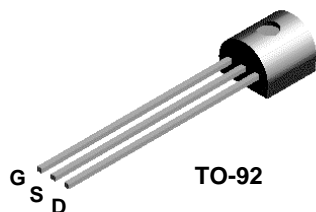
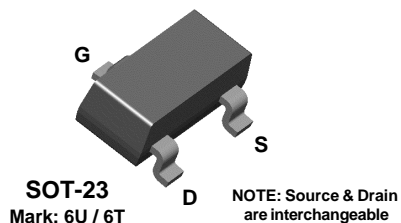


J309
J310



MMBFJ309
MMBFJ310



J309 / J310 / MMBFJ309 / MMBFJ310

N-Channel RF Amplifier

This device is designed for VHF/UHF amplifier, oscillator and mixer applications. As a common gate amplifier, 16 dB at 100 MHz and 12 dB at 450 MHz can be realized. Sourced from Process 92.

Absolute Maximum Ratings*

TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V _{DS}	Drain-Source Voltage	25	V
V _{GS}	Gate-Source Voltage	- 25	V
I _{GF}	Forward Gate Current	10	mA
T _J , T _{stg}	Operating and Storage Junction Temperature Range	-55 to +150	°C

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES:

- 1) These ratings are based on a maximum junction temperature of 150 degrees C.
- 2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

Thermal Characteristics

TA = 25°C unless otherwise noted

Symbol	Characteristic	Max		Units
		J309-J310	*MMBFJ309-310	
P _D	Total Device Dissipation	625	350	mW
	Derate above 25°C	5.0	2.8	mW/°C
R _{θJC}	Thermal Resistance, Junction to Case	125		°C/W
R _{θJA}	Thermal Resistance, Junction to Ambient	357	556	°C/W

* Device mounted on FR-4 PCB 1.6" X 1.6" X 0.06."

N-Channel RF Amplifier

(continued)

Electrical Characteristics

TA = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
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OFF CHARACTERISTICS

V _{(BR)GSS}	Gate-Source Breakdown Voltage	I _G = - 1.0 μA, V _{DS} = 0	- 25			V
I _{GSS}	Gate Reverse Current	V _{GS} = - 15 V, V _{DS} = 0 V _{GS} = - 15 V, V _{DS} = 0, T _A = 125°C			- 1.0 - 1.0	nA μA
V _{GS(off)}	Gate-Source Cutoff Voltage	V _{DS} = 10 V, I _D = 1.0 mA	- 1.0 - 2.0		- 4.0 - 6.5	V V

ON CHARACTERISTICS

I _{DSS}	Zero-Gate Voltage Drain Current*	V _{DS} = 10 V, V _{GS} = 0	309 310	12 24	30 60	mA mA
V _{GS(f)}	Gate-Source Forward Voltage	V _{DS} = 0, I _G = 1.0 mA			1.0	V

SMALL SIGNAL CHARACTERISTICS

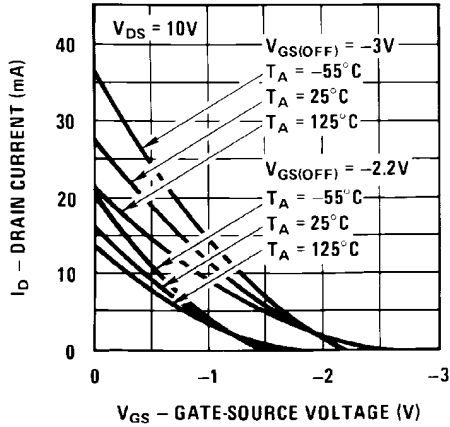
Re(Y _{is})	Common-Source Input Conductance	V _{DS} = 10, I _D = 10 mA, f = 100 MHz	309 310	0.7 0.5		mmhos mmhos
Re(Y _{os})	Common-Source Output Conductance	V _{DS} = 10, I _D = 10 mA, f = 100 MHz		0.25		mmhos
G _{pg}	Common-Gate Power Gain	V _{DS} = 10, I _D = 10 mA, f = 100 MHz		16		dB
Re(Y _{fs})	Common-Source Forward Transconductance	V _{DS} = 10, I _D = 10 mA, f = 100 MHz		12		mmhos
Re(Y _{ig})	Common-Gate Input Conductance	V _{DS} = 10, I _D = 10 mA, f = 100 MHz		12		mmhos
g _{fs}	Common-Source Forward Transconductance	V _{DS} = 10, I _D = 10 mA, f = 1.0 kHz	309 310	10,000 8000	20,000 18,000	μmhos μmhos
g _{oss}	Common-Source Output Conductance	V _{DS} = 10, I _D = 10 mA, f = 1.0 kHz			150	μmhos
g _{fg}	Common-Gate Forward Conductance	V _{DS} = 10, I _D = 10 mA, f = 1.0 kHz	309 310	13,000 12,000		μmhos μmhos
g _{og}	Common-Gate Output Conductance	V _{DS} = 10, I _D = 10 mA, f = 1.0 kHz	309 310	100 150		μmhos μmhos
C _{dg}	Drain-Gate Capacitance	V _{DS} = 0, V _{GS} = - 10 V, f = 1.0 MHz		2.0	2.5	pF
C _{sg}	Source-Gate Capacitance	V _{DS} = 0, V _{GS} = - 10 V, f = 1.0 MHz		4.1	5.0	pF
NF	Noise Figure	V _{DS} = 10 V, I _D = 10 mA, f = 450 MHz		3.0		dB
e _n	Equivalent Short-Circuit Input Noise Voltage	V _{DS} = 10 V, I _D = 10 mA, f = 100 Hz		6.0		nV/√Hz

*Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%

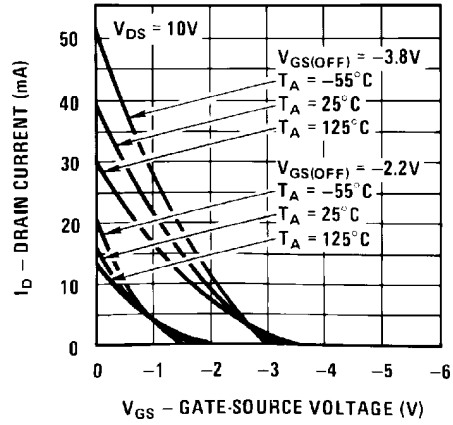
J309 / J310 / MMBFJ309 / MMBFJ310

Typical Characteristics

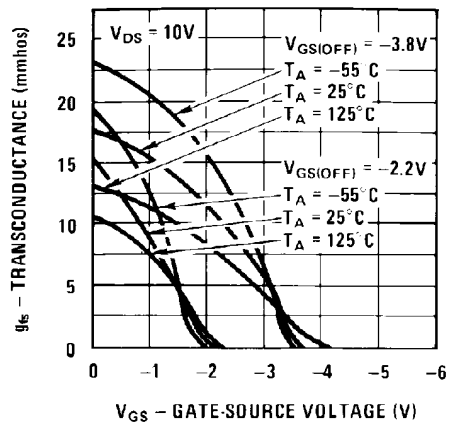
Transfer Characteristics



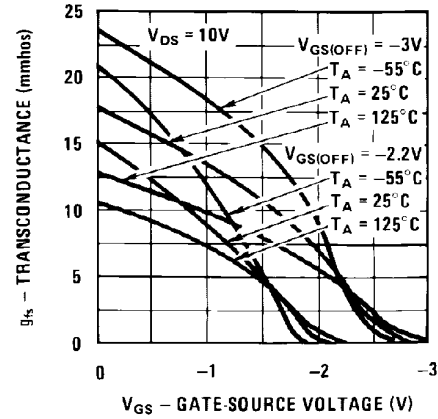
Transfer Characteristics



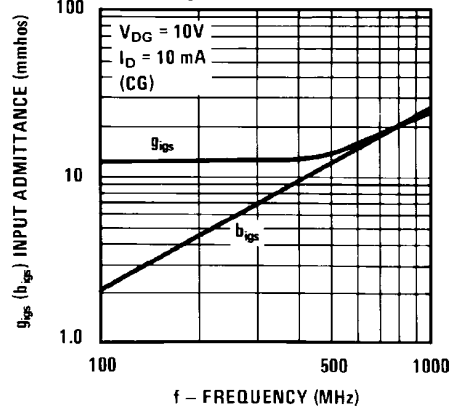
Transfer Characteristics



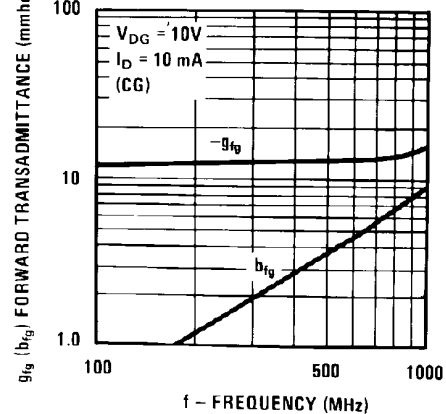
Transfer Characteristics



Input Admittance

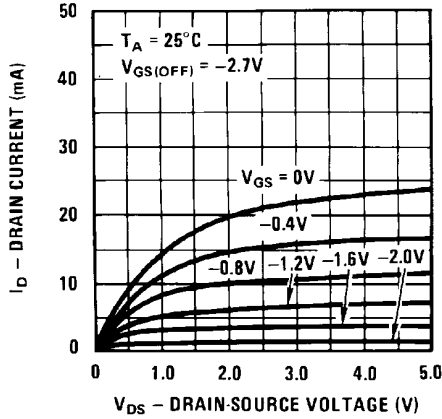


Forward Transadmittance

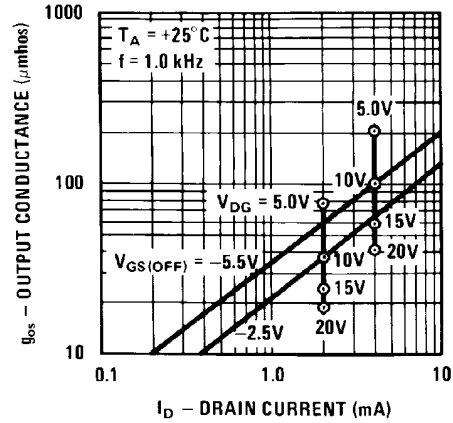


Typical Characteristics (continued)

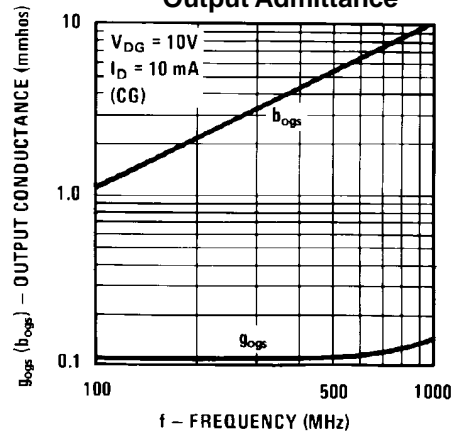
Common Drain-Source



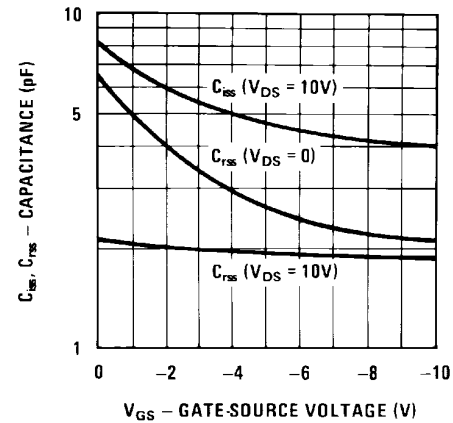
Output Conductance vs. Drain Current



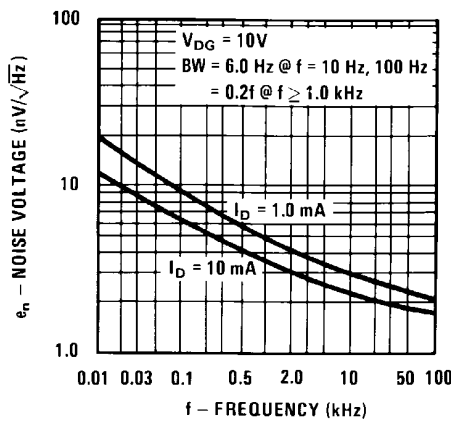
Output Admittance



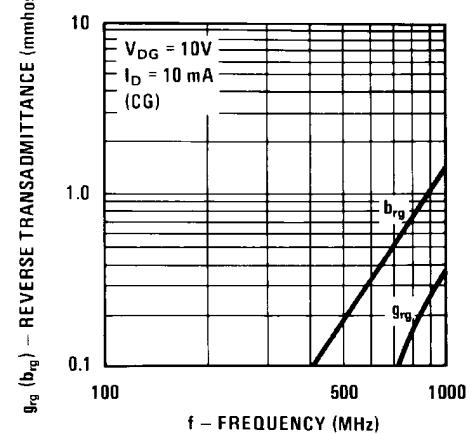
Capacitance vs. Voltage



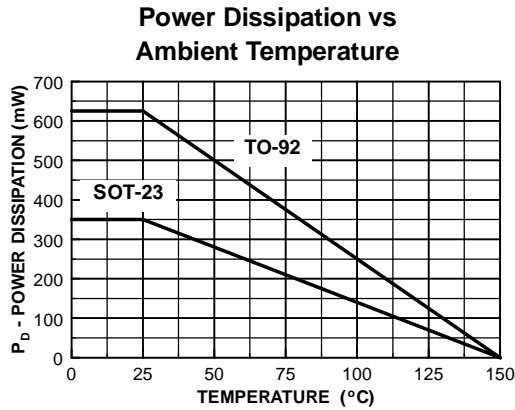
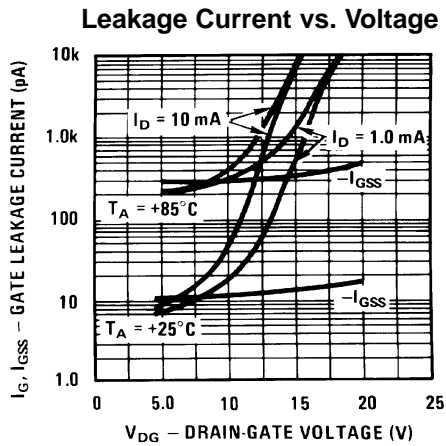
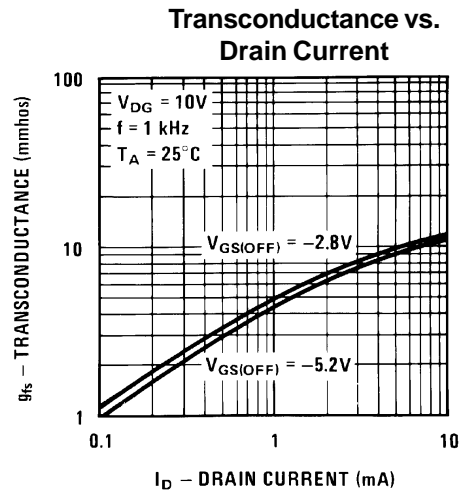
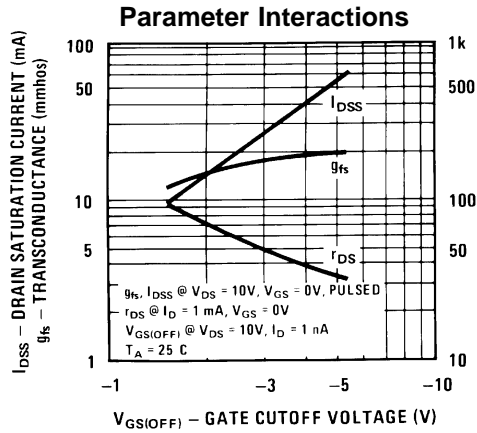
Noise Voltage vs. Frequency



Reverse Transadmittance



Typical Characteristics (continued)



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