

MGF0905A

L, S BAND POWER GaAs FET

DESCRIPTION

The MGF0905A, GaAs FET with an N-channel schottky gate, is designed for use in UHF band amplifiers.

FEATURES

- High output power
 $P_o = 34\text{dBm (TYP.) @ } f = 1.65\text{GHz, } P_{in} = 26\text{dBm}$
- High power gain
 $G_p = 8\text{dB (TYP.) @ } f = 1.65\text{GHz, } P_{in} = 26\text{dBm}$
- High power added efficiency
 $\eta_{add} = 40\% \text{ (TYP.) @ } f = 1.65\text{GHz, } P_{in} = 26\text{dBm}$

APPLICATION

For UHF Band power amplifiers

QUALITY GRADE

- GG

RECOMMENDED BIAS CONDITIONS

- $V_{DS} = 8\text{V}$
- $I_D = 800\text{mA}$
- $R_g = 100\Omega$
- Refer to Bias Procedure

ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

| Symbol | Parameter | Ratings | Unit |
|-----------|----------------------------|------------|------------------|
| V_{GS0} | Gate to source voltage | -17 | V |
| V_{GDO} | Gate to drain voltage | -17 | V |
| I_D | Drain current | 3200 | mA |
| I_{GR} | Reverse gate current | -10 | mA |
| I_{GF} | Forward gate current | 21.5 | mA |
| P_T | Total power dissipation *1 | 12 | W |
| T_{ch} | Channel temperature | 175 | $^\circ\text{C}$ |
| T_{stg} | Storage temperature | -65 ~ +175 | $^\circ\text{C}$ |

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

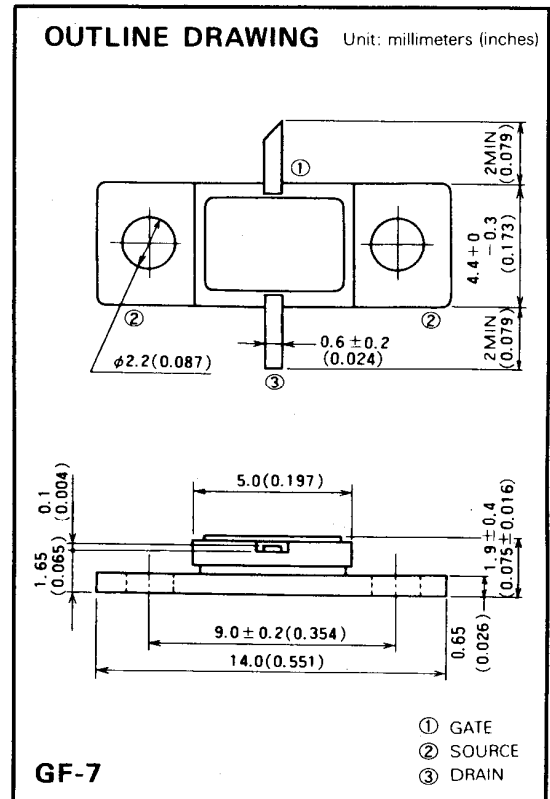
ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

| Symbol | Parameter | Test conditions | Limits | | | Unit |
|----------------|--------------------------------|----------------------------------------------------------------------------------------|--------|------|------|--------------------|
| | | | Min | Typ | Max | |
| I_{DSS} | Saturated drain current | $V_{DS} = 3\text{V, } V_{GS} = 0\text{V}$ | 1600 | 2400 | 3200 | mA |
| $V_{GS(off)}$ | Gate to source cut-off voltage | $V_{DS} = 3\text{V, } I_D = 10\text{mA}$ | -1 | -3 | -5 | V |
| g_m | Transconductance | $V_{DS} = 3\text{V, } I_D = 800\text{mA}$ | 500 | 800 | — | mS |
| P_o | Output power | $V_{DS} = 8\text{V, } I_D = 800\text{mA, } f = 1.65\text{GHz, } P_{in} = 26\text{dBm}$ | 33 | 34 | — | dBm |
| η_{add} | Power added efficiency | | — | 40 | — | % |
| $R_{th(ch-c)}$ | Thermal resistance *1 | ΔV_f method | — | — | 12.5 | $^\circ\text{C/W}$ |
| $R_{th(ch-a)}$ | Thermal resistance *2 | ΔV_f method | — | — | 72.5 | $^\circ\text{C/W}$ |

*1: Channel to case *2: Channel to ambient

OUTLINE DRAWING

Unit: millimeters (inches)

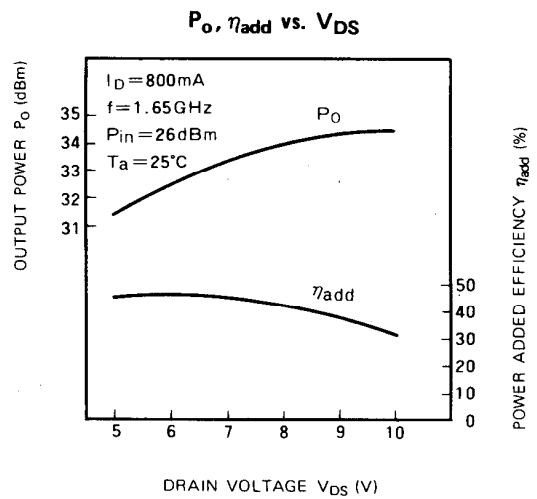
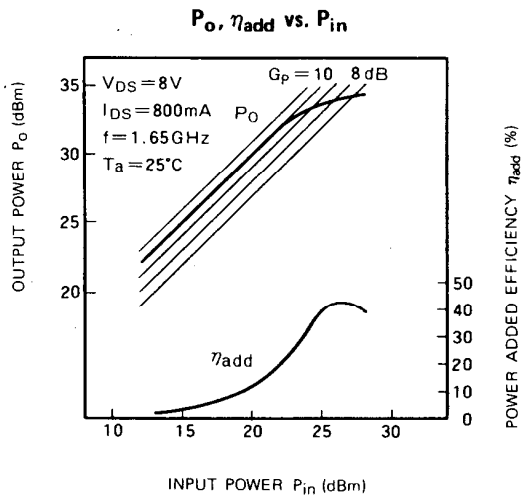
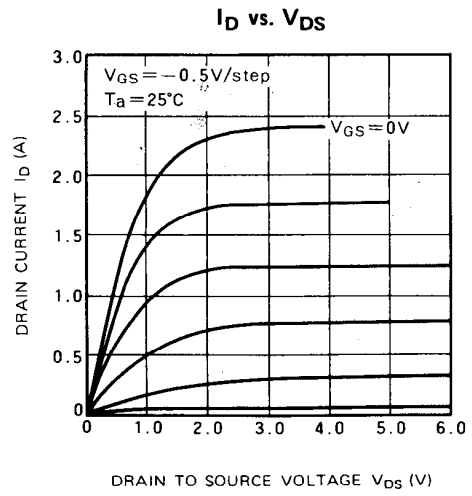
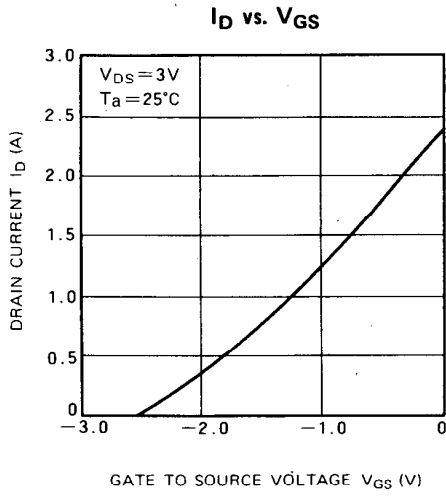


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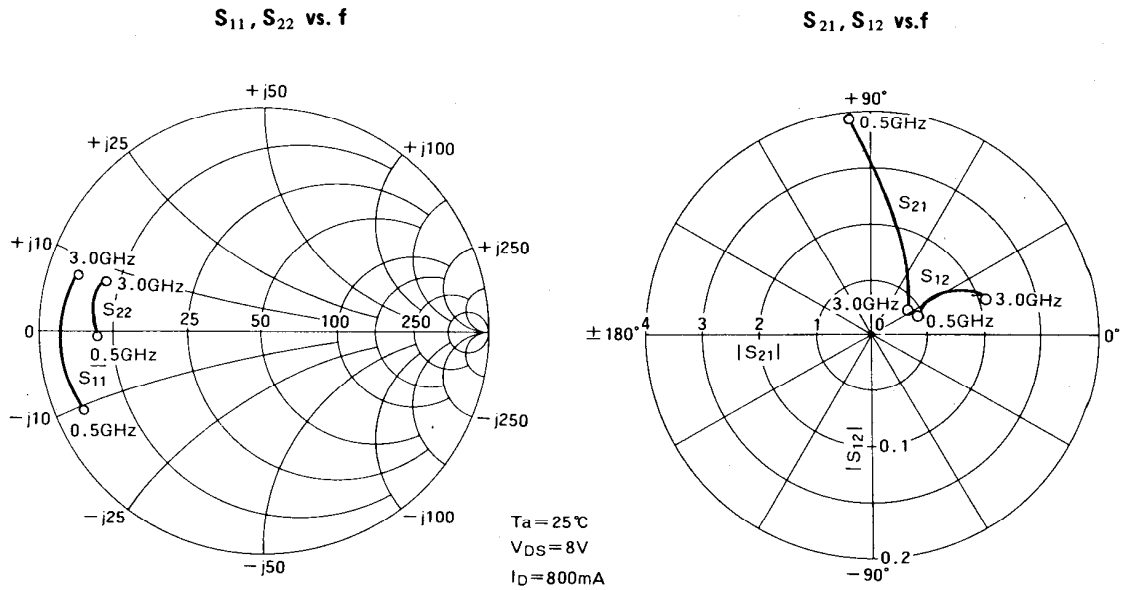
- ① GATE
- ② SOURCE
- ③ DRAIN

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TYPICAL CHARACTERISTICS



L, S BAND POWER GaAs FET



S PARAMETERS ($T_a = 25^\circ\text{C}$, $V_{DS} = 8\text{V}$, $I_D = 800\text{mA}$)

| 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 | 0.861 | -155.5 | 3.895 | 96.0 | 0.022 | 25.0 | 0.731 | -179.0 | 0.806 | 22.5 |
| 1.0 | 0.887 | -170.5 | 1.999 | 78.0 | 0.025 | 33.0 | 0.753 | 175.5 | 1.133 | 16.8 |
| 1.5 | 0.894 | 177.0 | 1.485 | 68.0 | 0.033 | 33.0 | 0.747 | 172.5 | 1.175 | 14.0 |
| 2.0 | 0.887 | 173.0 | 1.205 | 58.0 | 0.039 | 29.0 | 0.743 | 169.5 | 1.205 | 12.2 |
| 2.5 | 0.877 | 169.0 | 1.000 | 48.5 | 0.047 | 24.0 | 0.738 | 166.5 | 1.221 | 10.4 |
| 3.0 | 0.864 | 165.0 | 0.795 | 35.0 | 0.054 | 18.0 | 0.723 | 164.0 | 1.365 | 8.1 |