

**PRELIMINARY**

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

MITSUBISHI SEMICONDUCTOR <GaAs FET>

# MGFC39V6472A

**6.4~7.2GHz BAND 8W INTERNALLY MATCHED GaAs FET**

## DESCRIPTION

The MGFC39V6472A is an internally impedance-matched GaAs power FET especially designed for use in 6.4~7.2 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) @ 6.4~7.2GHz
- High power gain  
 $G_{LP} = 8$  dB (TYP) @ 6.4~7.2GHz
- High power added efficiency  
 $\eta_{add} = 28\%$  (TYP) @ 6.4~7.2GHz,  $P_{1dB}$
- Hermetically sealed metal-ceramic package
- Low distortion [Item: -51]  
 $IM_3 = -45$  dBc (TYP) @  $P_o = 28$  (dBm) S.C.L.

## APPLICATION

- Item-01: 6.4~7.2GHz band power amplifier
- Item-51: Digital radio communication

## QUALITY GRADE

- IG

## ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

Symbol	Parameter	Ratings	Unit
V <sub>GDO</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

## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

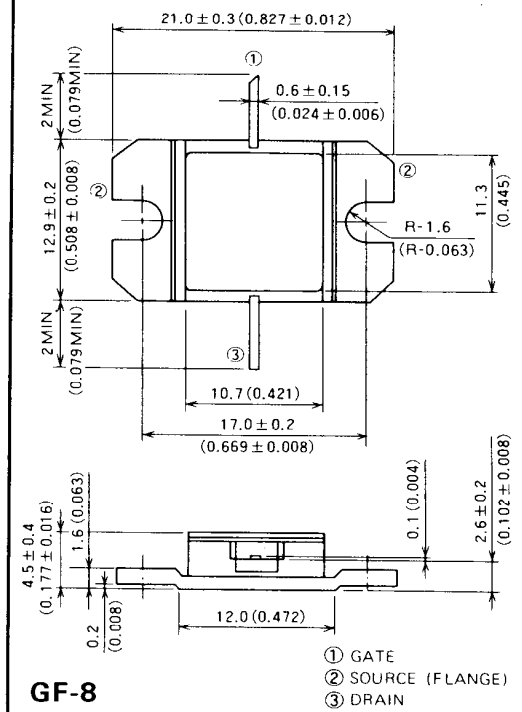
Symbol	Parameter	Test conditions	Limits			Unit	
			Min	Typ	Max		
I <sub>DSS</sub>	Saturated drain current	V <sub>DS</sub> = 3V, V <sub>GS</sub> = 0V	—	—	7.5	A	
g <sub>m</sub>	Transconductance	V <sub>DS</sub> = 3V, I <sub>D</sub> = 2.2A	—	2	—	S	
V <sub>GS(off)</sub>	Gate to source cut-off voltage	V <sub>DS</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 = 6.4~7.2GHz	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-c)</sub>	Thermal resistance *2		ΔV <sub>f</sub> method	—	—	3.5	°C/W

\*1: Item-51, 2-tone test P<sub>o</sub> = 28 dBm Single Carrier Level f = 7.2GHz Δf = 10 MHz.

\*2: Channel to case

## OUTLINE DRAWING

Unit: millimeters (inches)



GF-8

## RECOMMENDED BIAS CONDITIONS

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

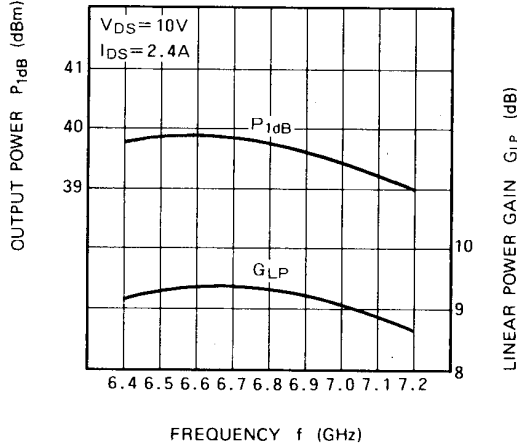
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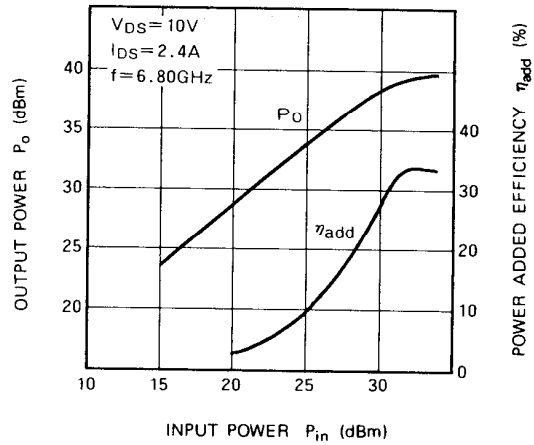
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**TYPICAL CHARACTERISTICS (Ta=25°C)**

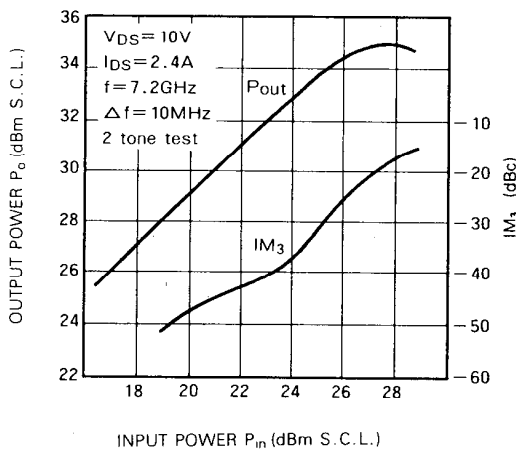
**P<sub>1dB</sub>, G<sub>LP</sub> vs. f**



**P<sub>o</sub>,  $\eta_{add}$  vs. P<sub>in</sub>**



**P<sub>o</sub>, IM<sub>3</sub> vs. P<sub>in</sub>**



**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.)
6.4	0.40	106	2.861	- 78	0.078	- 130	0.16	76
6.5	0.43	78	2.854	- 92	0.080	- 142	0.21	67
6.6	0.44	54	2.851	- 107	0.082	- 156	0.24	60
6.7	0.34	34	2.851	- 120	0.084	- 168	0.28	50
6.8	0.24	- 6	2.854	- 134	0.088	179	0.32	42
6.9	0.13	- 48	2.861	- 149	0.091	165	0.34	33
7.0	0.09	131	2.861	- 163	0.093	150	0.36	25
7.1	0.13	133	2.838	- 179	0.095	136	0.36	16
7.2	0.20	153	2.732	165	0.098	120	0.35	6