

# MGFC40V6472

## 6.4~7.2GHz BAND 10W INTERNALLY MATCHED GaAs FET

### DESCRIPTION

The MGFC40V6472 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  
 $P_{1dB} = 10W$  (TYP) @ 6.4~7.2GHz
- High power gain  
 $G_{LP} = 8$  dB (TYP) @ 6.4~7.2GHz
- High power added efficiency  
 $\eta_{add} = 32\%$  (TYP) @ 6.4~7.2GHz,  $P_{1dB}$
- Hermetically sealed metal-ceramic package
- Low distortion [Item: -51]  
 $IM_3 = -45$  dBc (TYP) @  $P_o = 29$  (dBm) S.C.L.

### APPLICATION

- Item-01: 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>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

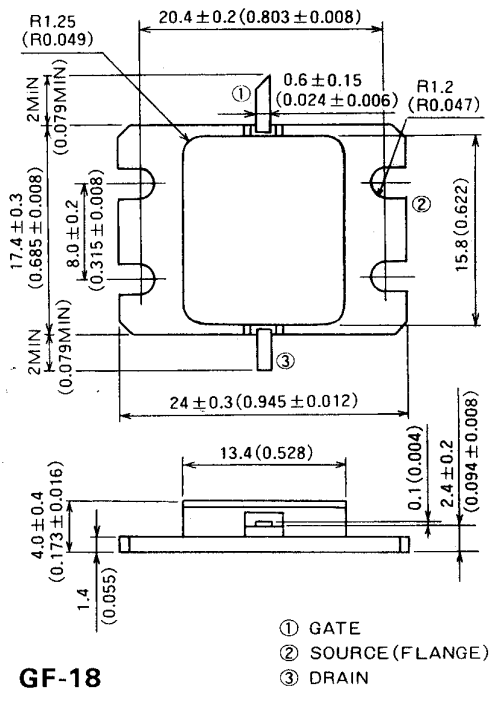
\*1: T<sub>c</sub> = 25°C

### 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	-2	-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 = 6.4~7.2GHz	39.5	40.5	—	dBm
G <sub>LP</sub>	Linear power gain		7	8	—	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(gh-c)</sub>	Thermal resistance *2		ΔV <sub>f</sub> method	—	—	3.5

\*1: Item-51, 2-tone test P<sub>o</sub> = 29 dBm Single Carrier Level f = 7.2GHz Δf = 10 MHz. \*2: Channel to case

### OUTLINE DRAWING Unit: millimeters (inches)

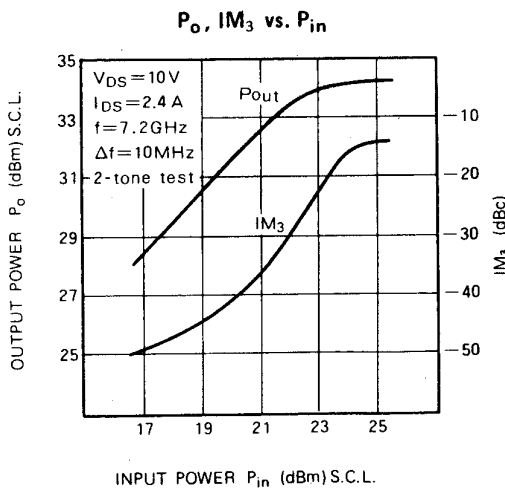
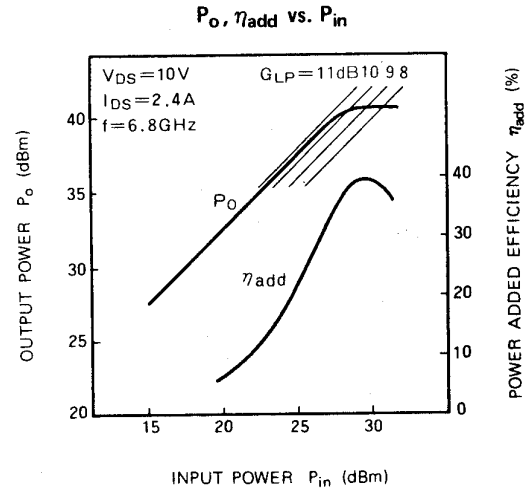
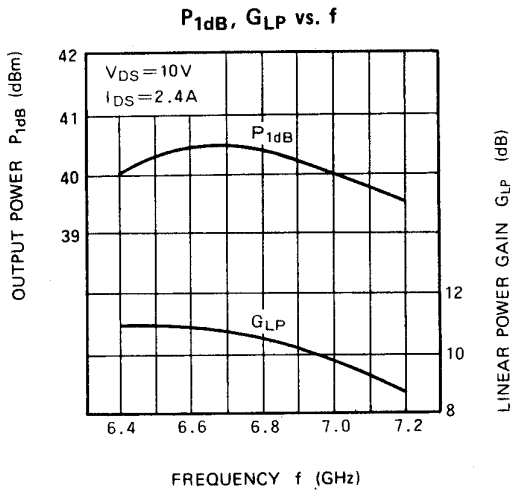


### RECOMMENDED BIAS CONDITIONS

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

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**TYPICAL CHARACTERISTICS**



**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.)
6.4	0.40	-170.9	3.51	34.3	0.071	-24.8	0.32	-134.4
6.5	0.41	140.3	3.51	-6.5	0.072	-65.4	0.31	-171.2
6.6	0.40	92.6	3.47	-47.4	0.073	-106.6	0.29	-155.1
6.7	0.39	41.3	3.43	-88.0	0.073	-147.2	0.26	123.6
6.8	0.40	-15.1	3.39	-129.5	0.073	171.2	0.21	95.4
6.9	0.44	-76.5	3.27	-173.5	0.071	127.6	0.14	77.0
7.0	0.45	-90.0	3.05	175.0	0.071	100.0	0.13	60.0
7.1	0.47	-110.0	2.92	165.0	0.070	80.0	0.15	50.0
7.2	0.49	-130.0	2.75	155.0	0.070	60.0	0.19	40.0