

MGF2407A

MICROWAVE POWER GaAs FET

DESCRIPTION

The MGF2407A, power GaAs FET with an N-channel schottky gate, is designed for use in S to Ku band amplifiers.

FEATURES

- High output power
 $P_{1dB} = 24.5 \text{ dBm (TYP.) @ 14.5 GHz}$
- High power gain
 $G_{LP} = 8 \text{ dB (TYP.) @ 14.5 GHz}$
- High power added efficiency
 $\eta_{add} = 30\% \text{ (TYP.) @ 14.5 GHz, } P_{1dB}$

APPLICATION

S to Ku band power amplifiers.

QUALITY GRADE

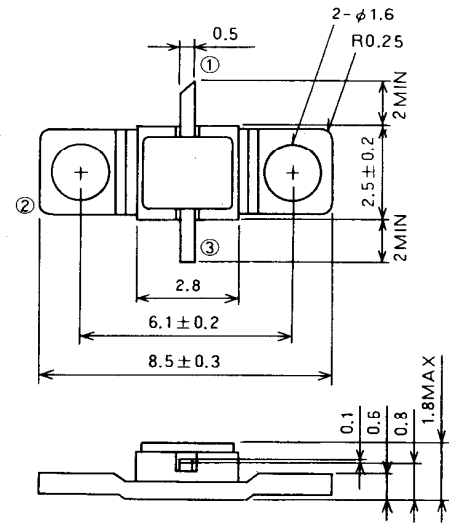
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RECOMMENDED BIAS CONDITIONS

- $V_{DS} = 10V$
- $I_D = 75mA$
- Refer to Bias Procedure

OUTLINE DRAWING

Unit: millimeters



GF-17

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	200	mA
I_{GR}	Reverse gate current	-0.6	mA
I_{GF}	Forward gate current	2.5	mA
P_T	Total power dissipation * 1	1.5	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	$V_{DS} = 3V, V_{GS} = 0V$	100	150	200	mA
$V_{GS(off)}$	Gate to source cut-off voltage	$V_{DS} = 3V, I_D = 0.5mA$	-1	-2.5	-4	V
g_m	Transconductance	$V_{DS} = 3V, I_D = 75mA$	50	65	—	mS
P_{1dB}	Output power at 1dB gain compression	$V_{DS} = 10V, I_D = 75mA, f = 14.5GHz,$	23.0	24.5	—	dBm
G_{LP}	Linear power gain		7.0	8.0	—	dB
η_{add}	Power added efficiency at P_{1dB}		—	30	—	%
$R_{th(ch-c)}$	Thermal resistance * 1	ΔV_f method	—	—	100	$^\circ\text{C/W}$

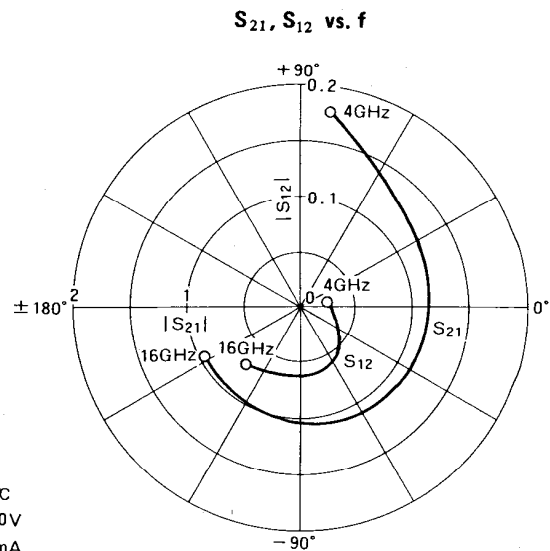
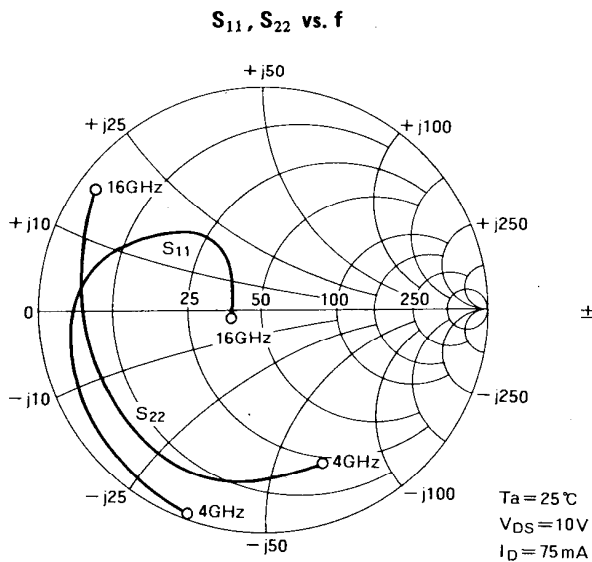
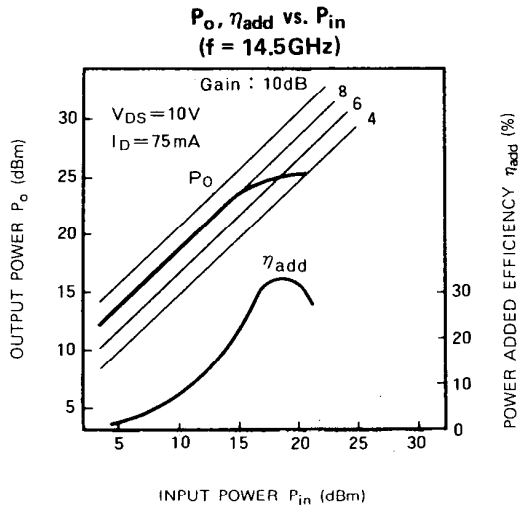
* 1: Channel to case



MITSUBISHI
ELECTRIC

MICROWAVE POWER GaAs FET

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



S PARAMETERS ($T_a = 25^\circ\text{C}$, $V_{\text{DS}} = 10\text{V}$, $I_{\text{D}} = 75\text{mA}$)

f (GHz)	S Parameters (TYP.)								K	MSG/MAG
	S ₁₁		S ₂₁		S ₁₂		S ₂₂			
	Magn.	Angle (deg.)	Magn.	Angle (deg.)	Magn.	Angle (deg.)	Magn.	Angle (deg.)	—	dB
4	0.968	−112.5	1.766	81.5	0.024	− 6.0	0.713	− 70.5	0.380	18.7
6	0.929	− 135.5	1.279	48.5	0.028	− 6.0	0.758	− 93.5	0.813	16.6
8	0.891	−157.5	1.147	26.0	0.033	− 17.0	0.777	−116.0	0.948	15.4
10	0.833	−180.0	1.111	− 5.0	0.041	− 30.5	0.782	−139.0	1.176	11.8
12	0.719	158.0	1.080	− 36.0	0.050	− 50.0	0.793	−164.5	1.583	8.9
14	0.469	133.5	1.030	− 85.0	0.059	− 82.0	0.818	168.0	2.276	6.1
16	0.172	−165.5	0.967	−153.0	0.073	−123.0	0.911	144.5	1.245	8.2



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