

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

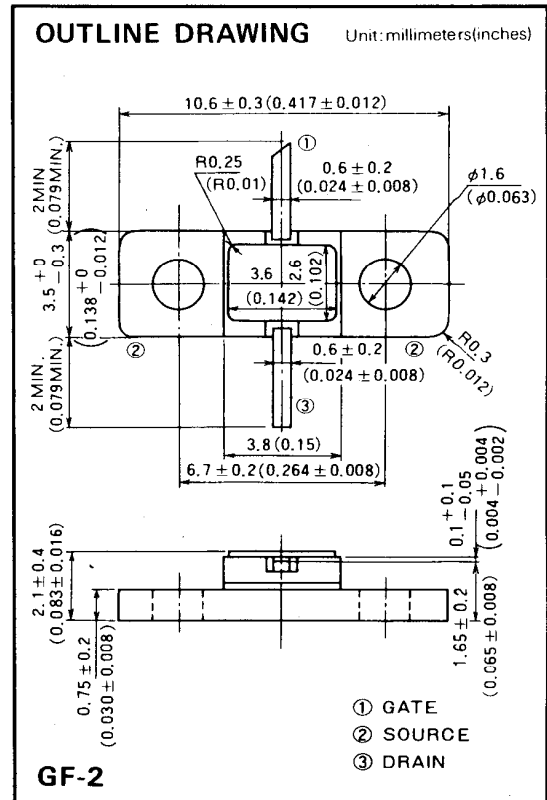
S to Ku band power amplifiers.

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	Ratings	Unit
V_{GD0}	Gate to drain voltage	-15	V
V_{GS0}	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: $T_C = 25^\circ\text{C}$

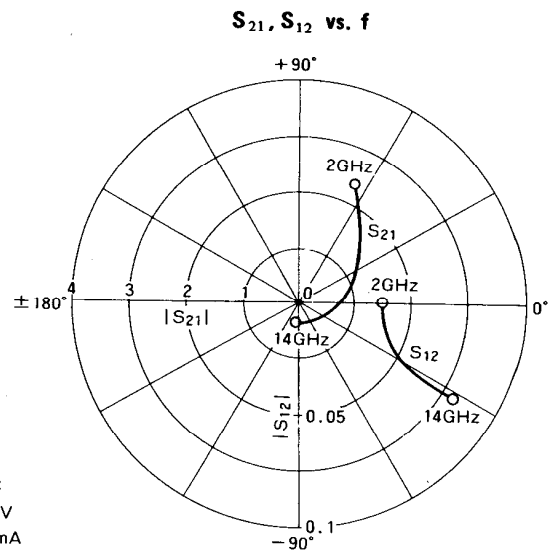
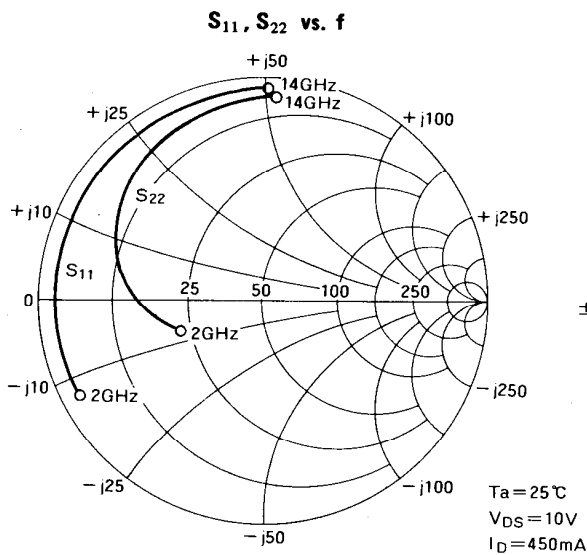
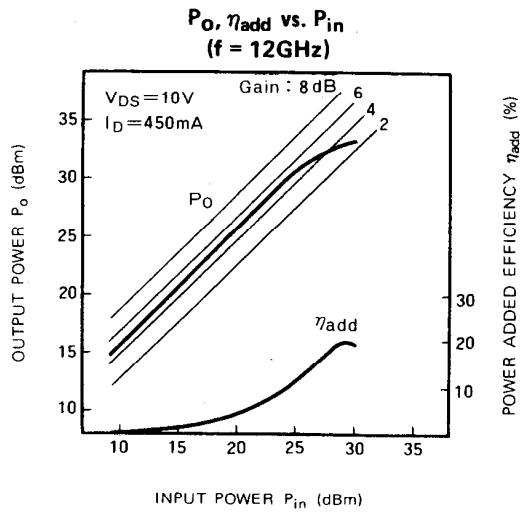
ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

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
η_{add}	Power added efficiency at P_{1dB}		—	21	—	%
$R_{th(ch-c)}$	Thermal resistance * 1	ΔV_f method	—	—	15	$^\circ\text{C/W}$

* 1: Channel to case

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



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

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