

# PFB6000

## N-CHANNEL TRENCH MOSFET

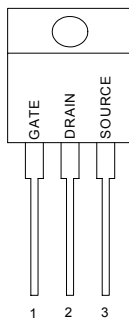
### APPLICATION

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

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

### PIN CONFIGURATION

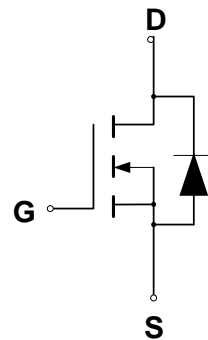
TO-220  
Front View



### 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	$V_{GS}$	$\pm 20$	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

# PFB6000

## N-CHANNEL TRENCH MOSFET

### ORDERING INFORMATION

Part Number	Package
PFB6000	TO-220

### ELECTRICAL CHARACTERISTICS

Unless otherwise specified,  $T_J = 25$  .

		CMP60N03LD13				
Characteristic	Symbol	Min	Typ	Max	Units	
<b>OFF Characteristics</b>						
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	$\mu\text{A}$	
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	
<b>ON Characteristics</b>						
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 $\Omega$	
Forward Transconductance ( $V_{DS} = 15\text{ V}$ , $I_D = 60\text{A}$ ) (Note 4)	$g_{FS}$		36		S	
<b>Dynamic Characteristics</b>						
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	
<b>Resistive Switching Characteristics</b>						
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	
<b>Source-Drain Diode Characteristics</b>						
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	

# PFB6000

## N-CHANNEL TRENCH MOSFET

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

