

MGFC44V6472

6.4~7.2GHz BAND 24W INTERNALLY MATCHED GaAs FET

DESCRIPTION

The MGFC44V6472 is an internally impedance-matched GaAs power FET especially designed for use in 6.4 ~ 7.2 GHz band amplifiers. The hermetically sealed metal-ceramic package guarantees high reliability.

FEATURES

- Class A operation
- Internally matched to 50Ω system
- High output power
 $P_{1dB} = 24W(TYP) @ 6.4 \sim 7.2 GHz$
- High power gain
 $G_{LP} = 8 dB(TYP) @ 6.4 \sim 7.2 GHz$
- High power added efficiency
 $\eta_{add} = 31\%(TYP) @ 6.4 \sim 7.2 GHz$
- Hermetically sealed metal-ceramic package
- Low distortion [Item: -51]
 $IM_3 = -42dBc(MIN) @ P_o = 33.5(dBm) S.C.L.$

APPLICATION

Item -01: 6.4 ~ 7.2GHz band power amplifier
 Item -51: Digital radio communication

QUALITY GRADE

- IG

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

| Symbol | Parameter | Ratings | Unit |
|------------------|----------------------------|------------|------|
| V _{GD0} | Gate to drain voltage | -15 | V |
| V _{GSO} | Gate to source voltage | -15 | V |
| I _D | Drain current | 20 | A |
| I _{GR} | Reverse gate current | -60 | mA |
| I _{GF} | Forward gate current | 126 | mA |
| P _T | Total power dissipation *1 | 93 | W |
| T _{ch} | Channel temperature | 175 | °C |
| T _{stg} | Storage temperature | -65 ~ +175 | °C |

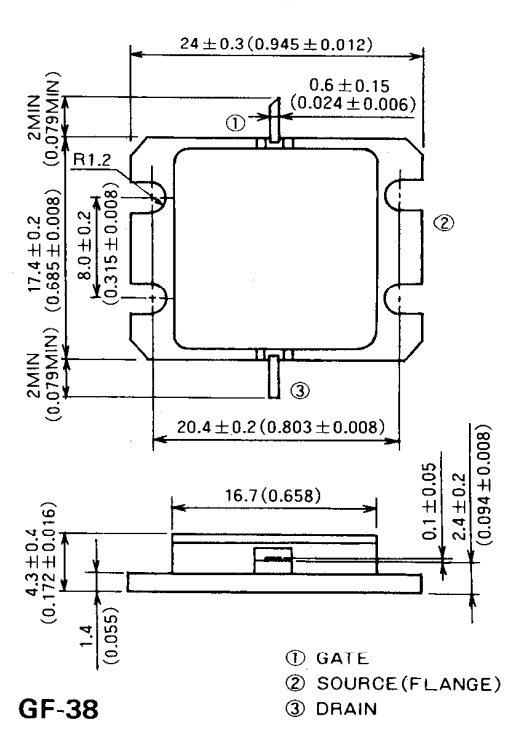
*1: T_c = 25°C

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

| Symbol | Parameter | Test conditions | Limits | | | Unit |
|-----------------------|--------------------------------------|--|--------|-----|-----|------|
| | | | Min | Typ | Max | |
| I _{DSS} | Saturated drain current | V _{DS} = 3V, V _{GS} = 0V | — | 18 | — | A |
| g _m | Transconductance | V _{DS} = 3V, I _D = 6.4A | — | 6.5 | — | S |
| V _{GS(off)} | Gate to source cut-off voltage | V _{DS} = 3V, I _D = 120mA | -2 | — | -5 | V |
| P _{1dB} | Output power at 1dB gain compression | V _{DS} = 10V, I _D = 6.4A, f = 6.4 ~ 7.2GHz | 43 | 44 | — | dBm |
| G _{LP} | Linear power gain | | 7 | 8 | — | dB |
| η _{add} | Power added efficiency | | — | 31 | — | % |
| IM ₃ | 3rd order IM distortion *1 | | -42 | — | — | dBc |
| R _{th(ch-c)} | Thermal resistance *2 | ΔV _f method | — | — | 1.6 | °C/W |

*1: Item-51, 2-tone test P_o = 33.5dBm Single Carrier Level f = 7.2 GHz Δf = 10 MHz. *2: Channel to case

OUTLINE DRAWING Unit: millimeters (inches)



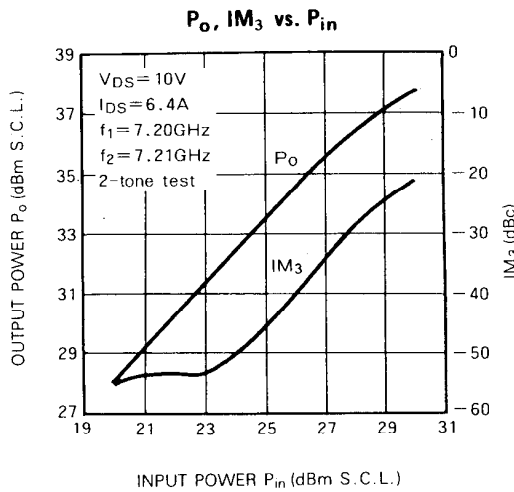
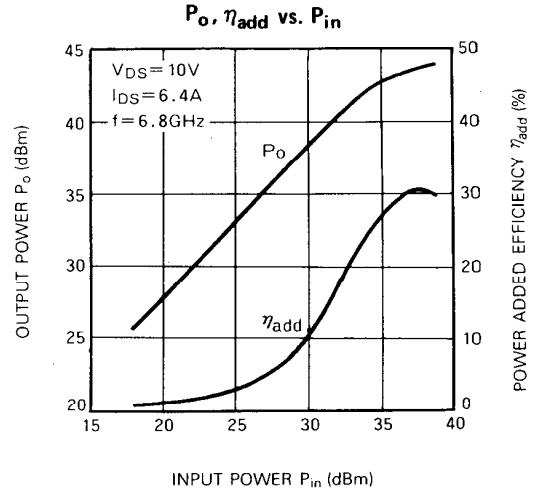
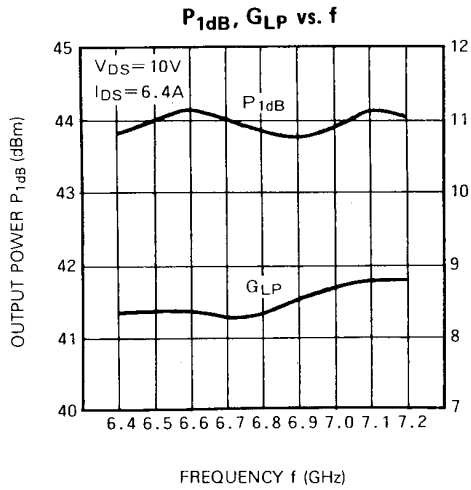
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RECOMMENDED BIAS CONDITIONS

- V_{DS} = 10V
- I_D = 6.4A
- R_g = 25 Ω
- Refer to Bias Procedure.

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



S PARAMETERS ($T_a=25^\circ\text{C}$, $V_{DS}=10\text{V}$, $I_{DS}=6.4\text{A}$)

| f (GHz) | S Parameter (TYP.) | | | | | | | |
|------------|--------------------|--------------|----------|--------------|----------|--------------|----------|--------------|
| | S_{11} | | S_{21} | | S_{12} | | S_{22} | |
| | Magn. | Angle (deg.) | Magn. | Angle (deg.) | Magn. | Angle (deg.) | Magn. | Angle (deg.) |
| 6.4 | 0.55 | 81 | 2.46 | -124 | 0.039 | -168 | 0.33 | 67 |
| 6.5 | 0.51 | 62 | 2.52 | -141 | 0.042 | 173 | 0.35 | 71 |
| 6.6 | 0.46 | 43 | 2.49 | -157 | 0.051 | 157 | 0.32 | 63 |
| 6.7 | 0.41 | 25 | 2.58 | -174 | 0.054 | 138 | 0.32 | 51 |
| 6.8 | 0.37 | 3 | 2.60 | 169 | 0.062 | 126 | 0.31 | 29 |
| 6.9 | 0.33 | -16 | 2.62 | 152 | 0.065 | 105 | 0.26 | 30 |
| 7.0 | 0.28 | -37 | 2.64 | 136 | 0.071 | 91 | 0.22 | 16 |
| 7.1 | 0.26 | -55 | 2.68 | 125 | 0.071 | 84 | 0.19 | 8 |
| 7.2 | 0.19 | -91 | 2.65 | 107 | 0.076 | 65 | 0.13 | 0 |