

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
 $P_{1dB} = 4W(TYP) @ 3.7 \sim 4.2GHz$
- High power gain
 $GLP = 11dB(TYP) @ 3.7 \sim 4.2GHz$
- High power added efficiency
 $\eta_{add} = 33\%(TYP) @ 3.7 \sim 4.2GHz$
- Hermetically sealed metal-ceramic package
- Low distortion [Item : -51]
 $IM_3 = -45dBc(TYP) @ P_o = 25(dBm) S.C.L.$

APPLICATION

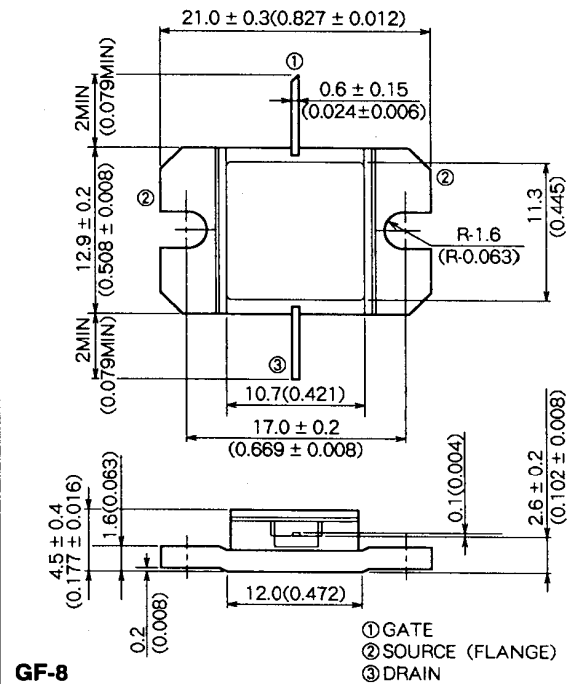
Item-01 : 3.7~4.2GHz band power amplifier
 Item-51 : Digital radio communication

QUALITY GRADE

- IG

OUTLINE DRAWING

Unit : millimeters (inches)



RECOMMENDED BIAS CONDITIONS

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

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	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	$^\circ C$
T_{stg}	Storage temperature	- 65 ~ + 175	$^\circ C$

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

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ C$)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
I_{DSS}	Saturated drain current	$V_{DS} = 3V, V_{GS} = 0V$	-	-	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	$V_{DS} = 10V, I_D = 1.2A, f = 3.7 \sim 4.2GHz$	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	$^\circ C/W$

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

* 2 : Channel to case

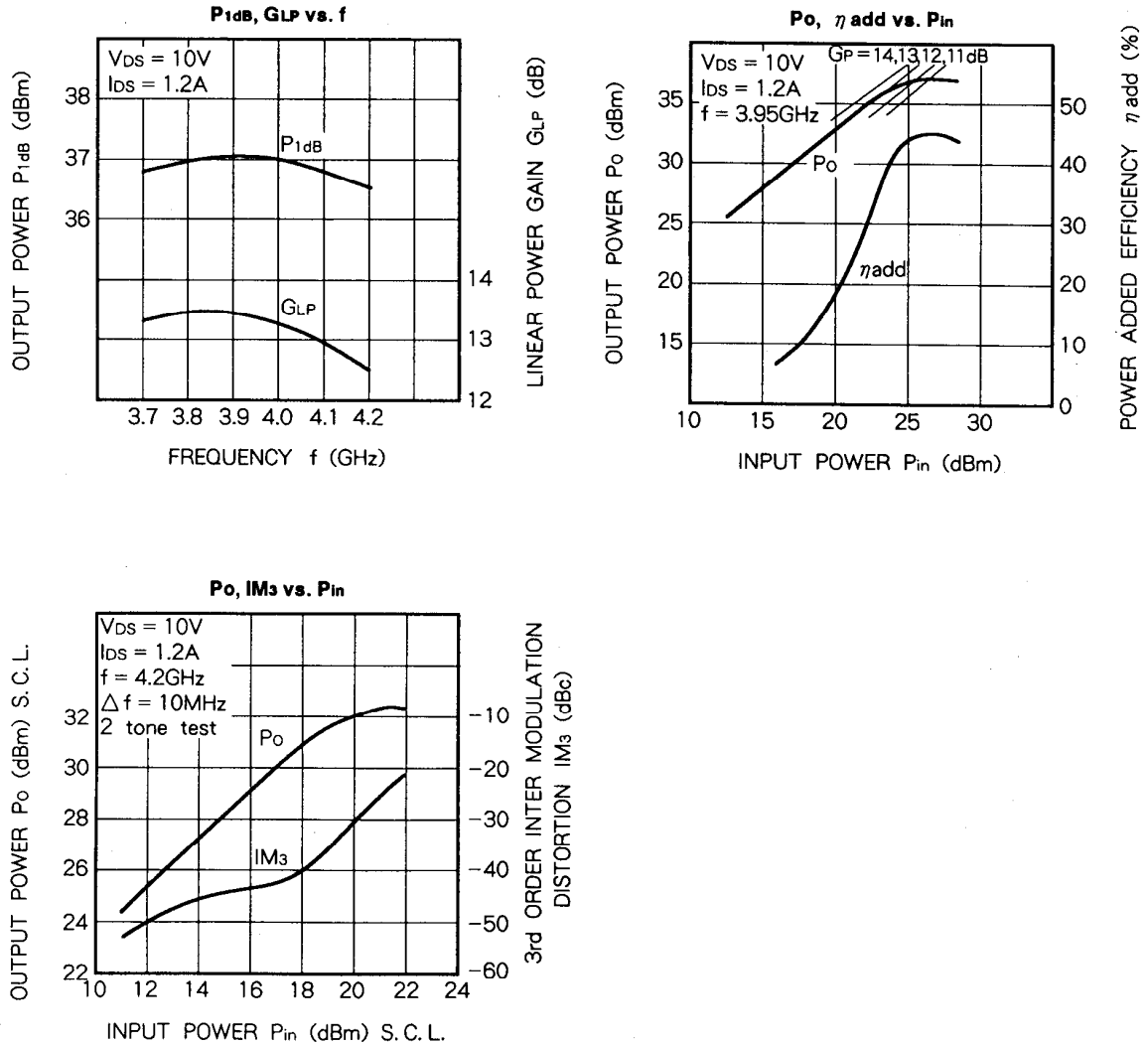
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TYPICAL CHARACTERISTICS



S PARAMETERS (T_a = 25°C, V_{DS} = 10V, I_{DS} = 1.2A)

f (GHz)	S parameters							
	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	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