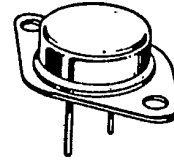


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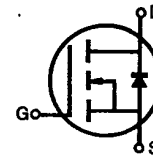
**IRF150/151/152/153****N-CHANNEL  
POWER MOSFETS****FEATURES**

- 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)

TO-3

**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	0.08 Ω	33A
IRF153	60V	0.08 Ω	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	P <sub>D</sub>	150				Watts
Derate above 25°C		1.2				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

**SAMSUNG SEMICONDUCTOR**

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**IRF150/151/152/153****N-CHANNEL  
POWER MOSFETS****ELECTRICAL CHARACTERISTICS** ( $T_C=25^\circ\text{C}$  unless otherwise specified)

Characteristic	Symbol	Type	Min	Typ	Max	Units	Test Conditions
Drain-Source Breakdown Voltage	$BV_{DSS}$	IRF150	100	—	—	V	$V_{GS}=0V$
		IRF152	—	—	—	—	—
		IRF151 IRF153	60	—	—	V	$I_D=250\mu A$
Gate Threshold Voltage	$V_{GS(th)}$	ALL	2.0	—	4.0	V	$V_{DS}=V_{GS}$ , $I_D=250\mu A$
Gate-Source Leakage Forward	$I_{GSS}$	ALL	—	—	100	nA	$V_{GS}=20V$
Gate-Source Leakage Reverse	$I_{GSS}$	ALL	—	—	-100	nA	$V_{GS}=-20V$
Zero Gate Voltage Drain Current	$I_{DSS}$	ALL	—	—	250	$\mu A$	$V_{DS}=\text{Max. Rating}$ , $V_{GS}=0V$
			—	—	1000	$\mu A$	$V_{DS}=\text{Max. Rating} \times 0.8$ , $V_{GS}=0V$ , $T_C=125^\circ\text{C}$
On-State Drain-Source Current (2)	$I_{D(on)}$	IRF150	40	—	—	A	$V_{DS} > I_{D(on)} \times R_{DS(on) \text{ max.}}$ , $V_{GS}=10V$
		IRF151	—	—	—	—	
		IRF152 IRF153	33	—	—	A	
Static Drain-Source On-State Resistance (2)	$R_{DS(on)}$	IRF150	—	0.04	0.055	$\Omega$	$V_{GS}=10V$ , $I_D=20A$
		IRF151	—	—	—	—	
		IRF152	—	0.06	0.08	$\Omega$	
		IRF153	—	—	—	—	
Forward Transconductance (2)	$g_{fs}$	ALL	9.0	12.3	—	S	$V_{DS} > I_{D(on)} \times R_{DS(on) \text{ max.}}$ , $I_D=20A$
Input Capacitance	$C_{iss}$	ALL	—	2900	3000	pF	$V_{GS}=0V$ , $V_{DS}=25V$ , $f=1.0\text{MHz}$
Output Capacitance	$C_{oss}$	ALL	—	1050	1500	pF	
Reverse Transfer Capacitance	$C_{rss}$	ALL	—	450	500	pF	
Turn-On Delay Time	$t_{d(on)}$	ALL	—	—	35	ns	$V_{DD}=0.5BV_{DSS}$ , $I_D=20A$ , $Z_\theta=4.7^\circ\text{C/W}$ (MOSFET switching times are essentially independent of operating temperature.)
Rise Time	$t_r$	ALL	—	—	100	ns	
Turn-Off Delay Time	$t_{d(off)}$	ALL	—	—	125	ns	
Fall Time	$t_f$	ALL	—	—	100	ns	
Total Gate Charge (Gate-Source Plus Gate-Drain)	$Q_g$	ALL	—	72	120	nC	$V_{GS}=10V$ , $I_D=50A$ , $V_{DS}=0.8 \text{ Max. Rating}$ (Gate charge is essentially independent of operating temperature.)
Gate-Source Charge	$Q_{gs}$	ALL	—	18	—	nC	
Gate-Drain ("Miller") Charge	$Q_{gd}$	ALL	—	54	—	nC	

**THERMAL RESISTANCE**

Junction-to-Case	$R_{thJC}$	ALL	—	—	0.83	K/W	
Case-to-Sink	$R_{thCS}$	ALL	—	0.1	—	K/W	Mounting surface flat, smooth, and greased
Junction-to-Ambient	$R_{thJA}$	ALL	—	—	30	K/W	Free Air Operation

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

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



SAMSUNG SEMICONDUCTOR

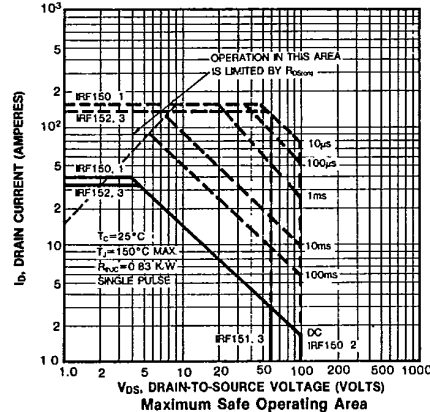
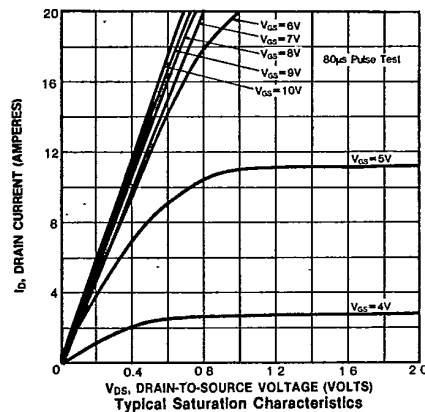
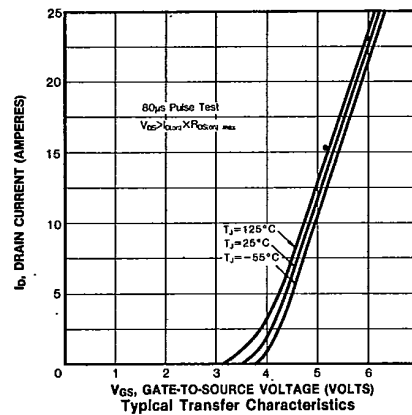
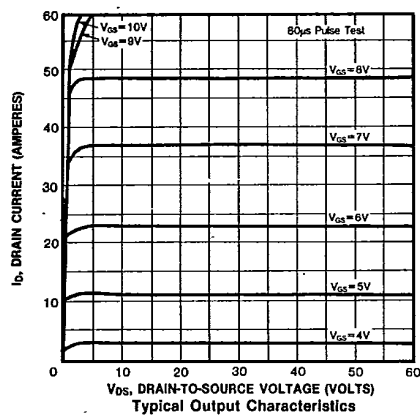
## IRF150/151/152/153

N-CHANNEL  
POWER MOSFETS

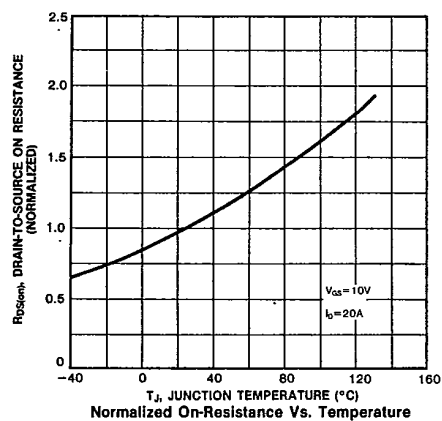
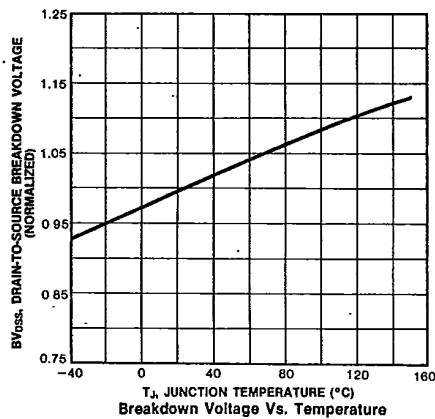
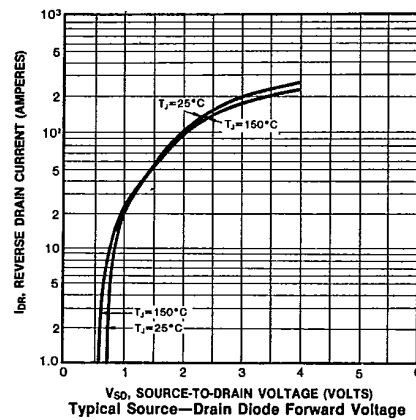
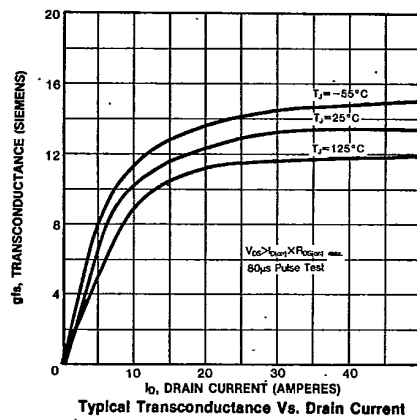
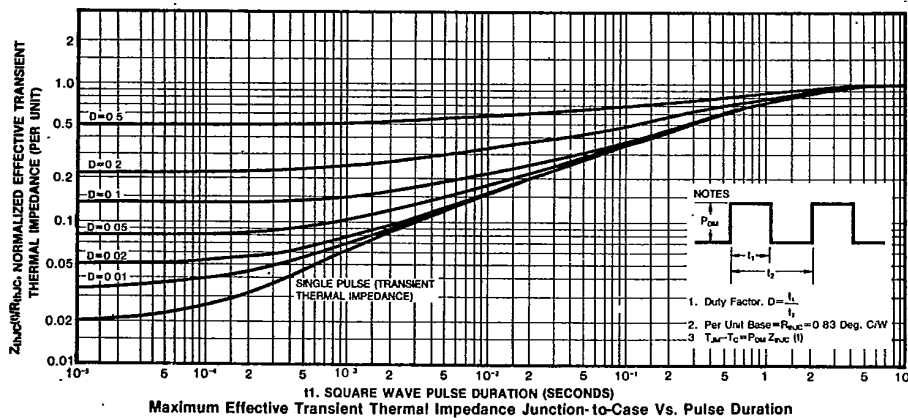
## SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Characteristic	Symbol	Type	Min	Typ	Max	Units	Test Conditions
Continuous Source Current (Body Diode)	$I_S$	IRF150	—	—	40	A	Modified MOSFET symbol showing the integral reverse P-N junction rectifier
		IRF151	—	—	—	A	
		IRF152	—	—	33	A	
		IRF153	—	—	—	A	
Pulse Source Current (Body Diode) (3)	$I_{SM}$	IRF150	—	—	160	A	
		IRF151	—	—	—	A	
		IRF152	—	—	132	A	
		IRF153	—	—	—	A	
Diode Forward Voltage (2)	$V_{SD}$	IRF150	—	—	2.5	V	$T_C=25^\circ\text{C}$ , $I_S=40\text{A}$ , $V_{GS}=0\text{V}$
		IRF151	—	—	—	V	$T_C=25^\circ\text{C}$ , $I_S=33\text{A}$ , $V_{GS}=0\text{V}$
		IRF152	—	—	2.3	V	$T_C=25^\circ\text{C}$ , $I_S=33\text{A}$ , $V_{GS}=0\text{V}$
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



## IRF150/151/152/153

N-CHANNEL  
POWER MOSFETS

## IRF150/151/152/153

N-CHANNEL  
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