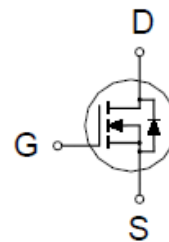
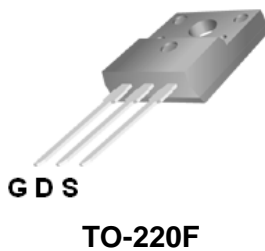


# P0850ATF

## N-Channel Enhancement Mode MOSFET

### PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	$I_D$
500V	$0.85\Omega @ V_{GS} = 10V$	8A



### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25\text{ }^\circ\text{C}$ Unless Otherwise Noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		$V_{DS}$	500	V
Gate-Source Voltage		$V_{GS}$	$\pm 30$	
Continuous Drain Current <sup>2</sup>	$T_C = 25\text{ }^\circ\text{C}$	$I_D$	8	A
	$T_C = 100\text{ }^\circ\text{C}$		5	
Pulsed Drain Current <sup>1,2</sup>		$I_{DM}$	30	
Avalanche Current <sup>3</sup>		$I_{AS}$	6.8	
Avalanche Energy <sup>3</sup>	$L = 10\text{mH}$	$E_{AS}$	232	mJ
Power Dissipation <sup>A</sup>	$T_C = 25\text{ }^\circ\text{C}$	$P_D$	39	W
	$T_C = 100\text{ }^\circ\text{C}$		15.6	
Operating Junction & Storage Temperature Range		$T_J, T_{STG}$	-55 to 150	$^\circ\text{C}$

### THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Case	$R_{\theta JC}$		1	$^\circ\text{C} / \text{W}$
Junction-to-Ambient	$R_{\theta JA}$		62.5	

<sup>1</sup>Pulse width limited by maximum junction temperature.

<sup>2</sup>Limited only by maximum temperature allowed.

<sup>3</sup> $V_{DD} = 50V$ , Starting  $T_J = 25^\circ\text{C}$

# P0850ATF

## N-Channel Enhancement Mode MOSFET

### ELECTRICAL CHARACTERISTICS (T<sub>J</sub> = 25 °C, Unless Otherwise Noted)

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT	
			MIN	TYP	MAX		
<b>STATIC</b>							
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	500			V	
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	2.5		4.5		
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±30V			±100	nA	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 500V, V <sub>GS</sub> = 0V, T <sub>C</sub> = 25 °C			25	μA	
		V <sub>DS</sub> = 500V, V <sub>GS</sub> = 0V, T <sub>C</sub> = 100 °C			250		
Drain-Source On-State Resistance <sup>1</sup>	R <sub>DS(ON)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 4A		0.65	0.85	Ω	
Forward Transconductance <sup>1</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 20V, I <sub>D</sub> = 4A		7		S	
<b>DYNAMIC</b>							
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 25V, f = 1MHz		1250		pF	
Output Capacitance	C <sub>oss</sub>				138		
Reverse Transfer Capacitance	C <sub>rss</sub>				14		
Total Gate Charge <sup>2</sup>	Q <sub>g</sub>	V <sub>DS</sub> = 250V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 4.8A		21.6		nC	
Gate-Source Charge <sup>2</sup>	Q <sub>gs</sub>				7.2		
Gate-Drain Charge <sup>2</sup>	Q <sub>gd</sub>				6.6		
Turn-On Delay Time <sup>2</sup>	t <sub>d(on)</sub>	V <sub>DD</sub> = 250V, I <sub>D</sub> = 4.8A, R <sub>G</sub> = 25Ω		23		nS	
Rise Time <sup>2</sup>	t <sub>r</sub>				71		
Turn-Off Delay Time <sup>2</sup>	t <sub>d(off)</sub>				112		
Fall Time <sup>2</sup>	t <sub>f</sub>				69		
<b>SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T<sub>J</sub> = 25 °C)</b>							
Continuous Current <sup>3</sup>	I <sub>S</sub>				8	A	
Forward Voltage <sup>1</sup>	V <sub>SD</sub>	I <sub>F</sub> = 4A, V <sub>GS</sub> = 0V			1.7	V	
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 4.8A, dI <sub>F</sub> /dt = 100A / μS, V <sub>GS</sub> = 0V		480		nS	
Reverse Recovery Charge	Q <sub>rr</sub>				5		nC

<sup>1</sup>Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

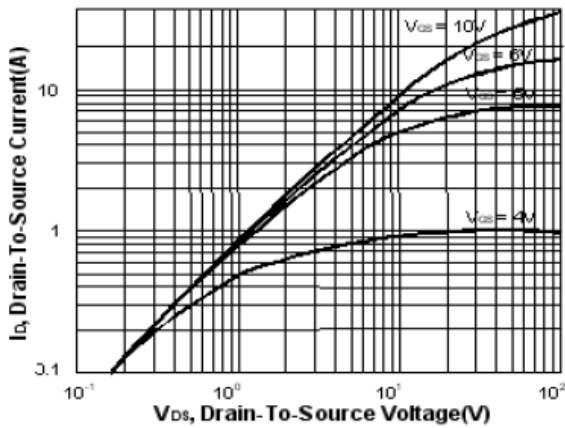
<sup>2</sup>Independent of operating temperature.

<sup>3</sup>Pulse width limited by maximum junction temperature.

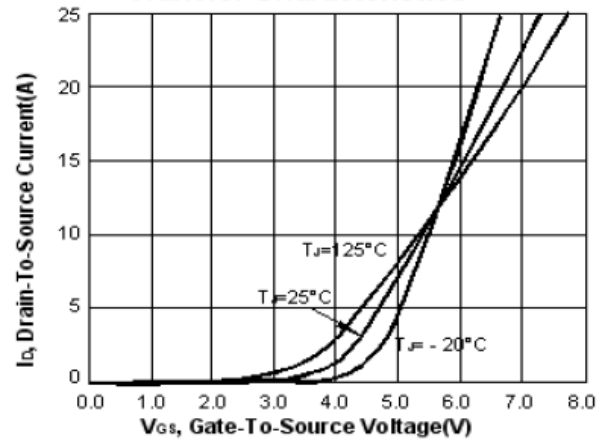
# P0850ATF

## N-Channel Enhancement Mode MOSFET

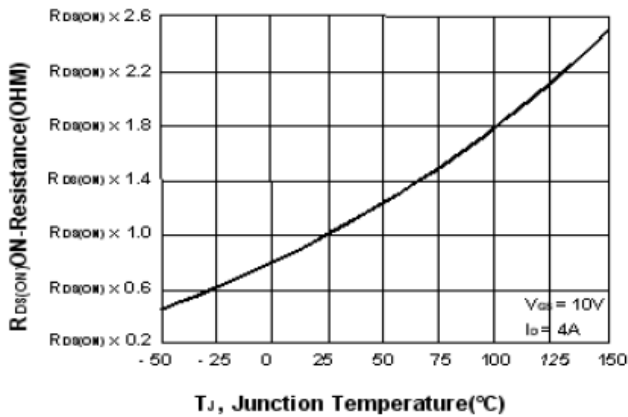
**Output Characteristics**



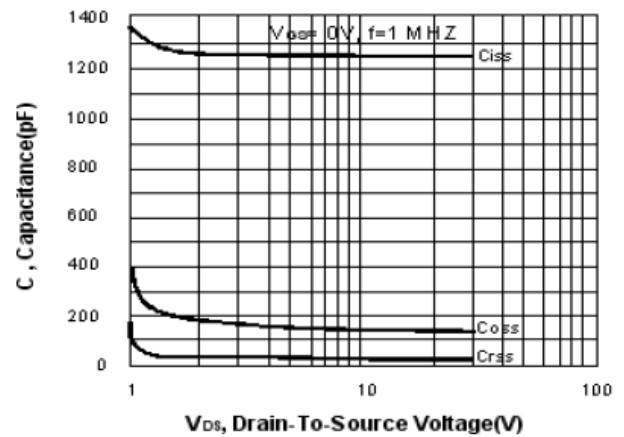
**Transfer Characteristics**



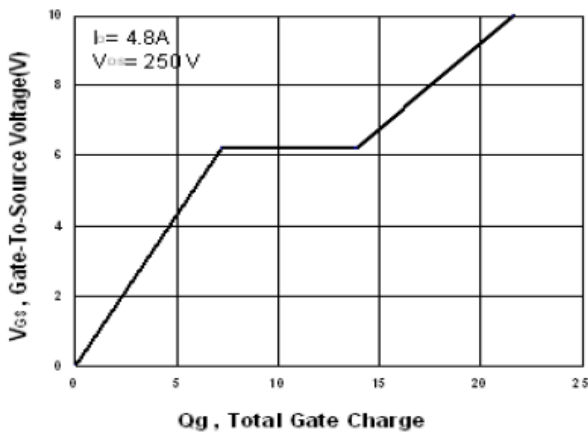
**On-Resistance VS Temperature**



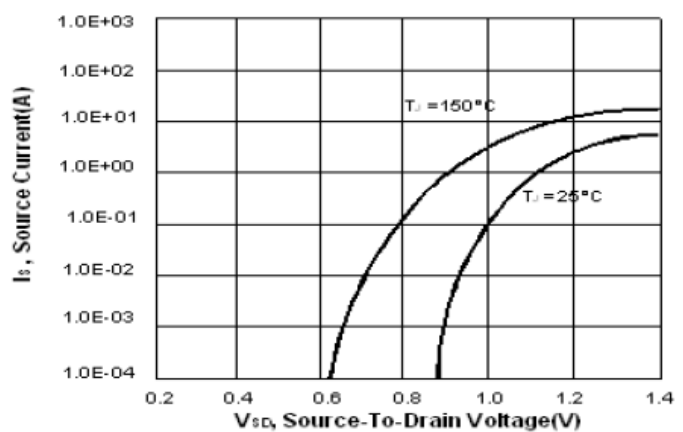
**Capacitance Characteristic**



**Gate charge Characteristics**



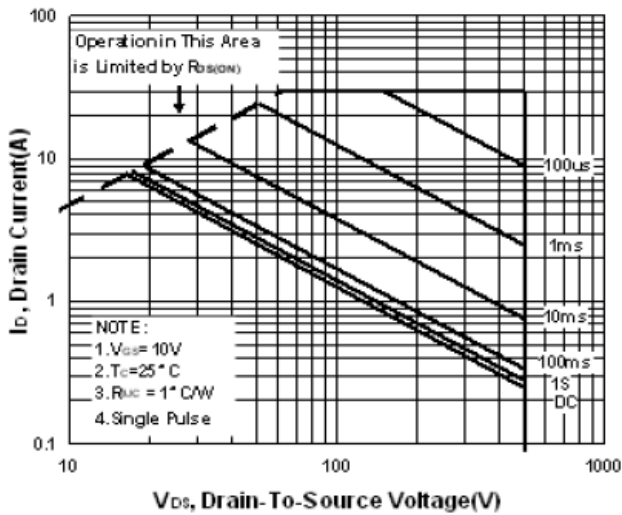
**Source-Drain Diode Forward Voltage**



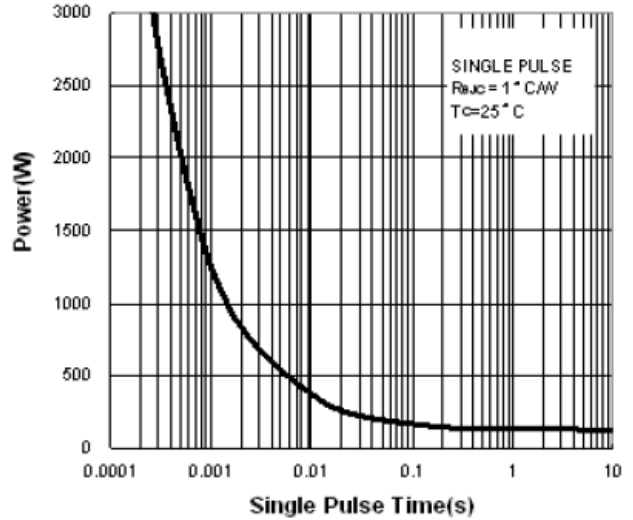
# P0850ATF

## N-Channel Enhancement Mode MOSFET

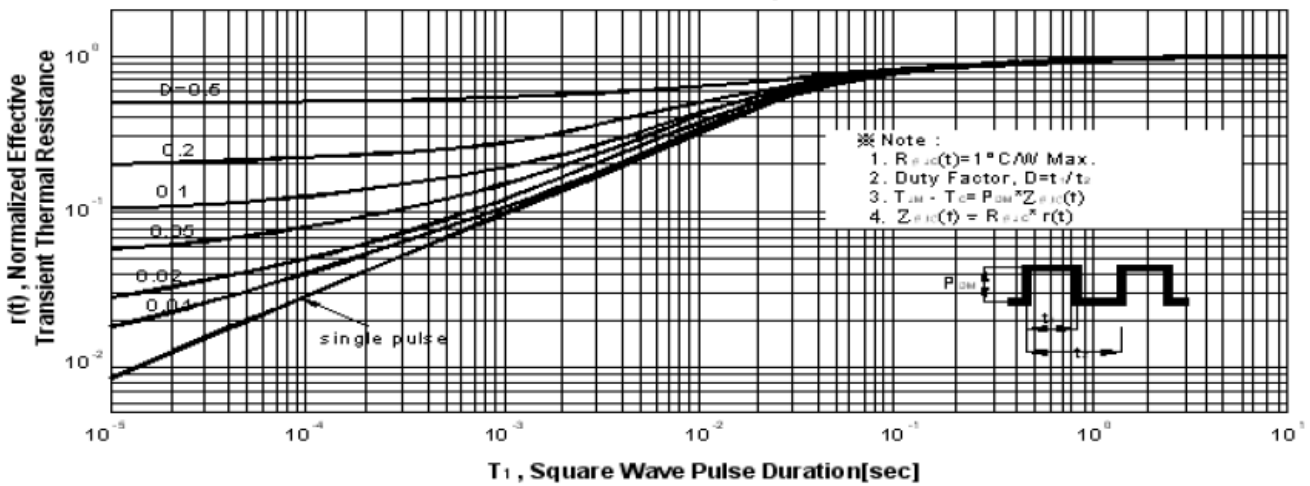
**Safe Operating Area**



**Single Pulse Maximum Power Dissipation**



**Transient Thermal Response Curve**



# P0850ATF

## N-Channel Enhancement Mode MOSFET

### Package Dimension

### TO-220F (3-Lead) MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	4.2		4.93	e	2.05	2.55	3.05
A1	2.34		3.1	F	27.45		30.6
B	17.77		20.3	G	7.72		9.3
b	0.6		1.05	H	6.1		7.1
b1	0.9	1.23	1.62	L	12.5		14.5
b2	0.6		1.9	L1	1.97		3.8
c	0.4		1.0	P	2.98		3.4
D	14.7		16.4	Q	2.1		2.96
D1	6.4		7.5	q	3.0		3.8
E	9.7		10.4				

