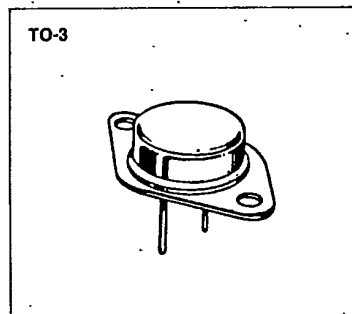
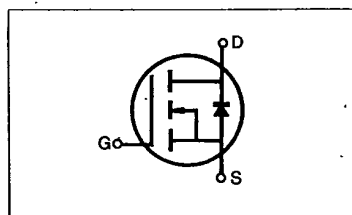


**N-CHANNEL
POWER MOSFETS****IRF130/131/132/133****FEATURES**

- 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 (Standard)

**PRODUCT SUMMARY**

Part Number	V _{DS}	R _{DS(on)}	I _D
IRF130	100V	0.18 Ω	14A
IRF131	60V	0.18 Ω	14A
IRF132	100V	0.25 Ω	12A
IRF133	60V	0.25 Ω	12A

**MAXIMUM RATINGS**

Characteristic	Symbol	IRF130	IRF131	IRF132	IRF133	Unit
Drain-Source Voltage (1)	V _{DSS}	100	60	100	60	V _{dc}
Drain-Gate Voltage (R _{GS} =1.0M Ω) (1)	V _{DGR}	100	60	100	60	V _{dc}
Gate-Source Voltage	V _{GS}	± 20				V _{dc}
Continuous Drain Current T _C =25°C	I _D	14	14	12	12	A _{dc}
Continuous Drain Current T _C =100°C	I _D	9.0	9.0	8.0	8.0	A _{dc}
Drain Current—Pulsed (3)	I _{DM}	56	56	48	48	A _{dc}
Gate Current—Pulsed	I _{GM}	± 1.5				A _{dc}
Total Power Dissipation @ T _C =25°C Derate above 25°C	P _D	75 0.6				Watts W/°C
Operating and Storage Junction Temperature Range	T _J , T _{stg}	-55 to 150				°C
Maximum Lead Temp. for Soldering Purposes, 1/8" from case for 5 seconds	T _L	300				°C

Notes: (1) T_J=25°C to 150°C

(2) Pulse test: Pulse width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

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

IRF130/131/132/133**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_{DS}	IRF130	100	—	—	V	$V_{GS}=0V$
		IRF132	—	—	—	—	—
		IRF131	60	—	—	V	$I_D=250\mu A$
		IRF133	—	—	—	—	—
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	μA	$V_{DS}=\text{Max. Rating}$, $V_{GS}=0V$
			—	—	1000	μA	$V_{DS}=\text{Max. Rating} \times 0.8$, $V_{GS}=0V$, $T_C=125^\circ\text{C}$
On-State Drain-Source Current (2)	$I_{D(on)}$	IRF130	14	—	—	A	$V_{DS}>I_{D(on)} \times R_{DS(on) \text{ max.}}$, $V_{GS}=10V$
		IRF131	—	—	—	—	
		IRF132	12	—	—	A	
		IRF133	—	—	—	—	
Static Drain-Source On-State Resistance (2)	$R_{DS(on)}$	IRF130	—	0.10	0.18	Ω	$V_{GS}=10V$, $I_D=8.0A$
		IRF131	—	—	—	—	
		IRF132	—	0.20	0.25	Ω	
		IRF133	—	—	—	—	
Forward Transconductance (2)	g_{fs}	ALL	4.0	5.5	—	S	$V_{DS}>I_{D(on)} \times R_{DS(on) \text{ max.}}$, $I_D=8.0A$
Input Capacitance	C_{iss}	ALL	—	680	800	pF	$V_{GS}=0V$, $V_{DS}=25V$, $f=1.0\text{MHz}$
Output Capacitance	C_{oss}	ALL	—	300	500	pF	
Reverse Transfer Capacitance	C_{ras}	ALL	—	100	150	pF	
Turn-On Delay Time	$t_{d(on)}$	ALL	—	—	30	ns	$V_{DD}=0.5BV_{DSS}$, $I_D=8.0A$, $Z_\theta=15\Omega$ (MOSFET switching times are essentially independent of operating temperature.)
Rise Time	t_r	ALL	—	—	75	ns	
Turn-Off Delay Time	$t_{d(off)}$	ALL	—	—	40	ns	
Fall Time	t_f	ALL	—	—	45	ns	
Total Gate Charge (Gate-Source Plus Gate-Drain)	Q_g	ALL	—	18	30	nC	$V_{GS}=10V$, $I_D=18A$, $V_{DS}=0.8 \text{ Max. Rating}$ (Gate charge is essentially independent of operating temperature.)
Gate-Source Charge	Q_{gs}	ALL	—	6.0	—	nC	
Gate-Drain ("Miller") Charge	Q_{gd}	ALL	—	12.0	—	nC	

THERMAL RESISTANCE

Junction-to-Case	R_{thJC}	ALL	—	—	1.67	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°C (2) Pulse test: Pulse width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

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

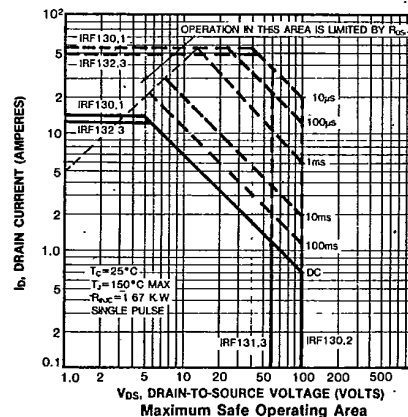
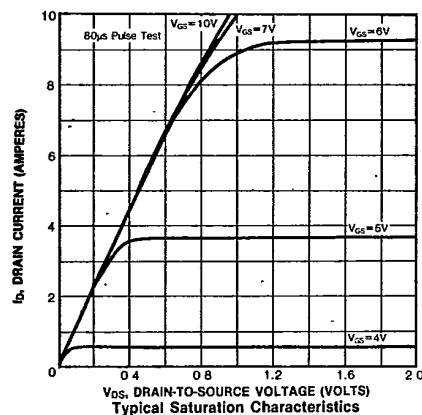
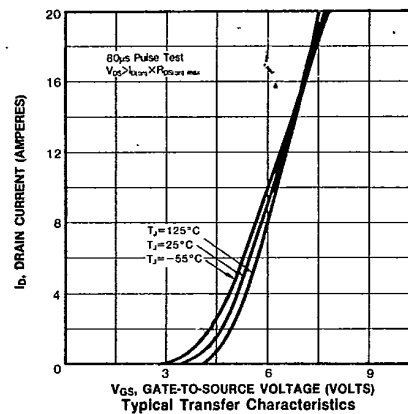
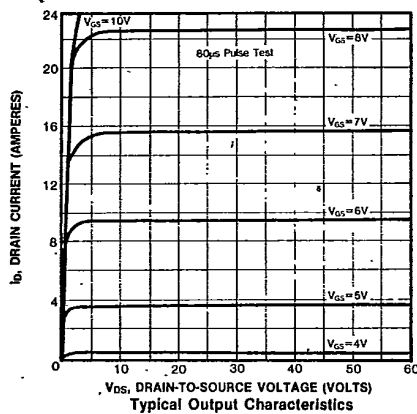
IRF130/131/132/133

N-CHANNEL
POWER MOSFETS

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

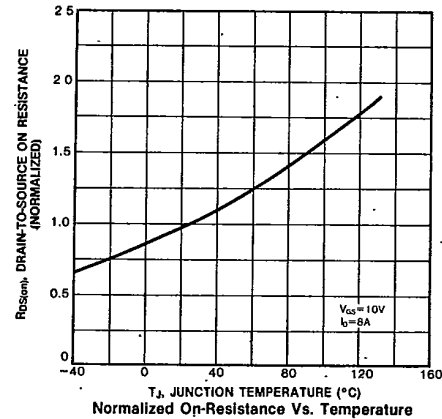
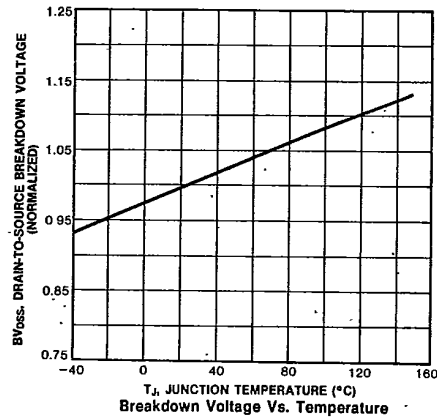
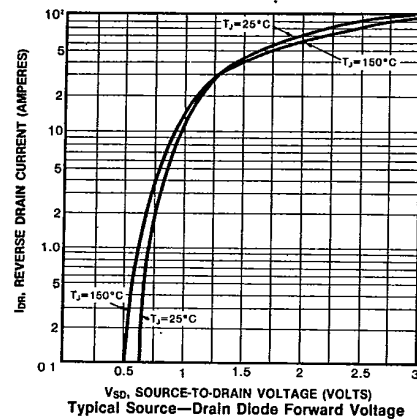
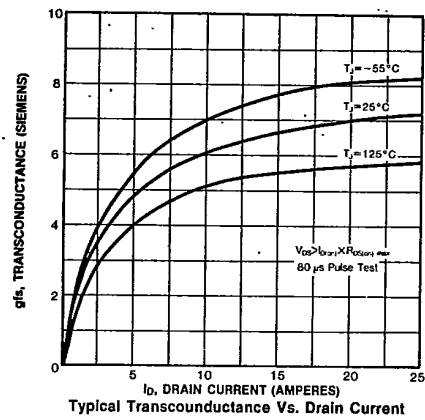
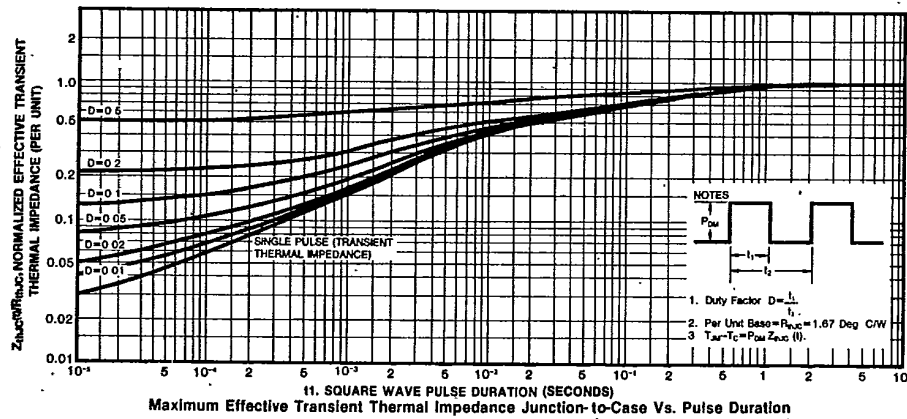
Characteristic	Symbol	Type	Min	Typ	Max	Units	Test Conditions
Continuous Source Current (Body Diode)	I_S	IRF130	—	—	14	A	Modified MOSFET symbol showing the integral reverse P-N junction rectifier
		IRF131	—	—	12	A	
		IRF132 IRF133	—	—	12	A	
Pulse Source Current (Body Diode) (3)	I_{SM}	IRF130	—	—	56	A	
		IRF131	—	—	48	A	
		IRF132 IRF133	—	—	48	A	
Diode Forward Voltage (2)	V_{SD}	IRF130	—	—	2.5	V	$T_C=25^\circ\text{C}$, $I_S=14\text{A}$, $V_{GS}=0\text{V}$
		IRF131	—	—	2.3	V	
		IRF132 IRF133	—	—	2.3	V	
Reverse Recovery Time	t_{rr}	ALL	—	360	—	ns	$T_J=150^\circ\text{C}$, $I_F=14\text{A}$, $dI_F/dt=100\text{A}/\mu\text{s}$

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 width limited by max. junction temperature



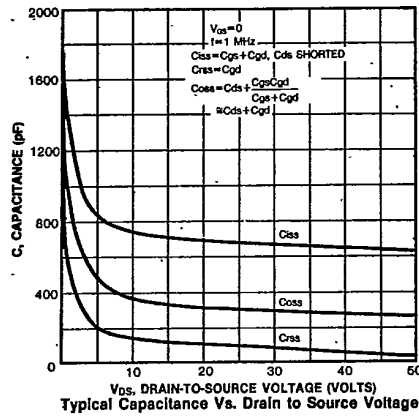
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IRF130/131/132/133

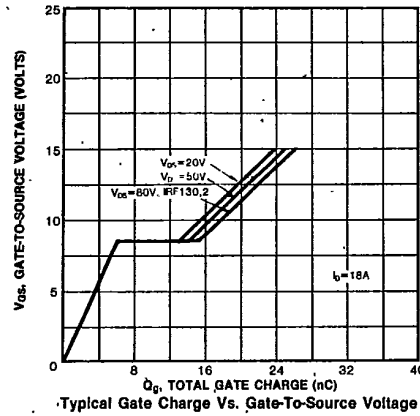
N-CHANNEL
POWER MOSFETS

SAMSUNG SEMICONDUCTOR

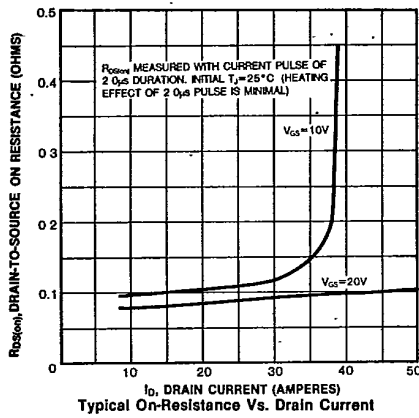
IRF130/131/132/133

N-CHANNEL
POWER MOSFETS

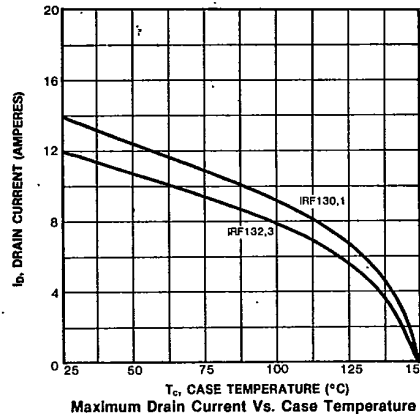
Typical Capacitance Vs. Drain to Source Voltage



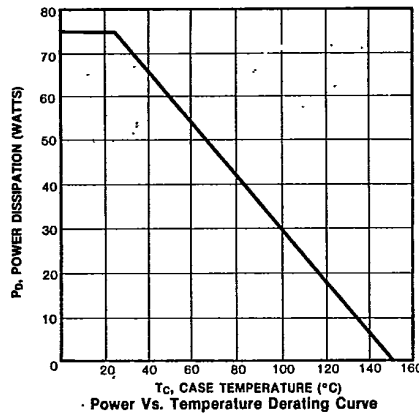
Typical Gate Charge Vs. Gate-To-Source Voltage



Typical On-Resistance Vs. Drain Current



Maximum Drain Current Vs. Case Temperature



Power Vs. Temperature Derating Curve

