

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
 $\eta_{add} = 30\%$ (TYP) @ 4.4 ~ 5.0 GHz, P_{1dB}
- Hermetically sealed metal-ceramic package
- Low distortion [Item: -51]
 $IM_3 = -45$ 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 (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	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: $T_c = 25^\circ C$

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

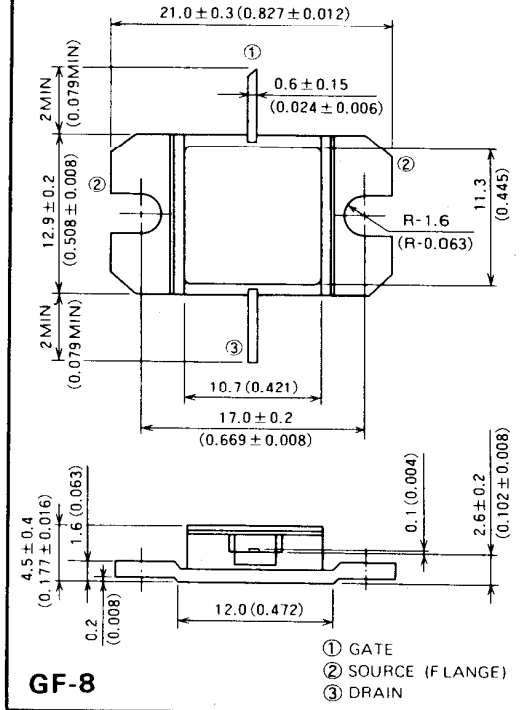
Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
I_{DSS}	Saturated drain current	$V_{DS} = 3V, V_{GS} = 0V$	—	—	7.5	A
g_m	Transconductance	$V_{DS} = 3V, I_D = 2.2A$	—	2	—	S
$V_{GS(off)}$	Gate to source cut-off voltage	$V_{DS} = 3V, I_D = 20mA$	—	—	-4.5	V
P_{1dB}	Output power at 1dB gain compression	$V_{DS} = 10V, I_D = 2.4A, f = 4.4 \sim 5.0GHz$	38	39	—	dBm
G_{LP}	Linear power gain		8	9	—	dB
I_D	Drain current		—	—	3.0	A
η_{add}	Power added efficiency		—	30	—	%
*1 IM_3	3rd order IM distortion *1		-42	-45	—	dBc
$R_{th(ch-c)}$	Thermal resistance *2		ΔV_f method	—	—	3.5

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

*2: Channel to case

OUTLINE DRAWING

Unit: millimeters (inches)



RECOMMENDED BIAS CONDITIONS

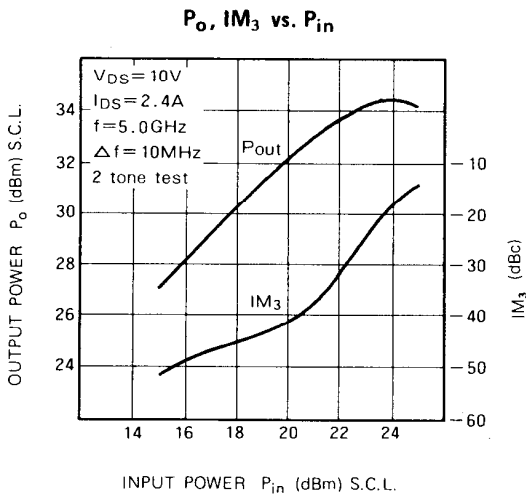
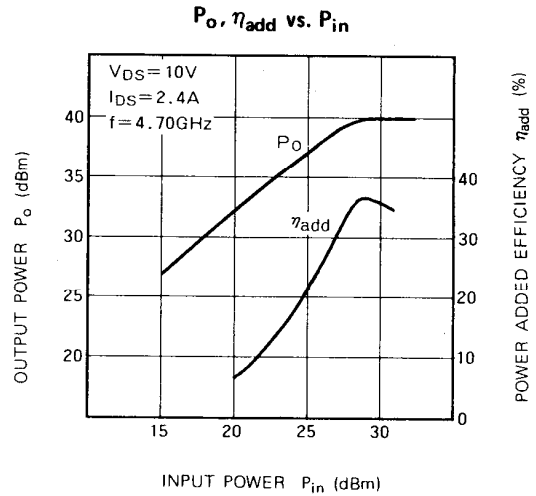
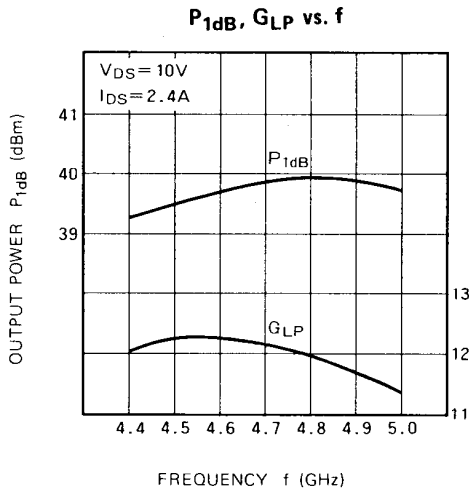
- $V_{DS} = 10V$
- $I_D = 2.4A$
- $R_g = 50\Omega$
- Refer to Bias Procedure

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TYPICAL CHARACTERISTICS (Ta=25°C)



S PARAMETERS (Ta=25°C, V_{DS}=10V, I_{DS}=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