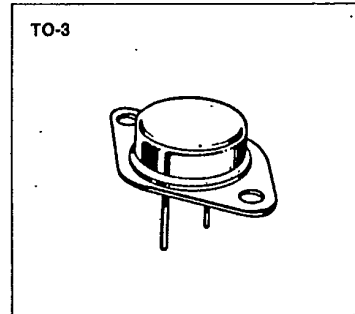


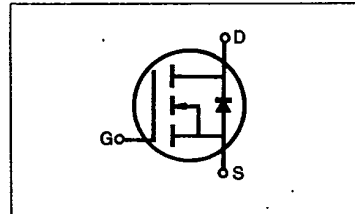
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**IRF150/151/152/153****N-CHANNEL  
POWER MOSFETS****FEATURES**

- Low  $R_{DS(on)}$
- Improved inductive ruggedness
- Fast switching times
- Rugged polysilicon gate cell structure
- Low input capacitance
- Extended safe operating area
- Improved high temperature reliability
- TO-3 package (High current)

**PRODUCT SUMMARY**

Part Number	V <sub>DS</sub>	R <sub>DS(on)</sub>	I <sub>D</sub>
IRF150	100V	0.055Ω	40A
IRF151	60V	0.055Ω	40A
IRF152	100V	0.08Ω	33A
IRF153	60V	0.08Ω	33A

**MAXIMUM RATINGS**

Characteristic	Symbol	IRF150	IRF151	IRF152	IRF153	Unit
Drain-Source Voltage (1)	V <sub>DSS</sub>	100	60	100	60	V <sub>dc</sub>
Drain-Gate Voltage (R <sub>GS</sub> =1.0MΩ) (1)	V <sub>DGR</sub>	100	60	100	60	V <sub>dc</sub>
Gate-Source Voltage	V <sub>GS</sub>	±20				V <sub>dc</sub>
Continuous Drain Current T <sub>C</sub> =25°C	I <sub>D</sub>	40	40	33	33	A <sub>dc</sub>
Continuous Drain Current T <sub>C</sub> =100°C	I <sub>D</sub>	25	25	20	20	A <sub>dc</sub>
Drain Current—Pulsed (3)	I <sub>DM</sub>	160	160	132	132	A <sub>dc</sub>
Gate Current—Pulsed	I <sub>GM</sub>	±1.5				A <sub>dc</sub>
Total Power Dissipation @ T <sub>C</sub> =25°C Derate above 25°C	P <sub>D</sub>	150 1.2				Watts W/°C
Operating and Storage Junction Temperature Range	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 width limited by max. junction temperature

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## IRF150/151/152/153

N-CHANNEL  
POWER MOSFETSELECTRICAL CHARACTERISTICS (T<sub>C</sub>=25°C unless otherwise specified)

Characteristic	Symbol	Type	Min	Typ	Max	Units	Test Conditions
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	IRF150 IRF152	100	—	—	V	V <sub>GS</sub> =0V
		IRF151 IRF153	60	—	—	V	I <sub>D</sub> =250μA
Gate Threshold Voltage	V <sub>GS(th)</sub>	ALL	2.0	—	4.0	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA
Gate-Source Leakage Forward	I <sub>GSS</sub>	ALL	—	—	100	nA	V <sub>GS</sub> =20V
Gate-Source Leakage Reverse	I <sub>GSS</sub>	ALL	—	—	-100	nA	V <sub>GS</sub> =-20V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	ALL	—	—	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
On-State Drain-Source Current (2)	I <sub>D(on)</sub>	IRF150 IRF151	40	—	—	A	V <sub>DS</sub> >I <sub>D(on)</sub> ×R <sub>DS(on)</sub> max., V <sub>GS</sub> =10V
		IRF152 IRF153	33	—	—	A	
Static Drain-Source On-State Resistance (2)	R <sub>DS(on)</sub>	IRF150 IRF151	—	0.04	0.055	Ω	V <sub>GS</sub> =10V, I <sub>D</sub> =20A
		IRF152 IRF153	—	0.06	0.08	Ω	
Forward Transconductance (2)	g <sub>fs</sub>	ALL	9.0	12.3	—	Ω	V <sub>DS</sub> >I <sub>D(on)</sub> ×R <sub>DS(on)</sub> max., I <sub>D</sub> =20A
Input Capacitance	C <sub>iss</sub>	ALL	—	2900	3000	pF	
Output Capacitance	C <sub>oss</sub>	ALL	—	1050	1500	pF	V <sub>GS</sub> =0V, V <sub>DS</sub> =25V, f=1.0MHz
Reverse Transfer Capacitance	C <sub>rss</sub>	ALL	—	450	500	pF	
Turn-On Delay Time	t <sub>d(on)</sub>	ALL	—	—	35	ns	V <sub>DD</sub> =0.5BV <sub>DSS</sub> , I <sub>D</sub> =20A, Z <sub>O</sub> =4.7Ω (MOSFET switching times are essentially independent of operating temperature.)
Rise Time	t <sub>r</sub>	ALL	—	—	100	ns	
Turn-Off Delay Time	t <sub>d(off)</sub>	ALL	—	—	125	ns	
Fall Time	t <sub>f</sub>	ALL	—	—	100	ns	
Total Gate Charge (Gate-Source Plus Gate-Drain)	Q <sub>g</sub>	ALL	—	72	120	nC	V <sub>GS</sub> =10V, I <sub>D</sub> =50A, V <sub>DS</sub> =0.8 Max. Rating (Gate charge is essentially independent of operating temperature.)
Gate-Source Charge	Q <sub>gs</sub>	ALL	—	18	—	nC	
Gate-Drain ("Miller") Charge	Q <sub>gd</sub>	ALL	—	54	—	nC	

## THERMAL RESISTANCE

Junction-to-Case	R <sub>thJC</sub>	ALL	—	—	0.83	K/W	
Case-to-Sink	R <sub>thCS</sub>	ALL	—	0.1	—	K/W	Mounting surface flat, smooth, and greased
Junction-to-Ambient	R <sub>thJA</sub>	ALL	—	—	30	K/W	Free Air Operation

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

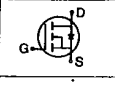
(2) Pulse test: Pulse width≤300μs, Duty Cycle≤2%

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

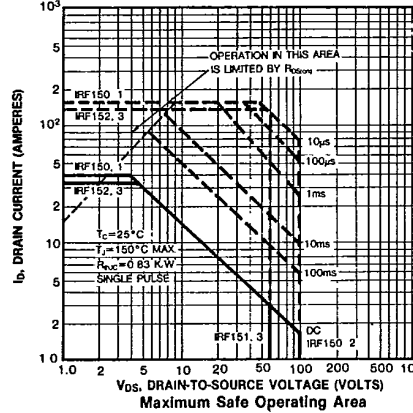
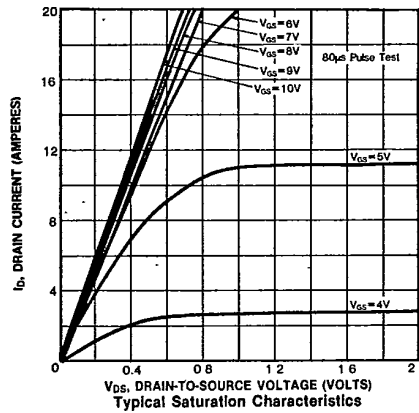
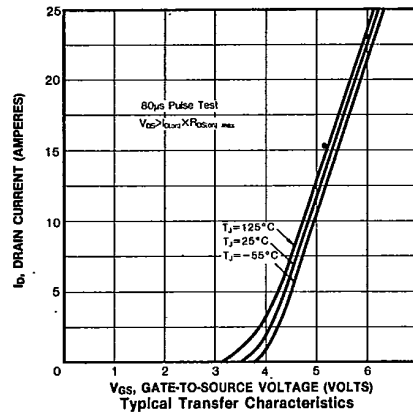
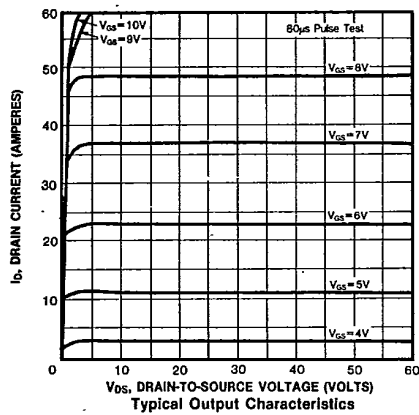
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POWER MOSFETS**

**IRF150/151/152/153**

**SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS**

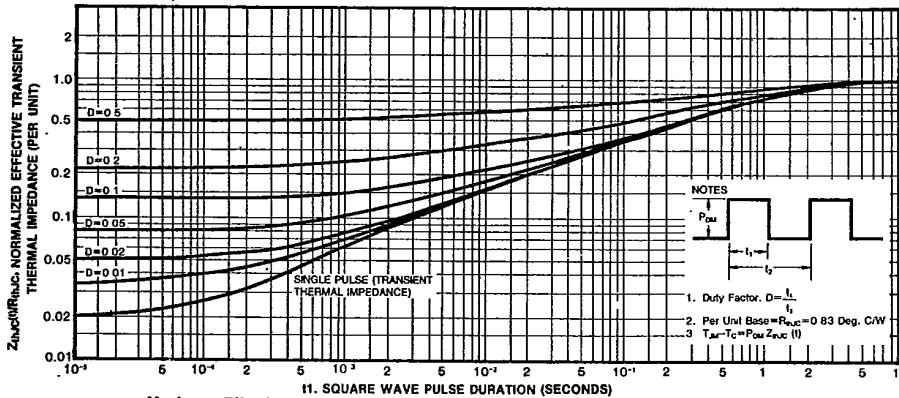
Characteristic	Symbol	Type	Min	Typ	Max	Units	Test Conditions
Continuous Source Current (Body Diode)	$I_S$	IRF150 IRF151	—	—	40	A	Modified MOSFET symbol showing the integral reverse P-N junction rectifier 
		IRF152 IRF153	—	—	33	A	
Pulse Source Current (Body Diode) (3)	$I_{SM}$	IRF150 IRF151	—	—	160	A	
		IRF152 IRF153	—	—	132	A	
		IRF150 IRF151	—	—	2.5	V	$T_C=25^\circ\text{C}$ , $I_S=40\text{A}$ , $V_{GS}=0\text{V}$
Diode Forward Voltage (2)	$V_{SD}$	IRF152 IRF153	—	—	2.3	V	$T_C=25^\circ\text{C}$ , $I_S=33\text{A}$ , $V_{GS}=0\text{V}$
		IRF150 IRF151	—	—	2.5	V	$T_C=25^\circ\text{C}$ , $I_S=40\text{A}$ , $V_{GS}=0\text{V}$
Reverse Recovery Time	$t_{rr}$	ALL	—	600	—	ns	$T_J=150^\circ\text{C}$ , $I_F=40\text{A}$ , $dI_F/dt=100\text{A}/\mu\text{s}$

Notes: (1)  $T_J=25^\circ\text{C}$  to  $150^\circ\text{C}$  (2) Pulse test: Pulse width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$   
 (3) Repetitive rating: Pulse width limited by max. junction temperature

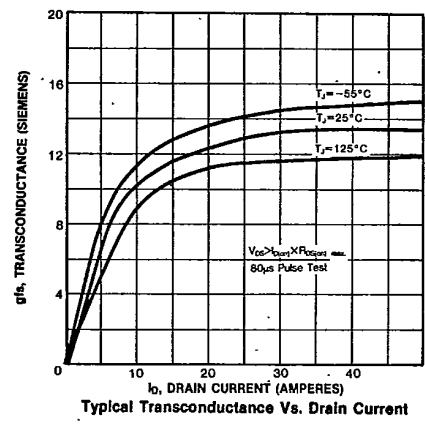


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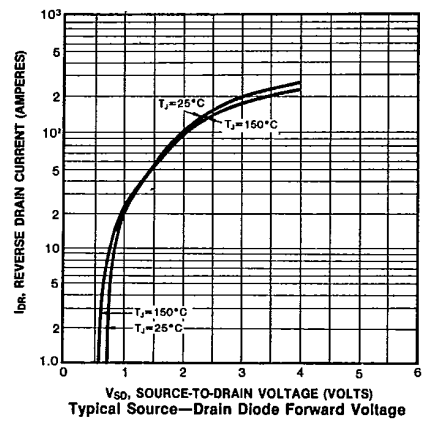
N-CHANNEL  
POWER MOSFETS



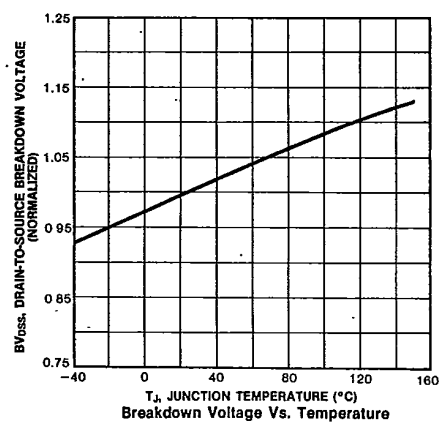
11. SQUARE WAVE PULSE DURATION (SECONDS)  
Maximum Effective Transient Thermal Impedance Junction-to-Case Vs. Pulse Duration



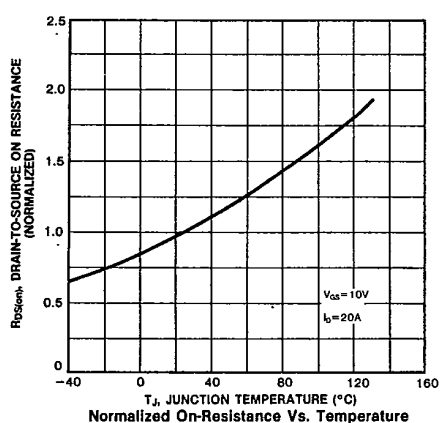
Typical Transconductance Vs. Drain Current



Typical Source-Drain Diode Forward Voltage



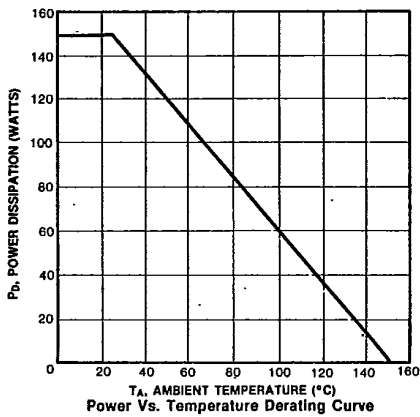
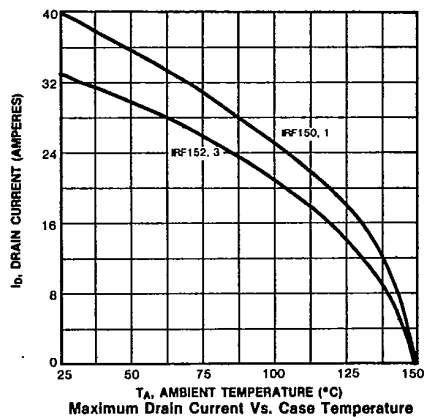
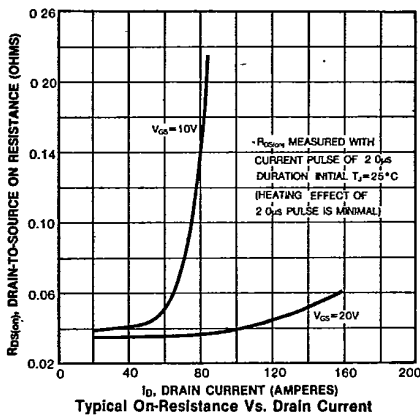
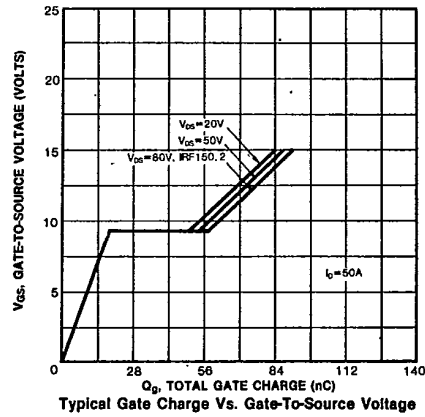
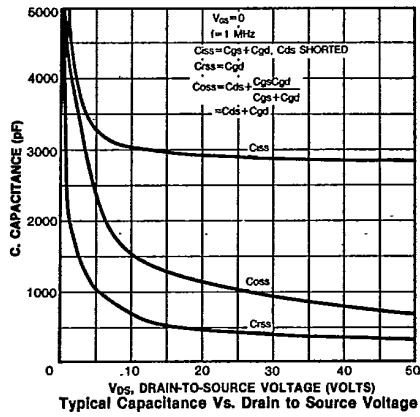
Breakdown Voltage Vs. Temperature



Normalized On-Resistance Vs. Temperature

IRF150/151/152/153

N-CHANNEL POWER MOSFETS



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