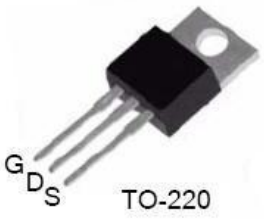
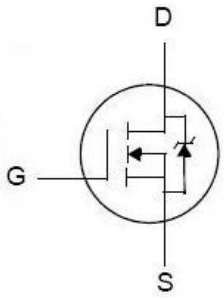
60V N-Channel MOSFET

BV_{DSS}	$R_{DS(ON)}$ (Max.)	I_D
60V	18mΩ	68A

General Features

- Low ON Resistance
- Low Gate Charge (typical 20nC)
- Fast Switching
- 100% Avalanche Tested
- Optimized Bvdss Capability
- RoHS Compliant
- Halogen-free available





Applications

- Power Supply
- DC-DC Converters

Ordering Information

Part Number	Package	Marking
FTP18N06N	TO-220	FTP18N06N

Absolute Maximum Ratings

T_C=25℃ unless otherwise specified

Symbol	Parameter	FTP18N06N	Unit
V_{DSS}	Drain-to-Source Voltage[1]	60	V
I_D	Continuous Drain Current	68	A
I_{DM}	Pulsed Drain Current, V_{GS}@10V[2]	272	
P_D	Power Dissipation	115	W
	Derating Factor above 25℃	0.77	W/℃
V_{GS}	Gate-to-Source Voltage	±20	V
E_{AS}	Single Pulse Avalanche Energy L=11.9 I_D=5.5A	360	mJ
dv/dt	Peak Diode Recovery dv/dt[3]	4.5	V/ns
T_L	Soldering Temperature Distance of 1.6mm from case for 10 seconds	300	℃
T_J and T_{STG}	Operating and Storage Temperature Range	-55 to 175	

**Drain Current limited by Maximum Junction Temperature.*
Caution: Stresses greater than those listed in the "Absolute Maximum Ratings" may cause permanent damage to the device.

Thermal Characteristics

Symbol	Parameter	FTP18N06N	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	1.3	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62	

Electrical Characteristics

OFF Characteristics

T_J =25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	60	--	--	V	V_{GS}=0V, I_D=250μA
I_{DSS}	Drain-to-Source Leakage Current	--	--	1.0	μA	V_{DS}=48V V_{GS}=0V
		--	--	100		V_{DS}=48V, V_{GS}=0V, T_J=125℃
I_{GSS}	Gate-to-Source Leakage Current	--	--	100	nA	V_{GS}=+20V
		--	--	-100		V_{GS}=-20V

ON Characteristics

T_J =25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance	--	12.5	18	mΩ	V_{GS}=10V, I_D=30A[4]
$V_{GS(TH)}$	Gate Threshold Voltage	2.0	--	4.0	V	V_{DS} = V_{GS}, I_D=250μA
gfs	Forward Transconductance	--	--	--	S	V_{DS} =30V, I_D=30A[4]

Dynamic Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
C_{ISS}	Input Capacitance	--	1008	--	Pf	V_{GS}=0V V_{DS}=30V f=1.0MHz
C_{OSS}	Output Capacitance	--	158	--		
C_{RSS}	Reverse Transfer Capacitance	--	67	--		
Q_G	Total Gate Charge	--	20	--	nC	V_{DD}=30V I_D=68A V_{GS}=10V
Q_{GS}	Gate-to-Source Charge	--	7.0	--		
Q_{GD}	Gate-to-Drain (Miller) Charge	--	6.8	--		

Resistive Switching Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$t_{d(ON)}$	Turn-on Delay Time	--	8.7	--	Ns	V_{DD}=30V I_D=68A V_{GS}=10V R_G=2.5Ω
t_{rise}	Rise Time	--	45.1	--		
$t_{d(OFF)}$	Turn-off Delay Time	--	25.6	--		
t_{fall}	Fall Time	--	6.8	--		

Source-Drain Diode Characteristics

T_J=25℃ unless otherwise specified

Symbol	Parameter	Min	Typ.	Max.	Units	Test Conditions
I_{SD}	Continuous Source Current (Body Diode)	--	--	68	A	Integral P-N diode in MOSFET
I_{SM}	Maximum Pulsed Current(Body Diode)	--	--	272	A	
V_{SD}	Diode Forward Voltage	--	--	1.2	V	I_S=30A, V_{GS}=0V
t_{rr}	Reverse Recovery Time	--	--	--	ns	V_{GS}=0V I_F=68A,di/dt=100A/μs
Q_{rr}	Reverse Recovery Charge	--	--	--	nC	

NOTE：

[1] T_J=+25℃ to +175℃
[2] Repetitive rating, pulse width limited by maximum junction temperature.
[3] I_{SD}=68A, di/dt≤100A/μs, V_{DD}≤BV_{DSS}, T_J=+175℃
[4] Pulse width≤380μs; duty cycle≤2%.

Figure 1. Maximum Power Dissipation V.S Case Temperature

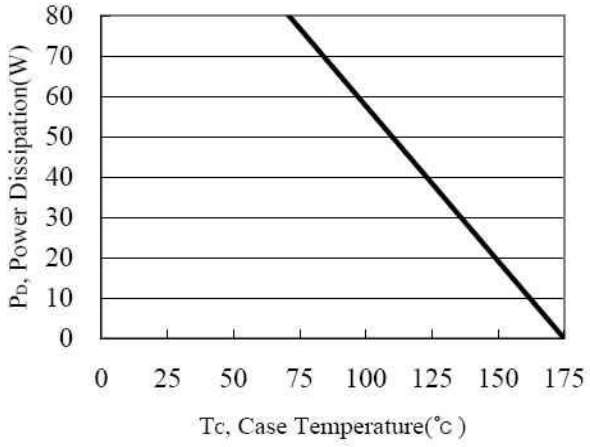


Figure 2. Maximum Continuous Drain Current V.S Case Temperature

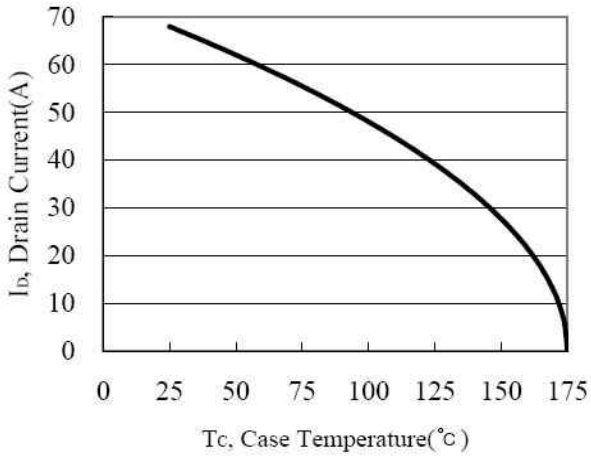


Figure 3. Typical Output Characteristics

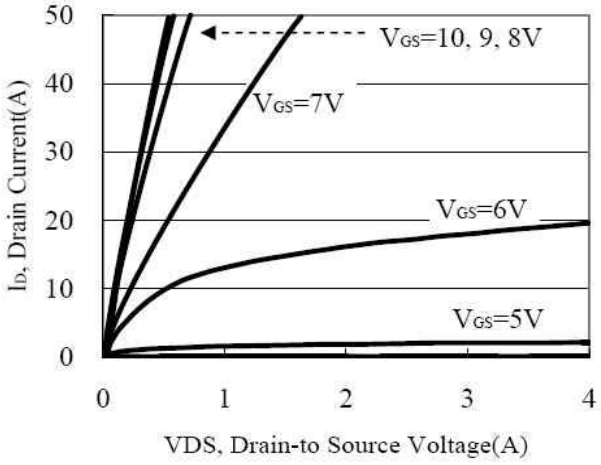


Figure 4. Breakdown Voltage V.S Junction Temperature

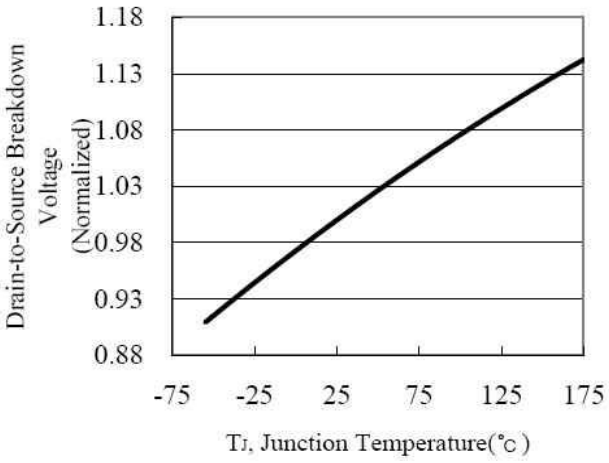


Figure 5. Threshold Voltage V.S Junction Temperature

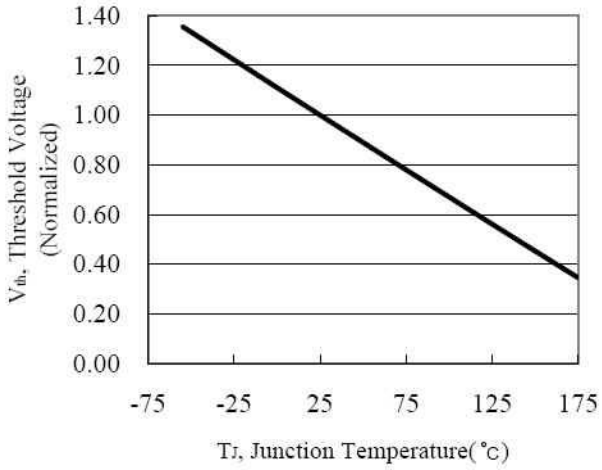


Figure 6. Drain-to-Source Resistance V.S Junction Temperature

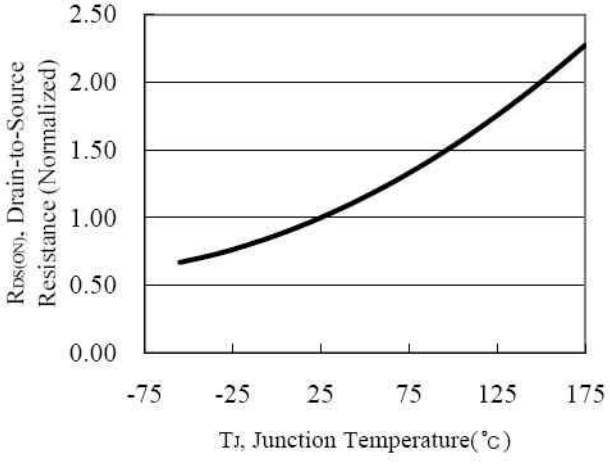


Figure 7. Typical Gate Charge vs. Gate-to-Source Voltage

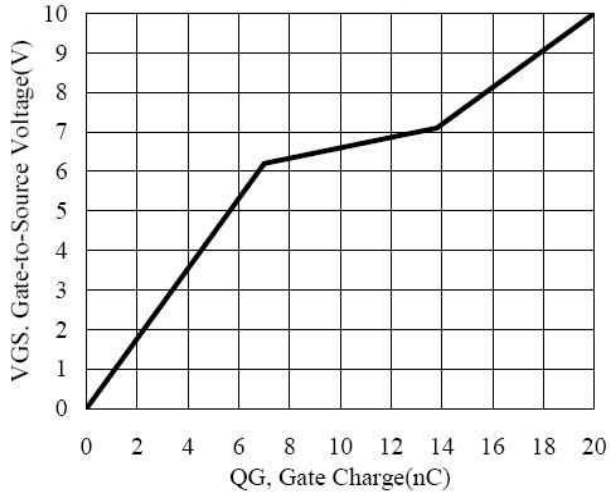


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

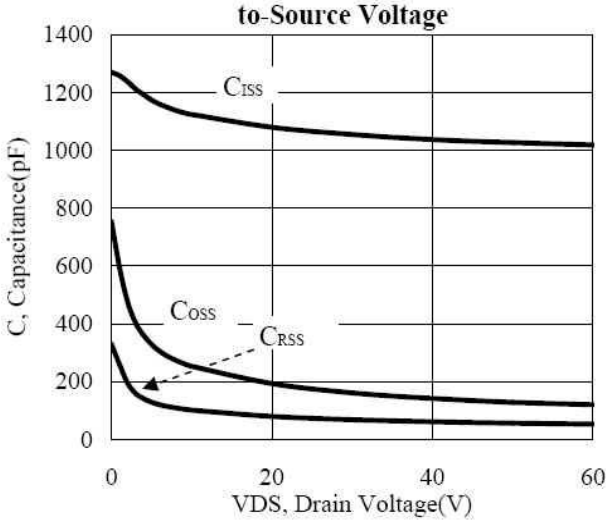


Figure 9. Unclamped Inductive Switching Capability

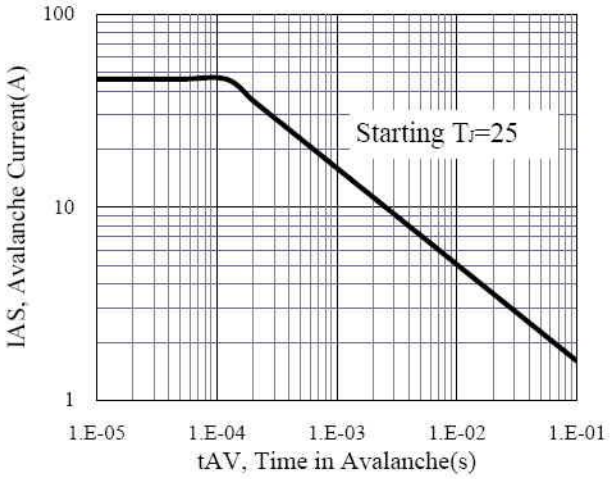
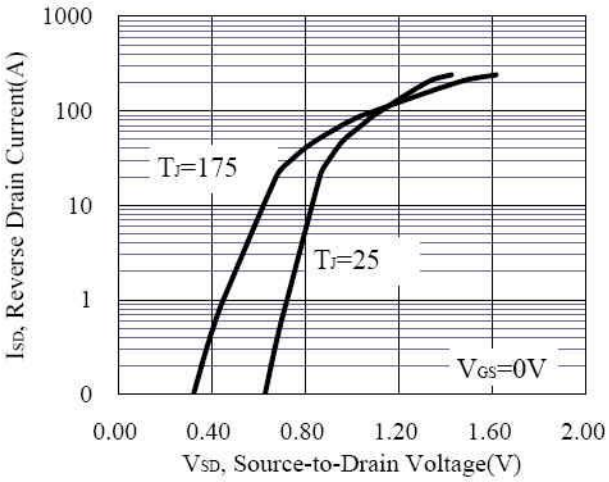
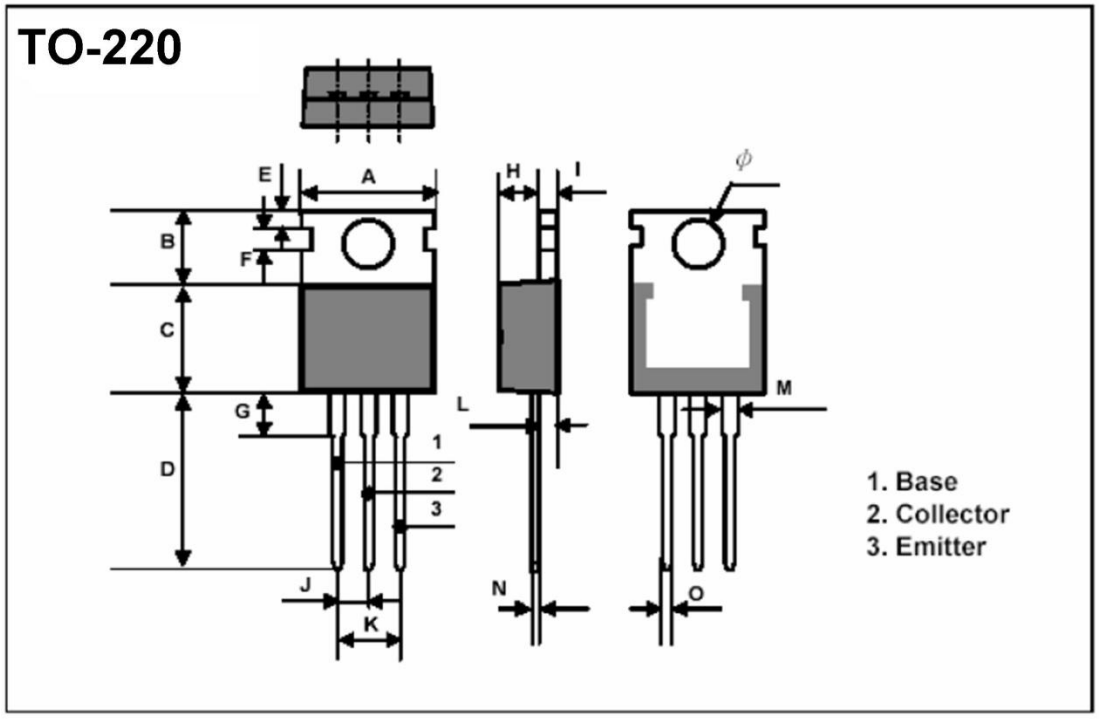


Figure 10. Source-Drain Diode Forward Voltage



Package Dimensions



symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	9.7	10.1	0.382	0.398
B	6.3	6.7	0.248	0.264
C	9.0	9.47	0.354	0.373
D	12.8	13.3	0.504	0.524
E	1.2	1.4	0.047	0.055
F	1.7TYP		0.067TYP	
G	2.65TYP		0.104TYP	
H	3.0	3.4	0.118	0.134
I	1.25	1.4	0.049	0.055
J	2.4	2.7	0.094	0.106
K	5.0	5.15	0.197	0.203
L	2.2	2.6	0.087	0.102
M	1.25	1.45	0.049	0.057
N	0.45	0.6	0.018	0.024
O	0.7	0.9	0.027	0.035
ϕ	3.6		0.142	

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