



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

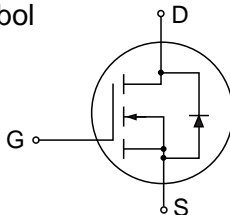
Description

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.

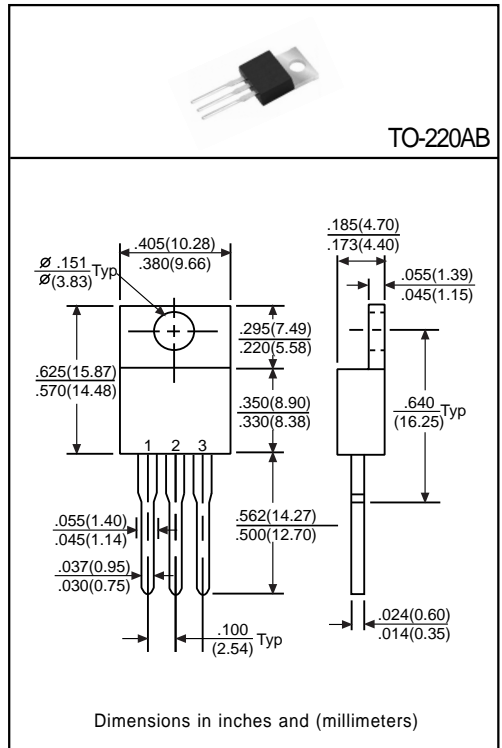
Pinning

- 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}	± 20	V
Total Power Dissipation @ $T_c=25^\circ\text{C}$ Derate above 25°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	Ω	$V_{GS}=10V, I_D=4.0A(\text{Note})$	
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 $\leq 2\%$

