PRELIMINARY

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

MGFC39V6472A

6.4~7.2GHz BAND 8W INTERNALLY MATCHED GaAs FET

DESCRIPTION

The MGFC39V6472A 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} = 8W (TYP) @ 6.4~7.2GHz
- High power gain
  G_{LP} = 8 dB (TYP) @ 6.4~7.2GHz
- High power added efficiency
  η_{add} = 28% (TYP) @ 6.4~7.2GHz, P_{1dB}
- Hermetically sealed metal-ceramic package
- Low distortion [Item: -51]
  IM_3 = -45 dBc (TYP) @ P_o = 28 (dBm) S.C.L.

APPLICATION

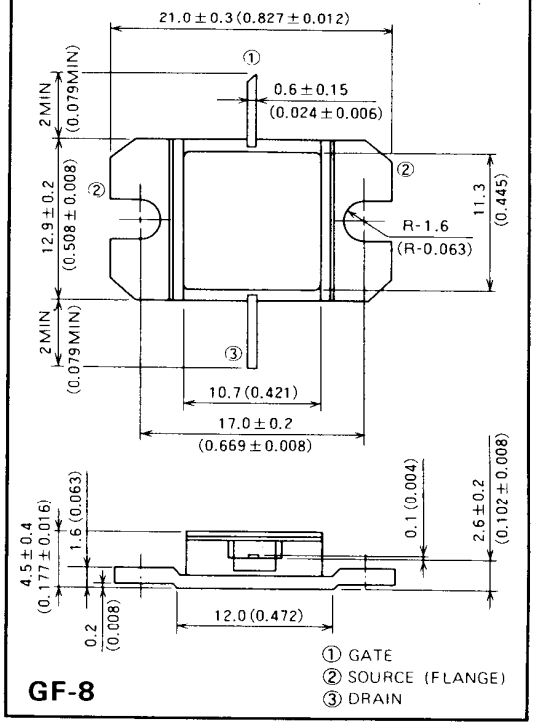
Item-01: 6.4~7.2GHz band power amplifier
Item-51: Digital radio communication

QUALITY GRADE

- IG

OUTLINE DRAWING

Unit: millimeters (inches)



GF-8

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	7.5	A
I_{GR}	Reverse gate current	−20	mA
I_{GF}	Forward gate current	42	mA
P_T	Total power dissipation *1	42.8	W
Tch	Channel temperature	175	°C
Tstg	Storage temperature	−65~+175	°C

*1: T_C = 25°C

RECOMMENDED BIAS CONDITIONS

- V_{DS} = 10V
- I_D = 2.4A
- Rg = 50Ω
- 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	—	—	7.5	A
g_m	Transconductance	V_{DS} = 3V, I_D = 2.2A	—	2	—	S
$V_{GS(off)}$	Gate to source cut-off voltage	V_{DS} = 3V, I_D = 20mA	—	—	−4.5	V
P_{1dB}	Output power at 1dB gain compression	V_{DS} = 10V, I_D = 2.4A, f = 6.4~7.2GHz	38	39	—	dBm
G_{LP}	Linear power gain		7	8	—	dB
I_D	Drain current		—	—	3.0	A
η_{add}	Power added efficiency		—	28	—	%
IM_3	3rd order IM distortion *1		−42	−45	—	dBc
$R_{th(ch-c)}$	Thermal resistance *2	$\triangle V_f$ method	—	—	3.5	°C/W

*1: Item-51, 2-tone test P_o = 28 dBm Single Carrier Level f = 7.2GHz Δf = 10 MHz. *2: Channel to case

MITSUBISHI ELECTRIC

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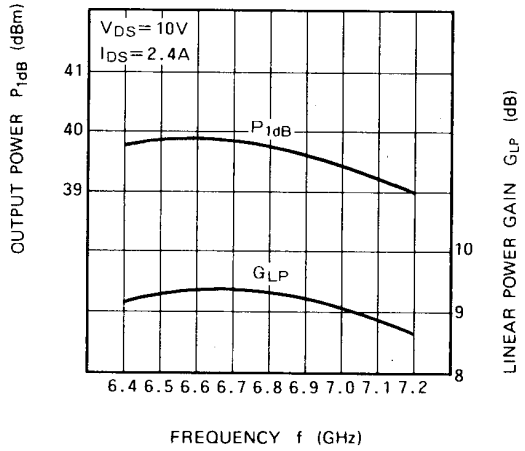
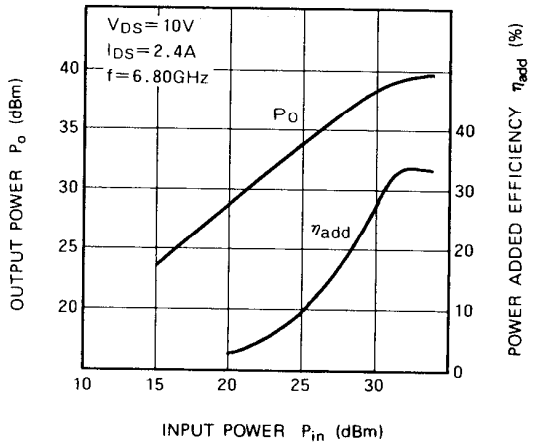
6.4~7.2GHz BAND 8W INTERNALLY MATCHED GaAs FET

TYPICAL CHARACTERISTICS (Ta=25℃)

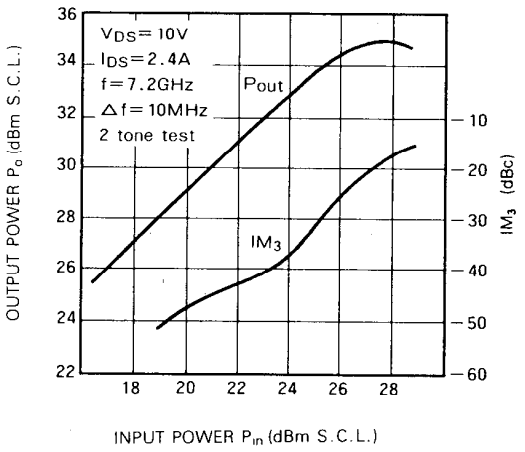
P_{1dB}, G_{LP} vs. f



P_o, η_{add} vs. P_{in}



P_o, IM_3 vs. P_{in}



S PARAMETERS (Ta=25°C, V_{DS}=10V, I_{DS}=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	106	2.861	− 78	0.078	−130	0.16	76
6.5	0.43	78	2.854	− 92	0.080	−142	0.21	67
6.6	0.44	54	2.851	−107	0.082	−156	0.24	60
6.7	0.34	34	2.851	−120	0.084	−168	0.28	50
6.8	0.24	− 6	2.854	−134	0.088	179	0.32	42
6.9	0.13	− 48	2.861	−149	0.091	165	0.34	33
7.0	0.09	131	2.861	−163	0.093	150	0.36	25
7.1	0.13	133	2.838	−179	0.095	136	0.36	16
7.2	0.20	153	2.732	165	0.098	120	0.35	6