POWER™

PFP2N70/PFF2N70

700V N-Channel MOSFET

FEATURES

- Originative New Design
- 100% EAS Test
- Rugged Gate Oxide Technology
- Extremely Low Intrinsic Capacitances
- Remarkable Switching Characteristics
- Unequalled Gate Charge : 10.5 nC (Typ.)
- Extended Safe Operating Area
- Lower $R_{DS(ON)}$: 5.5 Ω (Typ.) @V_{GS}=10V

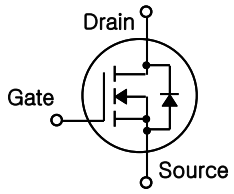
APPLICATION

- Low power battery chargers
- Switch mode power supply (SMPS)
- DC-AC converters.

BV_{DSS} = 700 V

$R_{DS(on)\ typ}$ = 5.5 Ω

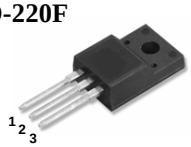
I_D = 1.6 A



TO-220

1.Gate 2. Drain 3. Source

TO-220F



1.Gate 2. Drain 3. Source

Absolute Maximum Ratings

T_C=25℃ unless otherwise specified

Symbol	Parameter	PFP2N70	PFF2N70	Units
V_{DSS}	Drain-Source Voltage	700		V
I_D	Drain Current – Continuous (T_C = 25℃)	1.6	1.6*	A
	Drain Current – Continuous (T_C = 100℃)	1.0	1.0*	A
I_{DM}	Drain Current – Pulsed (Note 1)	6	6*	A
V_{GS}	Gate-Source Voltage	±30		V
E_{AS}	Single Pulsed Avalanche Energy (Note 2)	110		mJ
I_{AR}	Avalanche Current (Note 1)	1.6		A
E_{AR}	Repetitive Avalanche Energy (Note 1)	4.4		mJ
dv/dt	Peak Diode Recovery dv/dt (Note 3)	5.5		V/ns
P_D	Power Dissipation (T_C = 25℃)	54	23	W
	– Derate above 25℃	0.43	0.18	W/℃
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150		℃
T_L	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	300		℃

* Drain current limited by maximum junction temperature

Thermal Resistance Characteristics

Symbol	Parameter	PFP2N70	PFF2N70	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	2.32	5.5	℃/W
$R_{\theta CS}$	Thermal Resistance, Case-to-Sink	0.5	--	
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62.5	62.5	

Electrical Characteristics T_C=25 °C unless otherwise specified

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
On Characteristics						
V_{GS}	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250 μA	2.0	--	4.0	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS} = 10 V, I_D = 0.8 A	--	5.5	6.8	Ω
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_D = 250 μA	700	--	--	V
ΔBV_{DSS} /ΔT_J	Breakdown Voltage Temperature Coefficient	I_D = 250 μA, Referenced to25℃	--	0.7	--	V/℃
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 700 V, V_{GS} = 0 V	--	--	10	μA
		V_{DS} = 560 V, T_C = 125℃	--	--	100	μA
I_{GSSF}	Gate-Body Leakage Current, Forward	V_{GS} = 30 V, V_{DS} = 0 V	--	--	100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	V_{GS} = -30 V, V_{DS} = 0 V	--	--	-100	nA
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} = 25 V, V_{GS} = 0 V, f = 1.0 MHz	--	340	445	pF
C_{oss}	Output Capacitance		--	45	60	pF
C_{rss}	Reverse Transfer Capacitance		--	7.5	10	pF
Switching Characteristics						
$t_{d(on)}$	Turn-On Time	V_{DS} = 350 V, I_D = 1.6 A, R_G = 25 Ω (Note 4,5)	--	10	20	ns
t_r	Turn-On Rise Time		--	25	50	ns
$t_{d(off)}$	Turn-Off Delay Time		--	20	40	ns
t_f	Turn-Off Fall Time		--	25	50	ns
Q_g	Total Gate Charge	V_{DS} = 560 V, I_D = 1.6 A, V_{GS} = 10 V (Note 4,5)	--	10.5	14.0	nC
Q_{gs}	Gate-Source Charge		--	2.0	--	nC
Q_{gd}	Gate-Drain Charge		--	4.0	--	nC
Source-Drain Diode Maximum Ratings and Characteristics						
I_S	Continuous Source-Drain Diode Forward Current		--	--	1.6	A
I_{SM}	Pulsed Source-Drain Diode Forward Current		--	--	6	
V_{SD}	Source-Drain Diode Forward Voltage	I_S = 1.6 A, V_{GS} = 0 V	--	--	1.5	V
trr	Reverse Recovery Time	I_S = 1.6 A, V_{GS} = 0 V di_F/dt = 100 A/μs (Note 4)	--	250	--	ns
Qrr	Reverse Recovery Charge		--	1.2	--	μC

Notes ;

1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. I_{AS}=1.6A, V_{DD}=50V, R_G=25Ω, Starting T_J=25°C
3. I_{SD}≤1.6A, di/dt≤300A/μs, V_{DD}≤BV_{DSS} , Starting T_J=25 °C
4. Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%
5. Essentially Independent of Operating Temperature