

# MGFC42V5964A

**PRELIMINARY**  
 Notice: This is not a final specification.  
 Some parametric limits are subject to change.

## 5.9~6.4GHz BAND 16W INTERNALLY MATCHED GaAs FET

### DESCRIPTION

The MGFC42V5964A is an internally impedance-matched GaAs power FET especially designed for use in 5.9 ~ 6.4 GHz band amplifiers. The hermetically sealed metal-ceramic package guarantees high reliability.

### FEATURES

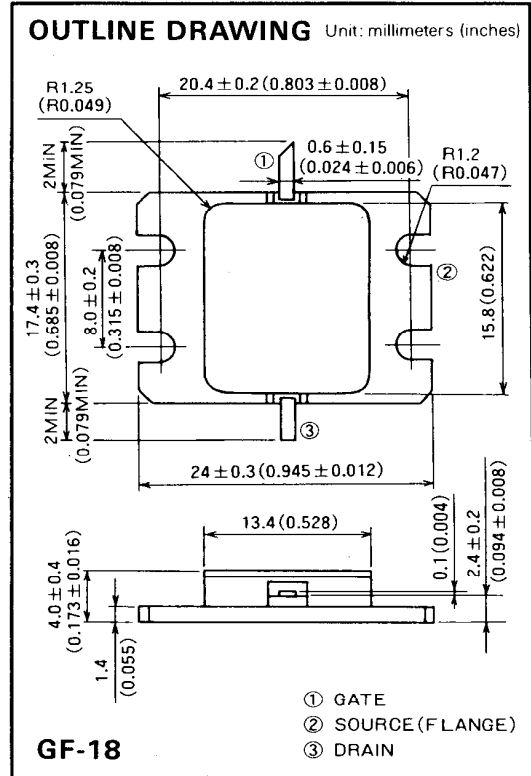
- Class A operation
- Internally matched to 50Ω system
- High output power  
 $P_{1dB} = 18W$  (TYP) @ 5.9 ~ 6.4 GHz
- High power gain  
 $G_{LP} = 9$  dB (TYP) @ 5.9 ~ 6.4 GHz
- High power added efficiency  
 $\eta_{add} = 33\%$  (TYP) @ 5.9 ~ 6.4 GHz,  $P_{1dB}$
- Hermetically sealed metal-ceramic package
- Low distortion [Item: -51]  
 $IM_3 = -45$  dBc (TYP) @  $P_o = 31$  (dBm) S.C.L.
- Low thermal resistance  $R_{th(ch-c)} \leq 1.6$  (°C/W)

### APPLICATION

- Item -01: 5.9 ~ 6.4 GHz 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              | 12         | A    |
| $I_{GR}$  | Reverse gate current       | -40        | mA   |
| $I_{GF}$  | Forward gate current       | 84         | mA   |
| $P_T$     | Total power dissipation *1 | 93.7       | W    |
| $T_{ch}$  | Channel temperature        | 175        | °C   |
| $T_{stg}$ | Storage temperature        | -65 ~ +175 | °C   |

\*1:  $T_c = 25^\circ C$

### RECOMMENDED BIAS CONDITIONS

- $V_{DS} = 10V$
- $I_D = 4.5A$
- $R_g = 25\Omega$
- Refer to Bias Procedure

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

| Symbol         | Parameter                            | Test conditions                                 | Limits              |      |     | Unit |
|----------------|--------------------------------------|---|---------------------|------|-----|------|
|                |                                      |   | Min                 | Typ  | Max |      |
| $I_{DSS}$      | Saturated drain current              | $V_{DS} = 3V, V_{GS} = 0V$                      | —                   | 9    | 12  | A    |
| $g_m$          | Transconductance                     | $V_{DS} = 3V, I_D = 4.4A$                       | —                   | 4    | —   | S    |
| $V_{GS(off)}$  | Gate to source cut-off voltage       | $V_{DS} = 3V, I_D = 80mA$                       | -2                  | -3   | -4  | V    |
| $P_{1dB}$      | Output power at 1dB gain compression | $V_{DS} = 10V, I_D = 4.5A, f = 5.9 \sim 6.4GHz$ | 41.5                | 42.5 | —   | dBm  |
| $G_{LP}$       | Linear power gain                    |   | 8                   | 9    | —   | dB   |
| $I_D$          | Drain current                        |   | —                   | 4.5  | —   | A    |
| $\eta_{add}$   | Power added efficiency               |   | —                   | 33   | —   | %    |
| $IM_3$         | 3rd order IM distortion *1           |   | -42                 | -45  | —   | dBc  |
| $R_{th(ch-c)}$ | Thermal resistance *2                |   | $\Delta V_f$ method | —    | —   | 1.6  |

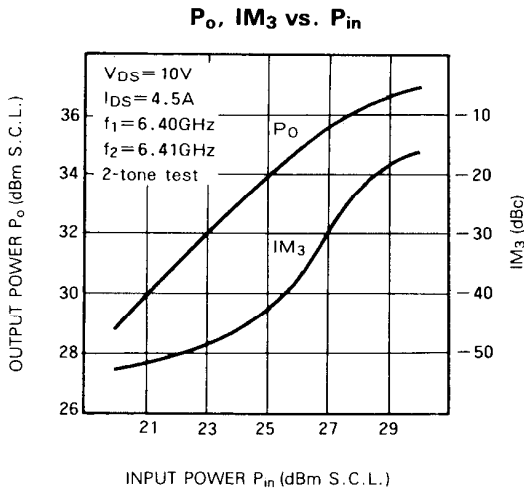
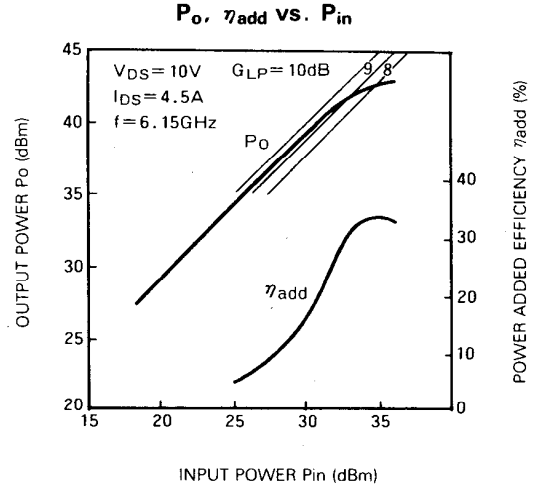
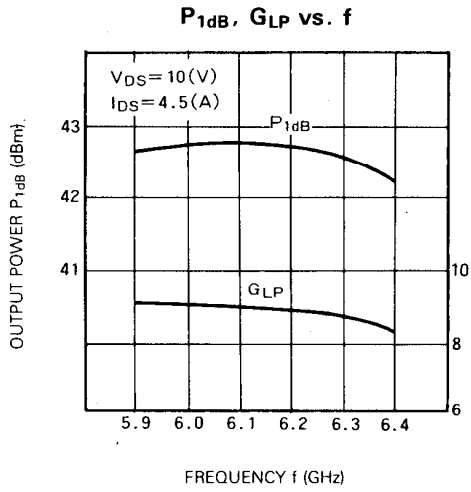
\*1: Item-51, 2-tone test  $P_o = 31$  dBm Single Carrier Level  $f = 6.4$  GHz  $\Delta f = 10$  MHz. \*2: Channel to case

**PRELIMINARY**

Notice: This is not a final specification.  
Some parametric limits are subject to change.

**5.9~6.4GHz BAND 16W INTERNALLY MATCHED GaAs FET**

**TYPICAL CHARACTERISTICS (Ta=25°C)**



**S PARAMETERS (Ta=25°C, V<sub>DS</sub>=10V, I<sub>DS</sub>=4.5A)**

| f<br>(GHz) | S Parameters (TYP.) |              |                 |              |                 |              |                 |              |
|------------|---------------------|--------------|-----------------|--------------|-----------------|--------------|-----------------|--------------|
|            | S <sub>11</sub>     |              | S <sub>21</sub> |              | S <sub>12</sub> |              | S <sub>22</sub> |              |
|            | Magn.               | Angle (deg.) | Magn.           | Angle (deg.) | Magn.           | Angle (deg.) | Magn.           | Angle (deg.) |
| 5.9        | 0.36                | 82           | 2.99            | -74          | 0.071           | -133         | 0.26            | 80           |
| 6.0        | 0.35                | 56           | 2.95            | -91          | 0.071           | -151         | 0.32            | 72           |
| 6.1        | 0.35                | 34           | 2.91            | -108         | 0.072           | -167         | 0.35            | 65           |
| 6.2        | 0.35                | 14           | 2.88            | -124         | 0.078           | 177          | 0.37            | 58           |
| 6.3        | 0.34                | -4           | 2.81            | -140         | 0.079           | 161          | 0.41            | 53           |
| 6.4        | 0.33                | -23          | 2.72            | -157         | 0.079           | 146          | 0.43            | 48           |