

# MGFC42V6472

## 6.4~7.2GHz BAND 16W INTERNALLY MATCHED GaAs FET

### DESCRIPTION

The MGFC42V6472 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

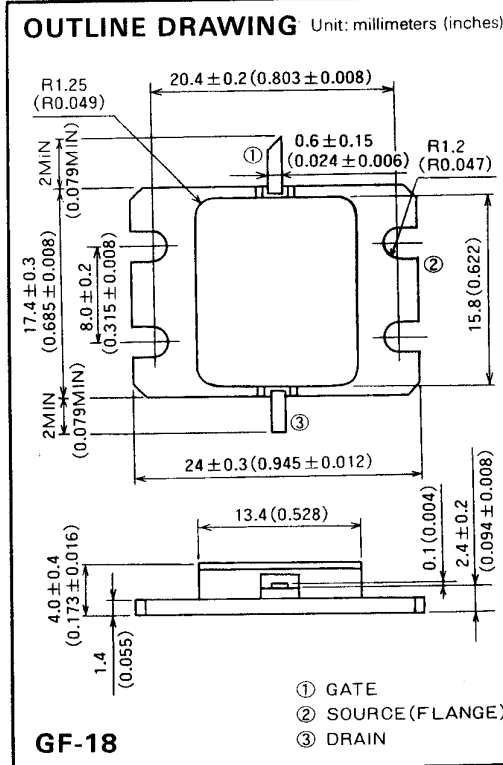
- Class A operation
- Internally matched to 50Ω system
- High output power  
 $P_{1dB} = 18W$  (TYP) @ 6.4 ~ 7.2 GHz
- High power gain  
 $G_{LP} = 8$  dB (TYP) @ 6.4 ~ 7.2 GHz
- High power added efficiency  
 $\eta_{add} = 30\%$  (TYP) @ 6.4 ~ 7.2 GHz,  $P_{1dB}$
- Hermetically sealed metal-ceramic package
- Low distortion [Item: -51]  
 $IM_3 = -45$  dBc (TYP) @  $P_o = 31$  (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	12	A
I <sub>GR</sub>	Reverse gate current	-40	mA
I <sub>GF</sub>	Forward gate current	84	mA
P <sub>T</sub>	Total power dissipation *1	78.9	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> = 4.5A
- R<sub>g</sub> = 25 Ω
- Refer to Bias Procedure

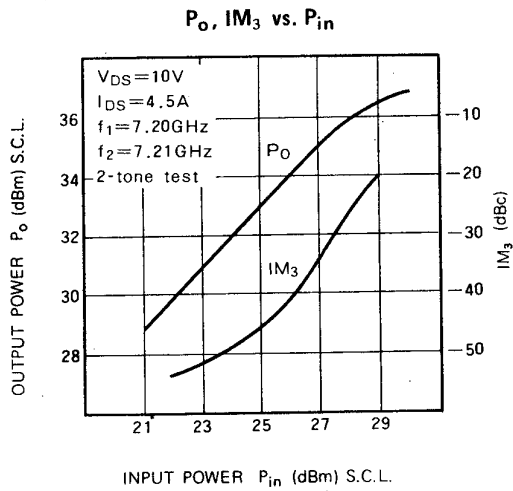
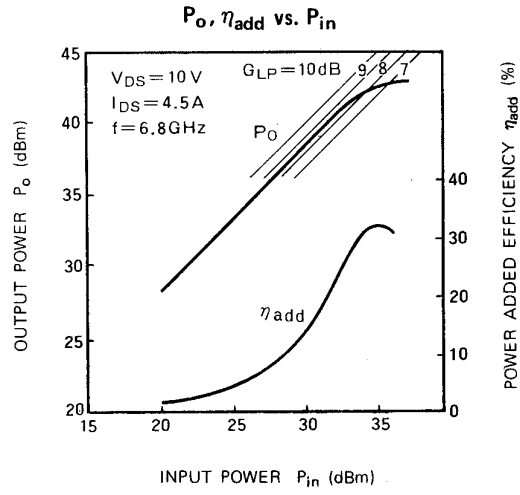
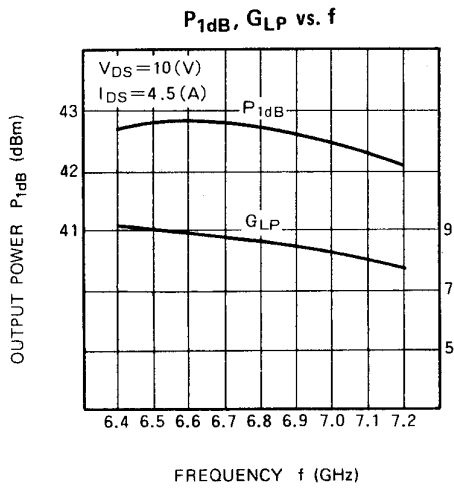
### ELECTRICAL CHARACTERISTICS (Ta = 25°C)

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	—	9	12	A
g <sub>m</sub>	Transconductance	V <sub>DS</sub> = 3V, I <sub>D</sub> = 4.4A	—	4	—	S
V <sub>GS(off)</sub>	Gate to source cut-off voltage	V <sub>DS</sub> = 3V, I <sub>D</sub> = 80mA	-2	-3	-4	V
P <sub>1dB</sub>	Output power at 1dB gain compression	V <sub>DS</sub> = 10V, I <sub>D</sub> = 4.5A, f = 6.4 ~ 7.2GHz	41.5	42.5	—	dBm
G <sub>LP</sub>	Linear power gain		7	8	—	dB
I <sub>D</sub>	Drain current		—	4.5	—	A
η <sub>add</sub>	Power added efficiency		—	30	—	%
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	—	—	1.9

\*1: Item-51, 2-tone test P<sub>o</sub> = 31 dBm Single Carrier Level f = 7.2 GHz Δf = 10 MHz. \*2: Channel to case

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**TYPICAL CHARACTERISTICS**



**S PARAMETERS** ( $T_a=25^\circ C$ ,  $V_{DS}=10V$ ,  $I_{DS}=4.5A$ )

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	0.41	77	2.83	-95	0.068	-147	0.30	67
6.5	0.40	59	2.80	-111	0.072	-162	0.35	59
6.6	0.38	42	2.78	-127	0.075	-177	0.40	54
6.7	0.36	26	2.72	-143	0.078	167	0.42	48
6.8	0.33	11	2.64	-158	0.080	151	0.44	42
6.9	0.28	-3	2.60	-173	0.081	137	0.45	36
7.0	0.22	-20	2.57	171	0.082	122	0.44	32
7.1	0.17	-46	2.53	157	0.084	108	0.43	28
7.2	0.14	-91	2.50	141	0.086	93	0.40	26