

# MGF2445

## MICROWAVE POWER GaAs FET

### 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

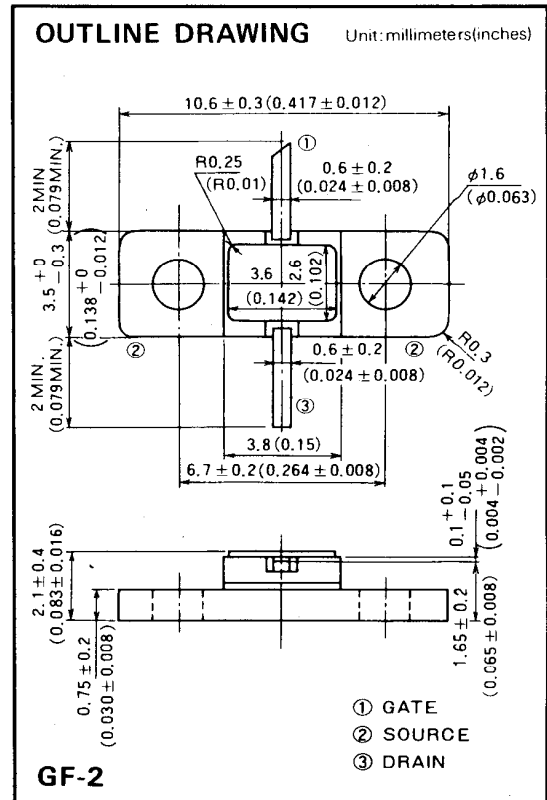
S to Ku band power amplifiers.

### QUALITY GRADE

- IG

### RECOMMENDED BIAS CONDITIONS

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



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

Symbol	Parameter	Rating	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:  $T_C = 25^\circ\text{C}$

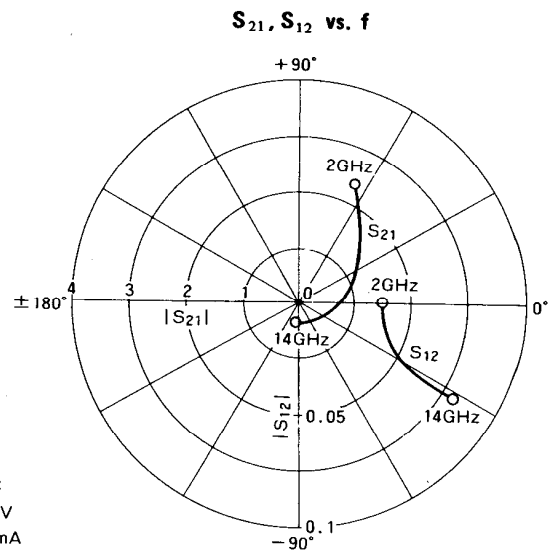
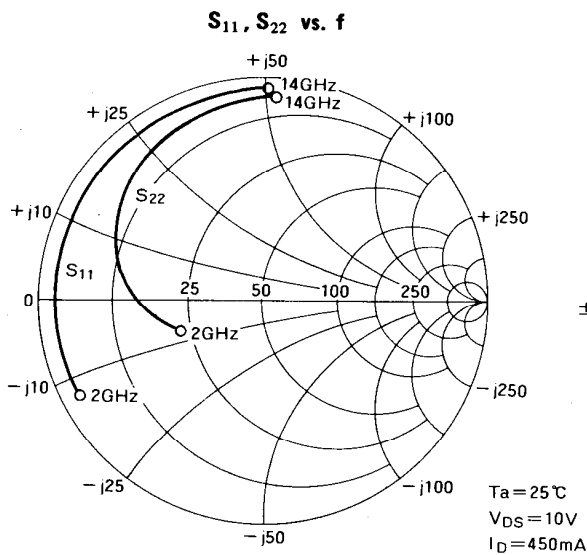
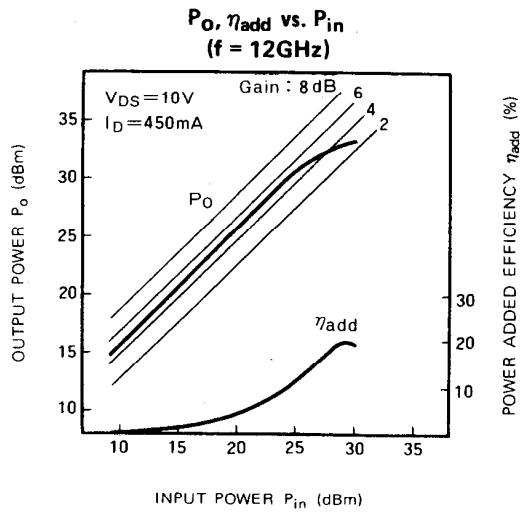
### ELECTRICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )

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 (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