102
D	8.90		9.90	0.350		0.390
E	9.90		10.3	0.390		0.406
F	6.30		6.90	0.248		0.272
G		2.54			0.1	
H	28.0		29.8	1.102		1.173
L1		3.39			0.133	
L2	1.14		1.70	0.045		0.067
L3	2.65		2.95	0.104		0.116
Φ		3.6			0.142	