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
  η_{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

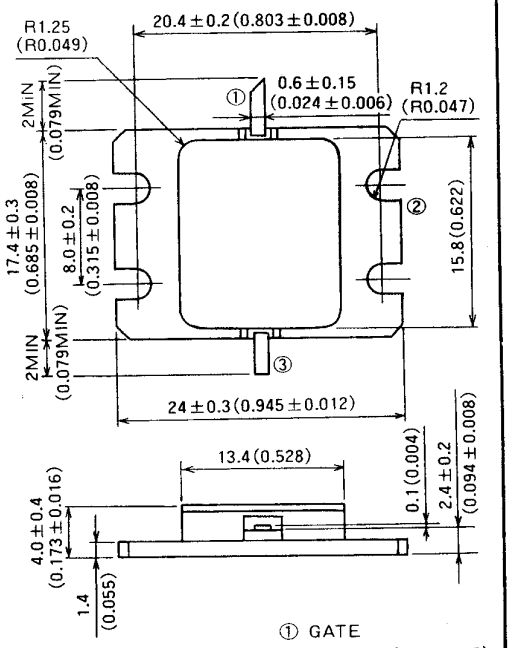
Item -01: 6.4 ~ 7.2GHz band power amplifier
Item -51: Digital radio communication

QUALITY GRADE

- IG

OUTLINE DRAWING

Unit: millimeters (inches)



GF-18

ABSOLUTE MAXIMUM RATINGS (Ta=25°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	78.9	W
T_{ch}	Channel temperature	175	°C
T_{stg}	Storage temperature	−65~+175	°C

*1: T_C = 25°C

RECOMMENDED BIAS CONDITIONS

- V_{DS}=10V
- I_D=4.5A
- Rg=25Ω
- Refer to Bias Procedure

ELECTRICAL CHARACTERISTICS (Ta=25°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=6.4~7.2GHz	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		—	30	—	%
IM_3	3rd order IM distortion *1		−42	−45	—	dBc
$R_{th(ch-c)}$	Thermal resistance *2	ΔV_f method	—	—	1.9	°C/W

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

MITSUBISHI ELECTRIC

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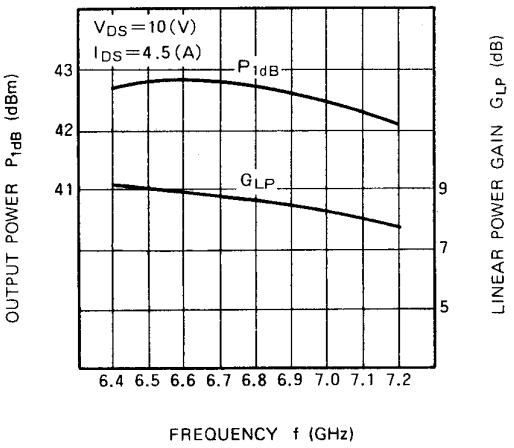
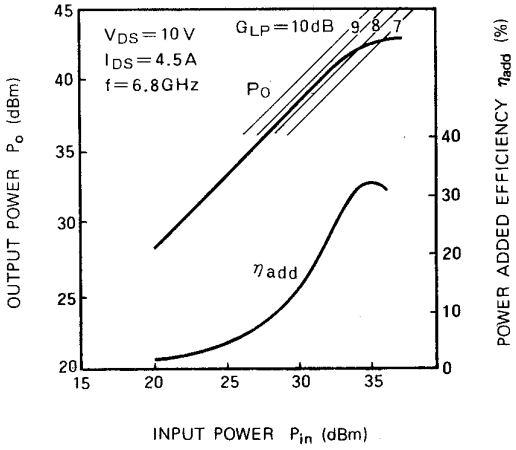
TYPICAL CHARACTERISTICS

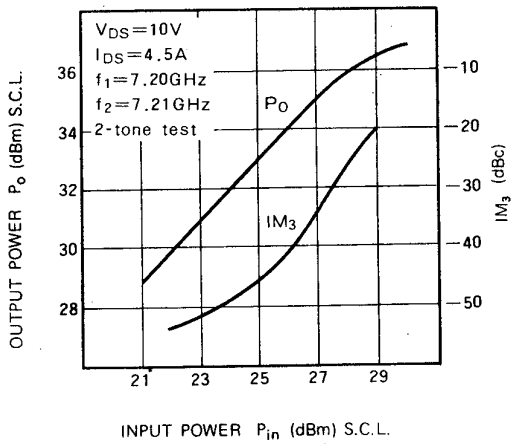
P_{1dB}, G_{LP} vs. f



P_o, η_{add} vs. P_{in}



P_o, IM_3 vs. P_{in}



S PARAMETERS (Ta=25°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