MGFK37V4045

14.0~14.5GHz BAND 5W INTERNALLY MATCHED GaAs FET

DESCRIPTION

The MGFK37V4045 is an internally impedance matched GaAs power FET especially designed for use in 14.0 ~ 14.5 GHz-band amplifiers. The hermetically sealed metal-ceramic package guarantees high reliability.

FEATURES

- Internally impedance matched
- High output power
  P_{1dB} = 5.5 W (TYP.) @ f = 14 ~ 14.5 GHz
- High linear power gain
  G_{LP} = 5.5 dB (TYP.) @ f = 14 ~ 14.5 GHz
- High power added efficiency
  η_{add} = 17% (TYP.) @ f = 14 ~ 14.5 GHz, P_{1dB}

APPLICATION

For use in 14.0 ~ 14.5 GHz-band amplifiers

QUALITY GRADE

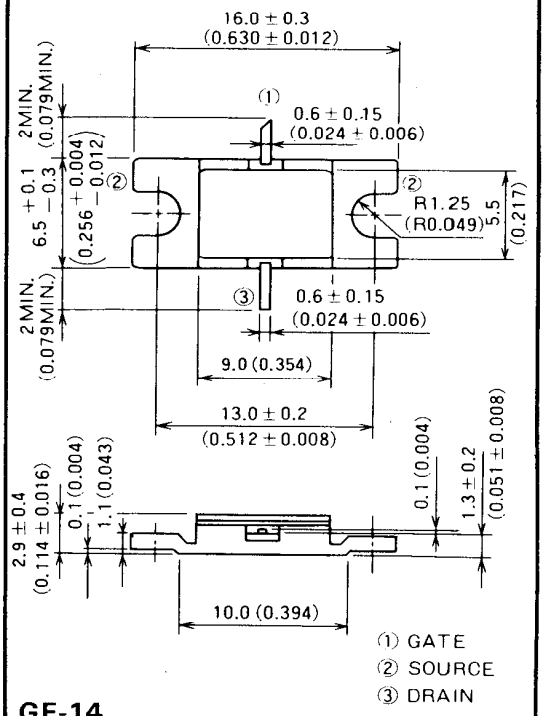
- IG

RECOMMENDED BIAS CONDITIONS

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

OUTLINE DRAWING

Unit: millimeters (inches)



GF-14

ABSOLUTE MAXIMUM RATINGS (Ta=25°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	6600	mA
I_{GR}	Reverse gate current	−17.5	mA
I_{GF}	Forward gate current	35	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_{GS}=0V	3600	5200	6600	mA
$V_{GS(off)}$	Gate to source cut-off voltage	V_{DS}=3V, I_D=20mA	−2	—	−5	V
g_m	Transconductance	V_{DS}=3V, I_D=2400mA	1200	1700	—	mS
P_{1dB}	Output power at 1dB gain compression	V_{DS}=10V, I_D=2400mA, f=14.0~14.5GHz	36.5	37.4	—	dBm
G_{LP}	Linear power gain		4.5	5.5	—	dB
η_{add}	Power added efficiency		—	17	—	%
Rth(ch-c)	Thermal resistance *1	ΔV_f method	—	—	3.5	°C/W

*1: Channel to case

MITSUBISHI ELECTRIC

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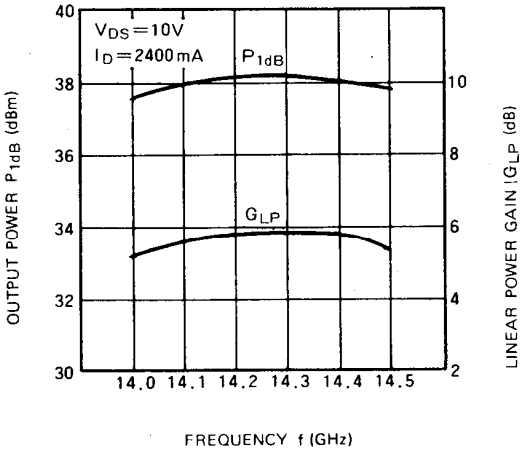
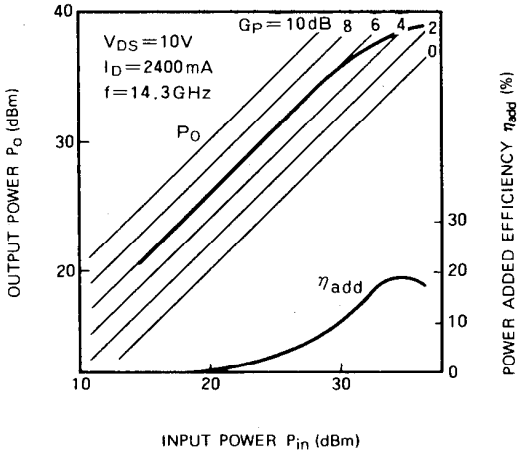
TYPICAL CHARACTERISTICS (Ta=25°C)

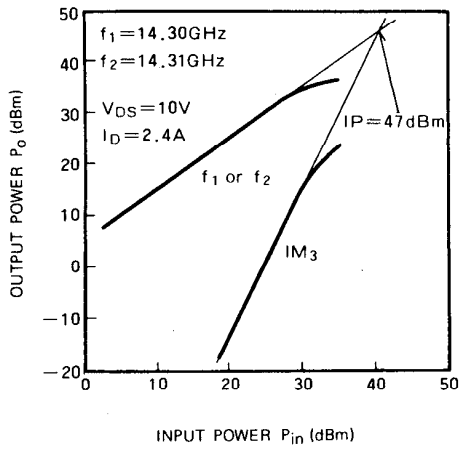
P_{1dB}, G_{LP} vs. f



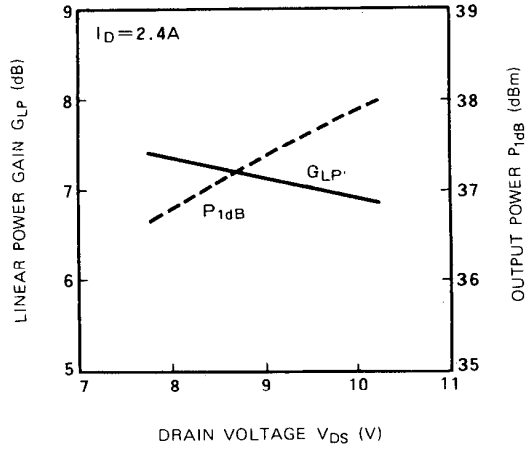
P_o, η_{add} vs. P_{in} (f = 14.3 GHz)



IM_3 vs. Pin



G_{LP} & P_{1dB} vs. V_{DS} (f = 14.3 GHz)



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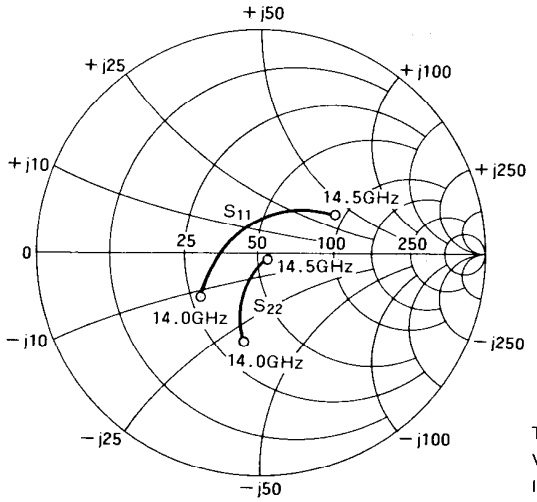
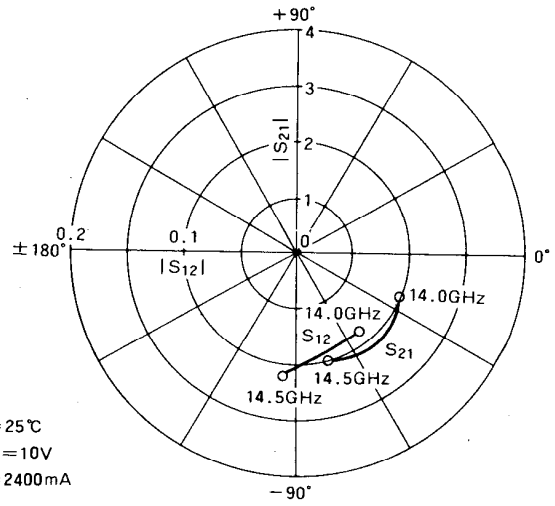
S_{11}, S_{22} vs. f



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



Ta=25℃
V_{DS}=10V
I_D=2400mA

S PARAMETERS (Ta=25°C, V_{DS}=10V, I_D=2400mA)

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.)
14.0	0.336	−143	1.950	−24	0.074	−52	0.396	− 99
14.1	0.201	−168	2.018	−34	0.081	−64	0.314	−104
14.2	0.128	145	2.042	−43	0.083	−72	0.228	−103
14.3	0.132	87	2.065	−54	0.094	−83	0.167	− 99
14.4	0.247	47	2.018	−64	0.099	−90	0.096	−100
14.5	0.398	26	1.950	−75	0.109	−98	0.053	− 49