

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
 $P_{1dB} = 2.0 \text{ W (TYP.) @ } f = 14 \sim 14.5 \text{ GHz}$
- High linear power gain
 $G_{LP} = 7.0 \text{ dB (TYP.) @ } f = 14 \sim 14.5 \text{ GHz}$
- High power added efficiency
 $\eta_{add} = 22\% \text{ (TYP.) @ } f = 14 \sim 14.5 \text{ GHz, } P_{1dB}$

APPLICATION

For use in 14.0 ~ 14.5 GHz-band amplifiers.

QUALITY GRADE

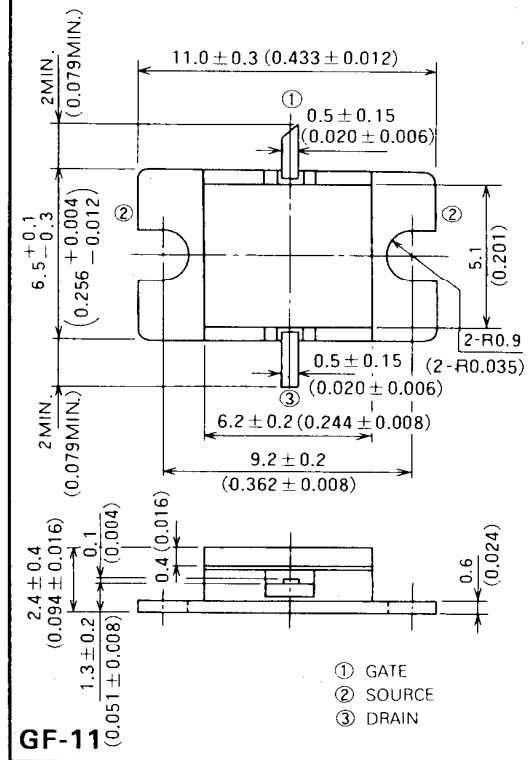
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RECOMMENDED BIAS CONDITIONS

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

OUTLINE DRAWING

Unit: millimeters (inches)



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

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
T_{ch}	Channel temperature	175	$^\circ\text{C}$
T_{stg}	Storage temperature	- 65 ~ + 175	$^\circ\text{C}$

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

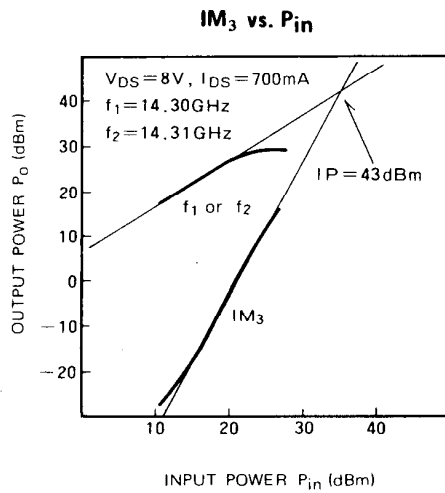
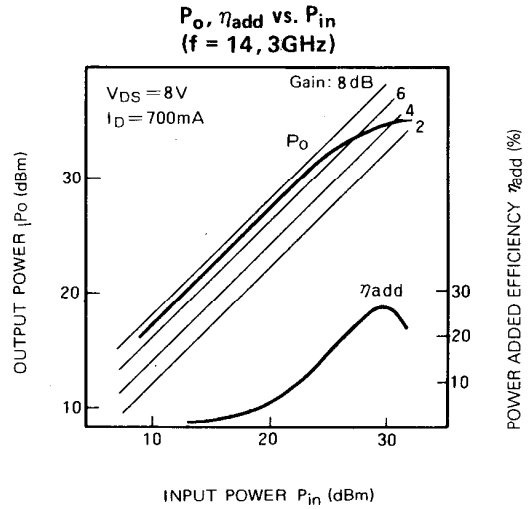
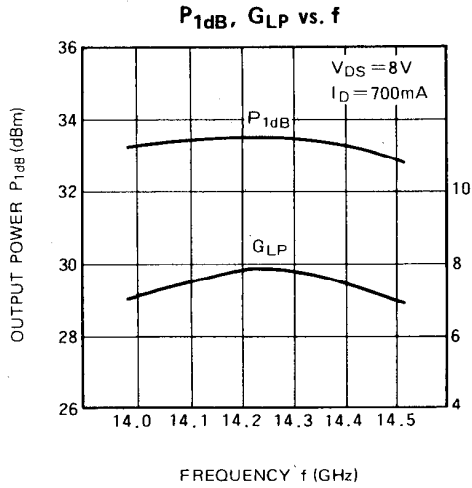
ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

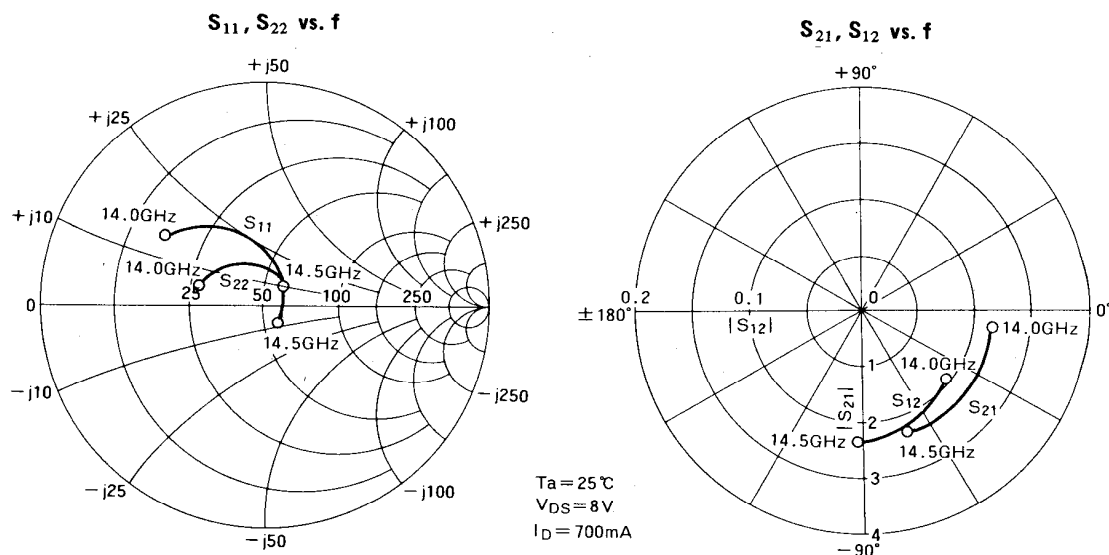
Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
I_{DSS}	Saturated drain current	$V_{DS} = 3\text{V}, V_{GS} = 0\text{V}$	—	1.1	1.8	A
$V_{GS(off)}$	Gate to source cut-off voltage	$V_{DS} = 3\text{V}, I_D = 4\text{mA}$	- 2	—	- 5	V
g_m	Transconductance	$V_{DS} = 3\text{V}, I_D = 700\text{mA}$	—	600	—	mS
P_{1dB}	Output power at 1dB gain compression	$V_{DS} = 8\text{V}, I_D = 700\text{mA}, f = 14.0 \sim 14.5\text{GHz}$	32.0	33.0	—	dBm
G_{LP}	Linear power gain		5.5	7.0	—	dB
η_{add}	Power added efficiency		—	22	—	%
$R_{th(ch-c)}$	Thermal resistance *1	ΔV_f method	—	—	10	$^\circ\text{C/W}$

*1: Channel to case

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



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S PARAMETERS ($T_a = 25^\circ\text{C}$, $V_{DS} = 8\text{V}$, $I_D = 700\text{mA}$)

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