

## DESCRIPTION

The MGF2445, power GaAs FET with an N-channel schottky gate, is designed for use in S to Ku band amplifiers.

## FEATURES

- High output power  
 $P_{1dB} = 1.6 \text{ W (TYP.) @ 12 GHz}$
- High power gain  
 $G_{LP} = 5 \text{ dB (TYP.) @ 12 GHz}$
- High power added efficiency  
 $\eta_{add} = 18\% \text{ (TYP.) @ 12 GHz, } P_{1dB}$

## APPLICATION

S to Ku band power amplifiers.

## QUALITY GRADE

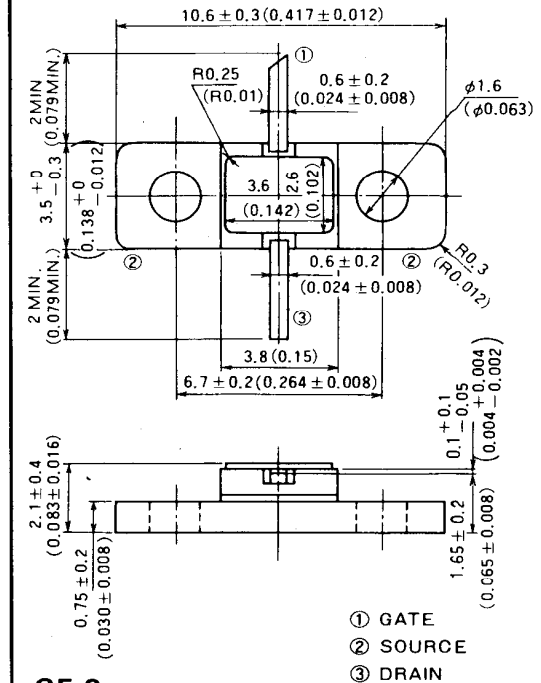
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## RECOMMENDED BIAS CONDITIONS

- $V_{DS} = 10\text{V}$
- $I_D = 450\text{mA}$
- Refer to Bias Procedure

## OUTLINE DRAWING

Unit: millimeters(inches)



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

| Symbol    | Parameter                   | Ratings    | Unit             |
|-----------|-----------------------------|------------|------------------|
| $V_{GDO}$ | Gate to drain voltage       | -15        | V                |
| $V_{GSO}$ | Gate to source voltage      | -15        | V                |
| $I_D$     | Drain current               | 1200       | mA               |
| $I_{GR}$  | Reverse gate current        | -3.6       | mA               |
| $I_{GF}$  | Forward gate current        | 15.0       | mA               |
| $P_T$     | Total power dissipation * 1 | 10.0       | W                |
| $T_{ch}$  | Channel temperature         | 175        | $^\circ\text{C}$ |
| $T_{stg}$ | Storage temperature         | -65 ~ +175 | $^\circ\text{C}$ |

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

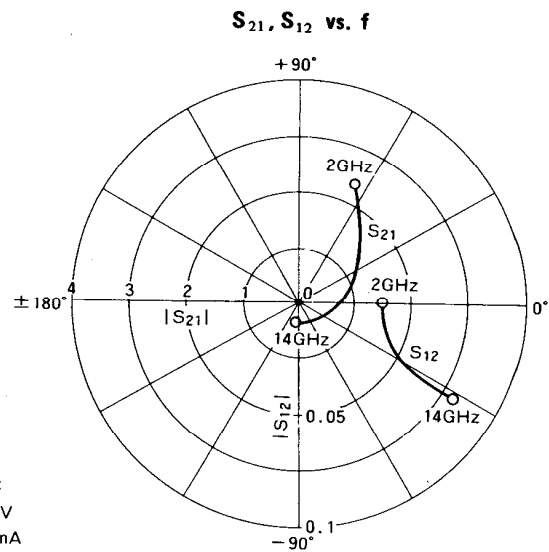
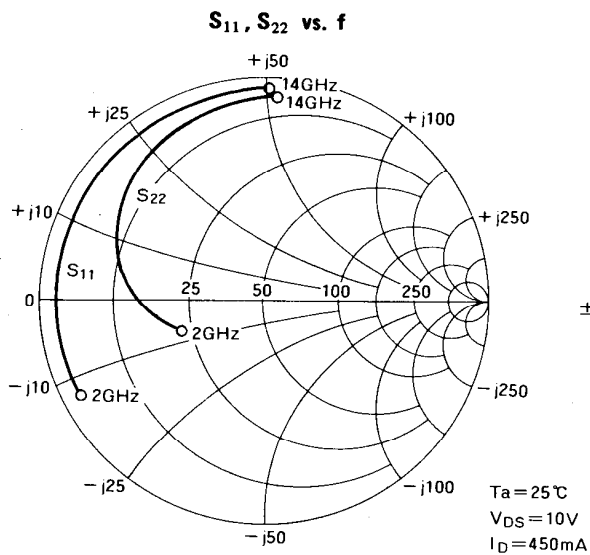
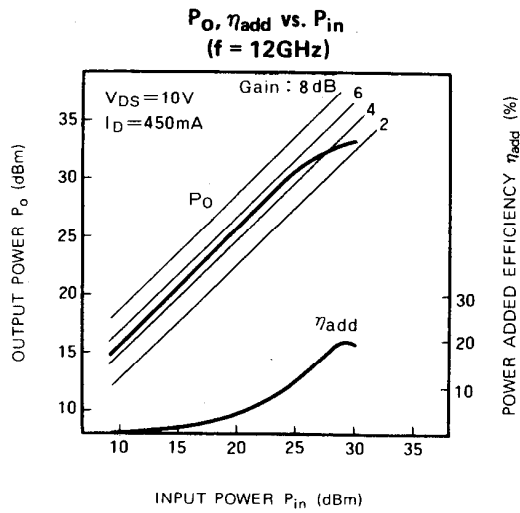
## ELECTRICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )

| Symbol         | Parameter                            | Test conditions                                             | Limits |      |      | Unit               |
|----------------|--------------------------------------|-------------------------------------------------------------|--------|------|------|--------------------|
|                |                                      |                                                             | Min    | Typ  | Max  |                    |
| $I_{DSS}$      | Saturated drain current              | $V_{DS} = 3\text{V}, V_{GS} = 0\text{V}$                    | 600    | 900  | 1200 | mA                 |
| $V_{GS(off)}$  | Gate to source cut-off voltage       | $V_{DS} = 3\text{V}, I_D = 3\text{mA}$                      | -1     | -2.5 | -4.0 | V                  |
| $g_m$          | Transconductance                     | $V_{DS} = 3\text{V}, I_D = 450\text{mA}$                    | 300    | 390  | —    | mS                 |
| $P_{1dB}$      | Output power at 1dB gain compression | $V_{DS} = 10\text{V}, I_D = 450\text{mA}, f = 12\text{GHz}$ | 30.8   | 320  | —    | dBm                |
| $G_{LP}$       | Linear power gain                    |                                                             | 4.5    | 5.0  | —    | dB                 |
| $\eta_{add}$   | Power added efficiency at $P_{1dB}$  |                                                             | —      | 21   | —    | %                  |
| $R_{th(ch-c)}$ | Thermal resistance * 1               | $\Delta V_f$ method                                         | —      | —    | 15   | $^\circ\text{C/W}$ |

\* 1: Channel to case

**MICROWAVE POWER GaAs FET**

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



**S PARAMETERS** ( $T_a = 25^\circ\text{C}$ ,  $V_{DS} = 10\text{V}$ ,  $I_D = 450\text{mA}$ )

| f<br>(GHz) | S Parameters (TYP.) |              |          |              |          |              |          |              |
|------------|---------------------|--------------|----------|--------------|----------|--------------|----------|--------------|
|            | $S_{11}$            |              | $S_{21}$ |              | $S_{12}$ |              | $S_{22}$ |              |
|            | Magn.               | Angle (deg.) | Magn.    | Angle (deg.) | Magn.    | Angle (deg.) | Magn.    | Angle (deg.) |
| 2          | 0.905               | -153.0       | 2.300    | 66.0         | 0.036    | 0.0          | 0.390    | -160.0       |
| 4          | 0.900               | -179.0       | 1.390    | 42.0         | 0.038    | -12.0        | 0.540    | -173.5       |
| 6          | 0.900               | 161.0        | 0.890    | 16.0         | 0.042    | -21.0        | 0.665    | 166.5        |
| 8          | 0.920               | 139.0        | 0.580    | -19.0        | 0.049    | -28.0        | 0.745    | 148.0        |
| 10         | 0.920               | 124.0        | 0.400    | -50.0        | 0.058    | -31.0        | 0.840    | 129.5        |
| 12         | 0.925               | 106.0        | 0.380    | -72.0        | 0.068    | -32.0        | 0.880    | 110.0        |
| 14         | 0.940               | 90.0         | 0.370    | -92.0        | 0.078    | -32.0        | 0.920    | 87.0         |