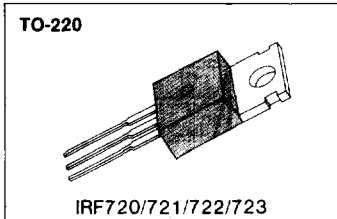


**FEATURES**

- 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



**PRODUCT SUMMARY**

Part Number	V <sub>DS</sub>	R <sub>DS(on)</sub>	I <sub>D</sub>
IRF720	400V	1.8Ω	3.3A
IRF721	350V	1.8Ω	3.3A
IRF722	400V	2.5Ω	2.8A
IRF723	350V	2.5Ω	2.8A

Datasheet.Directory

**MAXIMUM RATINGS**

Characteristics	Symbol	IRF720	IRF721	IRF722	IRF723	Unit
Drain-Source Voltage (1)	V <sub>DSS</sub>	400	350	400	350	Vdc
Drain-Gate Voltage (R <sub>GS</sub> =1.0MΩ)(1)	V <sub>DGR</sub>	400	350	400	350	Vdc
Gate-Source Voltage	V <sub>GS</sub>	±20				Vdc
Continuous Drain Current T <sub>C</sub> =25°C	I <sub>D</sub>	3.3	3.3	2.8	2.8	Adc
Continuous Drain Current T <sub>C</sub> =100°C	I <sub>D</sub>	2.1	2.1	1.8	1.8	Adc
Drain Current—Pulsed (3)	I <sub>DM</sub>	13	13	11	11	Adc
Gate Current—Pulsed	I <sub>GM</sub>	±1.5				Adc
Single Pulsed Avalanche Energy (4)	E <sub>AS</sub>	190				mJ
Avalanche Current	I <sub>AS</sub>	3.3				A
Total Power Dissipation @ T <sub>C</sub> =25°C Derate above 25°C	P <sub>D</sub>	50 0.40				Watts W/°C
Operating and Storage Junction to Case	T <sub>J</sub> , T <sub>stg</sub>	-55 to 150				°C
Maximum Lead Temp. for Soldering Purposes, 1/8" from case for 5 seconds	T <sub>L</sub>	300				°C

- Notes:** (1) T<sub>J</sub>=25°C to 150°C  
 (2) Pulse test: Pulse width≤300μs, Duty Cycle≤2%  
 (3) Repetitive rating: Pulse with limited by max. junction temperature  
 (4) L=31 mH, V<sub>dd</sub>=50V, R<sub>G</sub>=25Ω, Starting T<sub>J</sub>=25°C

## ELECTRICAL CHARACTERISTICS (T<sub>C</sub>=25°C unless otherwise specified)

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage IRF720 IRF722	400	—	—	V	V <sub>GS</sub> =0V I <sub>D</sub> =250μA
	IRF721 IRF723	350	—	—	V	
V <sub>GS(th)</sub>	Gate Threshold Voltage	2.0	—	4.0	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA
I <sub>GSS</sub>	Gate-Source Leakage Forward	—	—	100	nA	V <sub>GS</sub> =20V
I <sub>GSS</sub>	Gate-Source Leakage Reverse	—	—	-100	nA	V <sub>GS</sub> =-20V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	—	—	250	μA	V <sub>DS</sub> =Max. Rating, V <sub>GS</sub> =0V
		—	—	1000	μA	V <sub>DS</sub> =Max. Rating×0.8, V <sub>GS</sub> =0V, T <sub>C</sub> =125°C
I <sub>D(on)</sub>	On-State Drain-Source Current (2) IRF720 IRF721	3.3	—	—	A	V <sub>DS</sub> ≥8.2V, V <sub>GS</sub> =10V
	IRF722 IRF723	2.8	—	—	A	
R <sub>DS(on)</sub>	Static Drain-Source On-State Resistance (2) IRF720 IRF721	—	1.4	1.8	Ω	V <sub>GS</sub> =10V, I <sub>D</sub> =1.8A
	IRF722 IRF723	—	1.8	2.5	Ω	
g <sub>fs</sub>	Forward Transconductance (2)	1.0	2.2	—	Ω	V <sub>DS</sub> ≥50V, I <sub>D</sub> =1.8A
C <sub>iss</sub>	Input Capacitance	—	400	—	pF	V <sub>GS</sub> =0V, V <sub>DS</sub> =25V, f=1.0MHz
C <sub>oss</sub>	Output Capacitance	—	59.3	—	pF	
C <sub>rss</sub>	Reverse Transfer Capacitance	—	27	—	pF	
t <sub>d(on)</sub>	Turn-On Delay Time	—	10	15	ns	V <sub>DD</sub> =0.5BV <sub>DSS</sub> , I <sub>D</sub> =3.3A, Z <sub>O</sub> =18Ω (MOSFET switching times are essentially independent of operating temperature)
t <sub>r</sub>	Rise Time	—	14	20	ns	
t <sub>d(off)</sub>	Turn-Off Delay Time	—	30	45	ns	
t <sub>f</sub>	Fall Time	—	13	20	ns	
Q <sub>g</sub>	Total Gate Charge (Gate-Source Plus Gate-Drain)	—	12.5	15	nC	V <sub>GS</sub> =10V, I <sub>D</sub> =9.2A, V <sub>DS</sub> =0.8 Max. Rating (Gate charge is essentially independent of operating temperature.)
Q <sub>gs</sub>	Gate-Source Charge	—	2.8	—	nC	
Q <sub>gd</sub>	Gate-Drain ("Miller") Charge	—	9.7	—	nC	

## THERMAL RESISTANCE

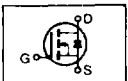
Symbol	Characteristic		IRF720-3	Unit	
R <sub>thJC</sub>	Junction-to-Case	MAX	2.5	K/W	
R <sub>thCS</sub>	Case-to-Sink	TYP	0.5	K/W	Mounting surface flat, smooth, and greased
R <sub>thJA</sub>	Junction-to-Ambient	MAX	80	K/W	Free Air Operation

Notes: (1) T<sub>J</sub>=25°C to 150°C

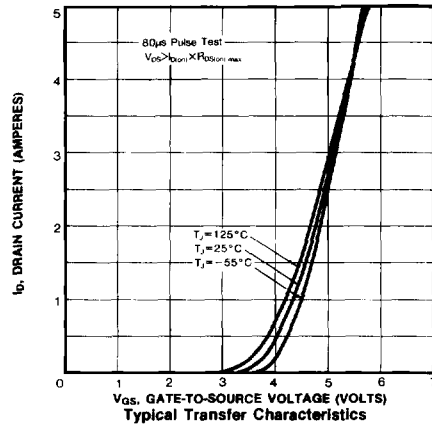
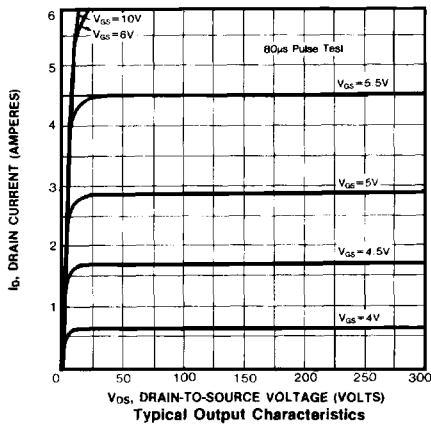
(2) Pulse test: Pulse width≤300μs, Duty Cycle≤2%

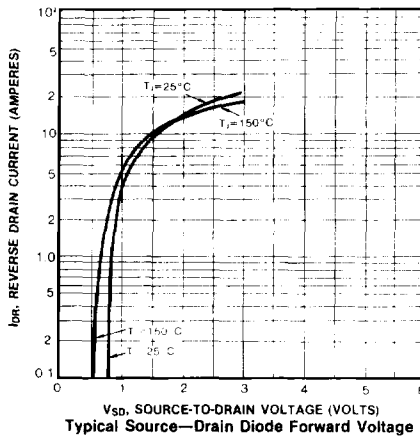
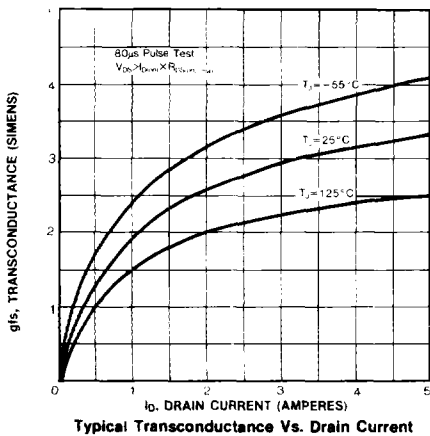
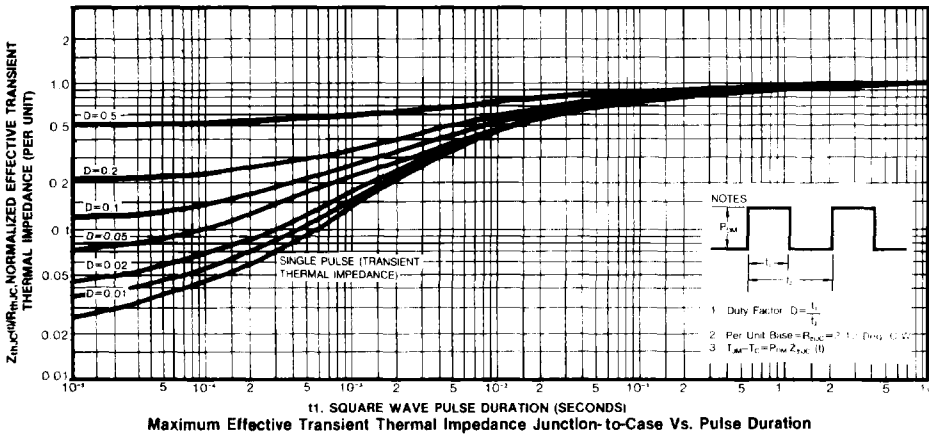
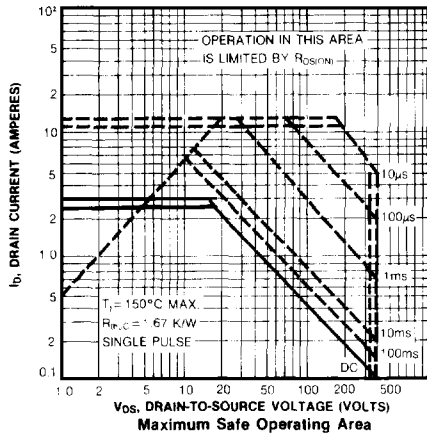
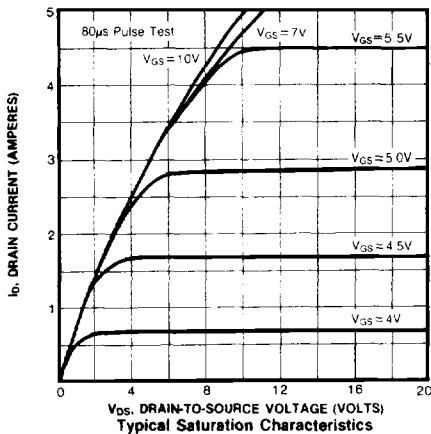
(3) Repetitive rating: Pulse width limited by max. junction temperature

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

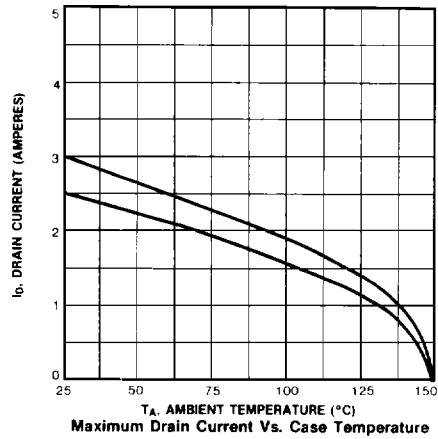
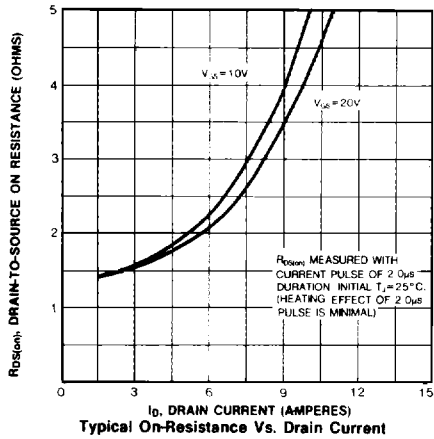
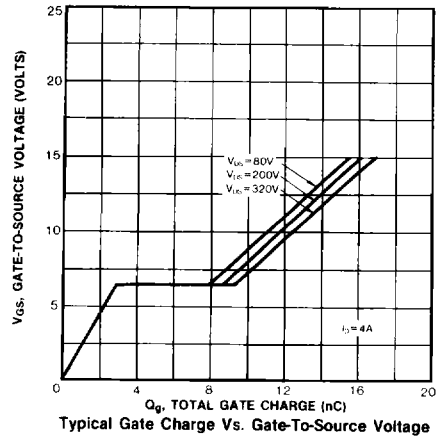
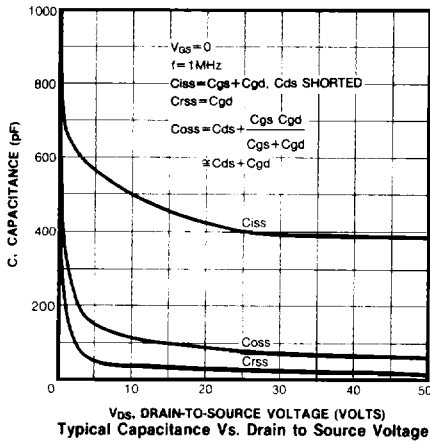
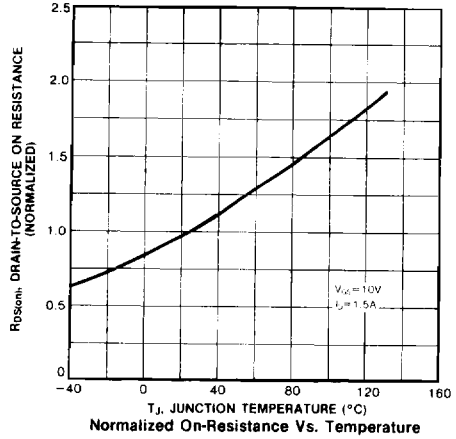
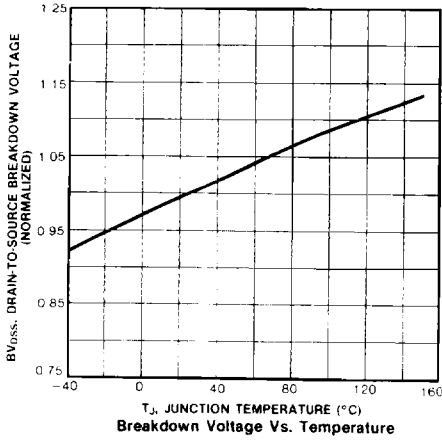
Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
I <sub>S</sub>	Continuous Source Current (Body Diode) IRF720 IRF721	—	—	3.3	A	Modified MOSFET symbol showing the integral reverse P-N junction rectifier 
	IRF722 IRF723	—	—	2.8	A	
I <sub>SM</sub>	Pulse Source Current(Body Diode)(3) IRF720 IRF721	—	—	13	A	
	IRF722 IRF723	—	—	11	A	
V <sub>SD</sub>	Diode Forward Voltage (2) IRF720 IRF721	—	—	1.8	V	T <sub>C</sub> =25°C, I <sub>S</sub> =3.3A, V <sub>GS</sub> =0V
	IRF722 IRF723	—	—	1.7	V	T <sub>C</sub> =25°C, I <sub>S</sub> =2.8A, V <sub>GS</sub> =0V
	t <sub>rr</sub>	Reverse Recovery Time	—	270	ns	T <sub>J</sub> =25°C, I <sub>F</sub> =3.3A, dI <sub>F</sub> /dt=100A/μS

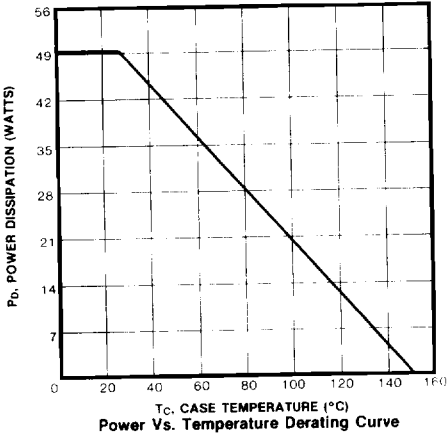
Notes: (1) T<sub>J</sub>=25°C to 150°C (2) Pulse test: Pulse width<300μs, Duty Cycle<2%  
(3) Repetitive rating: Pulse with limited by max. junction temperature





2





2