

MOTOROLA SEMICONDUCTOR TECHNICAL DATA

Advance Information

The RF Line

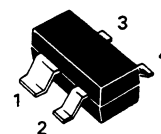
N-Channel Dual-Gate GaAs Field-Effect Transistor

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

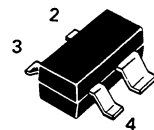
- Excellent Receiver Front End
- Low Noise Figure — NF = 1.2 dB, 800 MHz (Typ)
- High Power Gain — $G_p = 20$ dB, 800 MHz (Typ)
- High Transconductance — $g_m = 40$ mS (Typ)
- Gold Metallization
- Surface Mounted Package Styles

MRFG9801
MRFG9801R

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



**CASE 318A-03
SOT-143
MRFG9801**



**CASE 318C-01
REVERSED SOT
MRFG9801R**

MAXIMUM RATINGS

Rating	Symbol	MRFG9801/9801R	Unit
Drain-Source Voltage	V_{DS}	8	Vdc
Gate-Source Voltage — Reverse	V_{G1S} V_{G2S}	-6 -6	Vdc
Gate-Source Voltage — Forward	V_{G1S} V_{G2S}	+2 +2	Vdc
Drain Current — Continuous	I_D	80	mAdc
Storage Channel Temperature Range	T_{stg}	-65 to +125	°C
Junction Temperature Range	T_J	-65 to +125	°C

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 ($V_{G1S} = V_{G2S} = -5$ Vdc, $I_D = 100$ μA)	$V_{(BR)DSX}$	8	—	—	Vdc
Gate 1-to-Source Cutoff Voltage ($V_{DS} = 5$ Vdc, $V_{G2S} = 0$, $I_D = 500$ μA)	$V_{G1S(off)}$	-1	—	-4	Vdc
Gate 2-to-Source Cutoff Voltage ($V_{DS} = 5$ Vdc, $V_{G1S} = 0$, $I_D = 500$ μA)	$V_{G2S(off)}$	-1	—	-4	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}	40	70	120	mAdc
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SMALL-SIGNAL CHARACTERISTICS

Transconductance ($V_{DS} = 5$ Vdc, $V_{G2S} = 1.5$ Vdc, $I_D = 10$ mA, $f = 1$ kHz)	g_m	—	40	—	mS
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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)

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



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

Characteristic	Symbol	Min	Typ	Max	Unit
FUNCTIONAL CHARACTERISTICS					
Noise Figure (1) ($V_{DS} = 5\text{ Vdc}$, $V_{G2S} = 1.5\text{ Vdc}$, $I_{DS} = 10\text{ mA}$, $f = 800\text{ MHz}$)	NF	—	1.2	—	dB
Common Source Power Gain (1) ($V_{DS} = 5\text{ Vdc}$, $V_{G2S} = 1.5\text{ Vdc}$, $I_{DS} = 10\text{ mA}$, $f = 800\text{ MHz}$)	G_{ps}	—	20	—	dB

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

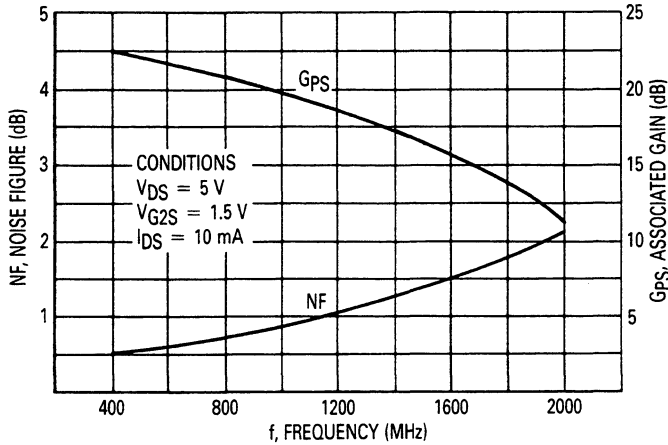


Figure 1. Power Gain and Noise Figure versus Frequency

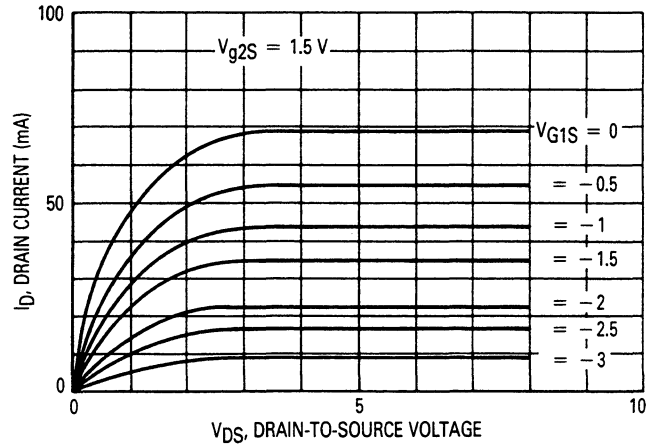


Figure 2. Drain Current versus Drain-to-Source Voltage

OUTLINE DIMENSIONS

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

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

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

CASE 318A-03

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

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	0.10	0.0005	0.004
L	2.59	2.99	0.102	0.118
M	1.20	1.80	0.047	0.071
R	0.72	0.83	0.028	0.033
U	0.79	0.88	0.031	0.035

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


CASE 318C-01



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