

MGF0805A

L & S Band GaAs FET [SMD non-matched]

DESCRIPTION

The MGF0805A, GaAs FET with an N-channel schottky Gate, is designed for MMDS/UMTS/WiMAX applications.

FEATURES

- High output power : $P_o = 36.5$ dBm (typ.)
- High power added efficiency : $\eta_{add} = 50$ % (typ.)
- Hermetic package
- Designed for use in Class AB linear amplifiers

APPLICATIONS

- L/S band power amplifiers

QUALITY

- GG

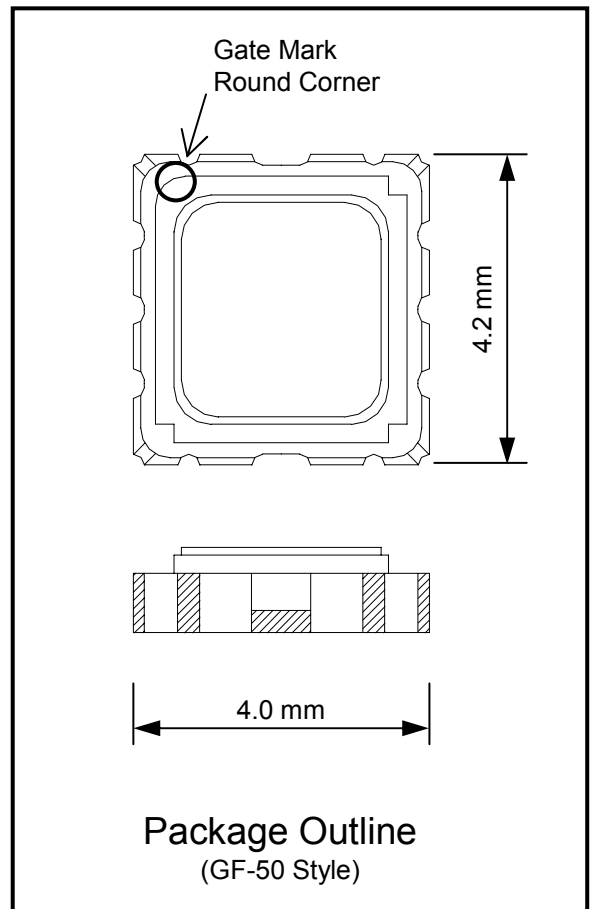
RECOMMENDED BIAS CONDITIONS

- $V_{ds} = 10$ V • $I_{ds} = 400$ mA • $R_g = 100$ Ω

Packaging Tape & Reel (1000 pcs)

Absolute maximum ratings (Ta = 25° C)

| Symbol | Parameter | Ratings | Unit |
|--------|-------------------------|--------------|------|
| VDS | Drain to Source Voltage | 15 | V |
| VGS | Gate to Source Voltage | - 5 | V |
| ID | Drain current | 2.5 | A |
| PT | Total power dissipation | 21 | W |
| IGR | Reverse gate current | - 10 | mA |
| IGF | Forward gate current | 21 | mA |
| Tch | Channel temperature | 175 | °C |
| Tstg | Storage temperature | - 55 to +150 | °C |



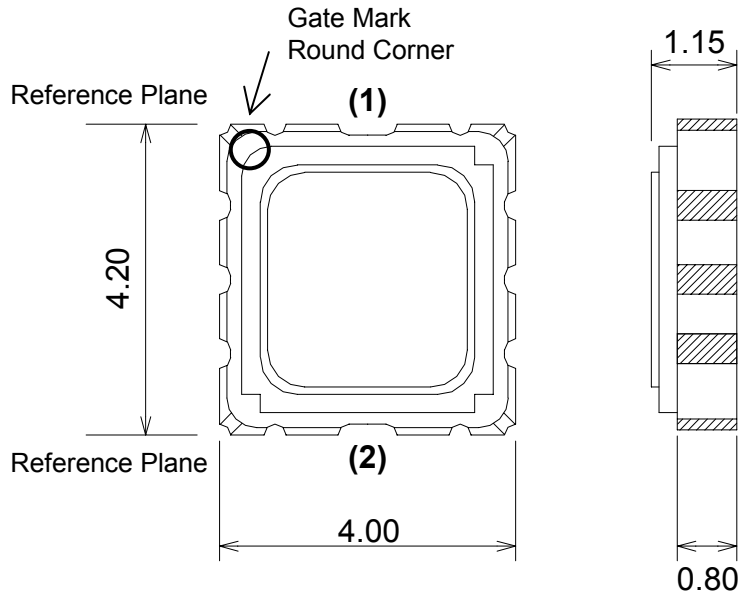
Electrical characteristics (Ta = 25° C)

| Symbol | Parameter | Test conditions | Limits | | | Unit |
|----------------|--------------------------------|--|--------|-------|-------|------|
| | | | Min. | Typ. | Max. | |
| IDSS | Saturated drain current | $V_{DS} = 3$ V, $V_{GS} = 0$ V | - | 1800 | - | mA |
| $V_{GS(off)}$ | Gate to source cut-off voltage | $V_{DS} = 3$ V, $I_{DS} = 10$ mA | - 0.5 | - 1.1 | - 2.0 | V |
| gm | Transconductance | $V_{DS} = 10$ V, $I_{DS} = 400$ mA | - | 1000 | - | mS |
| P_o | Output power | $V_{DS} = 10$ V, $I_{DQ} = 400$ mA, $f = 1.9$ GHz, $P_{in} = 22$ dBm | 35.0 | 36.5 | - | dBm |
| η_{add} | Power added efficiency | | - | 50 | - | % |
| GLP | Linear power gain | $V_{DS} = 10$ V, $I_{DQ} = 400$ mA, $f = 1.9$ GHz | 13.0 | 14.5 | - | dB |
| $R_{th(ch-c)}$ | Thermal resistance *1 | ΔV_f Method | - | 5 | 7 | °C/W |

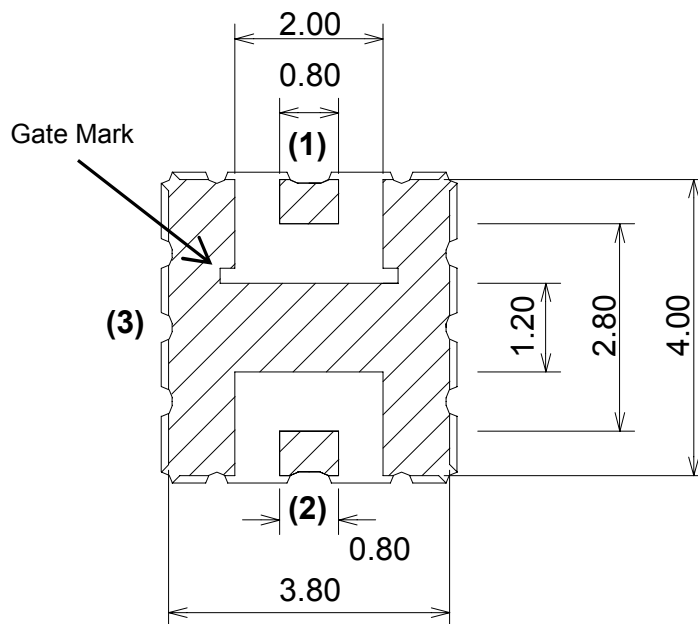
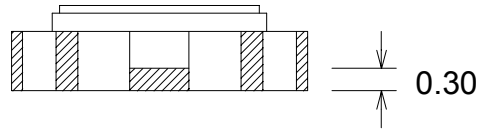
*1 : Channel to case

Specifications are subject to change without notice.

Outline Drawing



- (1) Gate
- (2) Drain
- (3) Source unit: mm



BACK SIDE PATTERN

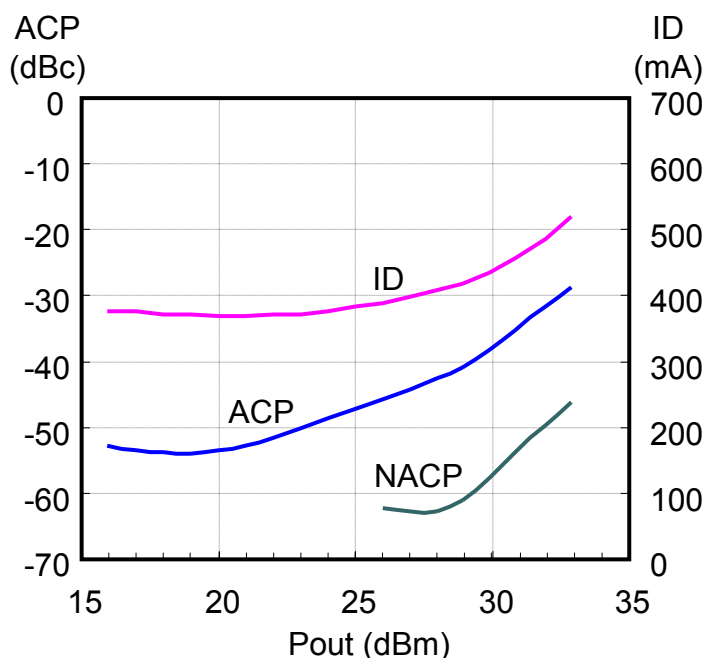
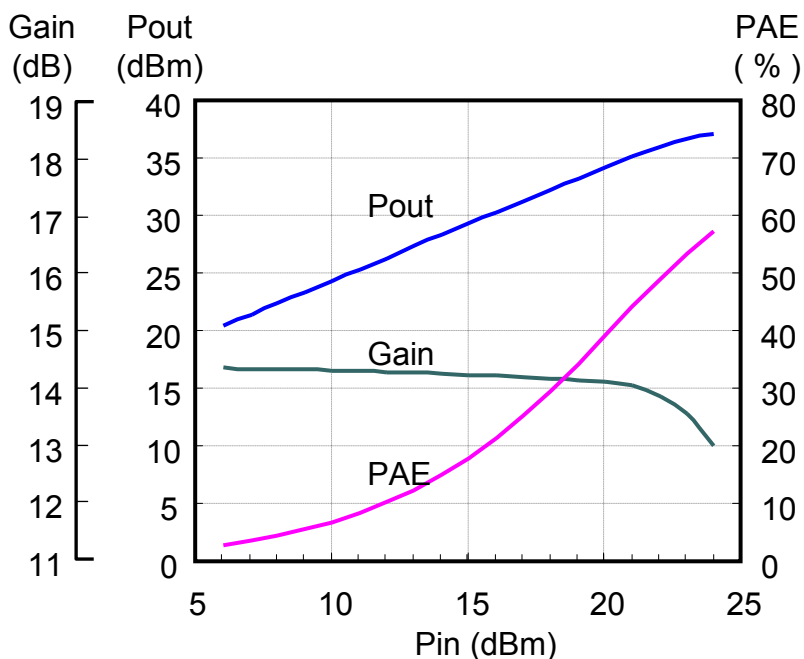
S-parameters:

Condition: VD = 10 V, ID = 400 mA, Ta = 25 deg. C

| Freq. (GHz) | S11 | | S21 | | S12 | | S22 | |
|----------------|-------|--------|-------|-------|--------|-------|-------|--------|
| | (mag) | (ang) | (mag) | (ang) | (mag) | (ang) | (mag) | (ang) |
| 0.4 | 0.935 | -149.9 | 7.946 | 99.7 | 0.0129 | 19.0 | 0.740 | -176.7 |
| 0.6 | 0.942 | -162.4 | 5.440 | 89.3 | 0.0132 | 14.1 | 0.740 | -179.0 |
| 0.8 | 0.943 | -169.6 | 4.092 | 82.2 | 0.0134 | 12.5 | 0.733 | 179.5 |
| 1.0 | 0.943 | -174.7 | 3.279 | 76.7 | 0.0136 | 12.0 | 0.729 | 178.4 |
| 1.2 | 0.943 | -178.5 | 2.743 | 71.7 | 0.0138 | 12.0 | 0.728 | 177.4 |
| 1.4 | 0.942 | 178.5 | 2.348 | 67.3 | 0.0140 | 12.7 | 0.732 | 176.8 |
| 1.6 | 0.939 | 175.8 | 2.050 | 63.0 | 0.0141 | 13.2 | 0.730 | 174.7 |
| 1.8 | 0.939 | 173.1 | 1.812 | 58.7 | 0.0142 | 14.3 | 0.741 | 173.8 |
| 2.0 | 0.937 | 170.5 | 1.639 | 53.8 | 0.0146 | 14.5 | 0.737 | 173.5 |
| 2.2 | 0.937 | 168.2 | 1.500 | 49.9 | 0.0151 | 14.9 | 0.739 | 172.7 |
| 2.4 | 0.935 | 166.2 | 1.379 | 46.0 | 0.0155 | 15.4 | 0.740 | 172.0 |
| 2.6 | 0.936 | 164.2 | 1.277 | 42.3 | 0.0159 | 15.4 | 0.745 | 171.2 |
| 2.8 | 0.935 | 162.3 | 1.192 | 38.5 | 0.0160 | 15.9 | 0.746 | 170.3 |
| 3.0 | 0.932 | 160.6 | 1.119 | 35.0 | 0.0163 | 17.6 | 0.750 | 169.3 |
| 3.2 | 0.934 | 158.6 | 1.059 | 31.4 | 0.0167 | 20.5 | 0.753 | 168.3 |
| 3.4 | 0.935 | 156.4 | 1.005 | 27.4 | 0.0182 | 21.4 | 0.755 | 167.0 |
| 3.6 | 0.933 | 154.4 | 0.955 | 23.6 | 0.0190 | 20.9 | 0.757 | 165.6 |
| 3.8 | 0.932 | 152.1 | 0.910 | 19.6 | 0.0199 | 20.5 | 0.758 | 164.2 |
| 4.0 | 0.931 | 149.8 | 0.870 | 15.7 | 0.0208 | 20.2 | 0.760 | 162.7 |
| 4.2 | 0.931 | 147.3 | 0.836 | 11.8 | 0.0215 | 20.1 | 0.761 | 161.0 |
| 4.4 | 0.929 | 144.6 | 0.808 | 7.9 | 0.0232 | 21.2 | 0.762 | 159.4 |
| 4.6 | 0.926 | 141.8 | 0.781 | 3.7 | 0.0249 | 19.2 | 0.764 | 157.8 |
| 4.8 | 0.924 | 138.9 | 0.757 | -0.4 | 0.0263 | 17.3 | 0.763 | 156.0 |
| 5.0 | 0.920 | 137.5 | 0.742 | -2.9 | 0.0281 | 17.4 | 0.767 | 156.5 |

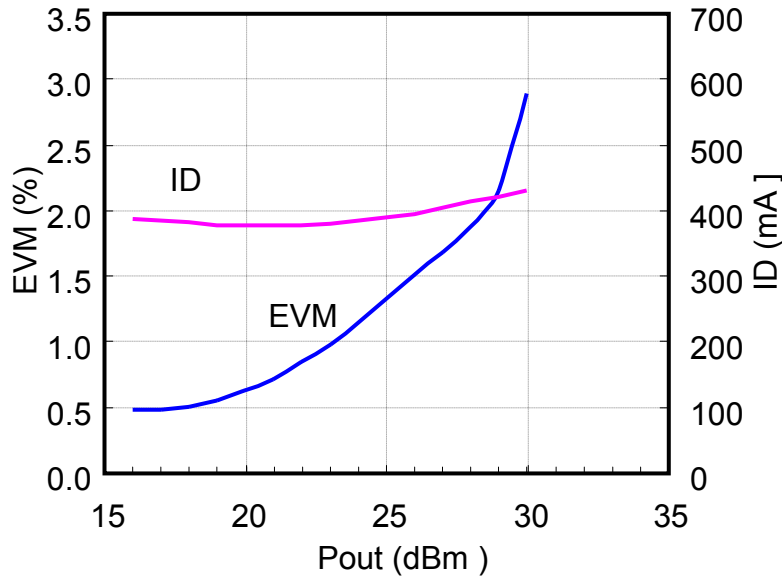
Note : Reference plane is shown in Outline Drawing

Example of Circuit Schematic and Characteristics : f = 2.6 GHz

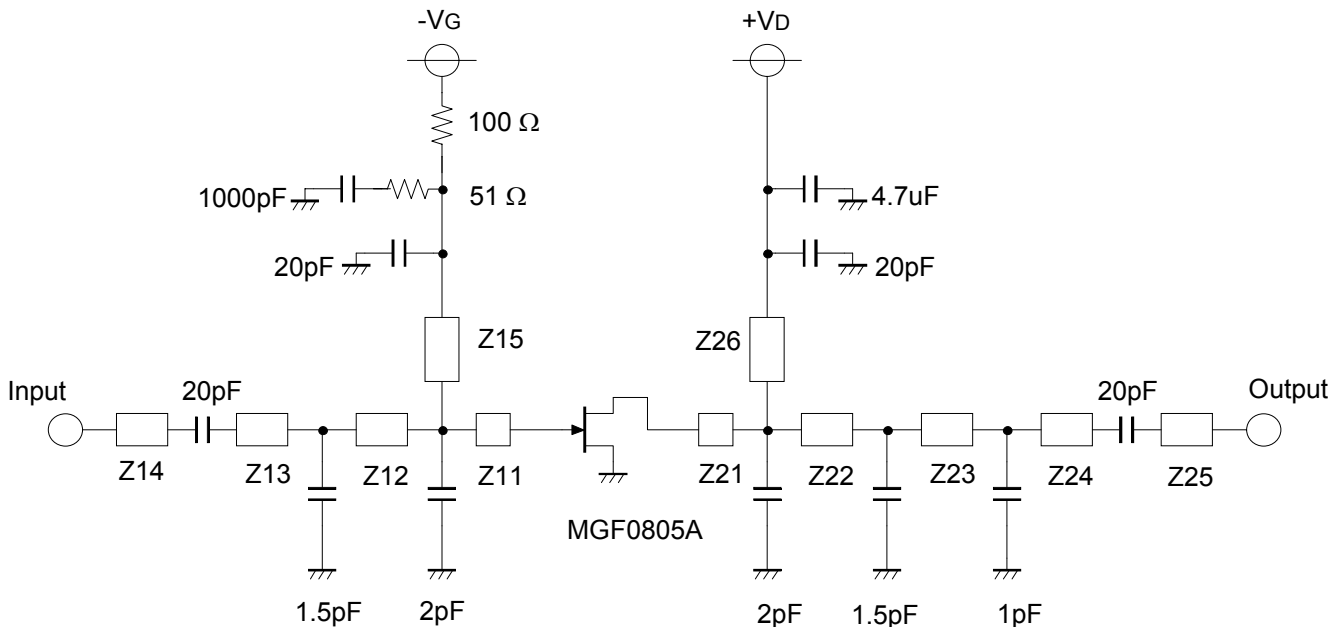


Bias condition: $V_D = 10\text{ V}$, $I_{DQ} = 400\text{ mA}$,
 Modulation signal: 3GPP TEST MODEL 1 (W-CDMA)

Example of Circuit Schematic and Characteristics : f = 2.6 GHz



Bias condition:
 $V_D = 10\text{ V}$,
 $I_{DQ} = 400\text{ mA}$
 Modulation signal:
 IEEE.802.16 WiMAX A,
 Downlink, 64QAM3/4



Z11 to Z26 : Microstrip line (L × W, Unit: mm)

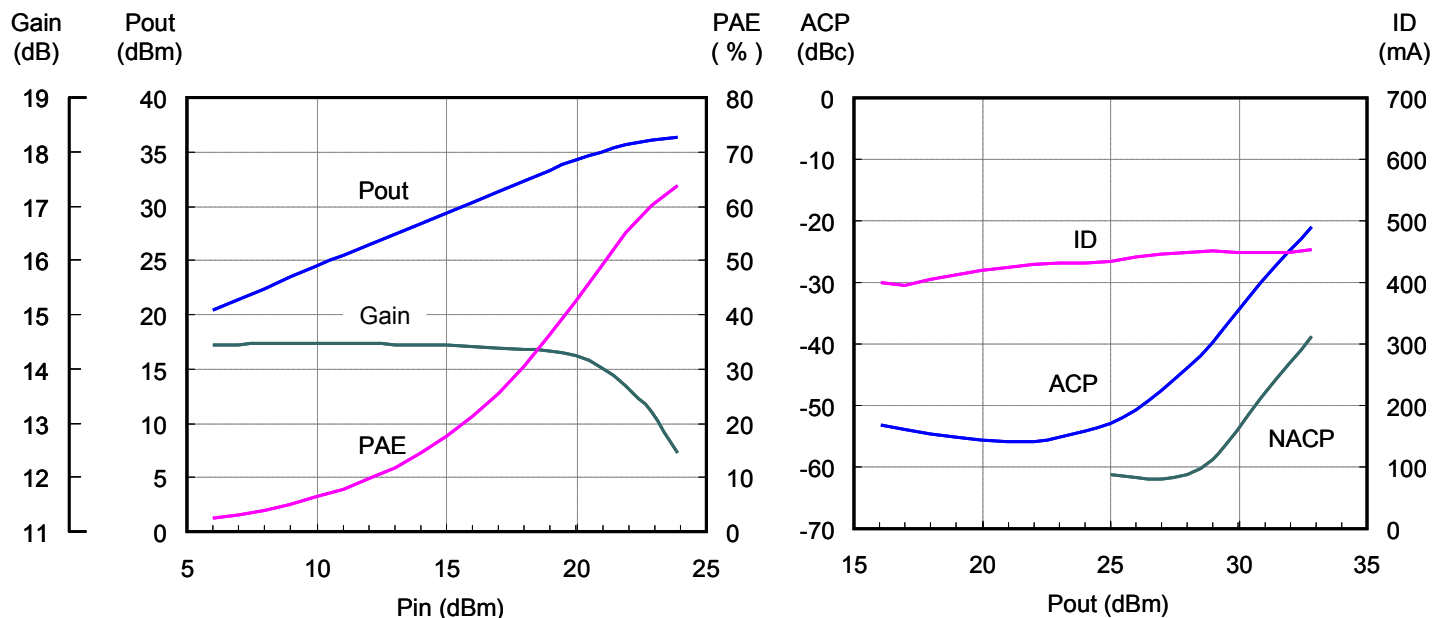
| | | | |
|------------------|------------------|------------------|------------------|
| Z11 : 1.0 × 0.9 | Z14 : 3.0 × 0.9 | Z22 : 2.1 × 0.9 | Z25 : 3.0 × 0.9 |
| Z12 : 0.8 × 0.9 | Z15 : 17.6 × 0.5 | Z23 : 3.2 × 0.9 | Z26 : 17.6 × 0.5 |
| Z13 : 14.5 × 0.9 | Z21 : 1.0 × 0.9 | Z24 : 10.0 × 0.9 | |

PCB : BT Resin, $\epsilon_r = 3.4$, Substrate thickness = 0.4 mm

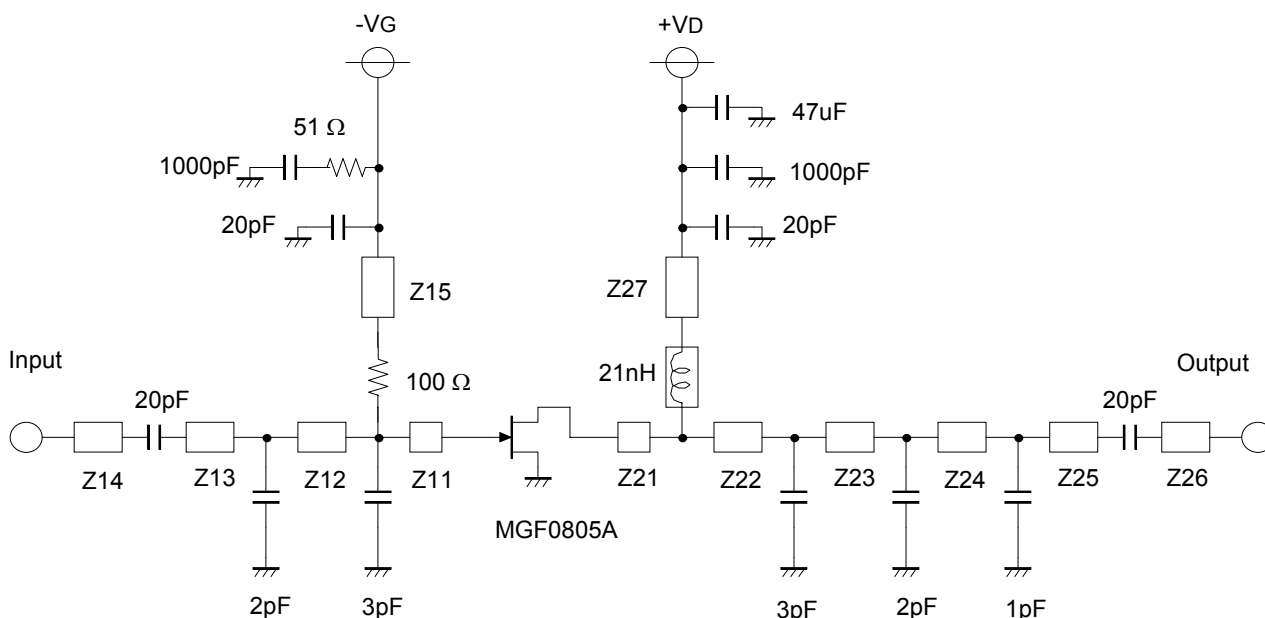
MGF0805A

L & S Band GaAs FET [SMD non-matched]

Example of Circuit Schematic and Characteristics : f = 1.9 GHz



Bias condition: $V_D = 10\text{ V}$, $I_{DQ} = 400\text{ mA}$,
 Modulation signal: 3GPP TEST MODEL 1 (W-CDMA)

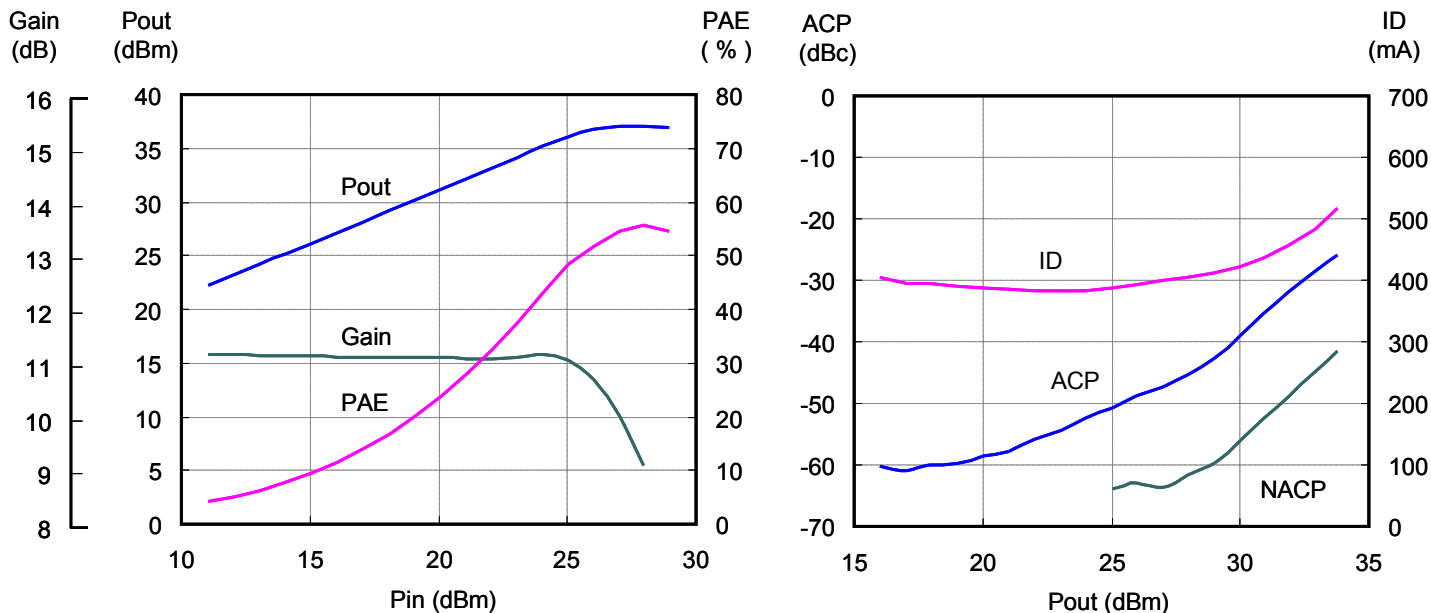


Z11 to Z27 : Microstrip line (L × W, Unit: mm)

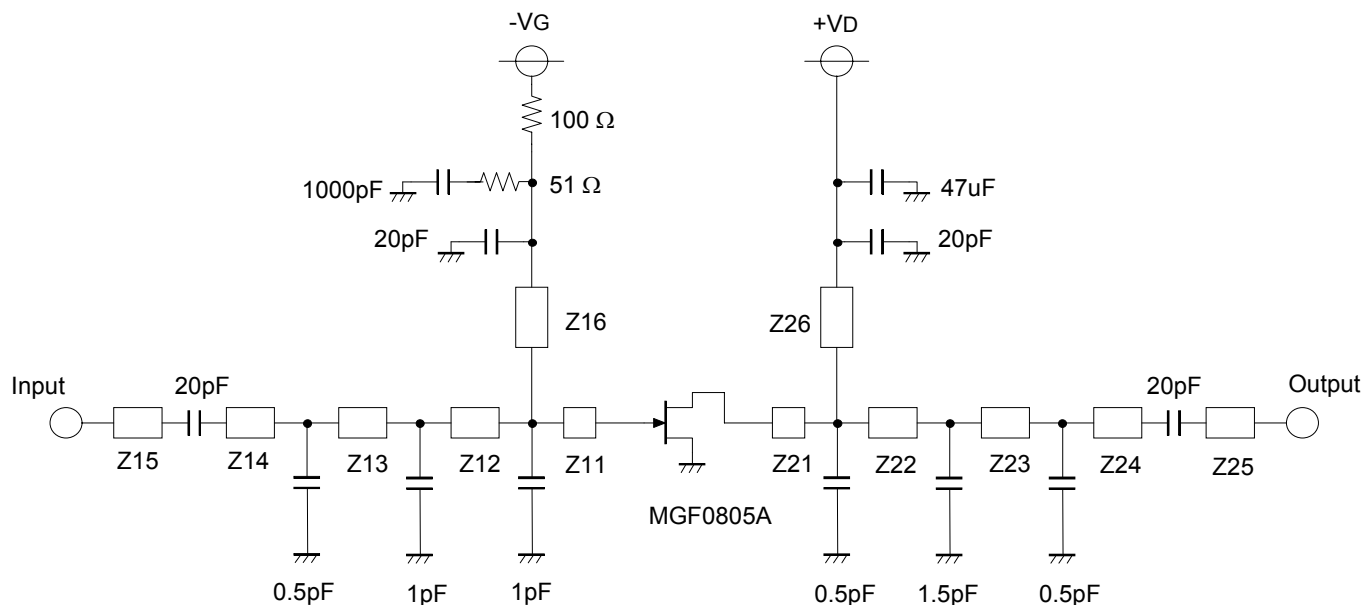
| | | | |
|-----------------|------------------|-----------------|-----------------|
| Z11 : 1.0 × 0.9 | Z14 : 3.0 × 0.9 | Z22 : 1.2 × 0.9 | Z25 : 2.8 × 0.9 |
| Z12 : 5.1 × 0.9 | Z15 : 22.0 × 0.5 | Z23 : 5.7 × 0.9 | Z26 : 3.0 × 0.9 |
| Z13 : 9.6 × 0.9 | Z21 : 1.0 × 0.9 | Z24 : 5.9 × 0.9 | Z27 : 22 × 0.5 |

PCB : BT Resin, $\epsilon_r = 3.4$, Substrate thickness = 0.4 mm

Example of Circuit Schematic and Characteristics : f = 3.5 GHz



Bias condition: $V_D = 10\text{ V}$, $I_{DQ} = 400\text{ mA}$,
 Modulation signal: 3GPP TEST MODEL 1 (W-CDMA)



Z11 to Z26 : Microstrip line (L × W, Unit: mm)

| | | | |
|------------------|------------------|-----------------|------------------|
| Z11 : 1.0 × 0.9 | Z14 : 3.7 × 0.9 | Z21 : 1.0 × 0.9 | Z24 : 4.7 × 0.9 |
| Z12 : 0.8 × 0.9 | Z15 : 3.0 × 0.9 | Z22 : 0.8 × 0.9 | Z25 : 3.0 × 0.9 |
| Z13 : 10.8 × 0.9 | Z16 : 13.3 × 0.5 | Z23 : 9.8 × 0.9 | Z26 : 13.3 × 0.5 |

PCB : BT Resin, $\epsilon_r = 3.4$, Substrate thickness = 0.4 mm

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