



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

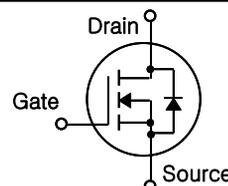
- ❑ Low power battery chargers
- ❑ Switch mode power supply (SMPS)
- ❑ DC-AC converters.

PFP2N70/PFF2N70 700V N-Channel MOSFET

$$BV_{DSS} = 700 \text{ V}$$

$$R_{DS(on) \text{ typ}} = 5.5 \ \Omega$$

$$I_D = 1.6 \text{ A}$$



TO-220



1.Gate 2. Drain 3. Source

TO-220F



1.Gate 2. Drain 3. Source

Absolute Maximum Ratings $T_C=25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	PFP2N70	PFF2N70	Units
V_{DSS}	Drain-Source Voltage	700		V
I_D	Drain Current – Continuous ($T_C = 25^\circ\text{C}$)	1.6	1.6*	A
	Drain Current – Continuous ($T_C = 100^\circ\text{C}$)	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 ($T_C = 25^\circ\text{C}$)	54	23	W
	– Derate above 25°C	0.43	0.18	W/ $^\circ\text{C}$
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150		$^\circ\text{C}$
T_L	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	300		$^\circ\text{C}$

* 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	$^\circ\text{C}/\text{W}$
$R_{\theta CS}$	Thermal Resistance, Case-to-Sink	0.5	--	
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62.5	62.5	

Electrical Characteristics $T_C=25\text{ }^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
On Characteristics						
V_{GS}	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	2.0	--	4.0	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS} = 10\ \text{V}, I_D = 0.8\ \text{A}$	--	5.5	6.8	Ω
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0\ \text{V}, I_D = 250\ \mu\text{A}$	700	--	--	V
$\Delta BV_{DSS} / \Delta T_J$	Breakdown Voltage Temperature Coefficient	$I_D = 250\ \mu\text{A}$, Referenced to $25\text{ }^\circ\text{C}$	--	0.7	--	$\text{V}/^\circ\text{C}$
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 700\ \text{V}, V_{GS} = 0\ \text{V}$	--	--	10	μA
		$V_{DS} = 560\ \text{V}, T_C = 125\text{ }^\circ\text{C}$	--	--	100	μA
I_{GSSF}	Gate-Body Leakage Current, Forward	$V_{GS} = 30\ \text{V}, V_{DS} = 0\ \text{V}$	--	--	100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	$V_{GS} = -30\ \text{V}, V_{DS} = 0\ \text{V}$	--	--	-100	nA
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS} = 25\ \text{V}, V_{GS} = 0\ \text{V},$ $f = 1.0\ \text{MHz}$	--	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	$V_{DS} = 350\ \text{V}, I_D = 1.6\ \text{A},$ $R_G = 25\ \Omega$ (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	$V_{DS} = 560\ \text{V}, I_D = 1.6\ \text{A},$ $V_{GS} = 10\ \text{V}$ (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	$I_S = 1.6\ \text{A}, V_{GS} = 0\ \text{V}$	--	--	1.5	V
t_{rr}	Reverse Recovery Time	$I_S = 1.6\ \text{A}, V_{GS} = 0\ \text{V}$ $di_F/dt = 100\ \text{A}/\mu\text{s}$ (Note 4)	--	250	--	ns
Q_{rr}	Reverse Recovery Charge		--	1.2	--	μC

Notes ;

1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. $I_{AS}=1.6\text{A}, V_{DD}=50\text{V}, R_G=25\Omega$, Starting $T_J=25\text{ }^\circ\text{C}$
3. $I_{SD}\leq 1.6\text{A}, di/dt\leq 300\text{A}/\mu\text{s}, V_{DD}\leq BV_{DSS}$, Starting $T_J=25\text{ }^\circ\text{C}$
4. Pulse Test : Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$
5. Essentially Independent of Operating Temperature