

MGF2415A

MICROWAVE POWER GaAs FET

DESCRIPTION

The MGF2415A, power GaAs FET with an N-channel schottky gate, is designed for use in S to Ku band amplifiers.

FEATURES

- High output power
 $P_{1dB} = 27.5 \text{ dBm (TYP.) @ 14.5 GHz}$
- High power gain
 $G_{LP} = 7.5 \text{ dB (TYP.) @ 14.5 GHz}$
- High power added efficiency
 $\eta_{add} = 29\% \text{ (TYP.) @ 14.5 GHz, } P_{1dB}$

APPLICATION

S to Ku band power amplifiers.

QUALITY GRADE

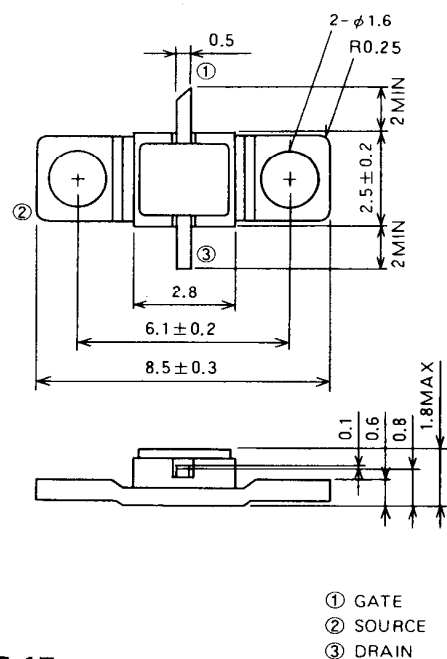
- IG

RECOMMENDED BIAS CONDITIONS

- $V_{DS} = 10V$
- $I_D = 150mA$
- Refer to Bias Procedure

OUTLINE DRAWING

Unit: millimeters



GF-17

ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ C$)

Symbol	Parameter	Ratings	Unit
V_{GDO}	Gate to drain voltage	-15	V
V_{GSO}	Gate to source voltage	-15	V
I_D	Drain current	400	mA
I_{GR}	Reverse gate current	-1.2	mA
I_{GF}	Forward gate current	5.0	mA
P_T	Total power dissipation * 1	2.5	W
T_{ch}	Channel temperature	175	$^\circ C$
T_{stg}	Storage temperature	-65 ~ +175	$^\circ C$

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

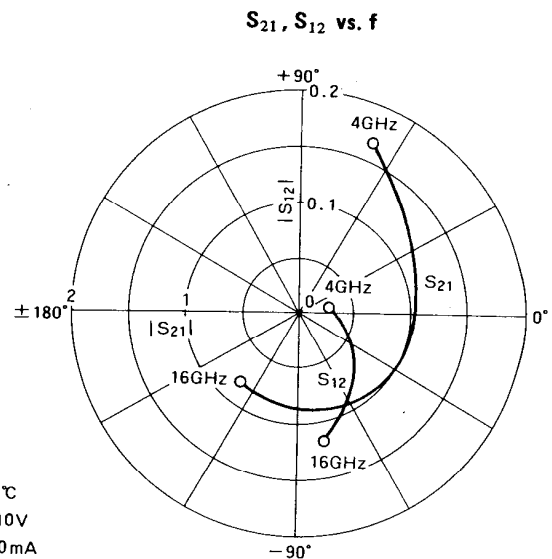
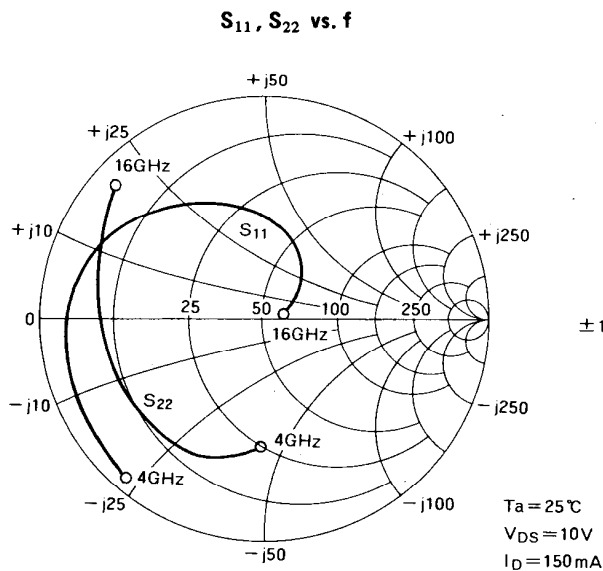
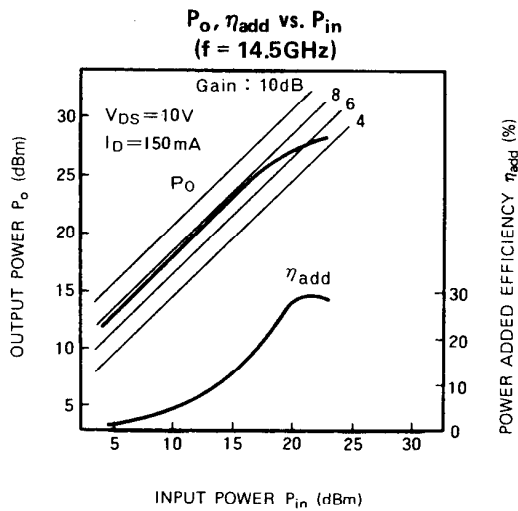
ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ C$)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
I_{DSS}	Saturated drain current	$V_{DS} = 3V, V_{GS} = 0V$	200	300	400	mA
$V_{GS(off)}$	Gate to source cut-off voltage	$V_{DS} = 3V, I_D = 1mA$	-1	-2.5	-4	V
g_m	Transconductance	$V_{DS} = 3V, I_D = 150mA$	100	130	—	mS
P_{1dB}	Output power at 1dB gain compression	$V_{DS} = 10V, I_D = 150mA, f = 14.5GHz,$	26.0	27.5	—	dBm
G_{LP}	Linear power gain		6.5	7.5	—	dB
η_{add}	Power added efficiency at P_{1dB}		—	29	—	%
$R_{th(ch-c)}$	Thermal resistance * 1	ΔV_f method	—	—	60	$^\circ C/W$

* 1: Channel to case

MICROWAVE POWER GaAs FET

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



S PARAMETERS ($T_a = 25^\circ\text{C}$, $V_{DS} = 10\text{V}$, $I_D = 150\text{mA}$)

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.)		
4	0.930	−132.0	1.656	62.0	0.028	10.0	0.564	− 93.5	0.774	17.7
6	0.904	−156.0	1.250	42.5	0.034	2.0	0.654	−108.0	0.884	15.7
8	0.847	−177.0	1.067	22.5	0.040	− 6.0	0.699	−128.5	1.248	11.3
10	0.804	162.0	1.010	− 8.5	0.045	−14.0	0.704	−149.5	1.521	9.3
12	0.709	141.0	0.968	− 30.0	0.052	−22.0	0.721	−173.0	1.917	7.2
14	0.530	109.5	0.869	− 78.0	0.069	−41.0	0.772	163.5	2.106	5.0
16	0.083	21.0	0.779	−130.0	0.113	−77.0	0.889	139.5	1.154	6.0