

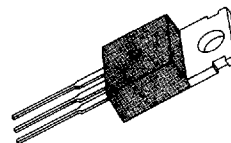
IRF9620/9621/9622/9623

P-CHANNEL
POWER MOSFETS

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_{DS}	-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 $T_J=25^\circ C$

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POWER MOSFETSELECTRICAL 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	-200	—	—	V	V _{GS} =0V I _D =-250 μ A
	IRF9622	—	—	—	—	
	IRF9621	-150	—	—	V	
	IRF9623	—	—	—	—	
V _{GS(th)}	Gate Threshold Voltage	2.0	—	4.0	V	V _{DS} =V _{GS} , I _D =-250 μ A
I _{GSS}	Gate-Source Leakage Forward	—	—	100	nA	V _{GS} =-20V
I _{GSS}	Gate-Source Leakage Reverse	—	—	-100	nA	V _{GS} =20V
I _{OSS}	Zero Gate Voltage Drain Current	—	—	250	μ A	V _{DS} =Max. Rating, V _{GS} =0V
		—	—	1000	μ A	V _{DS} =Max. Rating $\times$ 0.8, V _{GS} =0V, T _C =125 $^\circ$ C
I _{D(on)}	On-State Drain-Source Current (2) IRF9620	-3.5	—	—	A	V _{DS} $\leq$ -8.4V, V _{GS} =-10V
	IRF9621	—	—	—	—	
	IRF9622	-3.0	—	—	A	
	IRF9623	—	—	—	—	
R _{DS(on)}	Static Drain-Source On-State Resistance (2) IRF9620	—	—	1.5	Ω	V _{GS} =-10V, I _D =-1.5A
	IRF9621	—	—	—	—	
	IRF9622	—	—	2.4	Ω	
	IRF9623	—	—	—	—	
g _{fs}	Forward Transconductance (2)	1.0	—	—	μ	V _{DS} $\leq$ -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 =50 Ω (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

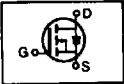
Notes: (1) T_J=25 $^\circ$ C to 150 $^\circ$ C(2) Pulse test: Pulse width $\leq$ 300 μ s, Duty Cycle $\leq$ 2%

(3) Repetitive rating: Pulse width limited by max. junction temperature

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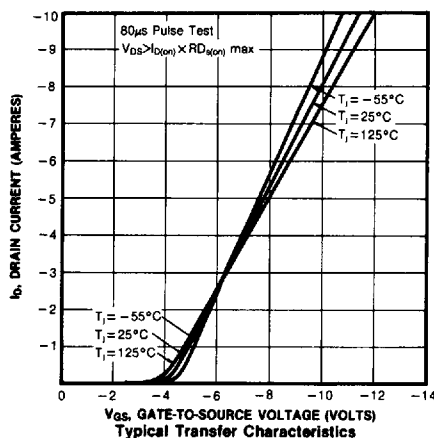
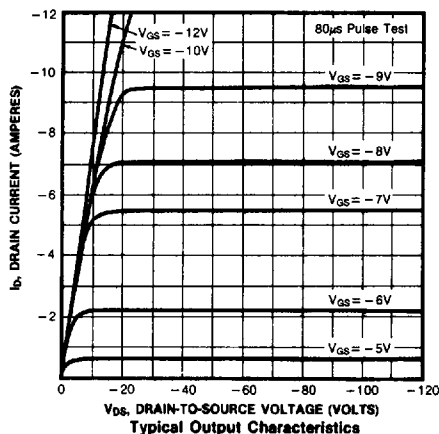
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SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

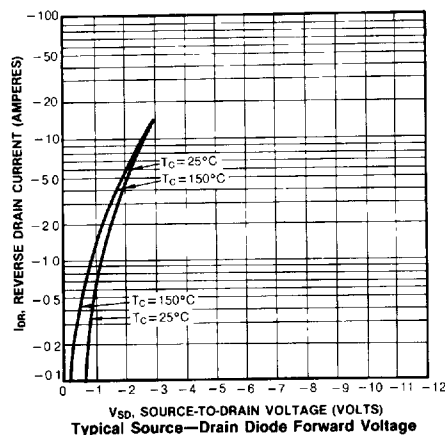
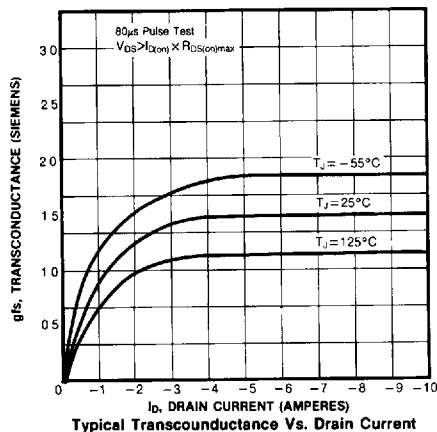
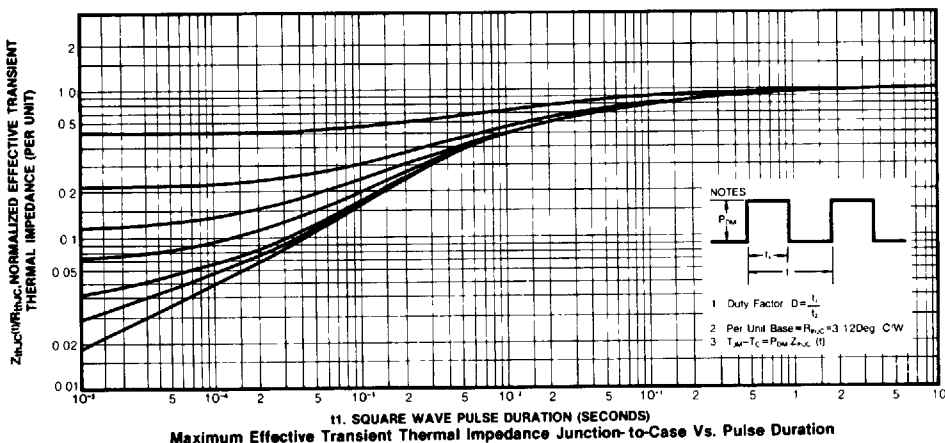
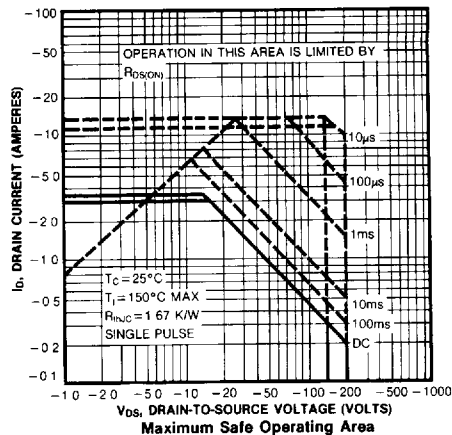
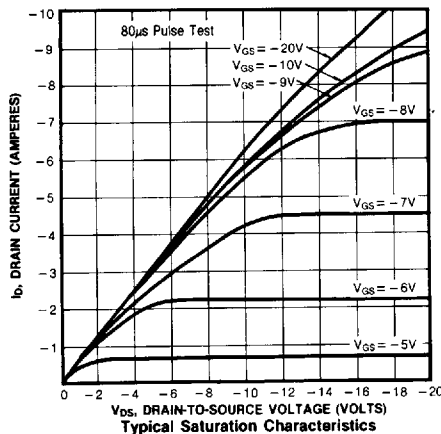
Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
I_S	Continuous Source Current (Body Diode) IRF9620 IRF9621	—	—	-3.5	A	Modified MOSFET symbol showing the integral reverse P-N junction rectifier 
	IRF9622 IRF9623	—	—	-3.0	A	
I_{SM}	Pulse Source Current(Body Diode)(3) IRF9620 IRF9621	—	—	-14	A	
	IRF9622 IRF9623	—	—	-12	A	
V_{SD}	Diode Forward Voltage (2) IRF9620 IRF9621	—	—	-7.0	V	$T_C = 25^\circ\text{C}$, $I_S = -3.5\text{A}$, $V_{GS} = 0\text{V}$
	IRF9622 IRF9623	—	—	-6.0	V	$T_C = 25^\circ\text{C}$, $I_S = -3.0\text{A}$, $V_{GS} = 0\text{V}$
t_{rr}	Reverse Recovery Time	—	300	—	ns	$T_J = 150^\circ\text{C}$, $I_F = -3.5\text{A}$, $dI_F/dt = 100\text{A}/\mu\text{s}$

Notes: (1) $T_J = 25^\circ\text{C}$ to 150°C (2) Pulse test: Pulse width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$

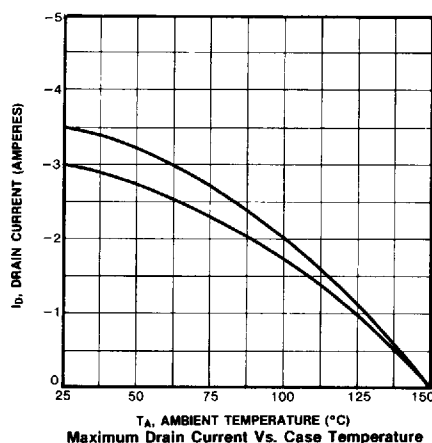
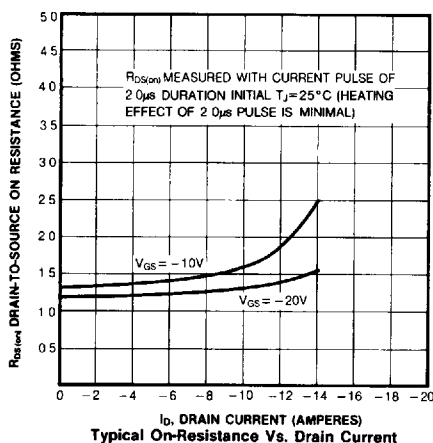
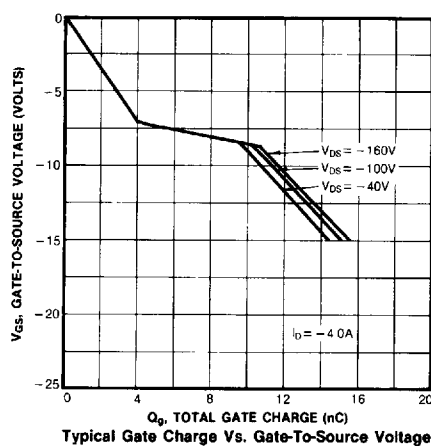
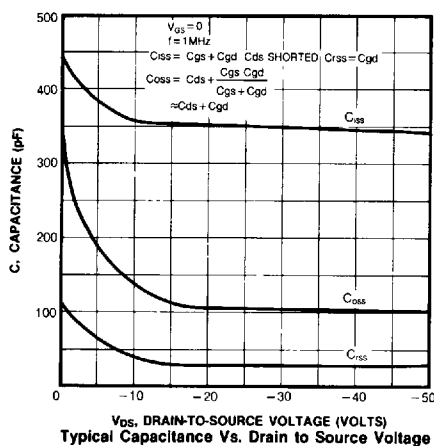
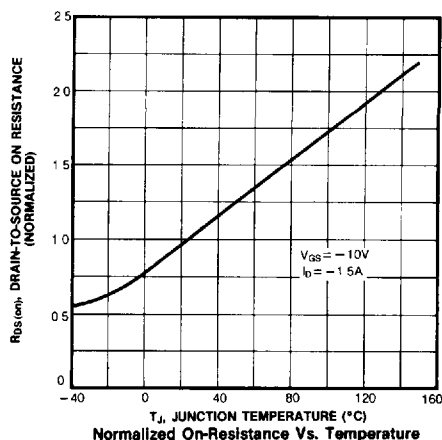
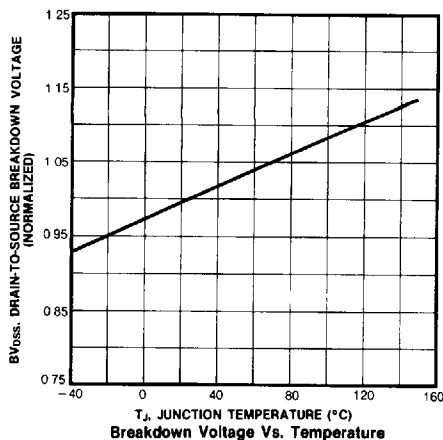
(3) Repetitive rating. Pulse with limited by max junction temperature



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