

# MGFC40V4450

## 4.4~5.0GHz BAND 10W INTERNALLY MATCHED GaAs FET

### DESCRIPTION

The MGFC40V4450 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

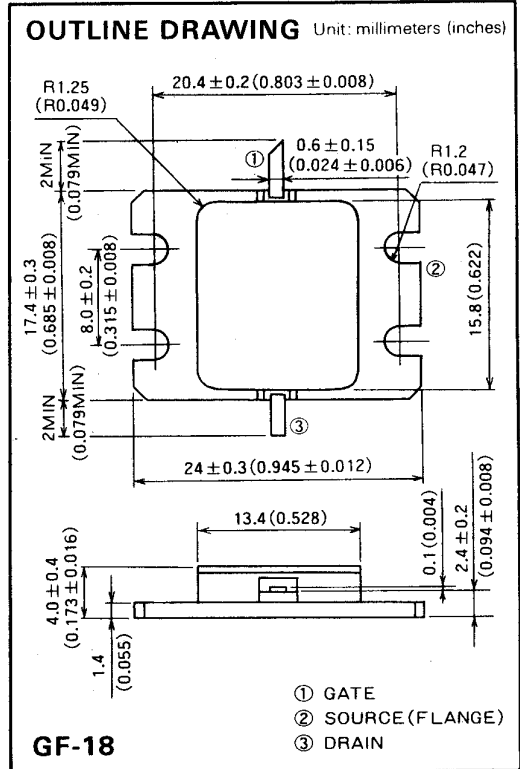
- Class A operation
- Internally matched to 50Ω system
- High output power  
 $P_{1dB} = 10W$  (TYP) @ 4.4 ~ 5.0 GHz
- High power gain  
 $G_{LP} = 10$  dB (TYP) @ 4.4 ~ 5.0 GHz
- High power added efficiency  
 $\eta_{add} = 32\%$  (TYP) @ 4.4 ~ 5.0 GHz,  $P_{1dB}$
- Hermetically sealed metal-ceramic package
- Low distortion [Item: -51]  
 $IM_3 = -45$  dBc (TYP) @  $P_o = 29$  (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 <sub>GD0</sub>	Gate to drain voltage	-15	V
V <sub>GSO</sub>	Gate to source voltage	-15	V
I <sub>D</sub>	Drain current	6	A
I <sub>GR</sub>	Reverse gate current	-20	mA
I <sub>GF</sub>	Forward gate current	42	mA
P <sub>T</sub>	Total power dissipation *1	42.8	W
T <sub>ch</sub>	Channel temperature	175	°C
T <sub>stg</sub>	Storage temperature	-65 ~ +175	°C

\*1: T<sub>c</sub> = 25°C

### RECOMMENDED BIAS CONDITIONS

- V<sub>DS</sub> = 10V
- I<sub>D</sub> = 2.4A
- R<sub>g</sub> = 50Ω
- Refer to Bias Procedure

### ELECTRICAL CHARACTERISTICS (Ta = 25°C)

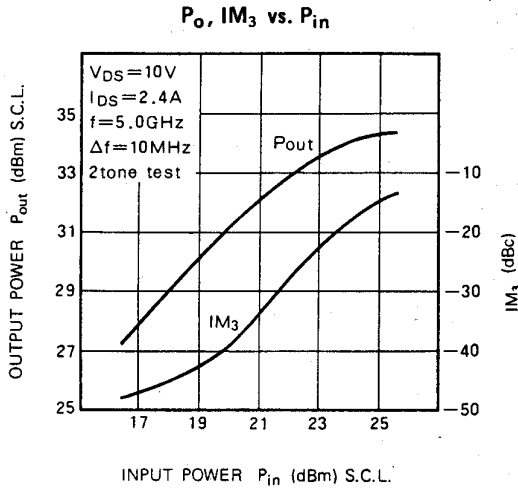
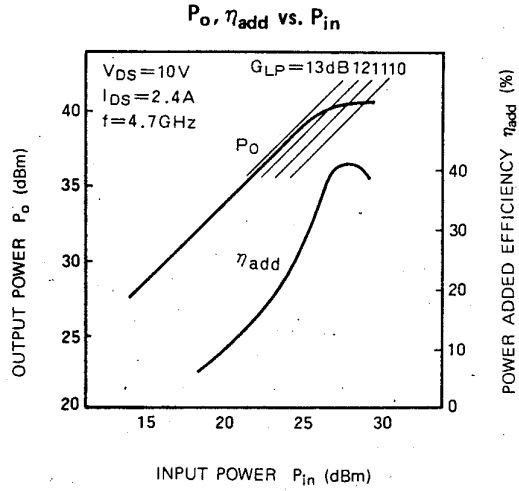
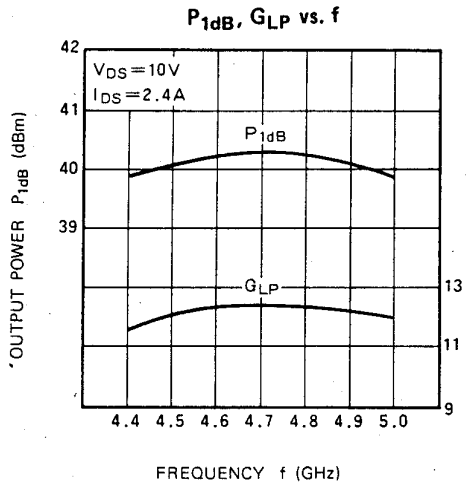
Symbol	Parameter	Test conditions	Limits			Unit	
			Min	Typ	Max		
I <sub>DSS</sub>	Saturated drain current	V <sub>DS</sub> = 3V, V <sub>GS</sub> = 0V	—	4.5	6	A	
g <sub>m</sub>	Transconductance	V <sub>DS</sub> = 3V, I <sub>D</sub> = 2.2A	—	2	—	S	
V <sub>GS(off)</sub>	Gate to source cut-off voltage	V <sub>DS</sub> = 3V, I <sub>D</sub> = 40mA	—	-3	-4	V	
P <sub>1dB</sub>	Output power at 1dB gain compression	V <sub>DS</sub> = 10V, I <sub>D</sub> = 2.4A, f = 4.4 ~ 5.0GHz	39.5	40.5	—	dBm	
G <sub>LP</sub>	Linear power gain		9	10	—	dB	
I <sub>D</sub>	Drain current		—	2.4	—	A	
η <sub>add</sub>	Power added efficiency		—	32	—	%	
IM <sub>3</sub>	3rd order IM distortion *1		-42	-45	—	dBc	
R <sub>th(ch-c)</sub>	Thermal resistance *2		ΔV <sub>f</sub> method	—	—	3.5	°C/W

\*1: Item -51, 2-tone test P<sub>o</sub> = 29 dBm Single Carrier Level f = 5.0 GHz Δf = 10 MHz \*2: Channel to case

# MGFC40V4450

## 4.4~5.0GHz BAND 10W INTERNALLY MATCHED GaAs FET

### TYPICAL CHARACTERISTICS (Ta=25°C)



### S PARAMETERS (Ta=25°C, V<sub>DS</sub>=10V, I<sub>DS</sub>=2.4A)

f (GHz)	S Parameters (TYP.)							
	S <sub>11</sub>		S <sub>21</sub>		S <sub>12</sub>		S <sub>22</sub>	
	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