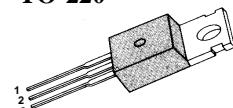


FEATURES

- Avalanche Rugged Technology
- Rugged Gate Oxide Technology
- Lower Input Capacitance
- Improved Gate Charge
- Extended Safe Operating Area
- Lower Leakage Current : 10 μ A (Max.) @ $V_{DS} = 200V$
- Low $R_{DS(ON)}$: 0.626 Ω (Typ.)

 $BV_{DSS} = 200 \text{ V}$
 $R_{DS(on)} = 0.8 \Omega$
 $I_D = 5 \text{ A}$
TO-220


1.Gate 2. Drain 3. Source

Absolute Maximum Ratings

Symbol	Characteristic	Value	Units
V_{DSS}	Drain-to-Source Voltage	200	V
I_D	Continuous Drain Current ($T_C=25^\circ\text{C}$)	5	A
	Continuous Drain Current ($T_C=100^\circ\text{C}$)	3.2	
I_{DM}	Drain Current-Pulsed	① 18	A
V_{GS}	Gate-to-Source Voltage	± 30	V
E_{AS}	Single Pulsed Avalanche Energy	② 67	mJ
I_{AR}	Avalanche Current	① 5	A
E_{AR}	Repetitive Avalanche Energy	① 4.7	mJ
dv/dt	Peak Diode Recovery dv/dt	③ 5.0	V/ns
P_D	Total Power Dissipation ($T_C=25^\circ\text{C}$)	47	W
	Linear Derating Factor	0.38	$\text{W}/^\circ\text{C}$
T_J, T_{STG}	Operating Junction and Storage Temperature Range	- 55 to +150	$^\circ\text{C}$
	Maximum Lead Temp. for Soldering Purposes, 1/8 " from case for 5-seconds	300	

Thermal Resistance

Symbol	Characteristic	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	--	2.65	$^\circ\text{C}/\text{W}$
$R_{\theta CS}$	Case-to-Sink	0.5	--	
$R_{\theta JA}$	Junction-to-Ambient	--	62.5	

IRF620A

N-CHANNEL
POWER MOSFET

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

Symbol	Characteristic	Min.	Typ.	Max.	Units	Test Condition
BV_{DSS}	Drain-Source Breakdown Voltage	200	--	--	V	$\text{V}_{\text{GS}}=0\text{V}, \text{I}_D=250\mu\text{A}$
$\Delta \text{BV}/\Delta T_J$	Breakdown Voltage Temp. Coeff.	--	0.24	--	$\text{V}/^\circ\text{C}$	$\text{I}_D=250\mu\text{A}$ See Fig 7
$\text{V}_{\text{GS(th)}}$	Gate Threshold Voltage	2.0	--	4.0	V	$\text{V}_{\text{DS}}=5\text{V}, \text{I}_D=250\mu\text{A}$
I_{GSS}	Gate-Source Leakage , Forward	--	--	100	nA	$\text{V}_{\text{GS}}=30\text{V}$
	Gate-Source Leakage , Reverse	--	--	-100		$\text{V}_{\text{GS}}=-30\text{V}$
I_{DSS}	Drain-to-Source Leakage Current	--	--	10	μA	$\text{V}_{\text{DS}}=200\text{V}$
		--	--	100		$\text{V}_{\text{DS}}=160\text{V}, \text{T}_C=125^\circ\text{C}$
$\text{R}_{\text{DS(on)}}$	Static Drain-Source On-State Resistance	--	--	0.8	Ω	$\text{V}_{\text{GS}}=10\text{V}, \text{I}_D=2.5\text{A}$ ④
g_{fs}	Forward Transconductance	--	2.41	--	Ω	$\text{V}_{\text{DS}}=40\text{V}, \text{I}_D=2.5\text{A}$ ④
C_{iss}	Input Capacitance	--	275	360	pF	$\text{V}_{\text{GS}}=0\text{V}, \text{V}_{\text{DS}}=25\text{V}, f=1\text{MHz}$ See Fig 5
C_{oss}	Output Capacitance	--	55	65		
C_{rss}	Reverse Transfer Capacitance	--	25	30		
$t_{\text{d(on)}}$	Turn-On Delay Time	--	10	30	ns	$\text{V}_{\text{DD}}=100\text{V}, \text{I}_D=5\text{A}, \text{R}_G=18\Omega$ See Fig 13 ④ ⑤
t_r	Rise Time	--	11	30		
$t_{\text{d(off)}}$	Turn-Off Delay Time	--	26	60		
t_f	Fall Time	--	15	40		
Q_g	Total Gate Charge	--	12	17	nC	$\text{V}_{\text{DS}}=160\text{V}, \text{V}_{\text{GS}}=10\text{V}, \text{I}_D=5\text{A}$ See Fig 6 & Fig 12 ④ ⑤
Q_{gs}	Gate-Source Charge	--	2.4	--		
Q_{gd}	Gate-Drain("Miller") Charge	--	6.2	--		

Source-Drain Diode Ratings and Characteristics

Symbol	Characteristic	Min.	Typ.	Max.	Units	Test Condition
I_S	Continuous Source Current	--	--	5	A	Integral reverse pn-diode in the MOSFET
I_{SM}	Pulsed-Source Current ①	--	--	18		
V_{SD}	Diode Forward Voltage ④	--	--	1.5	V	$\text{T}_J=25^\circ\text{C}, \text{I}_S=5\text{A}, \text{V}_{\text{GS}}=0\text{V}$
t_{rr}	Reverse Recovery Time	--	122	--	ns	$\text{T}_J=25^\circ\text{C}, \text{I}_F=5\text{A}$ $d\text{I}_F/dt=100\text{A}/\mu\text{s}$ ④
Q_{rr}	Reverse Recovery Charge	--	0.51	--		

Notes :

- ① Repetitive Rating : Pulse Width Limited by Maximum Junction Temperature
- ② $L=4\text{mH}, \text{I}_{AS}=5\text{A}, \text{V}_{DD}=50\text{V}, \text{R}_G=27\Omega$, Starting $\text{T}_J=25^\circ\text{C}$
- ③ $\text{I}_{SD} \leq 5\text{A}, d\text{I}/dt \leq 180\text{A}/\mu\text{s}, \text{V}_{DD} \leq \text{BV}_{DSS}$, Starting $\text{T}_J=25^\circ\text{C}$
- ④ Pulse Test : Pulse Width = $250\mu\text{s}$, Duty Cycle $\leq 2\%$
- ⑤ Essentially Independent of Operating Temperature

**N-CHANNEL
POWER MOSFET**

IRF620A

Fig 1. Output Characteristics

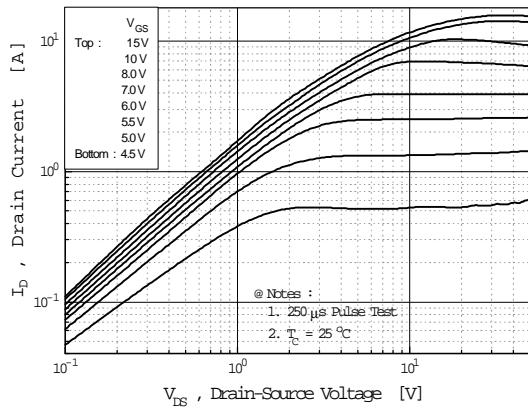


Fig 2. Transfer Characteristics

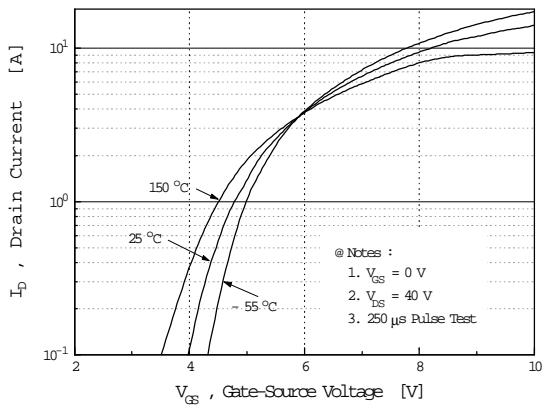


Fig 3. On-Resistance vs. Drain Current

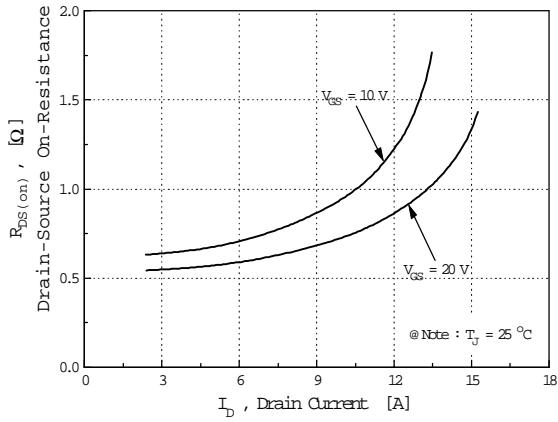


Fig 4. Source-Drain Diode Forward Voltage

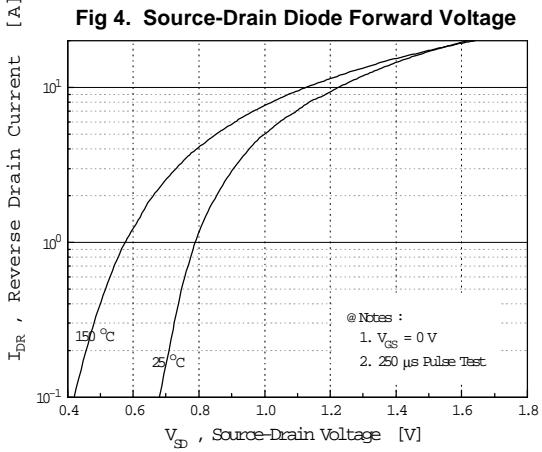


Fig 5. Capacitance vs. Drain-Source Voltage

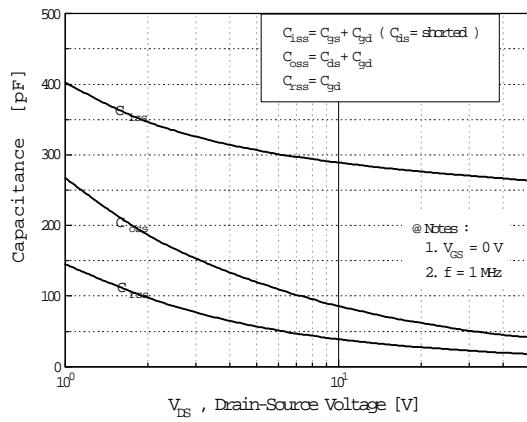


Fig 6. Gate Charge vs. Gate-Source Voltage

