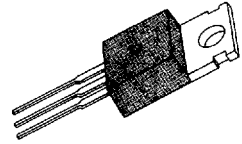


FEATURES

- Lower $R_{DS(on)}$
- Improved inductive ruggedness
- Fast switching times
- Rugged polysilicon gate cell structure
- Lower input capacitance
- Extended safe operating area
- Improved high temperature reliability

TO-220



IRF9620/9621/9622/9623

PRODUCT SUMMARY

Part Number	V_{DS}	$R_{DS(on)}$	I_D
IRF9620	-200V	1.5 Ω	-3.5A
IRF9621	-150V	1.5 Ω	-3.5A
IRF9622	-200V	2.4 Ω	-3.0A
IRF9623	-150V	2.4 Ω	-3.0A

MAXIMUM RATINGS

Characteristic	Symbol	IRF9620	IRF9621	IRF9622	IRF9623	Unit
Drain-Source Voltage (1)	V_{DSS}	-200	-150	-200	-150	Vdc
Drain-Gate Voltage ($R_{GS}=1.0M\Omega$)(1)	V_{DGR}	-200	-150	-200	-150	Vdc
Gate-Source Voltage	V_{GS}	± 20				Vdc
Continuous Drain Current $T_C=25^\circ C$	I_D	-3.5	-3.5	-3.0	-3.0	Adc
Continuous Drain Current $T_C=100^\circ C$	I_D	-2.0	-2.0	-1.5	-1.5	Adc
Drain Current—Pulsed (3)	I_{DM}	-14	-14	-12	-12	Adc
Gate Current—Pulsed	I_{GM}	± 1.5				Adc
Single Pulsed Avalanche Energy (4)	E_{AS}	270				mJ
Avalanche Current	I_{AS}	-3.5				A
Total Power Dissipation @ $T_C=25^\circ C$ Derate above $25^\circ C$	P_D	40 0.32				Watts W/ $^\circ C$
Operating and Storage Junction to Case	T_J, T_{stg}	-55 to 150				$^\circ C$
Maximum Lead Temp. for Soldering Purposes, 1/8" from case for 5 seconds	T_L	300				$^\circ C$

- Notes:** (1) $T_J=25^\circ C$ to $150^\circ C$
 (2) Pulse test: Pulse width $\leq 300\mu s$, Duty Cycle $\leq 2\%$
 (3) Repetitive rating: Pulse with limited by max. junction temperature
 (4) $L=35mH$, $V_{dd}=-50V$, $R_G=25\Omega$, Starting $T_J=25^\circ C$

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


Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
BV _{DSS}	Drain-Source Breakdown Voltage IRF9620 IRF9622	-200	—	—	V	V _{GS} =0V I _D =-250μA
	IRF9621 IRF9623	-150	—	—	V	
V _{GS(th)}	Gate Threshold Voltage	2.0	—	4.0	V	V _{DS} =V _{GS} , I _D =-250μA
I _{GSS}	Gate-Source Leakage Forward	—	—	100	nA	V _{GS} =-20V
I _{GSS}	Gate-Source Leakage Reverse	—	—	-100	nA	V _{GS} =20V
I _{DSS}	Zero Gate Voltage Drain Current	—	—	250	μA	V _{DS} =Max. Rating, V _{GS} =0V
		—	—	1000	μA	V _{DS} =Max. Rating×0.8, V _{GS} =0V, T _C =125°C
I _{D(on)}	On-State Drain-Source Current (2) IRF9620 IRF9621	-3.5	—	—	A	V _{DS} ≤-8.4V, V _{GS} =-10V
	IRF9622 IRF9623	-3.0	—	—	A	
R _{DS(on)}	Static Drain-Source On-State Resistance (2) IRF9620 IRF9621	—	—	1.5	Ω	V _{GS} =-10V, I _D =-1.5A
	IRF9622 IRF9623	—	—	2.4	Ω	
g _{fs}	Forward Transconductance (2)	1.0	—	—	∅	V _{DS} ≤-50V, I _D =-1.5A
C _{iss}	Input Capacitance	—	405	—	pF	V _{GS} =0V, V _{DS} =-25V, f=1.0MHz
C _{oss}	Output Capacitance	—	85.5	—	pF	
C _{rss}	Reverse Transfer Capacitance	—	27	—	pF	
t _{d(on)}	Turn-On Delay Time	—	—	40	ns	V _{DD} =0.5BV _{DSS} , I _D =-1.5A, Z _O =50Ω (MOSFET switching times are essentially independent of operating temperature)
t _r	Rise Time	—	—	50	ns	
t _{d(off)}	Turn-Off Delay Time	—	—	50	ns	
t _f	Fall Time	—	—	40	ns	
Q _g	Total Gate Charge (Gate-Source Plus Gate-Drain)	—	—	22	nC	V _{GS} =-15V, I _D =-4.0A, V _{DS} =0.8 Max. Rating (Gate charge is essentially independent of operating temperature)
Q _{gs}	Gate-Source Charge	—	—	9	nC	
Q _{gd}	Gate-Drain ("Miller") Charge	—	—	13	nC	

THERMAL RESISTANCE

Symbol	Characteristic		IRF9620-3	Unit	
R _{thJC}	Junction-to-Case	MAX	3.12	K/W	
R _{thCS}	Case-to-Sink	TYP	1.0	K/W	Mounting surface flat, smooth, and greased
R _{thJA}	Junction-to-Ambient	MAX	80	K/W	Free Air Operation

- Notes:** (1) T_J=25°C to 150°C
 (2) Pulse test: Pulse width≤300μs, Duty Cycle≤2%
 (3) Repetitive rating Pulse width limited by max junction temperature

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
I _S	Continuous Source Current (Body Diode) IRF9620 IRF9621	—	—	-3.5	A	Modified MOSFET symbol showing the integral reverse P-N junction rectifier 
	IRF9622 IRF9623	—	—	-3.0	A	
I _{SM}	Pulse Source Current(Body Diode)(3) IRF9620 IRF9621	—	—	-14	A	
	IRF9622 IRF9623	—	—	-12	A	
V _{SD}	Diode Forward Voltage (2) IRF9620 IRF9621	—	—	-7.0	V	T _C =25°C, I _S =-3.5A, V _{GS} =0V
	IRF9622 IRF9623	—	—	-6.0	V	T _C =25°C, I _S =-3.0A, V _{GS} =0V
t _{rr}	Reverse Recovery Time	—	300	—	ns	T _J =150°C, I _F =-3.5A, dI _F /dt=100A/μS

Notes: (1) T_J=25°C to 150°C (2) Pulse test: Pulse width≤300μs, Duty Cycle≤2%
(3) Repetitive rating. Pulse with limited by max junction temperature

