

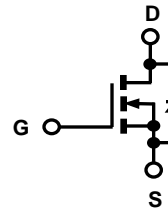


PMG4N70F N-Channel Enhancement Mode MOSFET

Features

- Low $r_{DS(on)}$
- Ultra Low Gate Charge
- High dv/dt capability
- High Unclamped Inductive Switching (UIS) capability
- High peak current capability
- Increased transconductance performance
- Optimized design for high performance power systems

Product Summary			
I_D	$T_A=25^\circ\text{C}$	4A	Max
$V_{(BR)DSS}$	$I_D=250\mu\text{A}$	700V	Min
$r_{DS(on)}$	$V_{GS}=10\text{V}$	1.0 Ω	Typ
Q_g	$V_{DS}=480\text{V}$	21nC	Typ



**T0220 Full-PAK
Isolated (T0-220)**
1=Gate, 2=Drain,
3=Source

Maximum ratings^b, at $T_j=25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Conditions	Value	Unit
Continuous drain current	I_D	$T_c=25^\circ\text{C}$	4	A
Pulsed drain current	$I_{D, pulse}$	$T_c=25^\circ\text{C}$	12	A
Avalanche energy, single pulse	E_{AS}	$I_D=2\text{A}$	80	mJ
Avalanche current, repetitive	I_{AR}	limited by $T_j\text{max}$	2	A
MOSFET dv/dt ruggedness	dv/dt	$V_{DS}=480\text{V}$, $I_D=4\text{A}$, $T_j=125^\circ\text{C}$	50	V/ns
Gate source voltage	V_{GS}	Static	± 20	V
		AC ($f > 1\text{Hz}$), $V_{GS}=30\text{V}$	± 20	
Power dissipation	P_{tot}	$T_c=25^\circ\text{C}$	35	W
Operating and storage temperature	T_j, T_{stg}		-55 to +150	$^\circ\text{C}$
Mounting torque		M 3 & 3.5 screws	60	Ncm

a When mounted on 1inch square 2oz copper clad FR-4

b Preliminary Data Sheet – Specifications subject to change

Parameter	Symbol	Conditions	Values			Unit
			Min	Typ	Max	

Thermal characteristics

Thermal resistance, junction-case ^a	R_{thJC}		-	-	3.5	°C/W
Thermal resistance, junction-ambient ^a	R_{thJA}	leaded	-	-	62	
Soldering temperature, wave soldering only allowed at leads	T_{sold}	1.6mm (0.063in.) from case for 10 s	-	-	260	°C

Electrical characteristics ^b, at $T_j=25^\circ\text{C}$, unless otherwise specified

Static characteristics

Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0\text{V}, I_D=250\mu\text{A}$	700	730	-	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	2.1	3	3.9	
Zero gate voltage drain current	I_{DSS}	$V_{DS}=700\text{V}, V_{GS}=0\text{V}, T_j=25^\circ\text{C}$	-	0.1	1	μA
		$V_{DS}=700\text{V}, V_{GS}=0\text{V}, T_j=150^\circ\text{C}$	-	-	100	
Gate source leakage current	I_{GSS}	$V_{GS}=\pm 20\text{V}, V_{DS}=0\text{V}$	-	-	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=10\text{V}, I_D=2\text{A}, T_j=25^\circ\text{C}$	-	1.0	1.2	Ω
		$V_{GS}=10\text{V}, I_D=2\text{A}, T_j=150^\circ\text{C}$	-	2.6	-	
Gate resistance	R_G	$f=1\text{MHz}$, open drain	-	0.5	-	Ω

Dynamic characteristics

Input capacitance	C_{iss}	$V_{GS}=0\text{V}, V_{DS}=25\text{V}, f=1\text{MHz}$	-	630	-	μF
Output capacitance	C_{oss}		-	430	-	
Reverse transfer capacitance	C_{rss}		-	12	-	
Transconductance	g_{fs}	$V_{DS}>2 \cdot I_D \cdot R_{DS}, I_D=2\text{A}$	-	4	-	S
Turn-on delay time	$t_{d(on)}$	$V_{DS}=480\text{V}, V_{GS}=10\text{V}, I_D=4\text{A}, R_G=4\Omega$ (External)	-	22	-	ns
Rise time	t_r		-	5	-	
Turn-off delay time	$t_{d(off)}$		-	67	-	
Fall time	t_f		-	4.5	-	

Parameter	Symbol	Conditions	Values			Unit
			Min	Typ	Max	

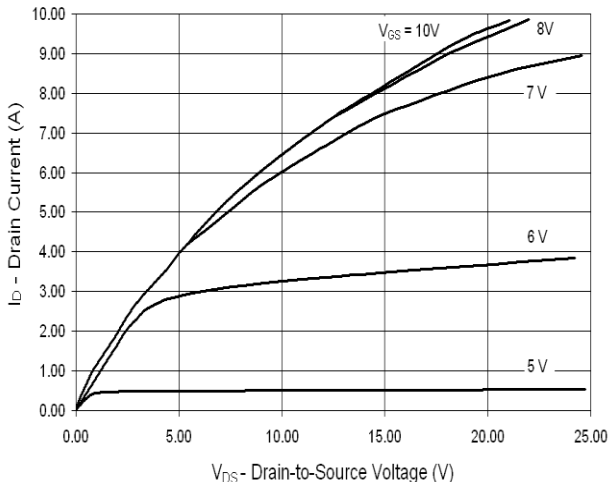
Gate charge characteristics

Gate to source charge	Q_{gs}	$V_{DS}=480\text{ V}, I_D=4\text{ A},$ $V_{GS}=0\text{ to }10\text{ V}$	-	4.6	-	nC
Gate to drain charge	Q_{gd}		-	6.8	-	
Gate charge total	Q_g		-	21	-	
Gate plateau voltage	V_{plateau}		-	5.5	-	V

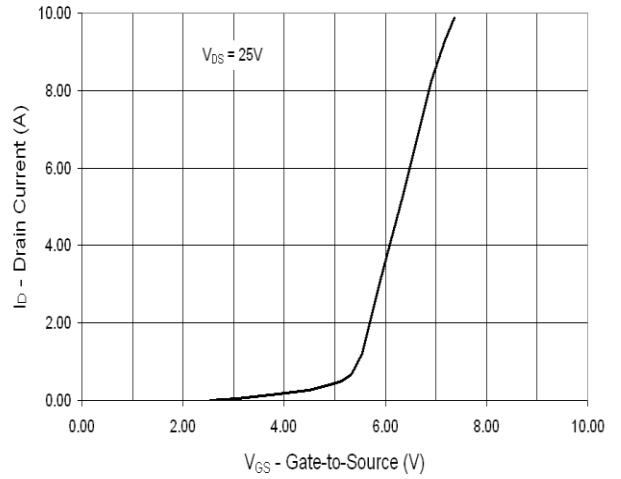
Reverse Diode

Diode forward voltage	V_{SD}	$V_{GS}=0\text{ V}, I_S=I_F$	-	1.0	1.2	V
Reverse recovery time	t_{rr}	$V_{RR}=480\text{ V}, I_S=I_F,$ $d_{iF}/d_t=100\text{ A}/\mu\text{S}$	-	200	-	ns
Reverse recovery charge	Q_{rr}		-	11	-	μC
Peak reverse recovery current	I_{rm}		-	70	-	A

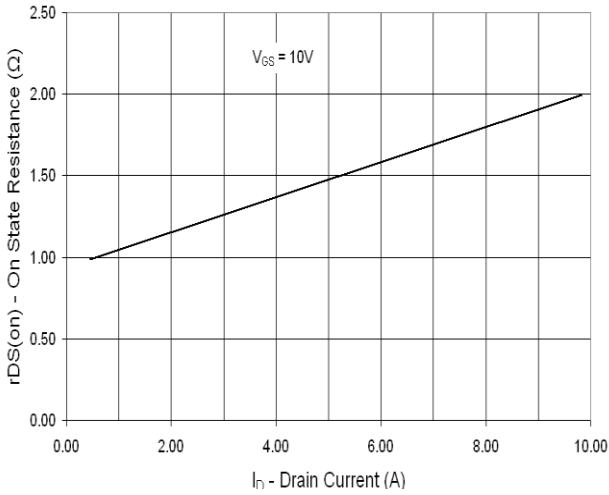
Output Characteristics



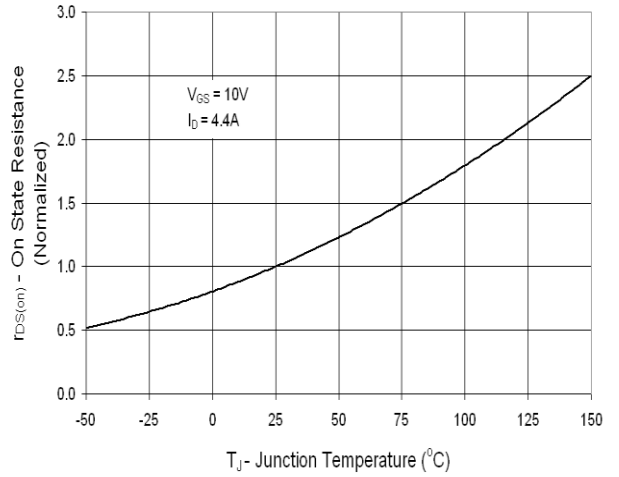
Transfer Characteristics



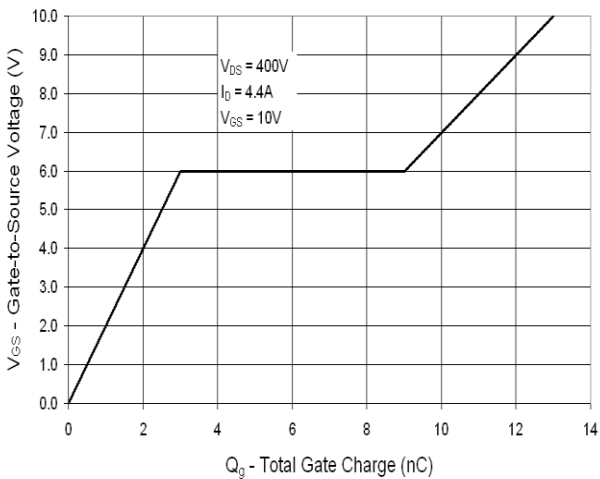
On State Resistance vs. Drain Current



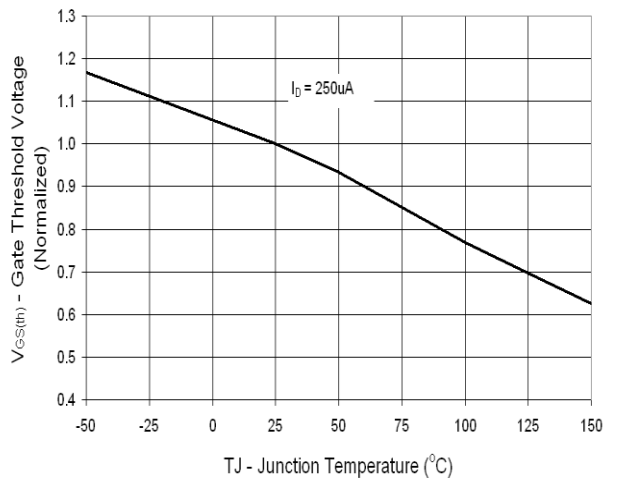
On State Resistance vs. Junction Temperature



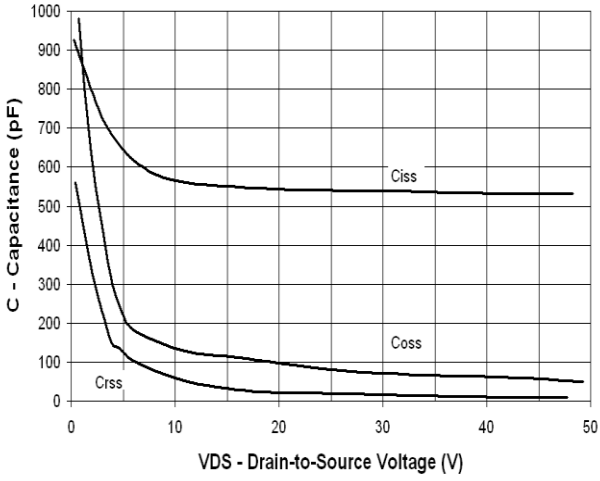
Gate Charge



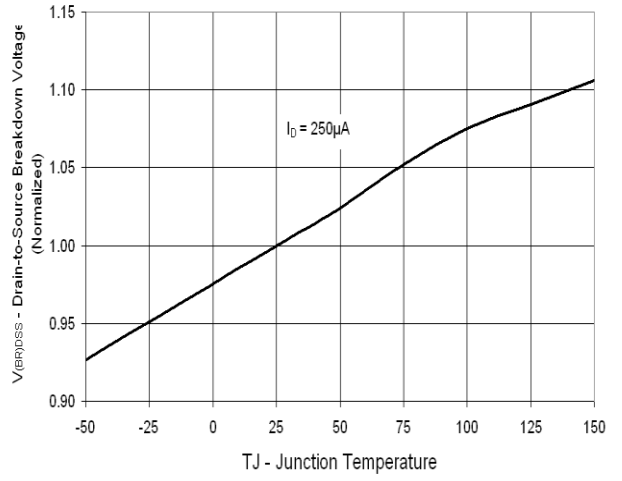
Gate Threshold Voltage vs. Junction Temperature



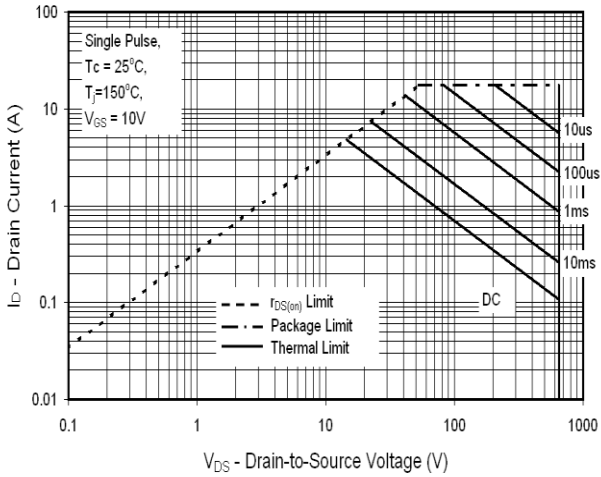
Capacitance



Drain-to-Source Breakdown Voltage vs. TJ



Maximum Rated Forward Biased Safe Operating Area



Transient Thermal Response, Junction-to-Case

