

PRELIMINARY

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

MITSUBISHI SEMICONDUCTOR <GaAs FET>

MGFC42V6472A

6.4~7.2GHz BAND 16W INTERNALLY MATCHED GaAs FET

DESCRIPTION

The MGFC42V6472A 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
 $\eta_{add} = 31\%$ (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.
- Low thermal resistance $R_{th(ch)} \leq 1.6(^{\circ}C/W)$

APPLICATION

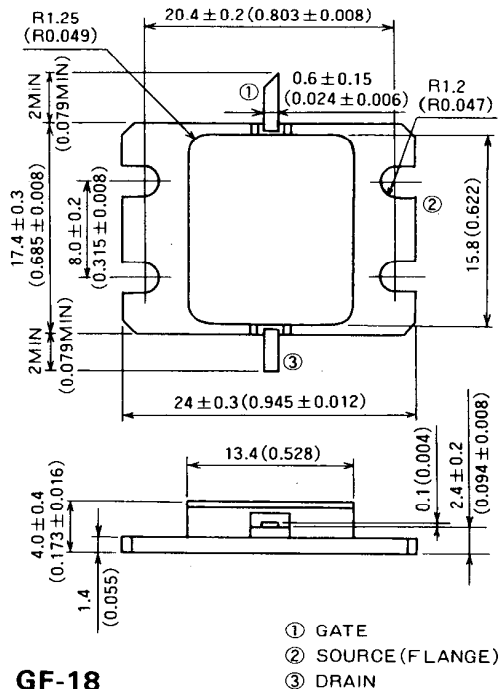
Item -01: 6.4 ~ 7.2GHz band power amplifier

Item -51: Digital radio communication

QUALITY GRADE

- IG

OUTLINE DRAWING

 Unit: millimeters (inches)

GF-18

ABSOLUTE MAXIMUM RATINGS

 ($T_a = 25^{\circ}C$)

Symbol	Parameter	Ratings	Unit
V_{GDO}	Gate to drain voltage	-15	V
V_{GSO}	Gate to source voltage	-15	V
I_D	Drain current	12	A
I_{GR}	Reverse gate current	-40	mA
I_{GF}	Forward gate current	84	mA
P_T	Total power dissipation *1	93.7	W
T_{ch}	Channel temperature	175	$^{\circ}C$
T_{stg}	Storage temperature	-65 ~ +175	$^{\circ}C$

*1: $T_c = 25^{\circ}C$

RECOMMENDED BIAS CONDITIONS

- $V_{DS} = 10V$
- $I_D = 4.5A$
- $R_g = 25\Omega$
- Refer to Bias Procedure

ELECTRICAL CHARACTERISTICS

 ($T_a = 25^{\circ}C$)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
I_{DSS}	Saturated drain current	$V_{DS} = 3V, V_{GS} = 0V$	—	9	12	A
g_m	Transconductance	$V_{DS} = 3V, I_D = 4.4A$	—	4	—	S
$V_{GS(off)}$	Gate to source cut-off voltage	$V_{DS} = 3V, I_D = 80mA$	-2	-3	-4	V
P_{1dB}	Output power at 1dB gain compression	$V_{DS} = 10V, I_D = 4.5A, f = 6.4 \sim 7.2GHz$	41.5	42.5	—	dBm
G_{LP}	Linear power gain		7	8	—	dB
I_D	Drain current		—	4.5	—	A
η_{add}	Power added efficiency		—	31	—	%
IM_3	3rd order IM distortion *1		-42	-45	—	dBc
$R_{th(ch-o)}$	Thermal resistance *2	ΔV_I method	—	—	1.6	$^{\circ}C/W$

*1: Item-51, 2-tone test $P_o = 31$ dBm Single Carrier Level $f = 7.2$ GHz $\Delta f = 10$ MHz. *2: Channel to case

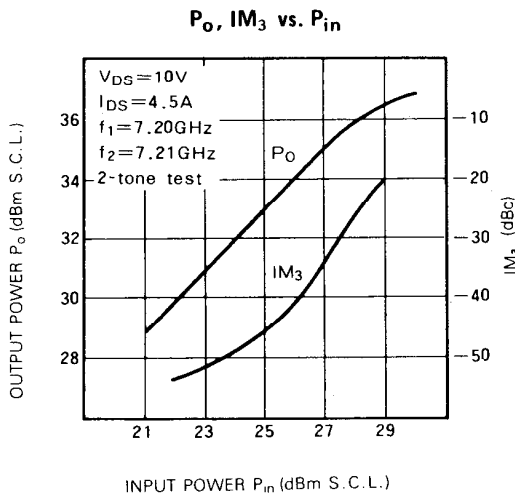
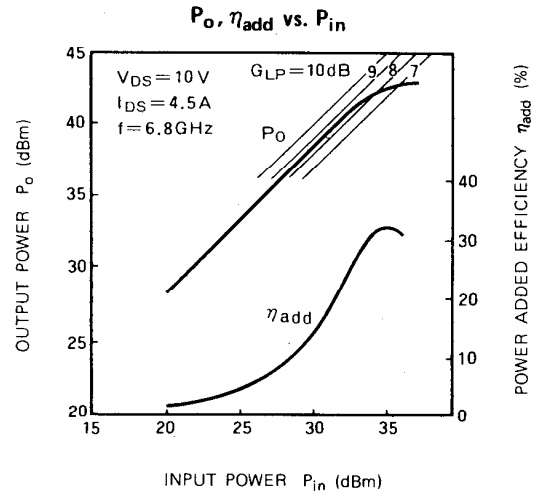
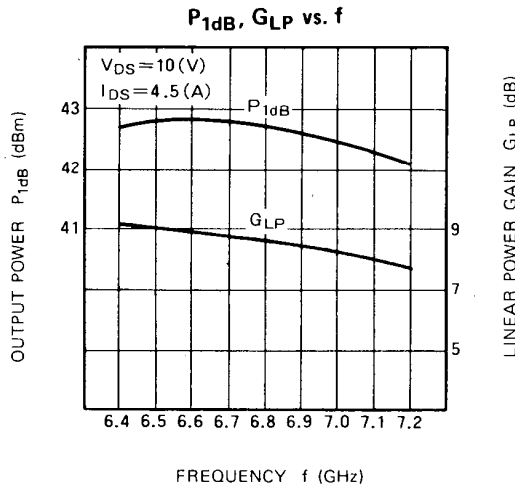
NOV. '97

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TYPICAL CHARACTERISTICS (Ta=25°C)



S PARAMETERS (Ta=25°C, VDS=10V, IDS=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