



DC COMPONENTS CO., LTD.

DISCRETE SEMICONDUCTORS

IRF840

TECHNICAL SPECIFICATIONS OF N-CHANNEL POWER MOSFET

$V_{DSS} = 500$  Volts

$R_{DS(on)} = 0.8$  Ohm

$I_D = 8.0$  Amperes

Features

- \* Repetitive Avalanche Rated
- \* Fast Switching
- \* Ease of Paralleling
- \* Simple Drive Requirements

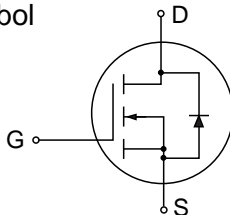
Description

Designed to withstand high energy in the avalanche mode and switch efficiently. Also offer a drain-to-source diode with fast recovery time. Designed for high voltage, high speed applications such as power supplies, PWM motor controls and other inductive loads, the avalanche energy capability is specified to eliminate the guesswork in designs where inductive loads are switched and offer additional safety margin against unexpected voltage transients.

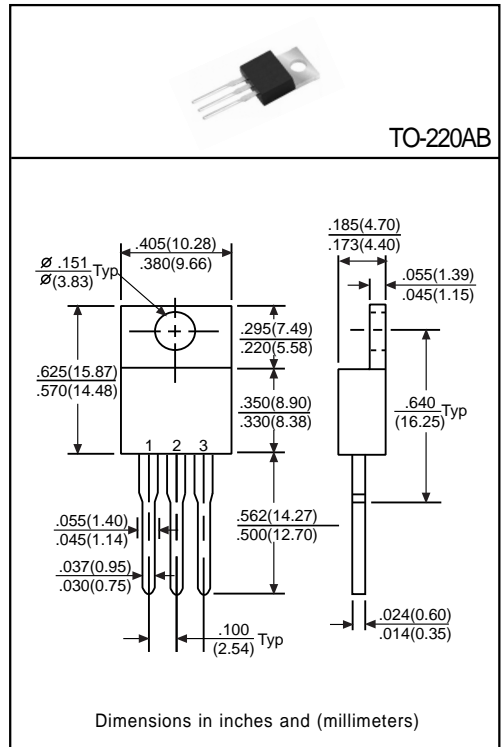
Pinning

- 1 = Gate
- 2 = Drain
- 3 = Source

Symbol



N-Channel MOSFET



Absolute Maximum Ratings

Characteristic	Symbol	Rating	Unit
Drain Current @ $T_c=25^\circ\text{C}$	$I_D$	8.0	A
Continuous Pulsed	$I_{DM}$	32	A
Gate-to-Source Voltage	$V_{GS}$	$\pm 20$	V
Total Power Dissipation @ $T_c=25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	125 1.0	W W/ $^\circ\text{C}$
Operating Junction Temperature	$T_J$	-55 to +150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55 to +150	$^\circ\text{C}$
Maximum Lead Temperature for Soldering Purposes, 1/8" from Case for 10 Seconds	$T_L$	260	$^\circ\text{C}$

Electrical Characteristics ( $T_J = 25^\circ\text{C}$  unless otherwise specified)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions	
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	500	-	-	V	$V_{GS}=0V, I_D=250\mu A$	
Drain-Source Leakage Current	$I_{DSS}$	-	-	0.25	mA	$V_{DS}=500V, V_{GS}=0V$	
		-	-	1.0		$V_{DS}=400V, V_{GS}=0V, T_J=125^\circ\text{C}$	
Gate-Source Forward Leakage Current	$I_{GSSF}$	-	-	100	nA	$V_{GSF}=20V, V_{DS}=0V$	
Gate-Source Reverse Leakage Current	$I_{GSSR}$	-	-	-100		$V_{GSR}=-20V, V_{DS}=0V$	
Gate Threshold Voltage	$V_{GS(th)}$	2.0	-	4.0	V	$V_{DS}=V_{GS}, I_D=250\mu A$	
Static Drain-Source On-Resistance	$R_{DS(on)}$	-	0.6	0.8	$\Omega$	$V_{GS}=10V, I_D=4.0A(\text{Note})$	
Forward Transconductance	$g_{FS}$	4.0	-	-	S	$V_{DS}=15V, I_D=4.0A(\text{Note})$	
Input Capacitance	$C_{iss}$	-	1450	1680	pF	$V_{DS}=25V, V_{GS}=0V, f=1.0\text{MHz}$	
Output Capacitance	$C_{oss}$	-	190	246			
Reverse Transfer Capacitance	$C_{rss}$	-	45.4	144			
Turn-On Delay Time	$t_{d(on)}$	-	15	50	ns	$V_{DD}=250V, I_D=8.0A, V_{GS}=10V, R_G=9.1\Omega(\text{Note})$	
Rise Time	$t_r$	-	33	72			
Turn-Off Delay Time	$t_{d(off)}$	-	40	150			
Fall Time	$t_f$	-	32	60			
Total Gate Charge	$Q_g$	-	40	64	nC	$V_{DS}=400V, I_D=8.0A, V_{GS}=10V(\text{Note})$	
Gate-Source Charge	$Q_{gs}$	-	8.0	-			
Gate-Drain Charge	$Q_{gd}$	-	17	-			
Internal Drain Inductance	$L_D$	-	4.5	-	nH	Measured from the drain lead 0.25" from package to center of die	
Internal Source Inductance	$L_S$	-	7.5	-	nH	Measured from the source lead 0.25" from package to source bond pad	
Diode Forward Voltage	$V_{SD}$	-	1.2	2.0	V	$I_S=8.0A, V_{GS}=0V(\text{Note})$	
Reverse Recovery Time	$t_{rr}$	-	320	-	ns	$I_F=8.0A, di/dt=100A/\mu s(\text{Note})$	
Forward Turn-On Time	$t_{on}$	Intrinsic turn-on time is negligible and dominated by inductance $L_S+L_D$					
Thermal Resistance	Junction to Case	$R_{\theta JC}$	-	-	1.0	$^\circ\text{C/W}$	-
	Junction to Ambient	$R_{\theta JA}$	-	-	62.5		

Note: Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$

