

< High-power GaAs FET (small signal gain stage) >

# MGF0910A

L & S BAND / 6W

non - matched

## DESCRIPTION

The MGF0910A, GaAs FET with an N-channel schottky gate, is designed for use in UHF band amplifiers.

## FEATURES

- Class A operation
- High output power  
P1dB=38.0dBm(TYP.) @f=2.3GHz
- High power gain  
GLP=11.0dB(TYP.) @f=2.3GHz
- High power added efficiency  
P.A.E =45%(TYP.) @f=2.3GHz,P1dB
- Hermetically sealed metal-ceramic package with ceramic lid

## APPLICATION

- For UHF Band power amplifiers

## QUALITY

- IG

## RECOMMENDED BIAS CONDITIONS

- Vds=10V • Ids=1.3A • Rg=100Ω Refer to Bias Procedure

## Absolute maximum ratings (Ta=25°C)

| Symbol | Parameter               | Ratings     | Unit |
|--------|-------------------------|-------------|------|
| VGDO   | Gate to drain voltage   | -15         | V    |
| VGSO   | Gate to source voltage  | -15         | V    |
| ID     | Drain current           | 5           | A    |
| IGR    | Reverse gate current    | -15         | mA   |
| IGF    | Forward gate current    | 31.5        | mA   |
| PT*1   | Total power dissipation | 27.3        | W    |
| Tch    | Channel temperature     | 175         | °C   |
| Tstg   | Storage temperature     | -65 to +175 | °C   |

\*1:Tc=25°C

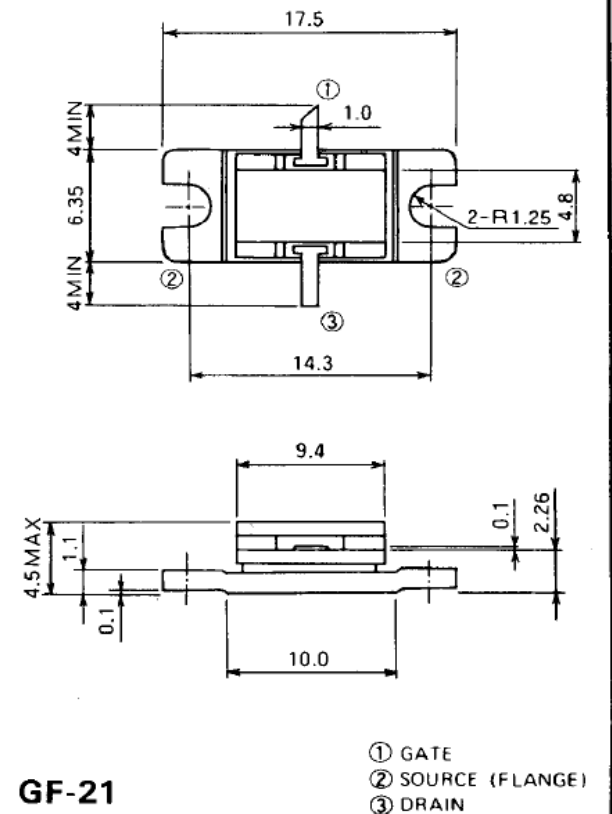
## Electrical characteristics (Ta=25°C)

| Symbol       | Parameter                            | Test conditions                     | Limits |      |      | Unit |
|--------------|--------------------------------------|-------------------------------------|--------|------|------|------|
|              |                                      |                                     | Min.   | Typ. | Max. |      |
| IDSS         | Saturated drain current              | VDS=3V,VGS=0V                       | -      | -    | 5    | A    |
| gm           | Transconductance                     | VDS=3V,ID=1.3A                      | -      | 1.5  | -    | S    |
| VGS(off)     | Gate to source cut-off voltage       | VDS=3V,ID=10mA                      | -2     | -    | -5   | V    |
| P1dB         | Output power at 1dB gain compression | VDS=10V,ID(RF off)=1.3A<br>f=2.3GHz | 37     | 38   | -    | dBm  |
| GLP          | Linear Power Gain                    |                                     | 10     | 11   | -    | dB   |
| P.A.E.       | Power added efficiency               |                                     | -      | 45   | -    | %    |
| Rth(ch-c) *2 | Thermal resistance                   | Δ Vf method                         | -      | -    | 5.5  | °C/W |

\*2 :Channel-case

## OUTLINE DRAWING

Unit: millimeters

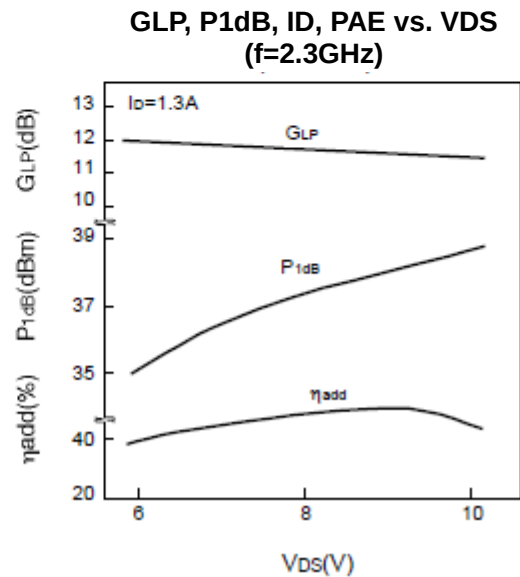
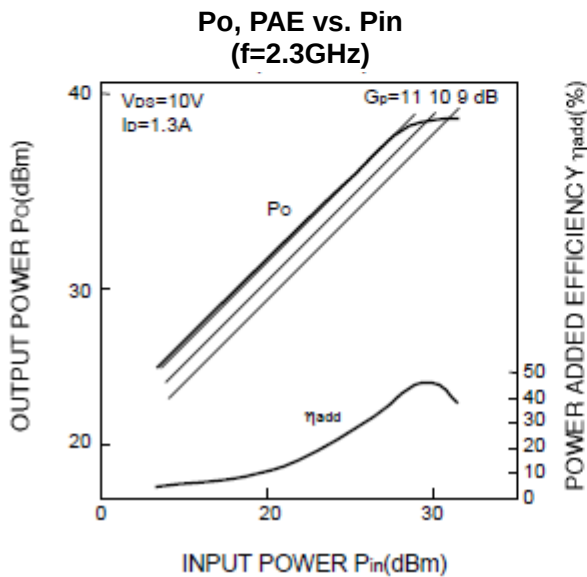
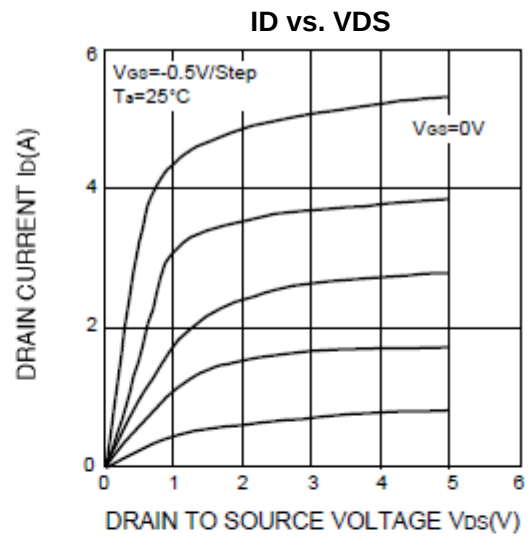
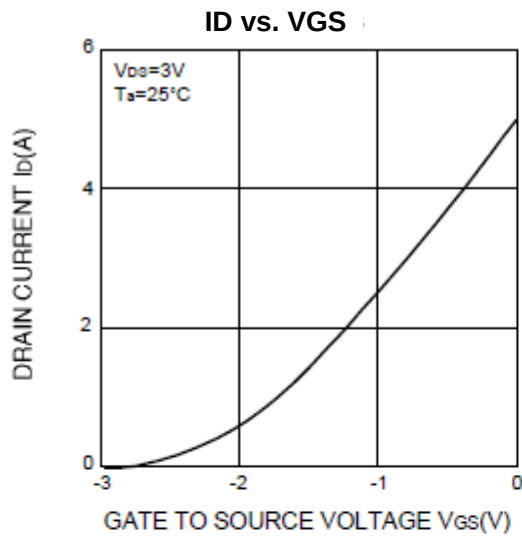


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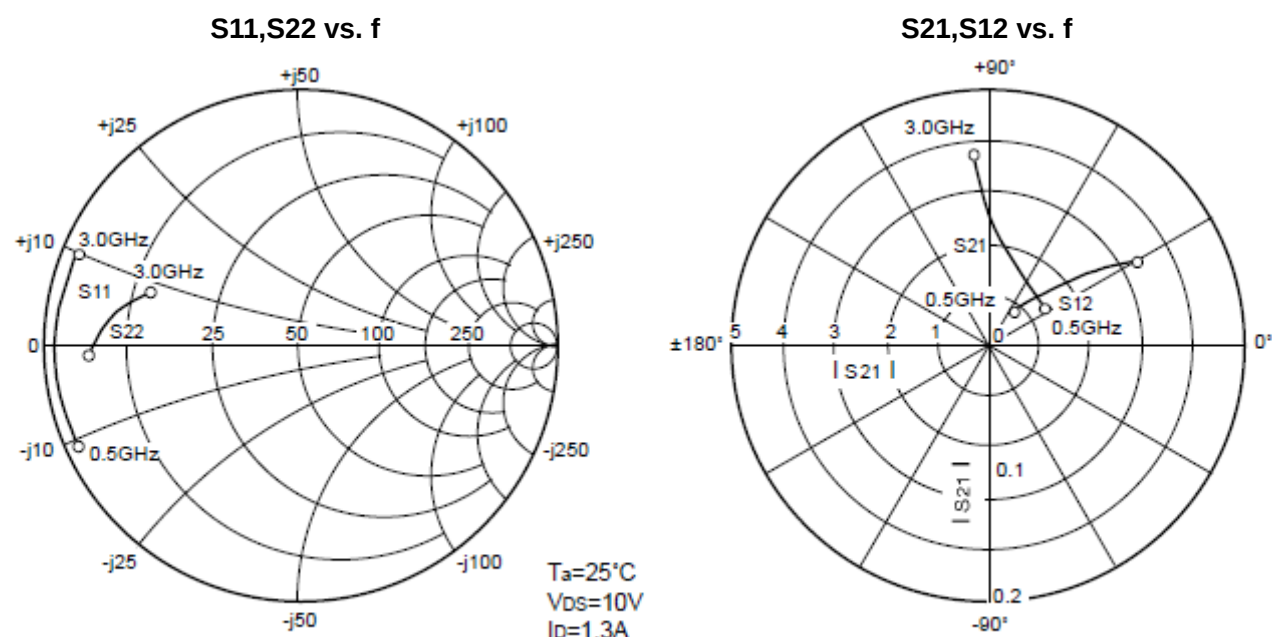
### MGF0910A TYPICAL CHARACTERISTICS( $T_a=25^{\circ}\text{C}$ )



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**MGF0910A S-parameters**( Ta=25deg.C , VDS=10(V),IDS=1.3(A) )

| Freq.<br>(GHz) | S11   |             | S21   |             | S12    |             | S22   |             | K     | MSG/MAG<br>(dB) |
|----------------|-------|-------------|-------|-------------|--------|-------------|-------|-------------|-------|-----------------|
|                | Magn. | Angle(deg.) | Magn. | Angle(deg.) | Magn.  | Angle(deg.) | Magn. | Angle(deg.) |       |                 |
| 0.50           | 0.962 | -155.5      | 3.762 | 97.8        | 0.0080 | 50.0        | 0.869 | -177.6      | 0.752 | 25.0            |
| 0.60           | 0.961 | -159.7      | 3.339 | 93.6        | 0.0090 | 49.9        | 0.869 | -179.6      | 0.795 | 24.8            |
| 0.70           | 0.960 | -163.4      | 2.768 | 90.8        | 0.0110 | 48.5        | 0.867 | 178.5       | 0.835 | 24.7            |
| 0.80           | 0.959 | -166.8      | 2.460 | 87.5        | 0.0130 | 47.5        | 0.865 | 178.2       | 0.842 | 23.5            |
| 0.90           | 0.958 | -168.4      | 2.219 | 87.1        | 0.0140 | 46.5        | 0.860 | 177.6       | 0.883 | 23.0            |
| 1.00           | 0.957 | -171.3      | 2.021 | 84.1        | 0.0149 | 46.0        | 0.854 | 176.8       | 0.902 | 23.1            |
| 1.10           | 0.956 | -173.8      | 1.830 | 82.2        | 0.0156 | 45.6        | 0.845 | 175.6       | 0.943 | 22.4            |
| 1.20           | 0.955 | -175.4      | 1.691 | 80.2        | 0.0172 | 44.6        | 0.840 | 176.6       | 1.025 | 21.5            |
| 1.30           | 0.954 | -176.8      | 1.590 | 78.0        | 0.0182 | 44.0        | 0.832 | 176.1       | 1.055 | 20.0            |
| 1.40           | 0.952 | -178.7      | 1.500 | 75.7        | 0.0189 | 43.5        | 0.825 | 175.7       | 1.085 | 19.0            |
| 1.50           | 0.950 | -179.7      | 1.425 | 73.7        | 0.0192 | 42.3        | 0.818 | 175.3       | 1.125 | 18.5            |
| 1.60           | 0.948 | 178.4       | 1.352 | 71.6        | 0.0195 | 40.9        | 0.805 | 175.1       | 1.175 | 17.8            |
| 1.70           | 0.946 | 177.2       | 1.330 | 69.9        | 0.0219 | 40.3        | 0.795 | 174.7       | 1.195 | 17.0            |
| 1.80           | 0.944 | 176.0       | 1.255 | 67.7        | 0.0224 | 39.0        | 0.782 | 174.0       | 1.212 | 16.9            |
| 1.90           | 0.941 | 174.7       | 1.201 | 66.2        | 0.0225 | 38.5        | 0.773 | 173.4       | 1.256 | 16.0            |
| 2.00           | 0.938 | 174.3       | 1.040 | 65.3        | 0.0235 | 38.0        | 0.757 | 174.4       | 1.285 | 15.4            |
| 2.10           | 0.934 | 173.3       | 0.993 | 63.3        | 0.0239 | 37.2        | 0.750 | 174.2       | 1.295 | 14.8            |
| 2.20           | 0.930 | 172.3       | 0.977 | 61.7        | 0.0249 | 36.5        | 0.740 | 173.4       | 1.305 | 14.5            |
| 2.30           | 0.926 | 171.2       | 0.949 | 59.1        | 0.0258 | 35.8        | 0.725 | 172.7       | 1.355 | 14.2            |
| 2.40           | 0.922 | 169.9       | 0.921 | 57.0        | 0.0265 | 35.3        | 0.708 | 172.2       | 1.395 | 13.8            |
| 2.50           | 0.918 | 169.0       | 0.909 | 55.4        | 0.0275 | 34.6        | 0.687 | 171.6       | 1.415 | 13.5            |
| 2.60           | 0.913 | 167.6       | 0.900 | 54.3        | 0.0280 | 33.6        | 0.672 | 170.3       | 1.435 | 12.8            |
| 2.70           | 0.907 | 166.1       | 0.876 | 52.2        | 0.0286 | 32.5        | 0.662 | 168.9       | 1.454 | 12.3            |
| 2.80           | 0.902 | 164.6       | 0.873 | 49.9        | 0.0296 | 31.2        | 0.642 | 167.7       | 1.475 | 11.9            |
| 2.90           | 0.895 | 163.3       | 0.843 | 48.4        | 0.0310 | 30.2        | 0.629 | 166.9       | 1.495 | 10.8            |
| 3.00           | 0.885 | 162.0       | 0.832 | 45.5        | 0.0320 | 29.1        | 0.610 | 159.4       | 1.525 | 10.5            |

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