Advanced Power MOSFET

SFS9634

FEATURES

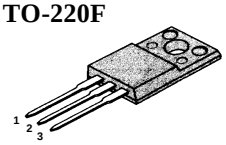
- Avalanche Rugged Technology
- Rugged Gate Oxide Technology
- Lower Input Capacitance
- Improved Gate Charge
- Extended Safe Operating Area
- Lower Leakage Current : 10 μA (Max.) @ V_{DS} = -250V
- Low $R_{DS(ON)}$: 0.876 Ω (Typ.)

BV_{DSS} = -250 V

$R_{DS(on)}$ = 1.3 Ω

I_D = -3.4 A

TO-220F



1.Gate 2. Drain 3. Source

Absolute Maximum Ratings

Symbol	Characteristic	Value	Units
V_{DSS}	Drain-to-Source Voltage	-250	V
I_D	Continuous Drain Current (T_C=25°C)	-3.4	A
	Continuous Drain Current (T_C=100°C)	-2.6	
I_{DM}	Drain Current-Pulsed ①	-14	A
V_{GS}	Gate-to-Source Voltage	± 30	V
E_{AS}	Single Pulsed Avalanche Energy ②	145	mJ
I_{AR}	Avalanche Current ①	-3.4	A
E_{AR}	Repetitive Avalanche Energy ①	3.3	mJ
dv/dt	Peak Diode Recovery dv/dt ③	-4.8	V/ns
P_D	Total Power Dissipation (T_C=25°C)	33	W
	Linear Derating Factor	0.26	W/°C
T_J , T_{STG}	Operating Junction and Storage Temperature Range	- 55 to +150	°C
T_L	Maximum Lead Temp. for Soldering Purposes, 1/8 " from case for 5-seconds	300	

Thermal Resistance

Symbol	Characteristic	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	--	3.79	°C/W
$R_{\theta JA}$	Junction-to-Ambient	--	62.5	

FAIRCHILD SEMICONDUCTOR™

©1999 Fairchild Semiconductor Corporation

Electrical Characteristics (T_C=25°C unless otherwise specified)

Symbol	Characteristic	Min.	Typ.	Max.	Units	Test Condition
BV_{DSS}	Drain-Source Breakdown Voltage	-250	--	--	V	V_{GS}=0V,I_D=-250μA
$\Delta BV/\Delta T_J$	Breakdown Voltage Temp. Coeff.	--	-0.22	--	V/°C	I_D=-250μA ***See Fig 7***
$V_{GS(th)}$	Gate Threshold Voltage	-2.0	--	-4.0	V	V_{DS}=-5V,I_D=-250μA
I_{GSS}	Gate-Source Leakage , Forward	--	--	-100	nA	V_{GS}=-30V
	Gate-Source Leakage , Reverse	--	--	100		V_{GS}=30V
I_{DSS}	Drain-to-Source Leakage Current	--	--	-10	μA	V_{DS}=-250V
		--	--	-100		V_{DS}=-200V,T_C=125°C
$R_{DS(on)}$	Static Drain-Source On-State Resistance	--	--	1.3	Ω	V_{GS}=-10V,I_D=-1.7A ④
g_{fs}	Forward Transconductance	--	3.2	--	Ω	V_{DS}=-40V,I_D=-1.7A ④
C_{iss}	Input Capacitance	--	750	975	pF	V_{GS}=0V,V_{DS}=-25V,f =1MHz ***See Fig 5***
C_{oss}	Output Capacitance	--	110	165		
C_{rss}	Reverse Transfer Capacitance	--	45	65		
$t_{d(on)}$	Turn-On Delay Time	--	13	35	ns	V_{DD}=-125V,I_D=-5.0A, R_G=12 Ω ***See Fig 13*** ④ ⑤
t_r	Rise Time	--	20	50		
$t_{d(off)}$	Turn-Off Delay Time	--	40	90		
t_f	Fall Time	--	16	40		
Q_g	Total Gate Charge	--	29	37	nC	V_{DS}=-200V,V_{GS}=-10V, I_D=-5.0A ***See Fig 6 & Fig 12*** ④ ⑤
Q_{gs}	Gate-Source Charge	--	5.4	--		
Q_{gd}	Gate-Drain(" Miller ") Charge	--	15.5	--		

Source-Drain Diode Ratings and Characteristics

Symbol	Characteristic	Min.	Typ.	Max.	Units	Test Condition
I_S	Continuous Source Current	--	--	-3.4	A	Integral reverse pn-diode in the MOSFET
I_{SM}	Pulsed-Source Current ①	--	--	-14		
V_{SD}	Diode Forward Voltage ④	--	--	-5.0	V	T_J=25°C,I_S=-3.4A,V_{GS}=0V
t_{rr}	Reverse Recovery Time	--	170	--	ns	T_J=25°C,I_F=-5.0A
Q_{rr}	Reverse Recovery Charge	--	1.17	--	μC	di_F/dt=100A/μs ④

Notes ;

① Repetitive Rating : Pulse Width Limited by Maximum Junction Temperature

② L=20mH, I_{AS}=-3.4A, V_{DD}=-50V, R_G=27Ω*, Starting T_J=25°C

③ I_{SD} ≤-5.0A, di/dt ≤400A/μs, V_{DD} ≤BV_{DSS}, Starting T_J=25°C

④ Pulse Test : Pulse Width = 250 μs, Duty Cycle ≤2%

⑤ Essentially Independent of Operating Temperature