MGFC39V3742

Plan for production discontinue

3.7~4.2GHz BAND 8W INTERNALLY MATCHED GaAs FET

DESCRIPTION

The MGFC39V3742 is an internally impedance-matched GaAs power FET especially designed for use in 3.7 ~ 4.2 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} = 8 W (TYP) @ 3.7 ~ 4.2 GHz
- High power gain
  G_{LP} = 10 dB (TYP) @ 3.7 ~ 4.2 GHz
- High power added efficiency
  η_{add} = 31% (TYP) @ 3.7 ~ 4.2 GHz, P_{1dB}
- Hermetically sealed metal-ceramic package

APPLICATION

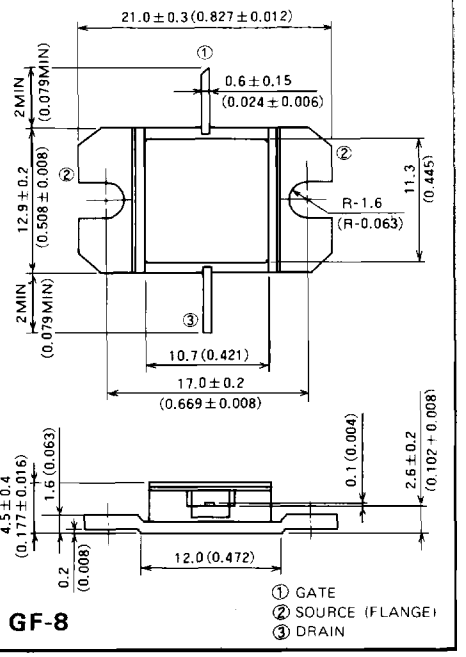
Item-01: 3.7~4.2 GHz band power amplifier
Item-51: Digital radio communication

QUALITY GRADE

- IG, IGX

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	5.6	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	—	4.0	5.6	A
g_m	Transconductance	V_{DS}=3V, I_D=2.2A	—	2.0	—	S
$V_{GS(off)}$	Gate to source cut-off voltage	V_{DS}=3V, I_D=20mA	−2	−3	−4	V
P_{1dB}	Output power at 1dB gain compression	V_{DS}=10V, I_D=2.4A, f=3.7~4.2GHz	38	39	—	dBm
G_{LP}	Linear power gain		9	10	—	dB
I_D	Drain current		—	2.2	2.8	A
η_{add}	Power added efficiency		—	31	—	%
IM_3	3rd order IM distortion *1		−42	−45	—	dBc
$R_{th(ch-c)}$	Thermal resistance *2	ΔV_f method	—	—	3.5	°C/W

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

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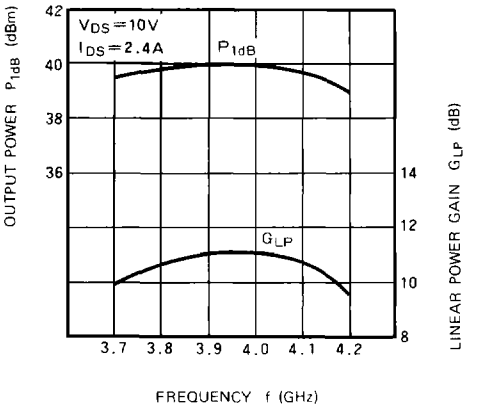
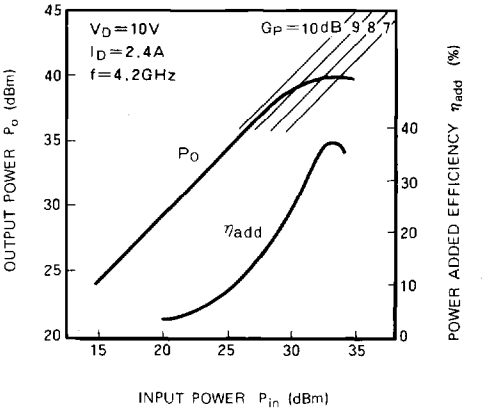
TYPICAL CHARACTERISTICS (Ta=25°C)

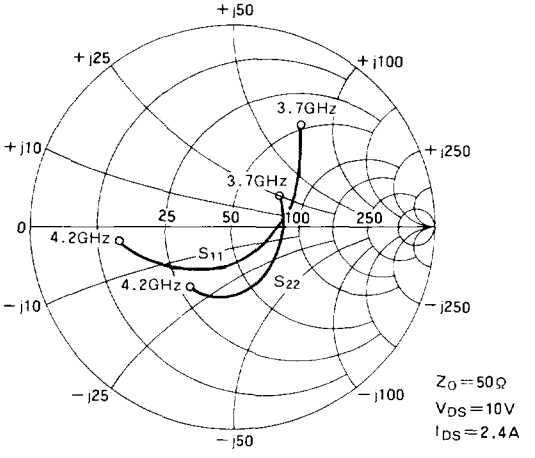
P_{1dB}, G_{LP} vs. f



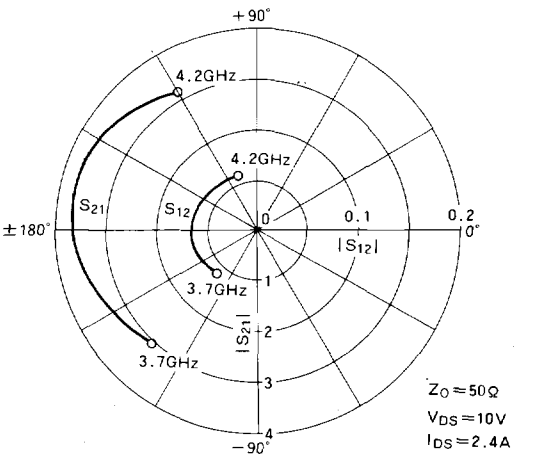
P_O, η_{add} vs. P_{in}



S_{11}, S_{22} vs. f



S_{21}, S_{12} vs.f



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.)
3.7	0.52	60	3.09	−133	0.058	−132	0.42	63
3.8	0.36	41	3.30	−152	0.062	−150	0.38	52
3.9	0.20	2	3.61	−171	0.064	−170	0.34	37
4.0	0.18	−86	3.67	169	0.064	166	0.30	15
4.1	0.34	−142	3.51	144	0.059	138	0.24	−30
4.2	0.57	−168	3.06	120	0.054	109	0.25	−78

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