

MGFK38V2228

12.2~12.8GHz BAND 6W INTERNALLY MATCHED GaAs FET

DESCRIPTION

The MGFK38V2228 is an internally impedance matched GaAs power FET especially designed for use in 12.2 ~ 12.8 GHz band amplifiers. The hermetically sealed metal-ceramic package guarantees high reliability.

FEATURES

- Internally impedance matched
- High output power
 $P_{1dB} = 6 \text{ W (TYP.) @ } f = 12.2 \sim 12.8 \text{ GHz}$
- High linear power gain
 $G_{LP} = 6.0 \text{ dB (TYP.) @ } f = 12.2 \sim 12.8 \text{ GHz}$
- High power added efficiency
 $\eta_{add} = 23\% \text{ (TYP.) @ } f = 12.2 \sim 12.8 \text{ GHz, } P_{1dB}$

APPLICATION

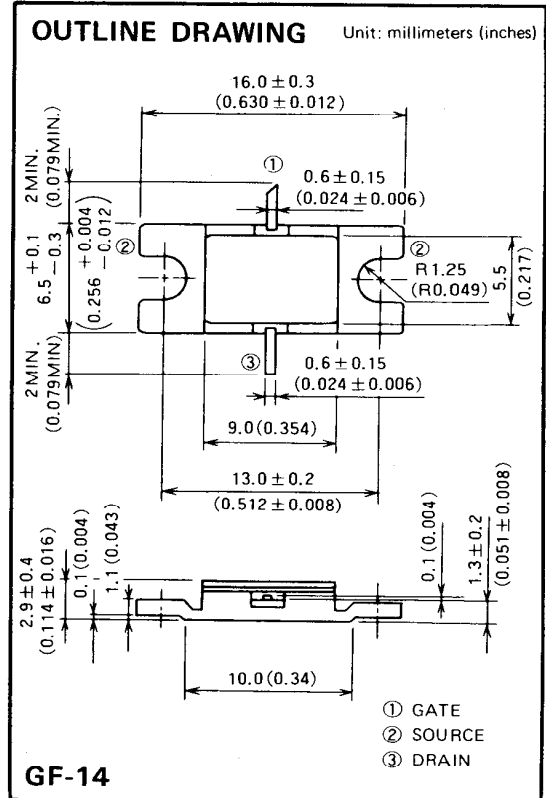
For use in 12.2 ~ 12.8 GHz band amplifiers.

QUALITY GRADE

- IG

RECOMMENDED BIAS CONDITIONS

- $V_{DS} = 10\text{V}$
- $I_D = 2.4\text{A}$
- 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	5.6	A
I_{GR}	Reverse gate current	-18	mA
I_{GF}	Forward gate current	36	mA
P_T	Total power dissipation *1	42.8	W
T_{ch}	Channel temperature	175	$^\circ\text{C}$
T_{stg}	Storage temperature	-65 ~ +175	$^\circ\text{C}$

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

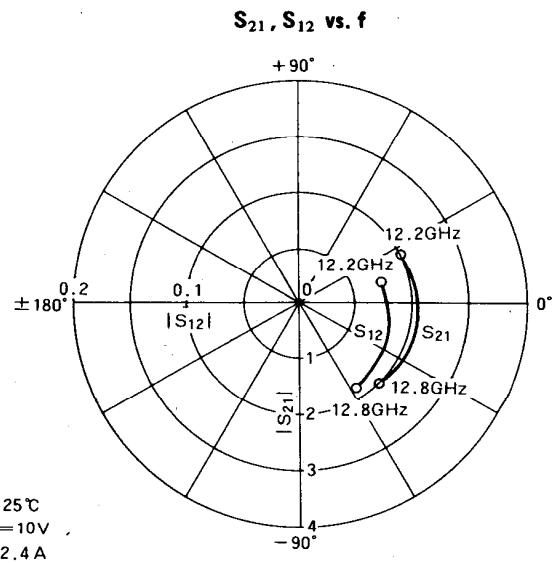
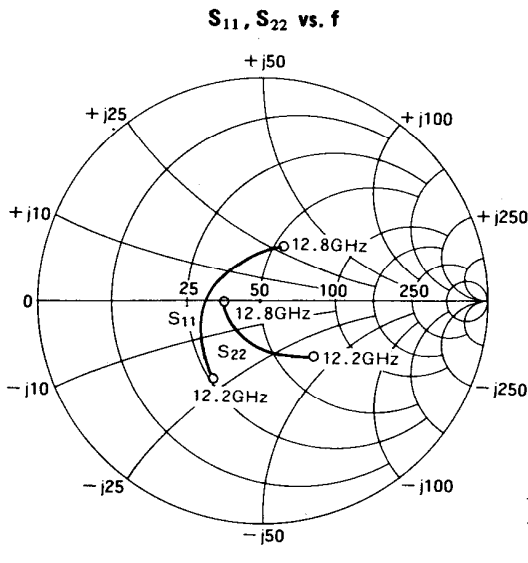
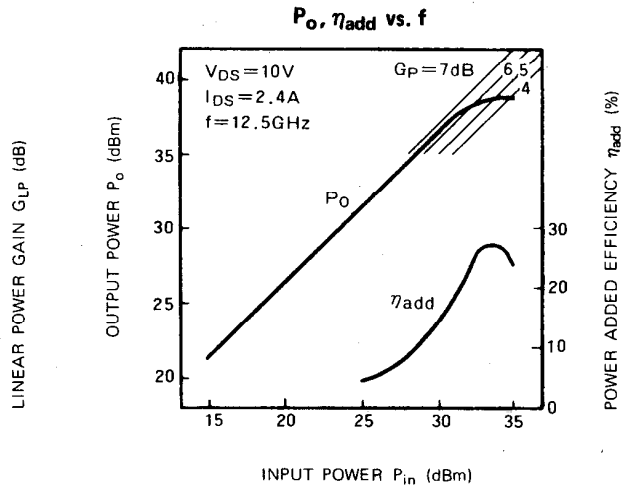
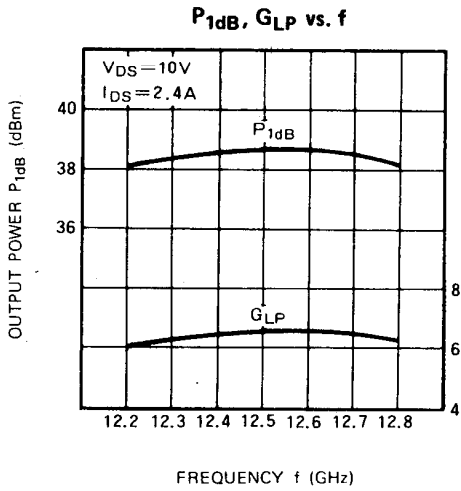
ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
I_{DSS}	Saturated drain current	$V_{DS} = 3\text{V}, V_{GS} = 0\text{V}$	—	4.0	5.6	A
g_m	Transconductance	$V_{DS} = 3\text{V}, I_D = 2.2\text{A}$	—	2.0	—	S
$V_{GS(off)}$	Gate to source cut-off voltage	$V_{DS} = 3\text{V}, I_D = 20\text{mA}$	-2	-3	-4	V
P_{1dB}	Output power at 1dB gain compression	$V_{DS} = 10\text{V}, I_D = 2.4\text{A}, f = 12.2 \sim 12.8\text{GHz}$	37	38	—	dBm
G_{LP}	Linear power gain		5.0	6.0	—	dB
η_{add}	Power added efficiency		—	23	—	%
$R_{th(ch-c)}$	Thermal resistance *1	ΔV_f method	—	—	3.5	$^\circ\text{C/W}$

*1: Channel to case

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



$T_a=25^\circ\text{C}$
 $V_{DS}=10\text{V}$
 $I_D=2.4\text{A}$

S PARAMETERS ($T_a=25^\circ\text{C}$, $V_{DS}=10\text{V}$, $I_{DS}=2.4\text{A}$)

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.)
12.2	0.409	-124	1.97	27	0.074	18	0.324	-50
12.3	0.346	-144	2.05	16	0.076	7	0.279	-62
12.4	0.278	-170	2.14	4	0.078	-6	0.232	-79
12.5	0.245	165	2.14	-6	0.082	-18	0.188	-105
12.6	0.220	132	2.09	-19	0.083	-31	0.173	-135
12.7	0.234	101	2.06	-30	0.085	-42	0.176	-158
12.8	0.253	69	1.99	-43	0.092	-55	0.185	178