



DC COMPONENTS CO., LTD.

DISCRETE SEMICONDUCTORS

IRF640

TECHNICAL SPECIFICATIONS OF N-CHANNEL POWER MOSFET

$V_{DSS} = 200$  Volts

$R_{DS(ON)} = 0.18$  Ohm

$I_D = 18$  Amperes

Features

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

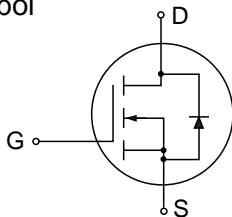
Description

Designed for low voltage, high speed power switching applications such as switching regulators, converters, solenoid and relay drivers.

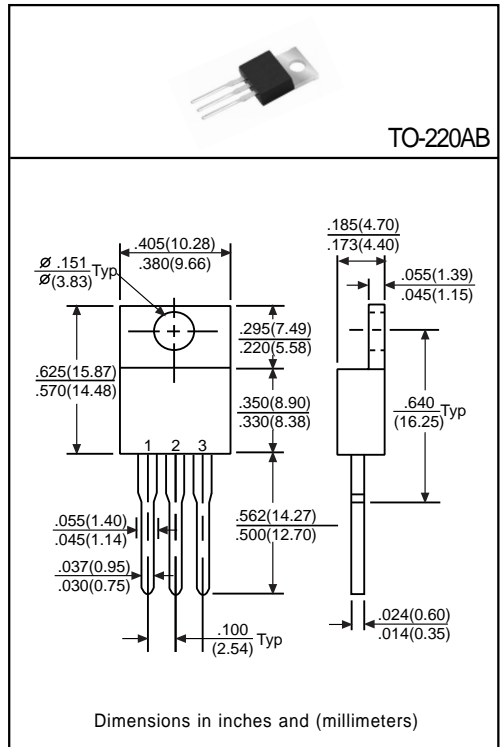
Pinning

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

Symbol



N-Channel MOSFET



Absolute Maximum Ratings

Characteristic	Symbol	Rating	Unit
Drain Current @ $T_c=25^\circ\text{C}$	$I_D$	18	A
Continuous Pulsed	$I_{DM}$	72	A
Gate-to-Source Voltage	$V_{GS}$	$\pm 20$	V
Total Power Dissipation @ $T_c=25^\circ\text{C}$	$P_D$	125	W
Derate above $25^\circ\text{C}$		1.0	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	$V_{(BR)DSS}$	200	-	-	V	$V_{GS}=0V, I_D=250\mu A$	
Drain-Source Leakage Current	$I_{DSS}$	-	-	0.2	mA	$V_{DS}=200V, V_{GS}=0V$	
		-	-	1.0		$V_{DS}=160V, V_{GS}=0V, T_J=125^\circ\text{C}$	
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	$R_{DS(on)}$	-	-	0.18	$\Omega$	$V_{GS}=10V, I_D=10A(\text{Note})$	
Forward Transconductance	$g_{FS}$	6.0	-	-	S	$V_{DS}\geq 3.2V, I_D=10A(\text{Note})$	
Input Capacitance	$C_{iss}$	-	-	1600	pF	$V_{DS}=25V, V_{GS}=0V, f=1.0\text{MHz}$	
Output Capacitance	$C_{oss}$	-	-	750			
Reverse Transfer Capacitance	$C_{rss}$	-	-	300			
Turn-On Delay Time	$t_{d(on)}$	-	-	30	ns	$V_{DD}=30V, I_D=10A, V_{GS}=10V, R_G=4.7\Omega(\text{Note})$	
Rise Time	$t_r$	-	-	60			
Turn-Off Delay Time	$t_{d(off)}$	-	-	80			
Fall Time	$t_f$	-	-	60			
Total Gate Charge	$Q_g$	-	36	63	nC	$V_{DS}=160V, I_D=18A, V_{GS}=10V(\text{Note})$	
Gate-Source Charge	$Q_{gs}$	-	16	-			
Gate-Drain Charge	$Q_{gd}$	-	26	-			
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	$V_{SD}$	-	1.8	2.0	V	$I_S=18A, V_{GS}=0V(\text{Note})$	
Reverse Recovery Time	$t_{rr}$	-	450	-	ns	$I_F=18A, di/dt=100A/\mu s(\text{Note})$	
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  $\leq 2\%$

