

# 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)

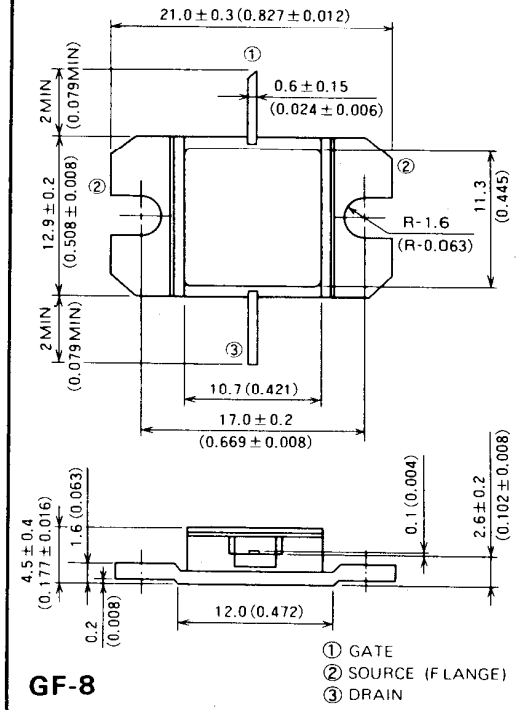
Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
$I_{DSS}$	Saturated drain current	$V_{DS} = 3V, V_{GS} = 0V$	—	—	7.5	A
$g_m$	Transconductance	$V_{DS} = 3V, I_D = 2.2A$	—	2	—	S
$V_{GS(off)}$	Gate to source cut-off voltage	$V_{DS} = 3V, I_D = 20mA$	—	—	-4.5	V
$P_{1dB}$	Output power at 1dB 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
$\eta_{add}$	Power added efficiency		—	30	—	%
*1 $IM_3$	3rd order IM distortion *1		-42	-45	—	dBc
$R_{th(ch-c)}$	Thermal resistance *2		$\Delta V_f$ 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

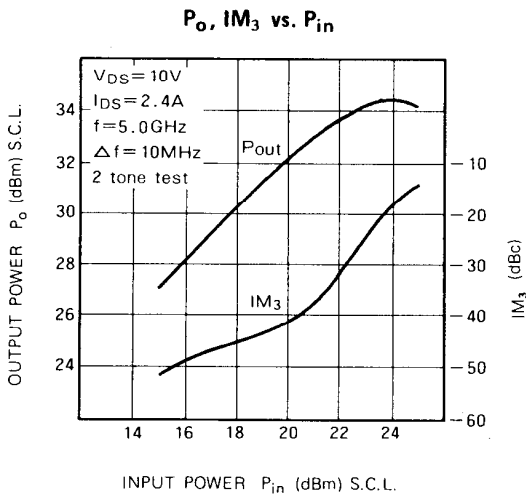
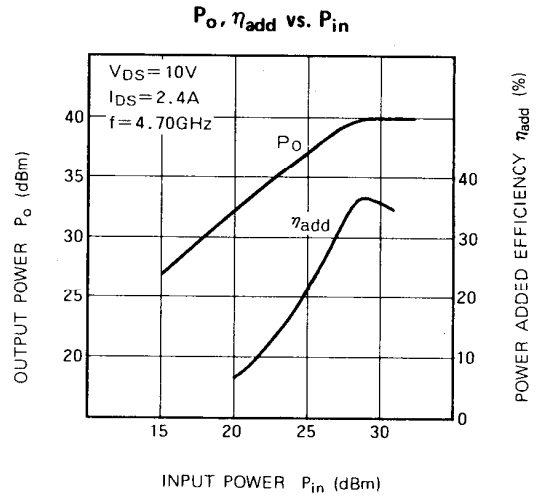
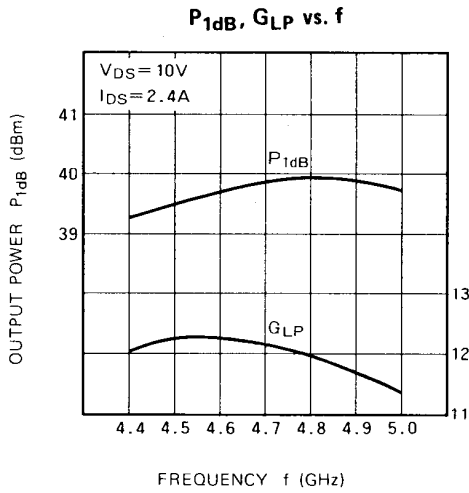
- $V_{DS} = 10V$
- $I_D = 2.4A$
- $R_g = 50\Omega$
- Refer to Bias Procedure

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**TYPICAL CHARACTERISTICS (Ta=25°C)**



**S PARAMETERS (Ta=25°C, 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