MITSUBISHI SEMICONDUCTOR <GaAs FET>

MGFK33V4045

14.0～14.5GHz BAND 2W INTERNALLY MATCHED GaAs FET

DESCRIPTION

The MGFK33V4045 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
- Flip-chip mounted
- High output power
  P_{1dB} = 2.0 W (TYP.) @ f = 14 ～ 14.5 GHz
- High linear power gain
  G_{LP} = 7.0 dB (TYP.) @ f = 14 ～ 14.5 GHz
- High power added efficiency
  η_{add} = 22% (TYP.) @ f = 14 ～ 14.5 GHz, P_{1dB}

APPLICATION

For use in 14.0 ～ 14.5 GHz-band amplifiers.

QUALITY GRADE

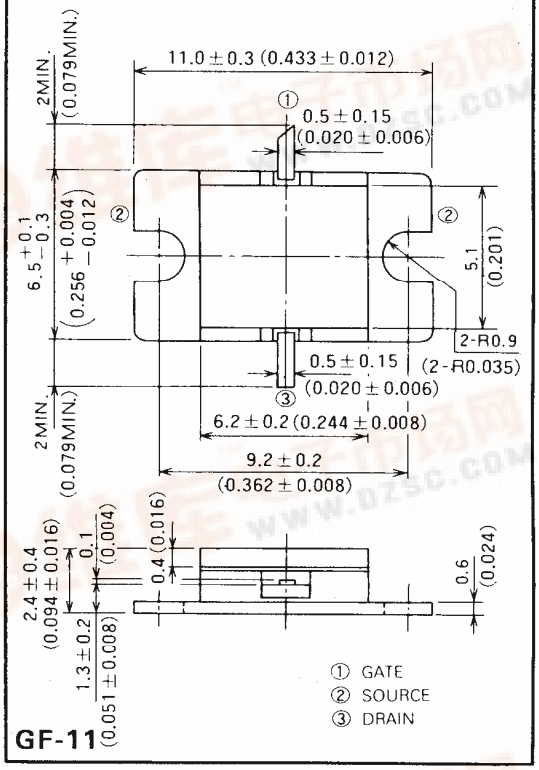
- IG

RECOMMENDED BIAS CONDITIONS

- V_{DS} = 8V
- I_D = 700mA
- Refer to Bias Procedure

OUTLINE DRAWING

Unit: millimeters (inches)



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	1800	mA
I_{GR}	Reverse gate current	−5.0	mA
I_{GF}	Forward gate current	10.0	mA
P_T	Total power dissipation *1	17	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	—	1.1	1.8	A
$V_{GS(off)}$	Gate to source cut-off voltage	V_{DS} = 3V, I_D = 4mA	−2	—	−5	V
g_m	Transconductance	V_{DS} = 3V, I_D = 700mA	—	600	—	mS
P_{1dB}	Output power at 1dB gain compression	V_{DS} = 8V, I_D = 700mA, f = 14.0 − 14.5GHz	32.0	33.0	—	dBm
G_{LP}	Linear power gain		5.5	7.0	—	dB
η_{add}	Power added efficiency		—	22	—	%
Rth(ch-c)	Thermal resistance *1	ΔV_f method	—	—	10	°C/W

*1: Channel to case

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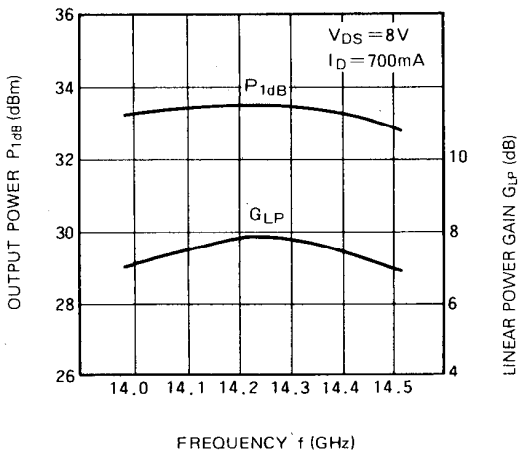
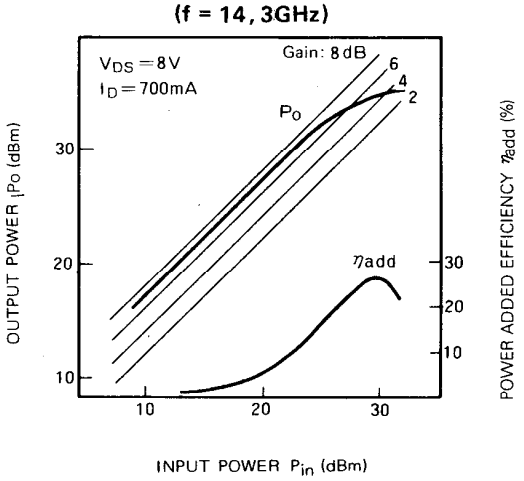
TYPICAL CHARACTERISTICS (T_a=25°C)

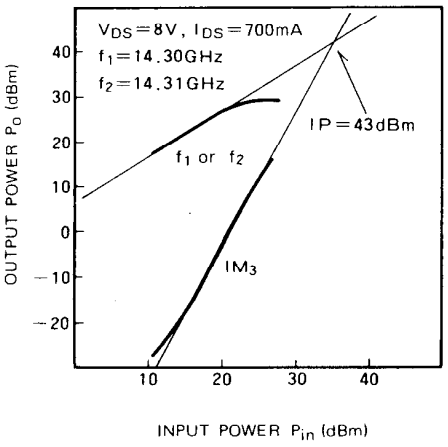
P_{1dB}, G_{LP} vs. f



P_o, η_{add} vs. P_{in} (f = 14, 3GHz)



IM_3 vs. P_{in}



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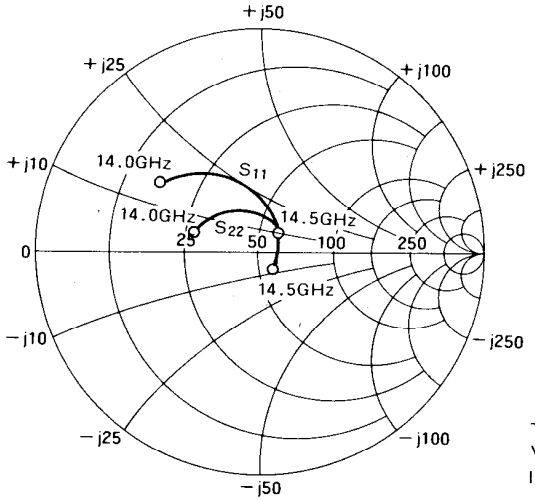
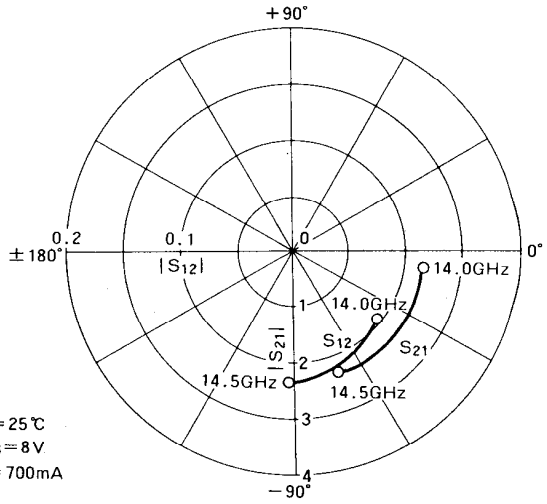
S_{11}, S_{22} vs. f



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



Ta = 25℃
V_{DS} = 8V
I_D = 700mA

S PARAMETERS (Ta = 25°C, V_{DS} = 8V, I_D = 700mA)

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	0.50	136	2.28	−10	0.099	−41	0.32	164
14.1	0.38	121	2.35	−25	0.108	−52	0.29	153
14.2	0.27	103	2.39	−38	0.113	−61	0.25	142
14.3	0.19	78	2.43	−51	0.127	−71	0.20	130
14.4	0.13	42	2.37	−62	0.134	−82	0.15	115
14.5	0.18	5	2.29	−72	0.142	−93	0.12	93