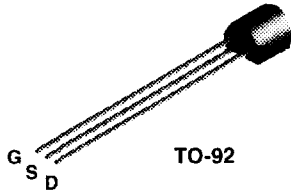
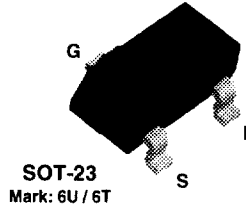


J309
J310



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	
P _D	Total Device Dissipation Derate above 25°C	350	225	mW
		2.8	1.8	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	$I_G = -1.0 \mu A, V_{DS} = 0$	-25			V
I_{GSS}	Gate Reverse Current	$V_{GS} = -15 V, V_{DS} = 0$ $V_{GS} = -15 V, V_{DS} = 0, T_A = 125^\circ C$			-1.0 -1.0	nA μA
$V_{GS(off)}$	Gate-Source Cutoff Voltage	$V_{DS} = 10 V, I_D = 1.0 nA$	-1.0 -2.0		-4.0 -6.5	V V

ON CHARACTERISTICS

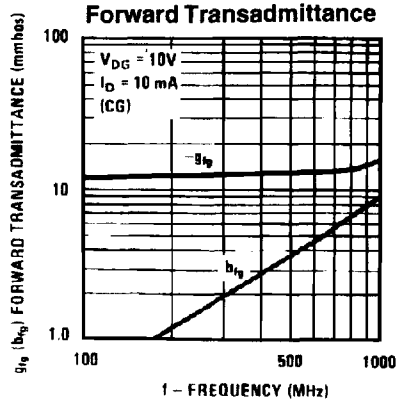
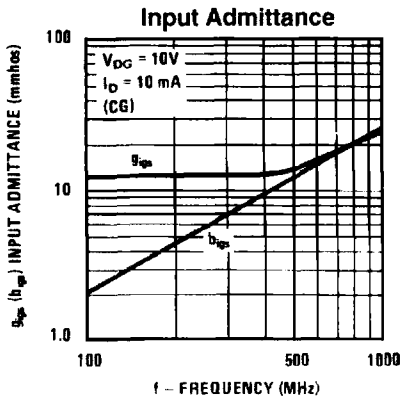
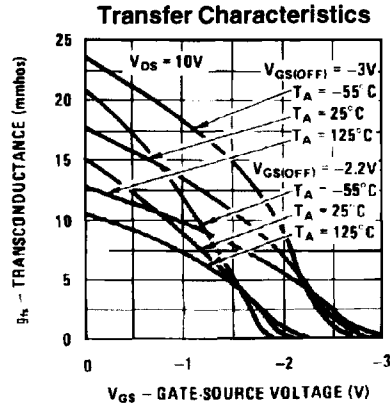
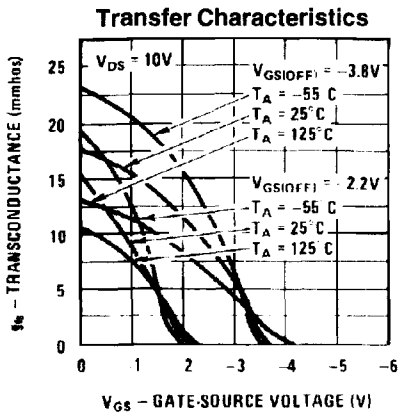
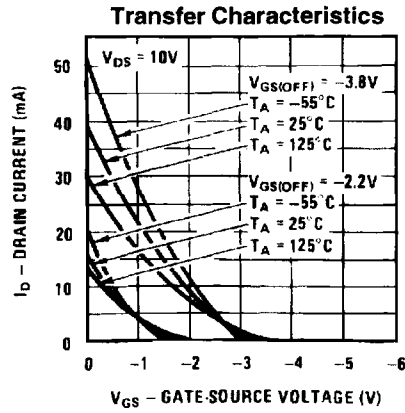
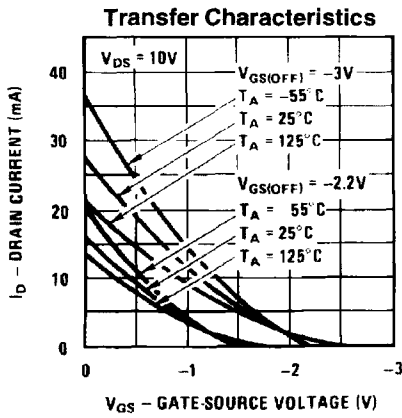
I_{DSS}	Zero-Gate Voltage Drain Current*	$V_{DS} = 10 V, V_{GS} = 0$	J309 J310	12 24	30 60	mA mA
$V_{GS(f)}$	Gate-Source Forward Voltage	$V_{DS} = 0, I_G = 1.0 mA$			1.0	V

SMALL SIGNAL CHARACTERISTICS

$Re(y_{is})$	Common-Source Input Conductance	$V_{DS} = 10, I_D = 10 mA, f = 100 MHz$ J309 J310		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
$Re(y_{fg})$	Common-Gate Input Conductance	$V_{DS} = 10, I_D = 10 mA, f = 100 MHz$		12		mmhos
g_{fs}	Common-Source Forward Transconductance	$V_{DS} = 10, I_D = 10 mA, f = 1.0 kHz$ J309 J310	10,000 8000		20,000 18,000	$\mu mhos$ $\mu mhos$
g_{os}	Common-Source Output Conductance	$V_{DS} = 10, I_D = 10 mA, f = 1.0 kHz$			150	$\mu mhos$
g_{fg}	Common-Gate Forward Conductance	$V_{DS} = 10, I_D = 10 mA, f = 1.0 kHz$ J309 J310		13,000 12,000		$\mu mhos$ $\mu mhos$
g_{og}	Common-Gate Output Conductance	$V_{DS} = 10, I_D = 10 mA, f = 1.0 kHz$ J309 J310		100 150		$\mu mhos$ $\mu mhos$
C_{dg}	Drain-Gate Capacitance	$V_{DS} = 0, V_{GS} = -10, f = 1.0 MHz$		2.0	2.5	pF
C_{sq}	Source-Gate Capacitance	$V_{DS} = 0, V_{GS} = -10, f = 1.0 MHz$		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/\sqrt{Hz}

*Pulse Test: Pulse Width $\leq 300 \mu s$, Duty Cycle $\leq 2.0\%$

Typical Characteristics

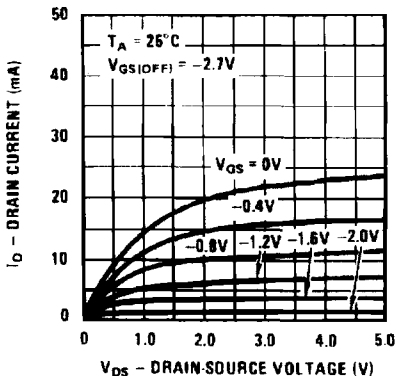


N-Channel RF Amplifier

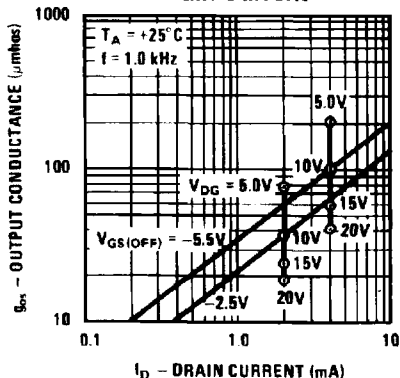
(continued)

Typical Characteristics (continued)

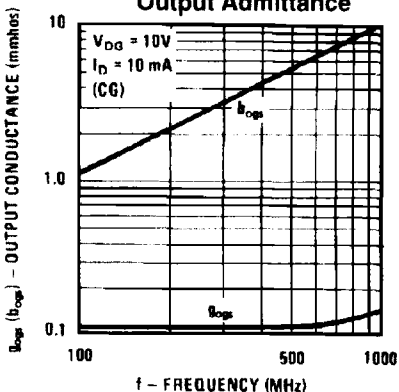
Common Drain-Source



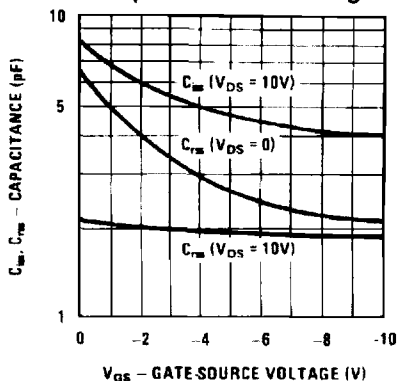
Output Conductance vs. Drain Current



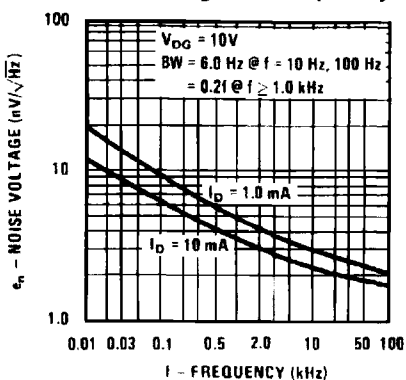
Output Admittance



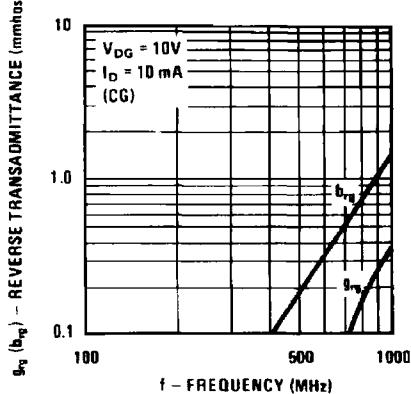
Capacitance vs. Voltage



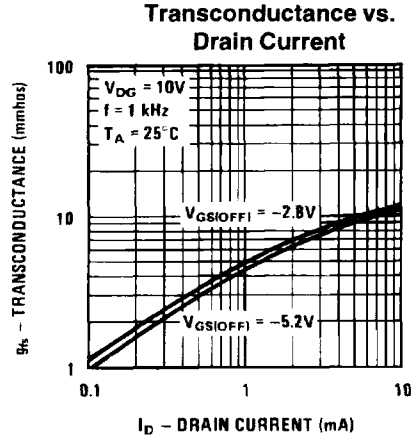
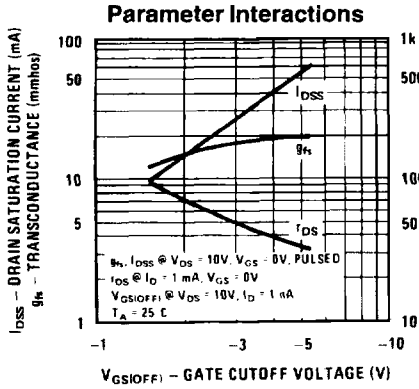
Noise Voltage vs. Frequency



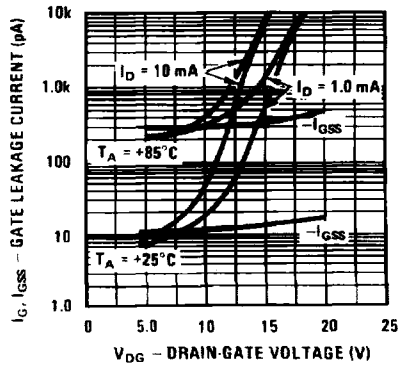
Reverse Transadmittance



Typical Characteristics (continued)



Leakage Current vs. Voltage



POWER DISSIPATION vs AMBIENT TEMPERATURE

