

PFB6000

N-CHANNEL TRENCH MOSFET

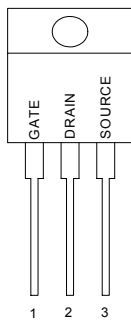
APPLICATION

- ◆ DC motor control
- ◆ UPS
- ◆ Class D Amplifier

V_{DSS}	$R_{DS(ON)}$ Typ.	I_D
60V	15.8m Ω	60A

PIN CONFIGURATION

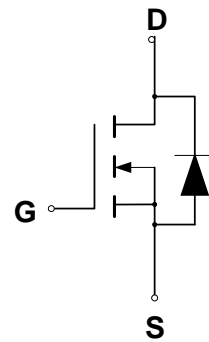
TO-220
Front View



FEATURES

- ◆ Low ON Resistance
- ◆ Low Gate Charge
- ◆ Peak Current vs Pulse Width Curve
- ◆ Inductive Switching Curves

SYMBOL



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain to Source Voltage (Note 1)	V_{DSS}	60	V
Drain to Current - Continuous $T_c = 25^\circ\text{C}$, $V_{GS}@10\text{V}$	I_D	60	A
- Continuous $T_c = 100^\circ\text{C}$, $V_{GS}@10\text{V}$	I_D	43	
- Pulsed $T_c = 25^\circ\text{C}$, $V_{GS}@10\text{V}$ (Note 2)	I_{DM}	241	
Gate-to-Source Voltage - Continue	V_{GS}	± 20	V
Total Power Dissipation	P_D	150	W
Derating Factor above 25		1.0	W/
Peak Diode Recovery dv/dt (Note 3)	dv/dt	4.5	V/ns
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 175	
Single Pulse Avalanche Energy $L=144\ \mu\text{H}, I_D=40\ \text{Amps}$	E_{AS}	500	mJ
Maximum Lead Temperature for Soldering Purposes	T_L	300	
Maximum Package Body for 10 seconds	T_{PKG}	260	
Pulsed Avalanche Rating	I_{AS}	60	A

THERMAL RESISTANCE

Symbol	Parameter	Min	Typ	Max	Units	Test Conditions
$R_{\theta JC}$	Junction-to-case			1.0	/W	Water cooled heatsink, P_D adjusted for a peak junction temperature of +175
$R_{\theta JA}$	Junction-to-ambient			62	/W	1 cubic foot chamber, free air

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ORDERING INFORMATION

Part Number	Package
PFB6000	TO-220

ELECTRICAL CHARACTERISTICS

Unless otherwise specified, $T_J = 25$.

		CMP60N03LD13			
Characteristic	Symbol	Min	Typ	Max	Units
OFF Characteristics					
Drain-to-Source Breakdown Voltage ($V_{GS} = 0\text{ V}$, $I_D = 250\ \mu\text{A}$)	V_{DSS}	60			V
Breakdown Voltage Temperature Coefficient (Reference to 25 , $I_D = 250\ \mu\text{A}$)	$V_{DSS}/\Delta T_J$		0.069		mV/
Drain-to-Source Leakage Current ($V_{DS} = 60\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 25$) ($V_{DS} = 48\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 150$)	I_{DSS}			25 250	μA
Gate-to-Source Forward Leakage ($V_{GS} = 20\text{ V}$)	I_{GSS}			100	nA
Gate-to-Source Reverse Leakage ($V_{GS} = -20\text{ V}$)	I_{GSS}			-100	nA
ON Characteristics					
Gate Threshold Voltage ($V_{DS} = V_{GS}$, $I_D = 250\ \mu\text{A}$)	$V_{GS(th)}$	1.0	2.0	3.0	V
Static Drain-to-Source On-Resistance (Note 4) ($V_{GS} = 10\text{ V}$, $I_D = 60\text{A}$)	$R_{DS(on)}$		15.8	18	m Ω
Forward Transconductance ($V_{DS} = 15\text{ V}$, $I_D = 60\text{A}$) (Note 4)	g_{FS}		36		S
Dynamic Characteristics					
Input Capacitance	($V_{DS} = 25\text{ V}$, $V_{GS} = 0\text{ V}$, $f = 1.0\text{ MHz}$)	C_{iss}		1430	pF
Output Capacitance		C_{oss}		420	pF
Reverse Transfer Capacitance		C_{rss}		88	pF
Total Gate Charge ($V_{GS} = 10\text{ V}$)	($V_{DS} = 30\text{ V}$, $I_D = 60\text{ A}$, $V_{GS} = 10\text{ V}$) (Note 5)	Q_g		37.7	nC
Gate-to-Source Charge		Q_{gs}		8.4	nC
Gate-to-Drain ("Miller") Charge		Q_{gd}		9.8	nC
Resistive Switching Characteristics					
Turn-On Delay Time	($V_{DD} = 30\text{ V}$, $I_D = 60\text{ A}$, $V_{GS} = 10\text{ V}$, $R_G = 9.1\Omega$) (Note 5)	$t_{d(on)}$		12.1	ns
Rise Time		t_{rise}		64	ns
Turn-Off Delay Time		$t_{d(off)}$		69	ns
Fall Time		t_{fall}		39	ns
Source-Drain Diode Characteristics					
Continuous Source Current (Body Diode)	Integral pn-diode in MOSFET	I_S		60	A
Pulse Source Current (Body Diode)		I_{SM}		241	A
Diode Forward On-Voltage ($I_S = 60\text{ A}$, $V_{GS} = 0\text{ V}$)		V_{SD}		1.5	V
Reverse Recovery Time	($I_F = 60\text{A}$, $V_{GS} = 0\text{ V}$, $d_i/d_t = 100\text{A}/\mu\text{s}$)	t_{rr}		55	ns
Reverse Recovery Charge		Q_{rr}		110	nC

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Note 1: $T_J = +25$ to $+175$

Note 2: Repetitive rating; pulse width limited by maximum junction temperature.

Note 3: $I_{SD} = 60A$, $di/dt \leq 100A/\mu s$, $V_{DD} \leq BV_{DSS}$, $T_J = +175$

Note 4: Pulse width $\leq 250\mu s$; duty cycle $\leq 2\%$

Note 5: Essentially independent of operating temperature.

PACKAGE DIMENSION

