MITSUBISHI SEMICONDUCTOR 〈GaAs FET〉

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 W (TYP.) @ f = 12.2 ~ 12.8 GHz
- High linear power gain
  G_{LP} = 6.0 dB (TYP.) @ f = 12.2 ~ 12.8 GHz
- High power added efficiency
  η_{add} = 23% (TYP.) @ f = 12.2 ~ 12.8 GHz, P_{1dB}

APPLICATION

For use in 12.2 ~ 12.8 GHz band amplifiers.

QUALITY GRADE

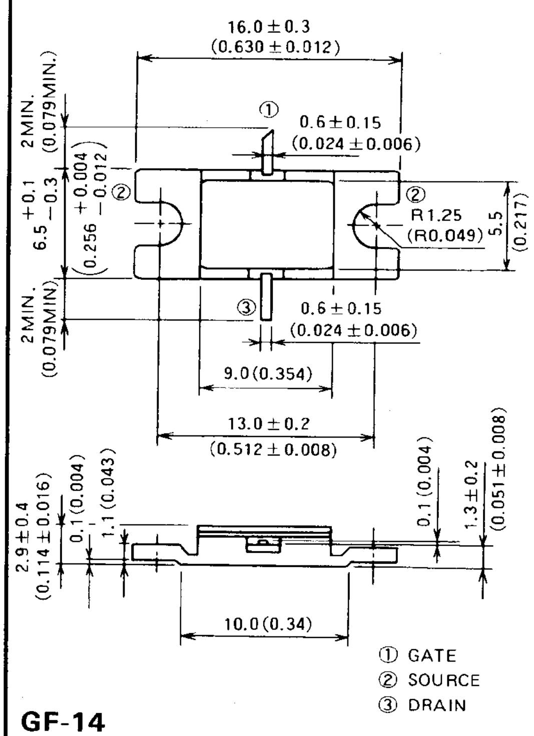
- IG

RECOMMENDED BIAS CONDITIONS

- V_{DS}=10V
- I_D=2.4A
- Refer to Bias Procedure

OUTLINE DRAWING

Unit: millimeters (inches)



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ABSOLUTE MAXIMUM RATINGS (Ta=25°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
Tch	Channel temperature	175	°C
Tstg	Storage temperature	−65~+175	°C

＊1: Tc=25°C

ELECTRICAL CHARACTERISTICS (Ta=25°C)

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

＊1: Channel to case

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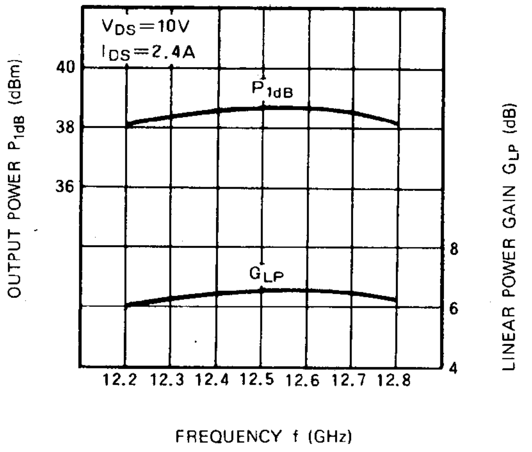
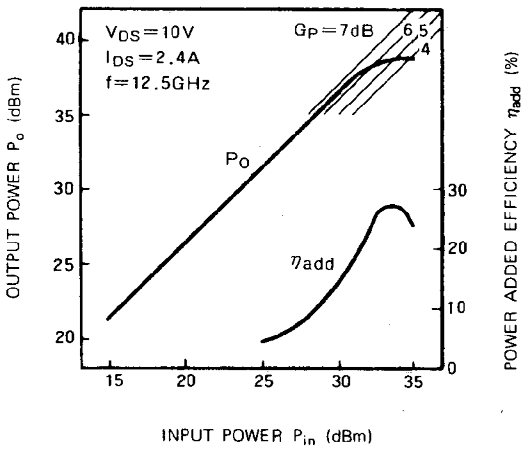
TYPICAL CHARACTERISTICS (Ta=25°C)

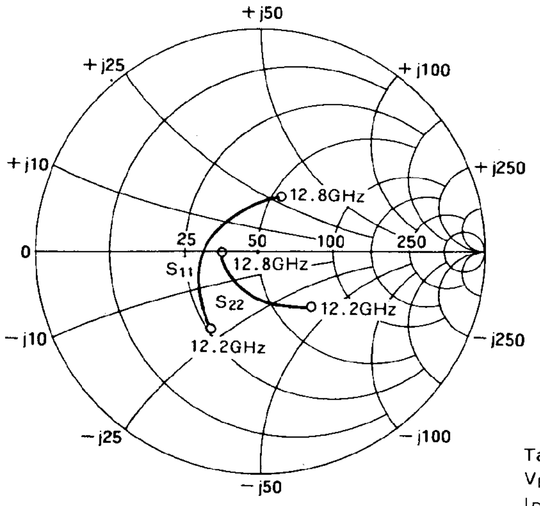
P_{1dB}, G_{LP} vs. f



P_o, η_{add} vs. f

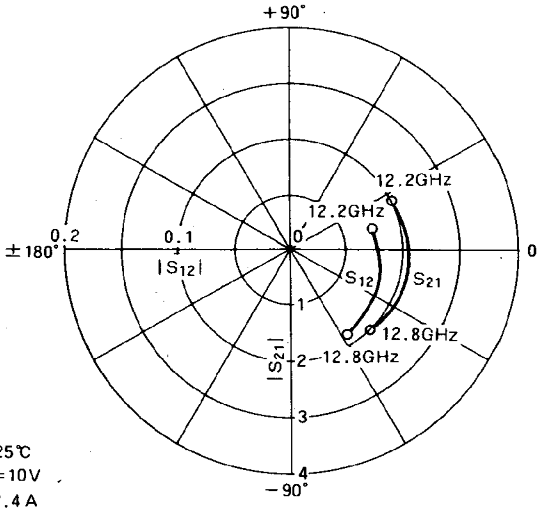


S_{11}, S_{22} vs. f



Ta=25℃
VDS=10V
ID=2.4A

S_{21}, S_{12} vs. f



S PARAMETERS (Ta=25°C, V_{DS}=10V, I_{DS}=2.4A)

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