

# N-Channel Enhancement Mode Field Effect Transistor

**- 75Amp 75Volt**

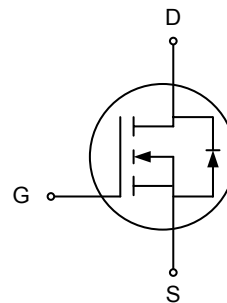
**Application**

- Servomotor control
- Power MOSFET gate drivers
- Other switching applications

**Feature**

- Small surface mounting type
- High density cell design for low RDS(ON)
- Suitable for high packing density
- Rugged and reliable
- High saturation current capability
- Voltage controlled small signal switch

**Circuit**



**Construction**

- N-Channel Enhancement

**Absolute Maximum Ratings**

PARAMETER	SYMBOL	PS75N75	UNIT
Drain-Source Voltage	V <sub>DS</sub>	75	V
Gate-Source Voltage	V <sub>GS</sub>	± 20	V
Drain Current-Continuous @ TA = 125°C (Note 1)	I <sub>D</sub>	75	A
	-Pulsed (Note 2)	I <sub>DM</sub>	
Drain-Source Diode Forward Current	I <sub>S</sub>	60	A
Maximum Power Dissipation	P <sub>D</sub>	220	W
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +175	°C
Thermal Resistance, Junction-to-Ambient	R <sub>θJA</sub>	50	°C/W

Note: 1.Surface Mounted on FR-4 Board, t ≤ 2%

June 2009 / Rev.6.4

2.Pulse Test : 380µs pulse width, 2% duty cycle

**Electrical Characteristics**

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
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**OFF CHARACTERISTICS**

Drain-Source Breakdown Voltage	BVDSS	VGS = 0V, ID = -250μA	75	-	-	V
Zero Gate Voltage Drain Current	IDSS	VDS = 20V, VGS = 0V	-	-	20	μA
Gate-Body Leakage	IGSS	VGS = ±16V, VDS = 0V	-	-	±100	nA

**ON CHARACTERISTICS**

Gate Threshold Voltage	VGS(th)	VDS = VGS, ID = -250μA	2	-	4	V
Static Drain-Source On-Resistance	RDS(ON)	VGS = 10V, ID = 48A	-	9	11	mΩ
Forward Transconductance	gFS	VDS = 25V, ID = 30A	-	50	-	S

**SWITCHING CHARACTERISTICS**

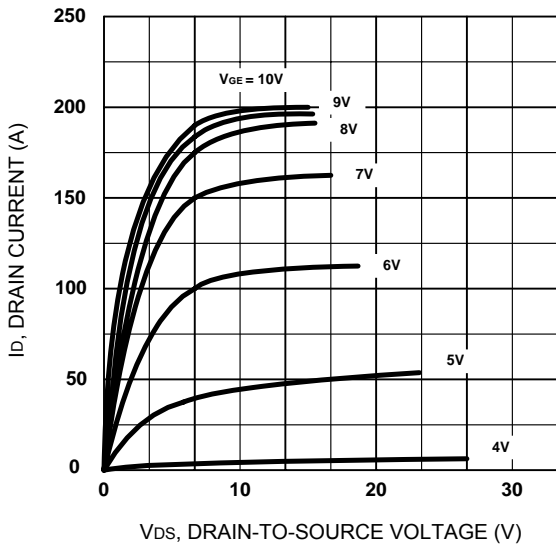
Total Gate Charge	Qg	VDS = 60V, ID = 48A VGS = 10V, RGEN = 4.7Ω	-	90	140	nC
Gate-Source Charge	Qgs		-	20	35	
Gate-Drain Charge	Qgd		-	30	45	
Turn-On Delay Time	TD(on)	VDD = 38V, ID = 48A VGEN = 10V, RL = 10Ω RGEN = 4.7Ω	-	12	-	nS
Rise Time	tr		-	79	-	
Turn-Off Delay Times	TD(off)	VDD = 38V, ID = 48A VGEN = 10V, RL = 10Ω RGEN = 4.7Ω	-	80	-	nS
Fall Time	tf		-	52	-	

**DYNAMIC CHARACTERISTICS**

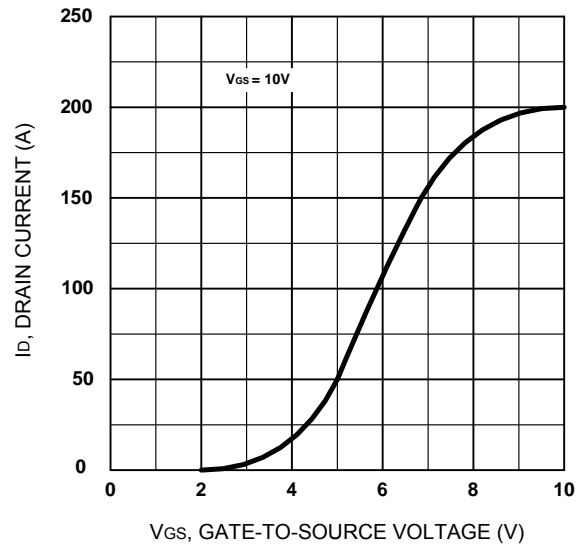
Input Capacitance	CISS	VDS = 25V, VGS = 0V f = 1.0MHz	-	3300	-	pF
Output Capacitance	COSS		-	530	-	
Reverse Transfer Capacitance	CRSS		-	80	-	

**DRAIN-SOURCE DIODE CHARACTERISTICS**

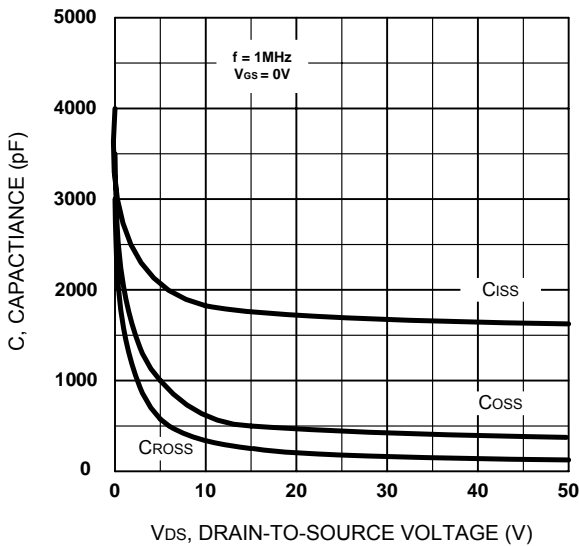
Diode Forward Voltage	VSD	VGS = 0V, IS = 60A	-	1.5	-	V
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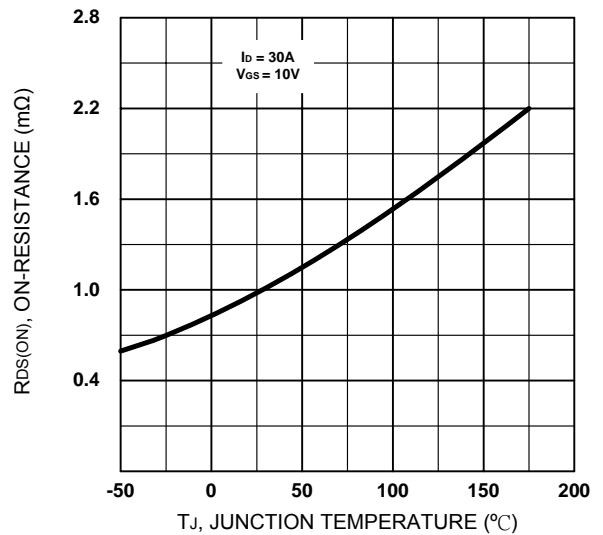
**Figure 1. Output Characteristics**



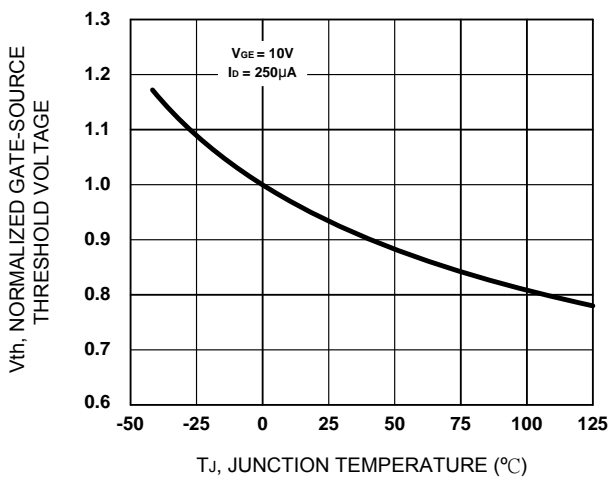
**Figure 2. Transfer Characteristics**



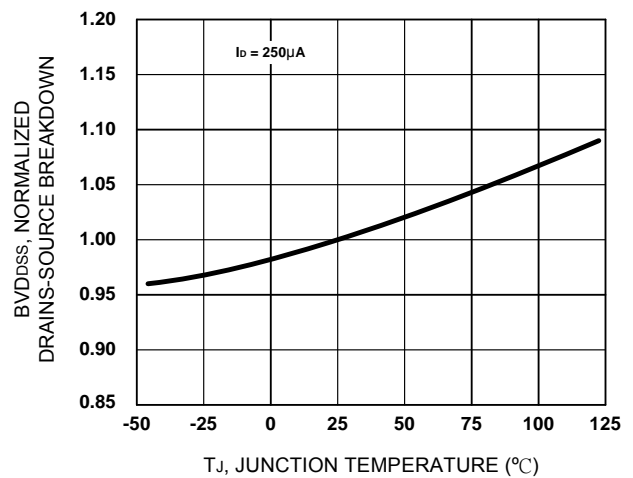
**Figure 3. Capacitance Characteristics**



**Figure 4. On-Resistance Variation with temperature**



**Figure 5. Gate Threshold Variation with Temperature**



**Figure 6. Breakdown Voltage Variation with Temperature**

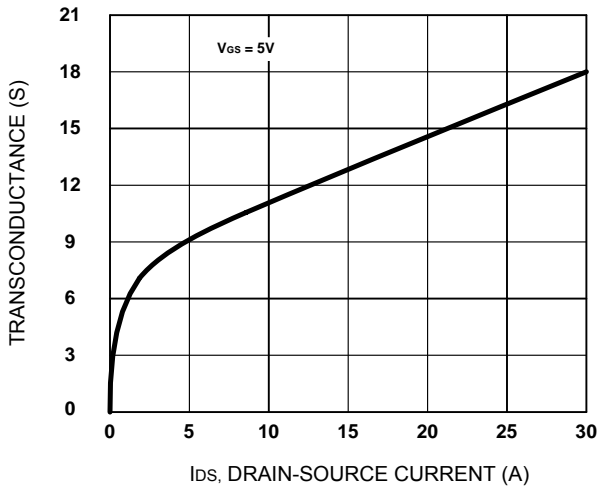


Figure 7. Transconductance Variation with Drain Current

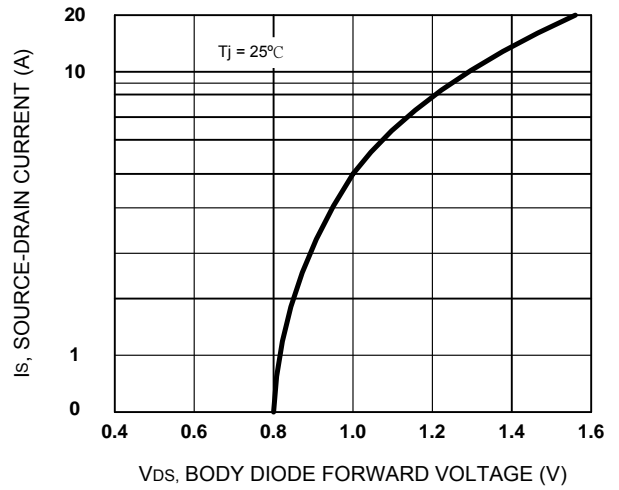


Figure 8. Body Diode Forward Voltage Variation with Source Current

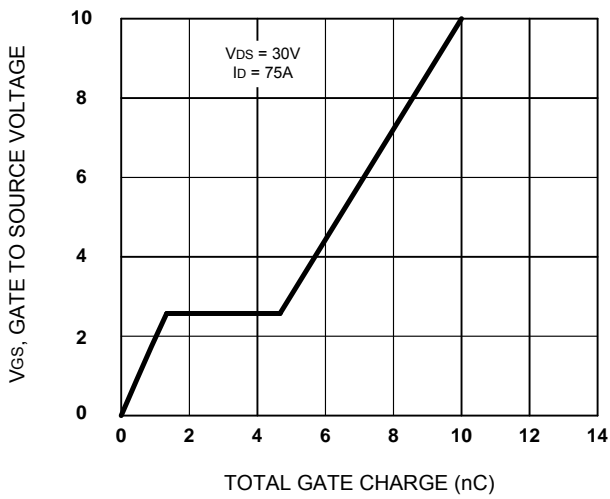
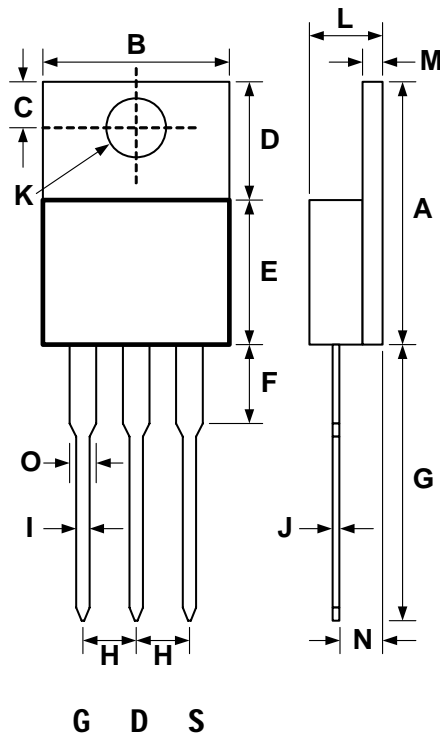


Figure 9. Gate Charge

## TO-220AB PACKAGE



DIMENSIONS					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.579	.606	14.70	15.40	
B	.392	.411	9.95	10.45	
C	.104	.116	2.65	2.95	
D	.248	.272	6.30	6.90	
E	.325	.350	8.25	8.90	
F	.126	.157	3.20	4.00	
G	.492	.551	12.50	14.00	
H	.096	.108	2.45	2.75	
I	.028	.039	0.70	1.00	
J	.010	.022	0.25	0.55	
K	.146	.157	3.70	4.00	
L	.167	.187	4.25	4.75	
M	.045	.057	1.15	1.45	
N	.089	.114	2.25	2.90	
O	.047	.055	1.20	1.40	