

# MGF0904A

## L, S BAND POWER GaAs FET

### DESCRIPTION

The MGF0904A, GaAs FET with an N-channel schottky gate, is designed for use in UHF band amplifiers.

### FEATURES

- High output power  
 $P_O = 28\text{dBm (TYP.) @ } f = 1.65\text{GHz, } P_{in} = 15\text{dBm}$
- High power gain  
 $G_P = 13.0\text{dB (TYP.) @ } f = 1.65\text{GHz, } P_{in} = 15\text{dBm}$
- High power added efficiency  
 $\eta_{add} = 40\% \text{ (TYP.) @ } f = 1.65\text{GHz, } P_{in} = 15\text{dBm}$

### APPLICATION

For UHF Band power amplifiers

### QUALITY GRADE

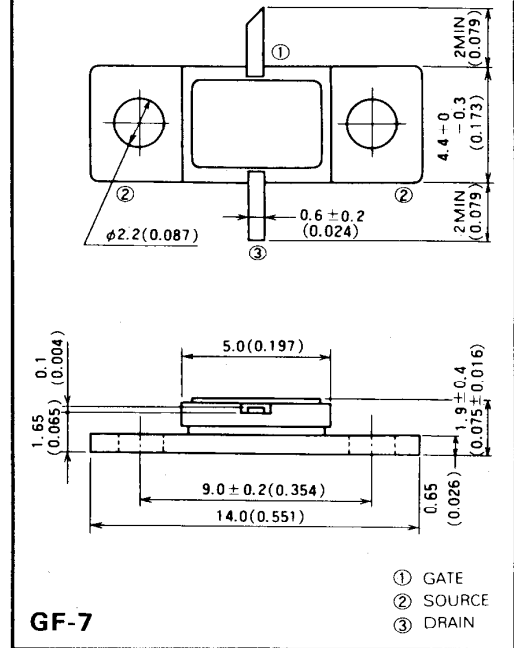
- GG

### RECOMMENDED BIAS CONDITIONS

- $V_{DS} = 8\text{V}$
- $I_D = 200\text{mA}$
- $R_g = 500\ \Omega$
- Refer to Bias Procedure

### OUTLINE DRAWING

Unit: millimeters (inches)



### ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

Symbol	Parameter	Rating	Unit
$V_{GSO}$	Gate to source voltage	-17	V
$V_{GDO}$	Gate to drain voltage	-17	V
$I_D$	Drain current	800	mA
$I_{GR}$	Reverse gate current	-2.5	mA
$I_{GF}$	Forward gate current	5.4	mA
$P_T$	Total power dissipation *1	3.75	W
$T_{ch}$	Channel temperature	175	°C
$T_{stg}$	Storage temperature	-65 ~ +175	°C

\*1:  $T_C = 25^\circ\text{C}$

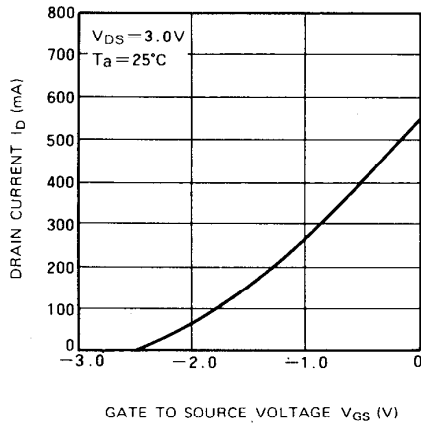
### ELECTRICAL CHARACTERISTICS (Ta = 25°C)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
$I_{DSS}$	Saturated drain current	$V_{DS} = 3\text{V, } V_{GS} = 0\text{V}$	400	550	800	mA
$V_{GS(off)}$	Gate to source cut-off voltage	$V_{DS} = 3\text{V, } I_D = 2.5\text{mA}$	-1	-3	-5	V
$g_m$	Transconductance	$V_{DS} = 3\text{V, } I_D = 300\text{mA}$	120	200	—	mS
$P_O$	Output power	$V_{DS} = 8\text{V, } I_D = 200\text{mA, } f = 1.65\text{GHz, } P_{in} = 15\text{dBm}$	26	28	—	dBm
$\eta_{add}$	Power added efficiency		—	40	—	%
$R_{th(ch-c)}$	Thermal resistance *1	$\Delta V_T$ method	—	—	40	°C/W
$R_{th(ch-a)}$	Thermal resistance (channel to ambient temperature)	$\Delta V_T$ method	—	—	100	°C/W

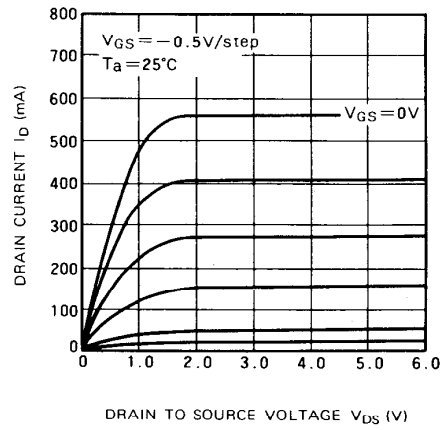
\*1: Channel to case

**TYPICAL CHARACTERISTICS**

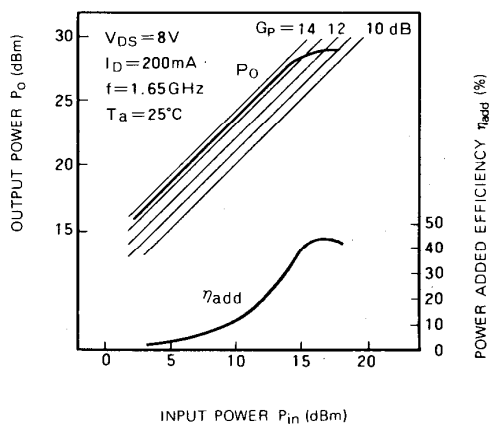
**$I_D$  vs.  $V_{GS}$**



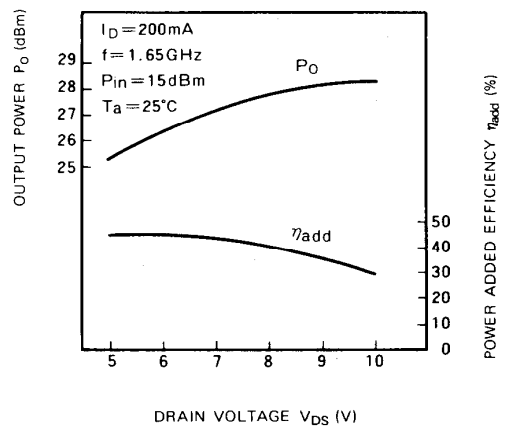
**$I_D$  vs.  $V_{DS}$**



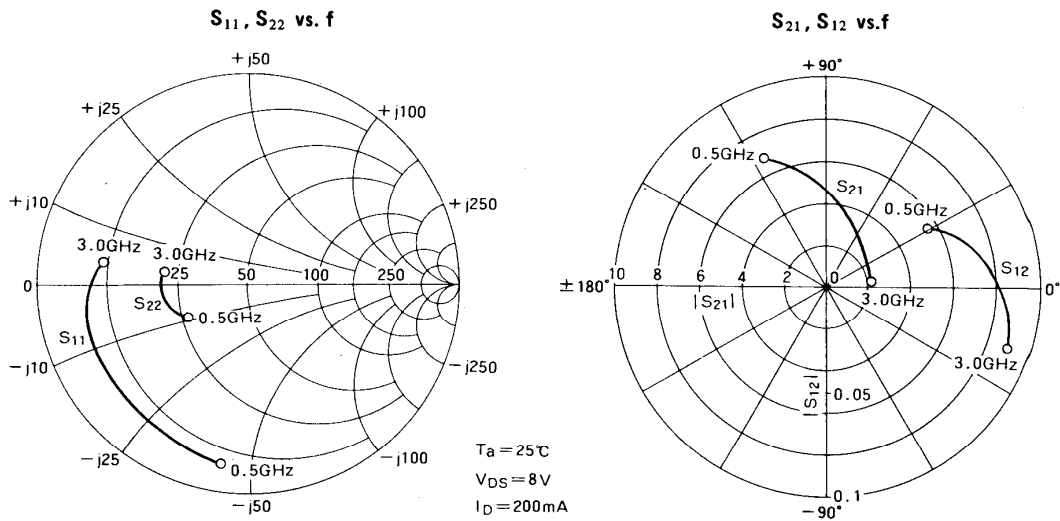
**$P_o, \eta_{add}$  vs.  $P_{in}$**



**$P_o, \eta_{add}$  vs.  $V_{DS}$**



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**S PARAMETERS** ( $T_a = 25^\circ\text{C}$ ,  $V_{DS} = 8\text{V}$ ,  $I_D = 200\text{mA}$ )

f (GHz)	$S_{11}$		$S_{21}$		$S_{12}$		$S_{22}$		K	MSG/MAG dB
	Magn.	Angle (deg.)	Magn.	Angle (deg.)	Magn.	Angle (deg.)	Magn.	Angle (deg.)		
0.5	0.851	-99.0	6.855	116.0	0.055	31.0	0.338	-149.0	0.277	21.0
1.0	0.801	-138.0	4.265	89.0	0.064	22.5	0.368	-162.0	0.521	18.2
1.5	0.788	-161.5	3.192	71.0	0.072	13.0	0.390	-173.3	0.655	16.5
2.0	0.740	-177.0	2.544	52.0	0.079	4.0	0.409	-178.0	0.847	15.1
2.5	0.713	176.5	2.180	30.0	0.085	-7.0	0.411	177.0	0.940	14.1
3.0	0.670	171.5	2.040	9.0	0.091	-18.0	0.402	172.0	1.070	11.9

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