

MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA

MRFG9661
MRFG9661R

Advance Information

The RF Line

**N-Channel Dual-Gate GaAs
Field-Effect Transistor**

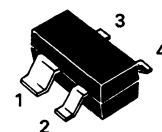
... depletion mode dual-gate MES FET designed for high frequency amplifier and mixer applications.

- Excellent Receiver Front End
- Low Noise Figure — NF = 1.4 dB, 1 GHz (Typ)
- High Power Gain — G_p = 17 dB, 1 GHz (Typ)
- High Transconductance — g_m = 20 mS (Typ)
- Gold Metallization
- Surface Mounted Package Styles

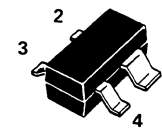
**SURFACE-MOUNTED
N-CHANNEL
DUAL-GATE
GaAs FIELD-EFFECT
TRANSISTOR**

MAXIMUM RATINGS

Rating	Symbol	MRFG9661/9661R	Unit
Drain-Source Voltage	V_{DS}	10	Vdc
Gate-Source Voltage — Reverse	V_{G1S} V_{G2S}	-8 -8	Vdc
Gate-Source Voltage — Forward	V_{G1S} V_{G2S}	+1 +1	Vdc
Drain Current — Continuous	I_D	80	mAdc
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	350 3.5	mW mW/°C
Storage Channel Temperature Range	T_{stg}	-65 to +125	°C
Junction Temperature Range	T_J	-65 to +125	°C



**CASE 318A-03
SOT-143
MRFG9661**



**CASE 318C-01
REVERSED SOT
MRFG9661R**

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Drain-Source Breakdown Voltage ($V_{G1S} = V_{G2S} = -4.5$ Vdc, $I_D = 100$ μA)	$V_{(BR)DSX}$	10	—	—	Vdc
Gate 1-to-Source Cutoff Voltage ($V_{DS} = 5$ Vdc, $V_{G2S} = 0$, $I_D = 500$ μA)	$V_{G1S(off)}$	-2	—	-4.5	Vdc
Gate 2-to-Source Cutoff Voltage ($V_{DS} = 5$ Vdc, $V_{G1S} = 0$, $I_D = 500$ μA)	$V_{G2S(off)}$	-2	—	-4.5	Vdc
Gate 1 Leakage Current ($V_{G1S} = -5$ Vdc, $V_{G2S} = V_{DS} = 0$)	I_{G1SS}	—	—	10	μAdc
Gate 2 Leakage Current ($V_{G2S} = -5$ Vdc, $V_{G1S} = V_{DS} = 0$)	I_{G2SS}	—	—	10	μAdc

ON CHARACTERISTICS

Zero-Gate Voltage Drain Current ($V_{DS} = 5$ Vdc, $V_{G1S} = V_{G2S} = 0$)	I_{DSS}	30	50	80	mAdc
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SMALL-SIGNAL CHARACTERISTICS

Transconductance ($V_{DS} = 5$ Vdc, $V_{G2S} = 0$, $I_D = 10$ mA, $f = 1$ kHz)	g_m	18	20	—	mS
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FUNCTIONAL CHARACTERISTICS

Noise Figure (1) ($V_{DS} = 5$ Vdc, $V_{G2S} = 0$, $I_{DS} = 10$ mA, $f = 1$ GHz)	NF	—	1.4	—	dB
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Handling and Packaging — MES devices are susceptible to damage from electrostatic charge. Reasonable precautions in handling and packaging MES devices should be observed.

(continued)

(1) Data taken using a 50 Ω test fixture, Microlab SF31N slug tuners, HP11590B bias networks and the HP8970A or Eaton 2075 noise figure meter.

This document contains information on a new product. Specifications and information herein are subject to change without notice.



MOTOROLA

ADI1397

ELECTRICAL CHARACTERISTICS — continued ($T_A = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
FUNCTIONAL CHARACTERISTICS — continued					
Common Source Power Gain (1) ($V_{DS} = 5\text{ Vdc}$, $V_{G2S} = 0$, $I_{DS} = 10\text{ mA}$, $f = 1\text{ GHz}$)	G_{ps}	—	17	—	dB
Intermodulation Distortion ($V_{DS} = 5\text{ Vdc}$, $I_{DS} = 10\text{ mA}$, $f_1 = 995\text{ MHz}$, $f_2 = 1001\text{ MHz}$, $V_{G2} = 0$, $P_{in} = -40\text{ dBm}$)	IMD_3	—	-65	—	dB
Linear Power Point (2) ($V_{DS} = 5\text{ Vdc}$, $I_{DS} = 10\text{ mA}$, $f_1 = 995\text{ MHz}$, $f_2 = 1001\text{ MHz}$, $V_{G2} = 0$)	P_L	—	+1	—	dBm
Output Power at 1 dB Compression Point ($V_{DS} = 5\text{ Vdc}$, $I_{DS} = 10\text{ mA}$, $f = 1\text{ GHz}$)	P_{out}	—	10	—	dBm

(1) Data taken using a 50 Ω test fixture, Microlab SF31N slug tuners, HP11590B bias networks and the HP8970A or Eaton 2075 noise figure meter.
 (2) The linear power point is the output power level at which either the signal $2f_1 \pm f_2$ or $2f_2 \pm f_1$ are 30 dB below f_1 or f_2 .

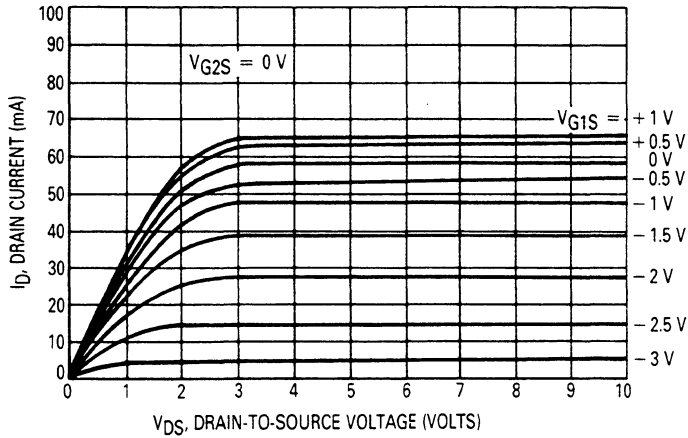


Figure 1. Drain Current versus Drain-To-Source Voltage

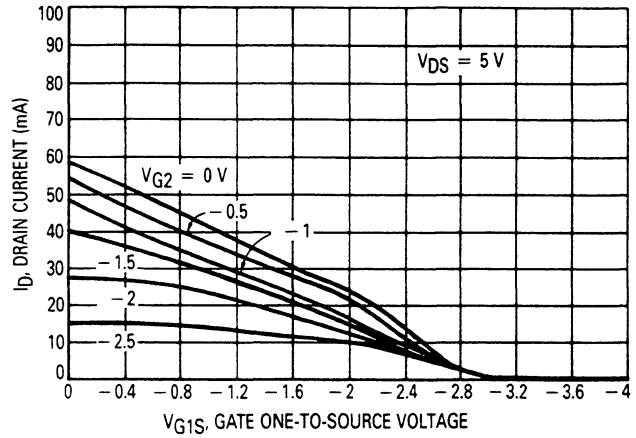


Figure 2. Drain Current versus Gate One-To-Source Voltage

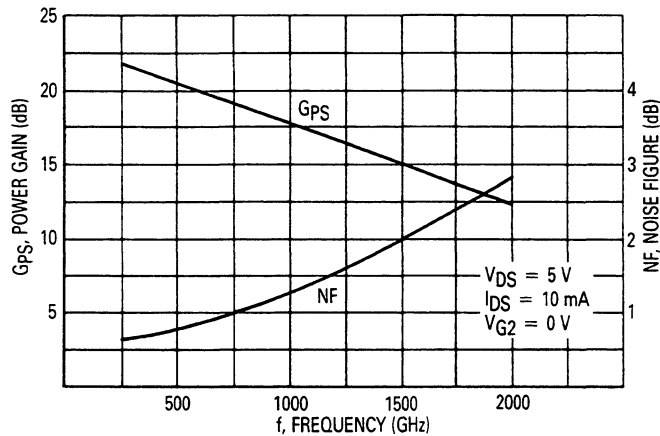


Figure 3. MRF9661, MRF9661R — Common Source Power Gain and Noise Figure versus Frequency

OUTLINE DIMENSIONS

STYLE 2:
PIN 1. SOURCE
2. DRAIN
3. GATE 1
4. GATE 2

STYLE 1:
PIN 1. SOURCE
2. GATE 1
3. GATE 2
4. DRAIN

NOTES:
1. DIMENSIONING & TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.80	3.04	0.110	0.120
B	1.20	1.39	0.047	0.055
C	0.84	1.14	0.033	0.045
D	0.38	0.45	0.015	0.018
F	0.08	0.15	0.003	0.006
G	1.78	2.03	0.070	0.080
H	0.445	0.60	0.0175	0.024
K	0.013	0.102	0.0005	0.004
L	2.11	2.48	0.083	0.098
M	0.46	0.60	0.018	0.024
R	0.71	0.83	0.028	0.033
U	0.79	0.88	0.031	0.035

CASE 318A-03


CASE 318C-01



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20799 PRINTED IN USA (1994) MPS/POD

MRFG9661/D

