

N-Channel Enhancement Mode Field Effect Transistor

- 90Amp 80Volt

☐ Application

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

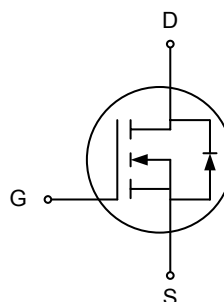
☐ Feature

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

☐ Construction

- N-Channel Enhancement

☐ Circuit



☐ Absolute Maximum Ratings

PARAMETER	SYMBOL	PS90N80	UNIT
Drain-Source Voltage	V_{DS}	>80	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous @ $T_A = 125^\circ\text{C}$ (Note 1)	I_D	90	A
-Pulsed (Note 2)	I_{DM}	300	
Drain-Source Diode Forward Current	I_S	60	A
Maximum Power Dissipation	P_D	220	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to +175	$^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	50	$^\circ\text{C/W}$

Note: 1.Surface Mounted on FR-4 Board, $t \leq 2\%$

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

June 2009 / Rev.6.4

☐ **Electrical Characteristics**

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
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
Ststic Drain-Source On-Resistance	RDS(ON)	VGS = 10V, ID = 40A	-	7.5	11	mΩ
Forward Transconductance	gFS	VDS = 25V, ID = 30A	-	50	-	S
SWITCHING CHARACTERSTICS						
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)		-	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

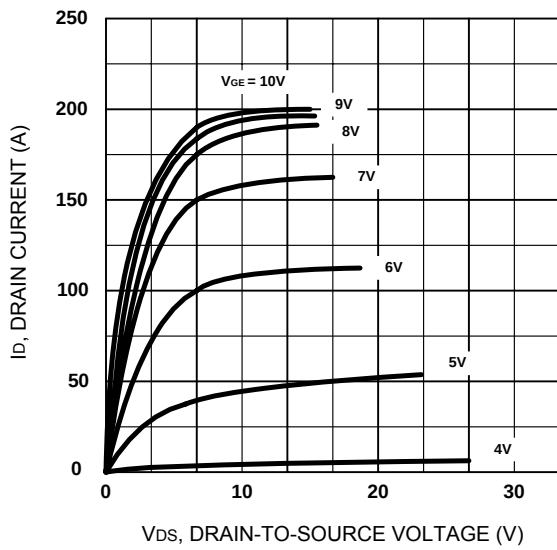


Figure 1. Output Characteristics

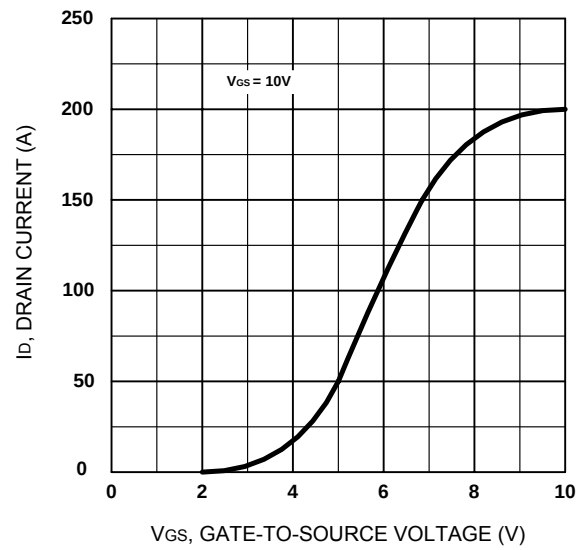


Figure 2. Transfer Characteristics

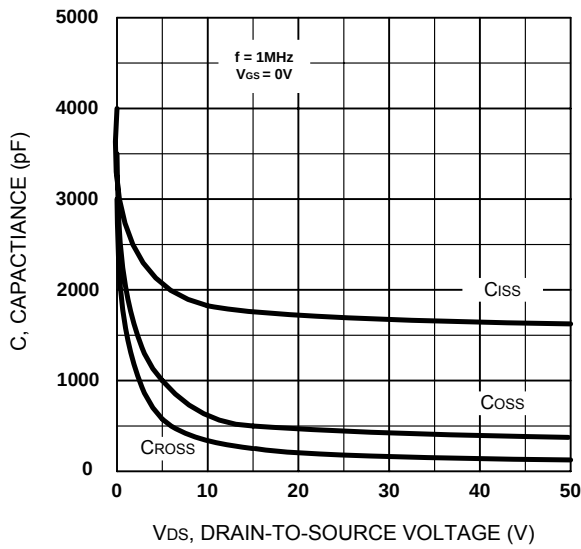


Figure 3. Capacitance Characteristics

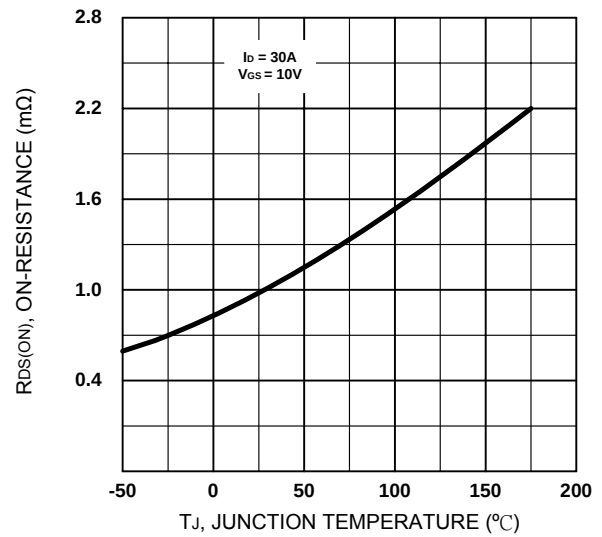


Figure 4. On-Resistance Variation with temperature

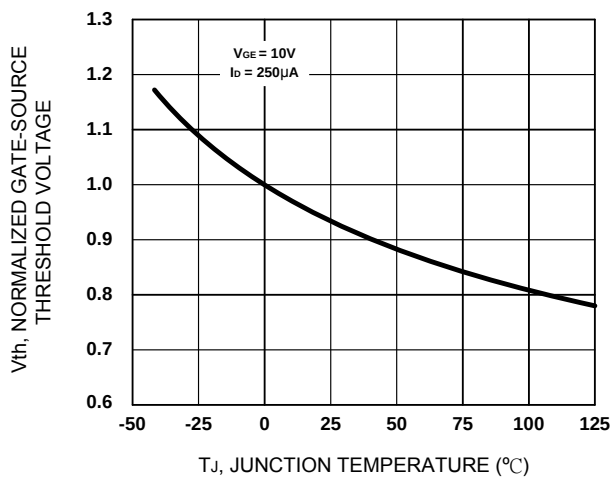


Figure 5. Gate Threshold Variation with Temperature

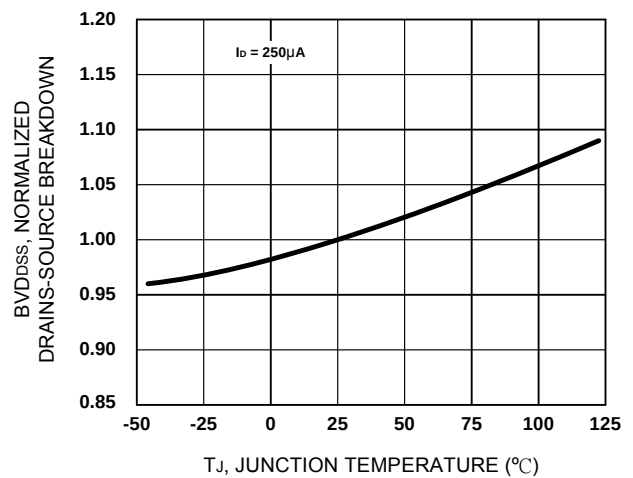


Figure 6. Breakdown Voltage Variation with Temperature

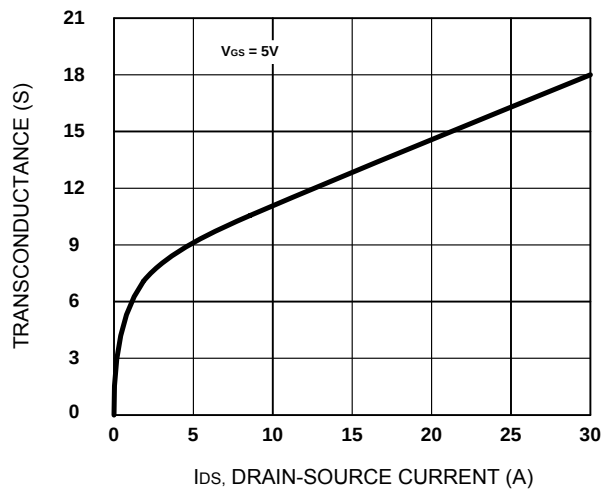


Figure 7. Transconductance Variation with Drain Current

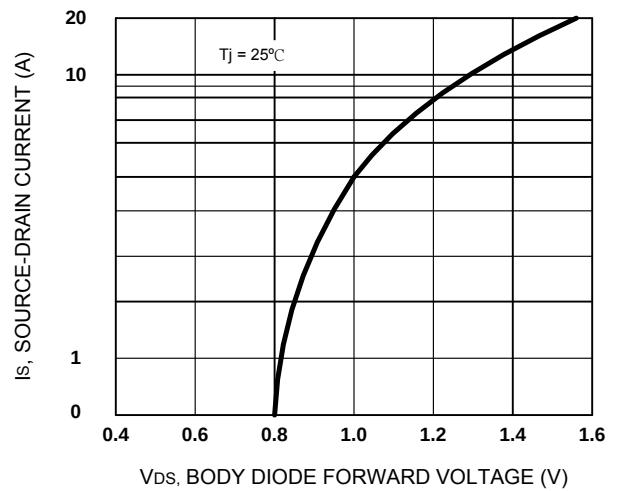


Figure 8. Body Diode Forward Voltage Variation with Source Current

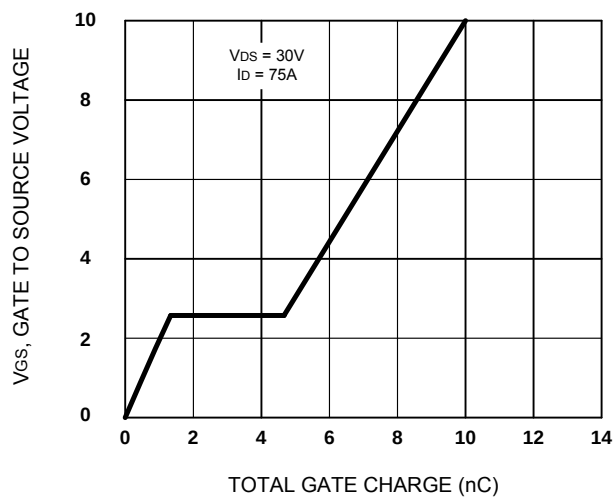
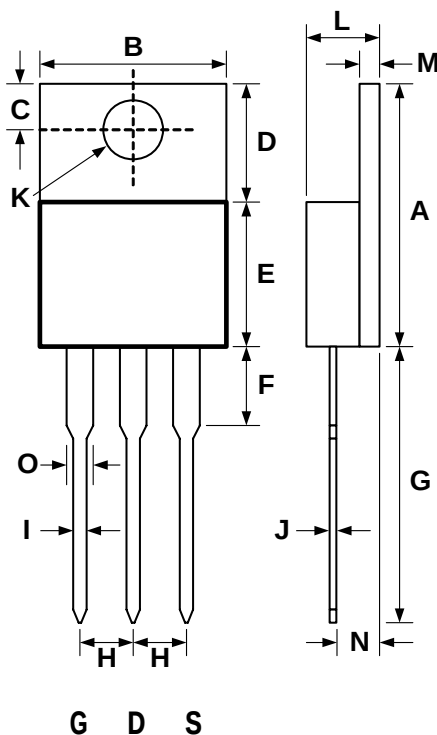


Figure 9. Gate Charge

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	