

PFB6000

N-CHANNEL TRENCH MOSFET

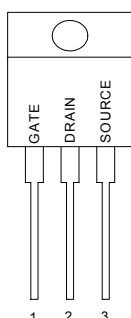
APPLICATION

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

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

PIN CONFIGURATION

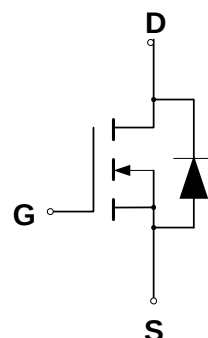
TO-220
Front View



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 V, I _D = 250 μA)	V _{DSS}	60			V
Breakdown Voltage Temperature Coefficient (Reference to 25 °C, I _D = 250 μA)	Δ V _{DSS} /ΔT _J		0.069		mV/°C
Drain-to-Source Leakage Current (V _{DS} = 60 V, V _{GS} = 0 V, T _J = 25 °C) (V _{DS} = 48 V, V _{GS} = 0 V, T _J = 150 °C)	I _{DSS}			25 250	μA
Gate-to-Source Forward Leakage (V _{GS} = 20 V)	I _{GSS}			100	nA
Gate-to-Source Reverse Leakage (V _{GS} = -20 V)	I _{GSS}			-100	nA
ON Characteristics					
Gate Threshold Voltage (V _{DS} = V _{GS} , I _D = 250 μA)	V _{GS(th)}	1.0	2.0	3.0	V
Static Drain-to-Source On-Resistance (Note 4) (V _{GS} = 10 V, I _D = 60A)	R _{DS(on)}		15.8	18	mΩ
Forward Transconductance (V _{DS} = 15 V, I _D = 60A) (Note 4)	g _{FS}		36		S
Dynamic Characteristics					
Input Capacitance	(V _{DS} = 25 V, V _{GS} = 0 V, f = 1.0 MHz)	C _{iss}		1430	pF
Output Capacitance		C _{oss}		420	pF
Reverse Transfer Capacitance		C _{rss}		88	pF
Total Gate Charge (V _{GS} = 10 V)	(V _{DS} = 30 V, I _D = 60 A, V _{GS} = 10 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 V, I _D = 60 A, V _{GS} = 10 V, R _G = 9.1Ω) (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 A, V _{GS} = 0 V)	V _{SD}		1.5	V
Reverse Recovery Time	(I _F = 60A, V _{GS} = 0 V, d _I /d _t = 100A/μs)	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

