

# MGFC39V7177A

**PRELIMINARY**

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

## 7.1~7.7GHz BAND 8W INTERNALLY MATCHED GaAs FET

### DESCRIPTION

The MGFC39V7177A is an internally impedance-matched GaAs power FET especially designed for use in 7.1~7.7 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) @ 7.1~7.7 GHz
- High power gain  
 $G_{LP} = 8$  dB (TYP) @ 7.1~7.7GHz
- High power added efficiency  
 $\eta_{add} = 28\%$  (TYP) @ 7.1~7.7 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: 7.1~7.7 GHz band power amplifier
- Item-51: Digital radio communication

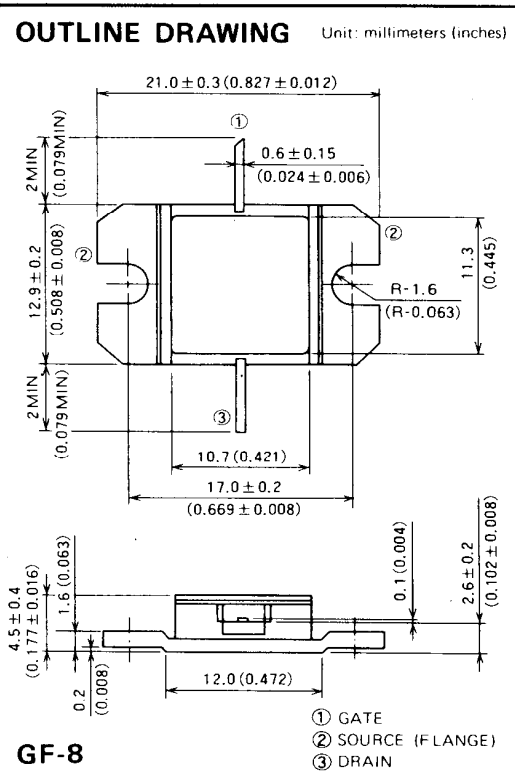
### QUALITY GRADE

- 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	7.5	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	—	—	7.5	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> = 20mA	—	—	-4.5	V
P <sub>1dB</sub>	Output power at 1dB gain compression	V <sub>DS</sub> = 10V, I <sub>D</sub> = 2.4A, f = 7.1~7.7GHz	38	39	—	dBm
G <sub>LP</sub>	Linear power gain		7	8	—	dB
I <sub>D</sub>	Drain current		—	—	3.0	A
η <sub>add</sub>	Power added efficiency		—	28	—	%
IM <sub>3</sub>	3rd order IM distortion *1		-42	-45	—	dBc
R <sub>th(ch-o)</sub>	Thermal resistance *2		ΔV <sub>f</sub> method	—	—	3.5

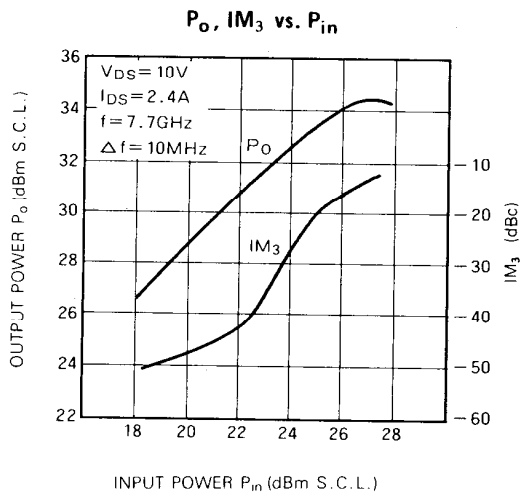
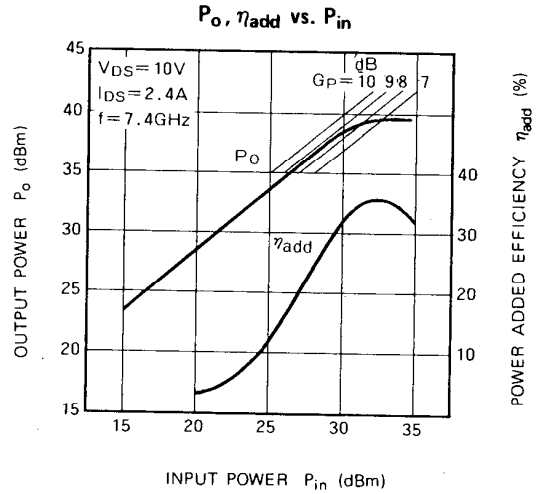
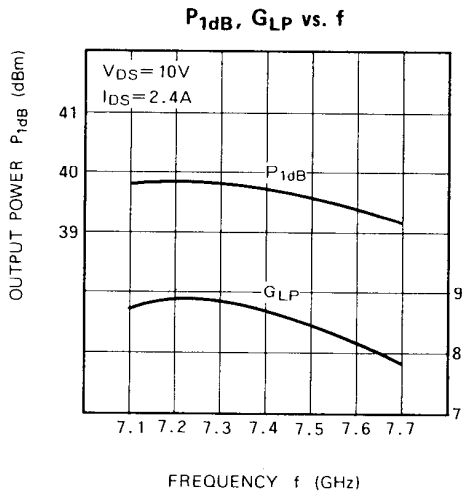
\*1: Item-51, 2-tone test P<sub>o</sub> = 28 dBm Single Carrier Level f = 7.7 GHz Δf = 10 MHz. \*2: Channel to case

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**TYPICAL CHARACTERISTICS (Ta=25°C)**



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

f (GHz)	S Parameters (TYP.)							
	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.)
7.1	0.43	53	2.69	- 71	0.056	- 103	0.35	- 91
7.2	0.39	35	2.74	- 86	0.061	- 119	0.30	- 103
7.3	0.35	16	2.71	- 101	0.064	- 133	0.25	- 119
7.4	0.26	- 9	2.68	- 118	0.067	- 150	0.21	- 137
7.5	0.22	- 46	2.65	- 134	0.070	- 167	0.19	- 157
7.6	0.21	- 106	2.55	- 153	0.071	175	0.16	- 177
7.7	0.30	- 150	2.49	- 171	0.068	158	0.16	167