

MGFC39V4450A

PRELIMINARY

Notice: This is not a final specification.
Some parametric limits are subject to change.

4.4~5.0GHz BAND 8W INTERNALLY MATCHED GaAs FET

DESCRIPTION

The MGFC39V4450A is an internally impedance-matched GaAs power FET especially designed for use in 4.4 ~ 5.0 GHz band amplifiers. The hermetically sealed metal-ceramic package guarantees high reliability.

FEATURES

- Class A operation
- Internally matched to 50Ω system
- High output power
P_{1dB} = 8W (TYP) @ 4.4 ~ 5.0 GHz
- High power gain
G_{LP} = 9 dB (TYP) @ 4.4 ~ 5.0 GHz
- High power added efficiency
η_{add} = 30% (TYP) @ 4.4 ~ 5.0 GHz, P_{1dB}
- Hermetically sealed metal-ceramic package
- Low distortion [Item: -51]
IM₃ = -45 dBc (TYP) @ P_o = 28 (dBm) S.C.L.

APPLICATION

- Item -01: 4.4 ~ 5.0 GHz band power amplifier
- Item -51: Digital radio communication

QUALITY GRADE

- IG

ABSOLUTE MAXIMUM RATINGS (T_a = 25°C)

Symbol	Parameter	Ratings	Unit
V _{GD0}	Gate to drain voltage	-15	V
V _{GS0}	Gate to source voltage	-15	V
I _D	Drain current	7.5	A
I _{GR}	Reverse gate current	-20	mA
I _{GF}	Forward gate current	42	mA
P _T	Total power dissipation *1	42.8	W
T _{ch}	Channel temperature	175	°C
T _{stg}	Storage temperature	-65 ~ +175	°C

*1: T_c = 25°C

ELECTRICAL CHARACTERISTICS (T_a = 25°C)

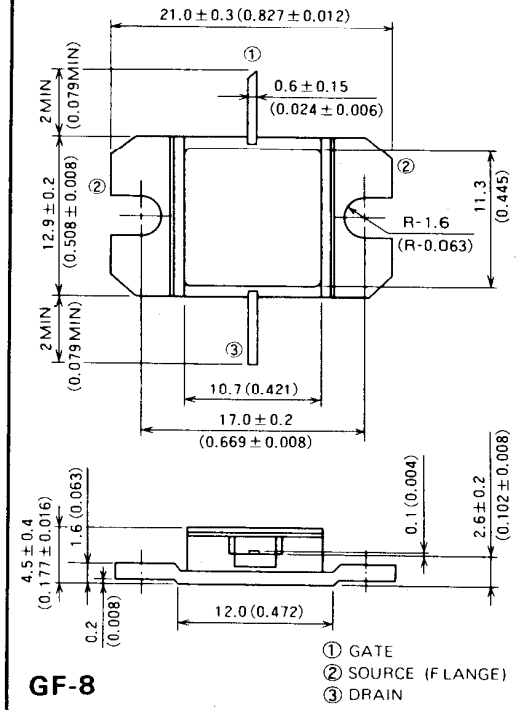
Symbol	Parameter	Test conditions	Limits			Unit	
			Min	Typ	Max		
I _{DSS}	Saturated drain current	V _{DS} = 3V, V _{GS} = 0V	—	—	7.5	A	
g _m	Transconductance	V _{DS} = 3V, I _D = 2.2A	—	2	—	S	
V _{GS(off)}	Gate to source cut-off voltage	V _{DS} = 3V, I _D = 20mA	—	—	-4.5	V	
P _{1dB}	Output power at 1dB gain compression	V _{DS} = 10V, I _D = 2.4A, f = 4.4 ~ 5.0GHz	38	39	—	dBm	
G _{LP}	Linear power gain		8	9	—	dB	
I _D	Drain current		—	—	3.0	A	
η _{add}	Power added efficiency		—	30	—	%	
*IM ₃	3rd order IM distortion *1		-42	-45	—	dBc	
R _{th(ch-c)}	Thermal resistance *2		ΔV _f method	—	—	3.5	°C/W

*1: Item-51, 2-tone test P_o = 28 dBm Single Carrier Level f = 5.0 GHz Δf = 10 MHz

*2: Channel to case

OUTLINE DRAWING

Unit: millimeters (inches)



RECOMMENDED BIAS CONDITIONS

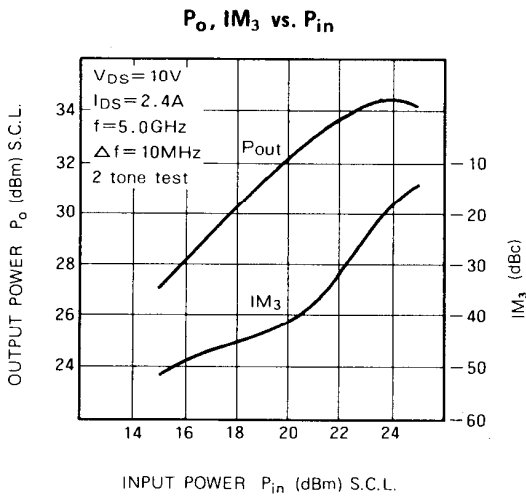
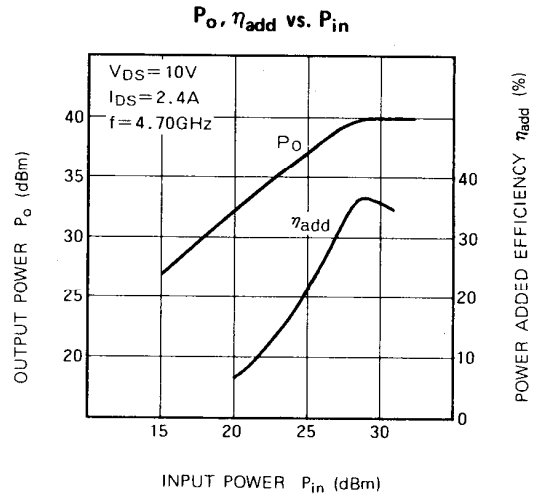
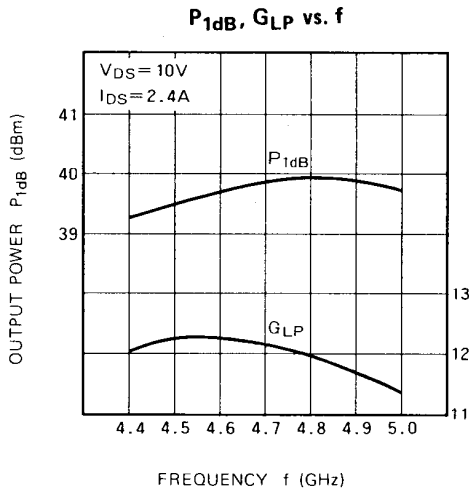
- V_{DS} = 10V
- I_D = 2.4A
- R_g = 50Ω
- Refer to Bias Procedure

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TYPICAL CHARACTERISTICS (Ta=25°C)



S PARAMETERS (Ta=25°C, VDS=10V, IDS=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.)
4.4	0.48	-176	4.140	21	0.084	-38	0.13	-115
4.5	0.48	157	4.202	1	0.089	-59	0.14	-158
4.6	0.46	131	4.173	-21	0.093	-80	0.16	175
4.7	0.43	104	4.088	-42	0.094	-99	0.18	155
4.8	0.37	72	3.976	-64	0.096	-120	0.18	139
4.9	0.32	31	3.824	-86	0.098	-141	0.15	122
5.0	0.34	-16	3.673	-109	0.096	-163	0.09	97