

# MGFC39V3742A

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

## 3.7~4.2GHz BAND 8W INTERNALLY MATCHED GaAs FET

### DESCRIPTION

The MGFC39V3742A is an internally impedance-matched GaAs power FET especially designed for use in 3.7 ~ 4.2 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) @ 3.7 ~ 4.2 GHz
- High power gain  
 $G_{LP} = 10$  dB (TYP) @ 3.7 ~ 4.2 GHz
- High power added efficiency  
 $\eta_{add} = 31\%$  (TYP) @ 3.7 ~ 4.2 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: 3.7 ~ 4.2 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

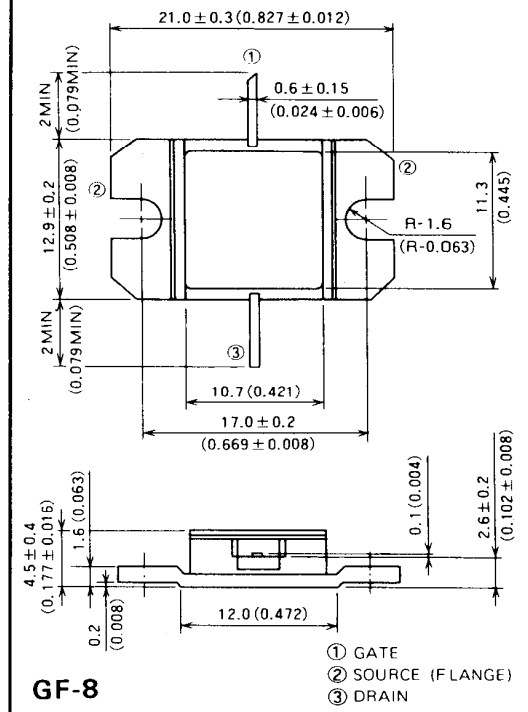
### ELECTRICAL CHARACTERISTICS (Ta=25°C)

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 = 3.7~4.2GHz	38	39	—	dBm
G <sub>LP</sub>	Linear power gain		9	10	—	dB
I <sub>D</sub>	Drain current		—	—	3.0	A
η <sub>add</sub>	Power added efficiency		—	31	—	%
* 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

\*1: Item-51, 2-tone test P<sub>o</sub> = 28 dBm Single Carrier Level f = 4.2 GHz Δf = 10 MHz \*2: Channel to case

### OUTLINE DRAWING

Unit: millimeters (inches)



### RECOMMENDED BIAS CONDITIONS

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

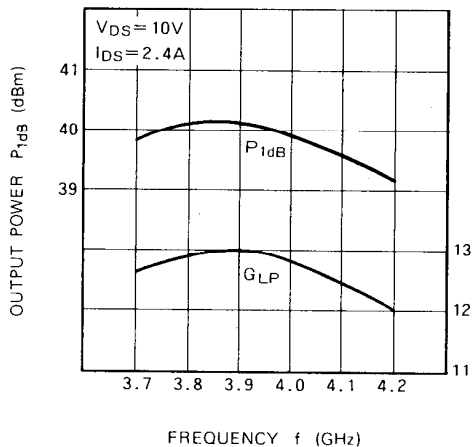
**PRELIMINARY**

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

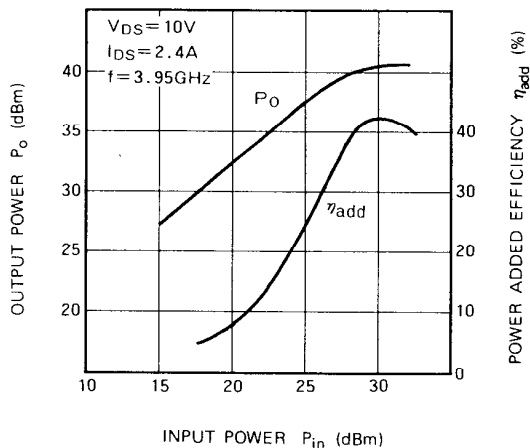
**3.7~4.2GHz BAND 8W INTERNALLY MATCHED GaAs FET**

**TYPICAL CHARACTERISTICS**

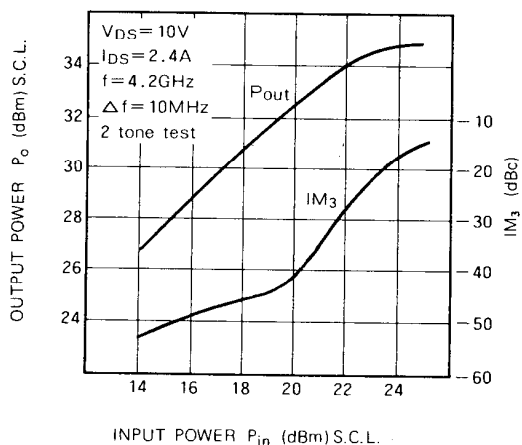
**$P_{1dB}$ ,  $G_{LP}$  vs.  $f$**



**$P_o$ ,  $\eta_{add}$  vs.  $P_{in}$**



**$P_o$ ,  $IM_3$  vs.  $P_{in}$**



**S PARAMETERS** ( $T_a=25^\circ C$ ,  $V_{DS}=10V$ ,  $I_{DS}=2.4A$ )

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.)
3.7	0.47	-180	4.295	26	0.069	-37	0.29	-124
3.8	0.48	162	4.426	3	0.072	-59	0.33	-154
3.9	0.44	136	4.472	-22	0.079	-82	0.37	-176
4.0	0.25	91	4.380	-48	0.084	-108	0.42	165
4.1	0.13	-55	4.181	-75	0.083	-136	0.46	141
4.2	0.34	-114	3.990	-103	0.078	-164	0.46	114