

PRELIMINARY

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

4.4~5.0GHz BAND 10W INTERNALLY MATCHED GaAs FET

DESCRIPTION

The MGFC40V4450A 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} = 10W (TYP) @ 4.4 ~ 5.0 GHz
- High power gain
G_{LP} = 10 dB (TYP) @ 4.4 ~ 5.0 GHz
- High power added efficiency
η_{add} = 32% (TYP) @ 4.4 ~ 5.0 GHz, P_{1dB}
- Hermetically sealed metal-ceramic package
- Low distortion [Item: -51]
IM₃ = -45 dBc (TYP) @ P_o = 29 (dBm) S.C.L.
- Low thermal resistance R_{th(ch-c)} ≤ 2.8°C/W

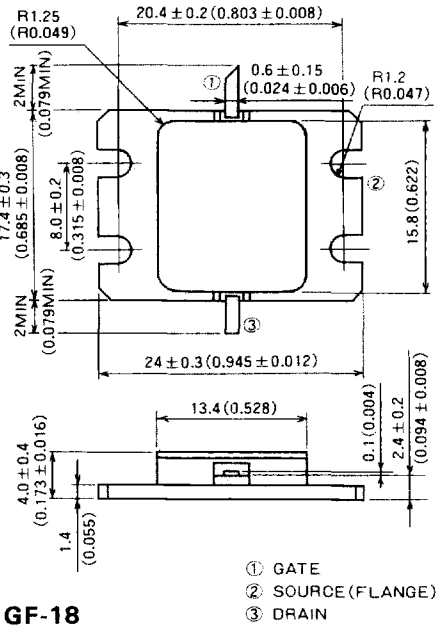
APPLICATION

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

QUALITY GRADE

- IG

OUTLINE DRAWING Unit: millimeters (inches)



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	6	A
I _{GR}	Reverse gate current	-20	mA
I _{GF}	Forward gate current	42	mA
P _T	Total power dissipation *1	53.5	W
T _{ch}	Channel temperature	175	°C
T _{stg}	Storage temperature	-65 ~ +175	°C

*1: T_c = 25°C

RECOMMENDED BIAS CONDITIONS

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

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	—	4.5	6	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 = 40mA	—	-3	-4	V	
P _{1dB}	Output power at 1dB gain compression	V _{DS} = 10V, I _D = 2.4A, f = 4.4~5.0GHz	39.5	40.5	—	dBm	
G _{LP}	Linear power gain		9	10	—	dB	
I _D	Drain current		—	3.0	—	A	
η _{add}	Power added efficiency		—	32	—	%	
IM ₃	3rd order IM distortion *1		-42	-45	—	dBc	
R _{th(ch-c)}	Thermal resistance *2		ΔV _f method	—	—	2.8	°C/W

*1: Item-51, 2-tone test P_o = 29 dBm Single Carrier Level f = 5.0 GHz Δf = 10 MHz

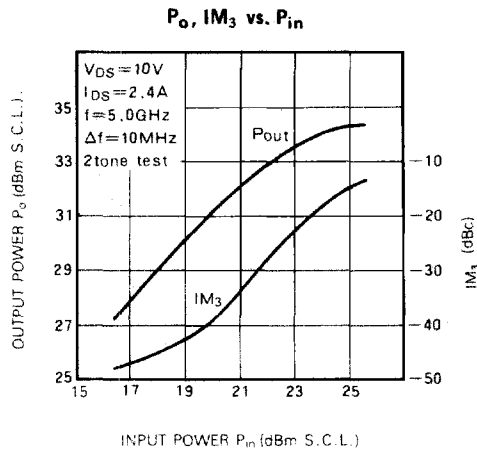
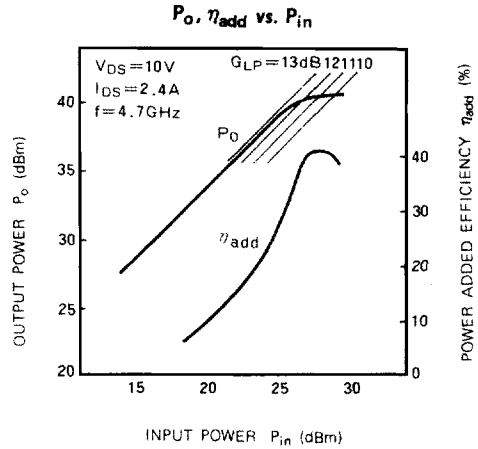
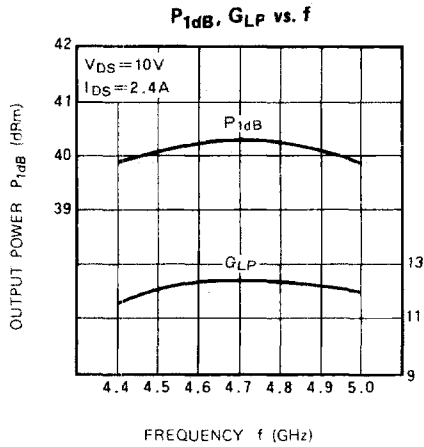
*2: Channel to case

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TYPICAL CHARACTERISTICS (Ta=25°C)



S PARAMETERS (Ta=25°C, VDS=10V, IDS=2.4A)

f (GHz)	S Parameters (TYP.)							
	S11		S21		S12		S22	
	Magn.	Angle (deg.)	Magn.	Angle (deg.)	Magn.	Angle (deg.)	Magn.	Angle (deg.)
4.4	0.53	80.6	3.71	- 88.6	0.062	-142.5	0.23	174.1
4.5	0.48	40.3	3.85	-126.6	0.067	178.3	0.20	128.7
4.6	0.41	- 1.4	3.96	-165.5	0.073	139.7	0.18	80.0
4.7	0.31	- 47.6	4.07	154.2	0.077	100.2	0.17	29.8
4.8	0.20	-109.9	4.08	112.7	0.081	59.4	0.15	- 22.7
4.9	0.18	153.5	3.67	69.6	0.082	17.9	0.12	- 77.5
5.0	0.31	78.9	3.66	26.7	0.079	- 24.5	0.07	-148.9