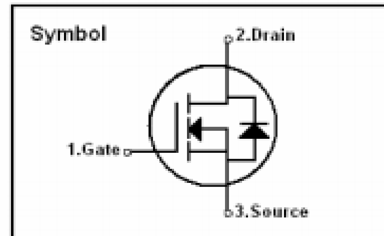
TO-220F Plastic-Encapsulate Mosfet

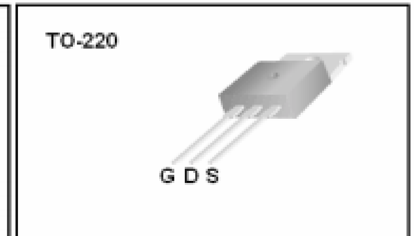
5N60

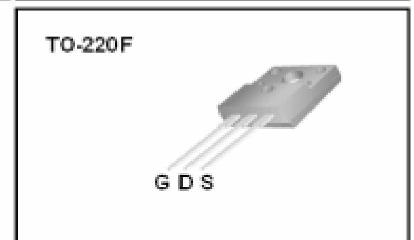
600V N-Channel MOSFET

Features

- 4.5A,600v,RDS(on)=2.2Ω@VGS=10V
- Gate charge (Typical 17nC)
- High ruggedness
- Fast switching
- 100% AvalancheTested
- Improved dv/dt capability







General Description

This Power MOSFET is produced using Faircard's advanced planar stripe, DMOS technology.This latest technology has been especially designed to minimize on-state resistance, have a high rugged avalanche characteristics, such as fast switching time,low on resistance.low gate charge and especially excellent avalanche characteristics . This power MOSFET is usually used at AC adaptors, on the battery charger and SMPS

Absolute Maximum Ratings

Symbol	Parameter	Value	Units
VDSS	Drain to Source Voltage	600	V
ID	Continuous Drain Current(@TC=25℃)	4.5	A
	Continuous Drain Current(@TC=100℃)	2.7	A
IDM	Drain Current Pulsed	18	A
VGS	Gate to Source Voltage	±30	V
EAS	Single Pulsed Avalanche Energy	280	mJ
EAR	Repetitive Avalanche Energy	13	mJ
dv/dt	Peak Diode Recovery dv/dt	4.5	V/ns
PD	Total Power Dissipation	120	W
	Derating Factor above 25℃	0.8	W/℃
TSTG,TJ	Operating Junction Temperature & Storage Temperature	-55-150	℃
TL	Maximum Lead Temperature for soldering purpose,1/8 from Case for 5 seconds	300	℃

Thermal Characteristics

Symbol	Parameter	Value	Units
$R_{\theta JC}$	Thermal Resistance,Junction-to-Case	1.25	℃/W
$R_{\theta CS}$	Thermal Resistance,Case-to-Sink Typ	0.5	℃/W
$R_{\theta JA}$	Thermal Resistance,Junction-to-Ambient	62.5	℃/W

5N60

Electrical Characteristics (TC = 25 °C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250uA	600	-	-	V
$\Delta BV_{DSS} / \Delta T_J$	Breakdown Voltage Temperature coefficient	I_D = 250uA, referenced to 25 °C	-	0.4	-	V/°C
I_{DSS}	Drain-Source Leakage Current	V_{DS} = 600V, V_{GS} = 0V	-	-	10	uA
		V_{DS} = 480V, T_C = 125 °C	-	-	100	uA
I_{GSS}	Gate-Source Leakage, Forward	V_{GS} = 30V, V_{DS} = 0V	-	-	100	nA
	Gate-source Leakage, Reverse	V_{GS} = -30V, V_{DS} = 0V	-	-	-100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250uA	2.0	-	4.0	V
$R_{DS(ON)}$	Static Drain-Source On-state Resistance	V_{GS} =10 V, I_D = 2.25A	-	2.0	2.2	Ω
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS} =0 V, V_{DS} =25V, f = 1MHz	-	545	780	pF
C_{oss}	Output Capacitance		-	35	80	
C_{rss}	Reverse Transfer Capacitance		-	8	11	
Dynamic Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD} =300V, I_D =4.5A, R_G =25Ω (Note 4, 5)	-	10	30	ns
t_r	Rise Time		-	35	80	
$t_{d(off)}$	Turn-off Delay Time		-	45	100	
t_f	Fall Time		-	40	90	
Q_g	Total Gate Charge	V_{DS} =480V, V_{GS} =10V, I_D =4.0A (Note 4, 5)	-	17	20	nC
Q_{gs}	Gate-Source Charge		-	2.8	-	
Q_{gd}	Gate-Drain Charge(Miller Charge)		-	6.2	-	

Source-Drain Diode Ratings and Characteristics

Symbl	Parameter	Test Conditions	Min.	Typ.	Max.	Unit.
I_S	Continuous Source Current	Integral Reverse p-n Junction	-	-	4.0	A
I_{SM}	Pulsed Source Current	Diode in the MOSFET	-	-	16	
V_{SD}	Diode Forward Voltage	I_S=4.5A, V_{GS} =0V	-	-	1.4	V
t_{rr}	Reverse Recovery Time	I_S=4.5A, V_{GS}=0V,dI_F/dt=100A/us	-	300	-	ns
Q_{rr}	Reverse Recovery Charge	I_S=4.5A, V_{GS}=0V,dI_F/dt=100A/us	-	2.2	-	uC

※ NOTES

1. Repeativity rating : pulse width limited by junction temperature
2. L = 27.5mH, I_{AS} =4.5A, V_{DD} = 50V, R_G = 25Ω , Starting T_J = 25°C
3. I_{SD} ≤ 4.5A, di/dt ≤ 200A/us, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C
4. Pulse Test : Pulse Width ≤ 300us, Duty Cycle ≤ 2%
5. Essentially independent of operating temperature