

PRELIMINARY

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

MITSUBISHI SEMICONDUCTOR (GaAs FET)

MGFC36V3742A

3.7~4.2GHz BAND 4W INTERNALLY MATCHED GaAs FET

DESCRIPTION

The MGFC36V3742A is an internally impedance-matched GaAs power FET especially designed for use in 3.7~4.2GHz 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} = 4W(TYP) @ 3.7~4.2GHz
- High power gain
GLP = 11dB(TYP) @ 3.7~4.2GHz
- High power added efficiency
η_{add} = 33%(TYP) @ 3.7~4.2GHz
- Hermetically sealed metal-ceramic package
- Low distortion (Item : -51)
IM₃ = -45dBc(TYP) @ P_o = 25(dBm) S.C.L.

APPLICATION

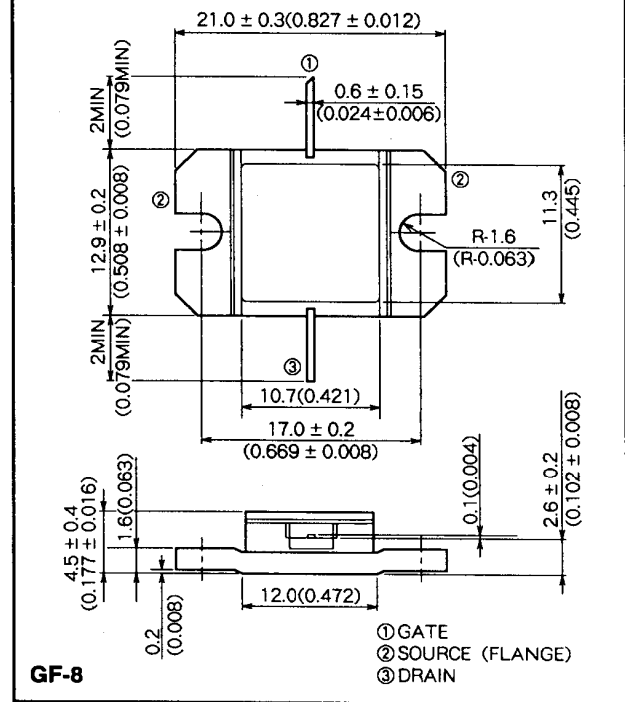
Item-01 : 3.7~4.2GHz band power amplifier
Item-51 : Digital radio communication

QUALITY GRADE

- IG

OUTLINE DRAWING

Unit : millimeters (inches)



RECOMMENDED BIAS CONDITIONS

- V_{DS} = 10V
- I_D = 1.2A
- R_G = 100(Ω)
- Refer to Bias Procedure

ABSOLUTE MAXIMUM RATINGS (T_a = 25°C)

Symbol	Parameter	Ratings	Unit
V _{GD0}	Gate to drain voltage	- 15	V
V _{GS0}	Gate to source voltage	- 15	V
I _D	Drain current	3.75	A
I _{GR}	Reverse gate current	- 10	mA
I _{GF}	Forward gate current	21	mA
P _T	Total power dissipation * 1	25	W
T _{ch}	Channel temperature	175	°C
T _{stg}	Storage temperature	- 65~+ 175	°C

* 1 : T_c = 25°C

ELECTRICAL CHARACTERISTICS (T_a = 25°C)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
I _{DSS}	Saturated drain current	V _{DS} = 3V, V _{GS} = 0V	-	-	3.75	A
g _m	Transconductance	V _{DS} = 3V, I _D = 1.1A	-	1	-	S
V _{GS(off)}	Gate to source cut-off voltage	V _{DS} = 3V, I _D = 10mA	-	-	- 4.5	V
P _{1dB}	Output power at 1dB gain compression	V _{DS} = 10V, I _D = 1.2A, f = 3.7~4.2GHz	35	36	-	dBm
GLP	Linear power gain		10	11	-	dB
I _D	Drain current		-	-	1.8	A
η _{add}	Power added efficiency		-	33	-	%
IM ₃	3rd order IM distortion * 1		- 42	- 45	-	dBc
R _{th(ch-c)}	Thermal resistance * 2		ΔV _f method	-	5	6

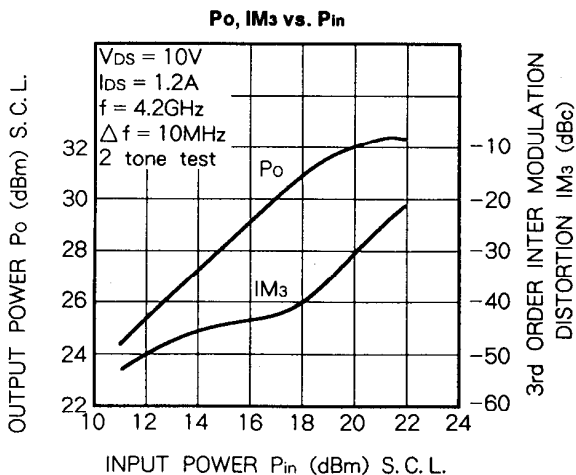
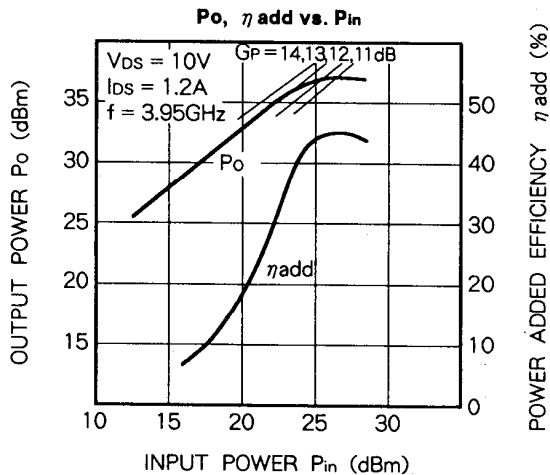
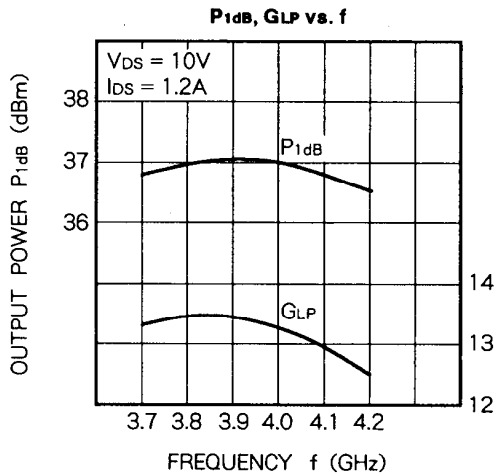
* 1 : Item-51, 2-tone test P_o = 25dBm Single Carrier Level f = 4.2GHz Δf = 10MHz

* 2 : Channel to case

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TYPICAL CHARACTERISTICS



S PARAMETERS (Ta = 25°C, Vbs = 10V, Ids = 1.2A)

f (GHz)	S parameters							
	S11		S21		S12		S22	
	Magn.	Angle(deg.)	Magn.	Angle(deg.)	Magn.	Angle(deg.)	Magn.	Angle(deg.)
3.7	0.43	-140	4.63	46	0.068	-14	0.16	-116
3.8	0.42	-172	4.69	25	0.067	-32	0.12	-147
3.9	0.40	162	4.69	5	0.071	-50	0.10	170
4.0	0.35	142	4.60	-12	0.071	-70	0.09	134
4.1	0.30	126	4.44	-28	0.071	-87	0.08	111
4.2	0.32	111	4.23	-45	0.070	-104	0.07	95