MGFC39V5964

Plan for production discontinue

5.9~6.4GHz BAND 8W INTERNALLY MATCHED GaAs FET

DESCRIPTION

The MGFC39V5964 is an internally impedance-matched GaAs power FET especially designed for use in 5.9 ~ 6.4 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) @ 5.9 ~ 6.4 GHz
- High power gain
  G_{LP} = 9 dB (TYP) @ 5.9 ~ 6.4 GHz
- High power added efficiency
  η_{add} = 30% (TYP) @ 5.9 ~ 6.4 GHz, P_{1dB}
- Hermetically sealed metal-ceramic package

APPLICATION

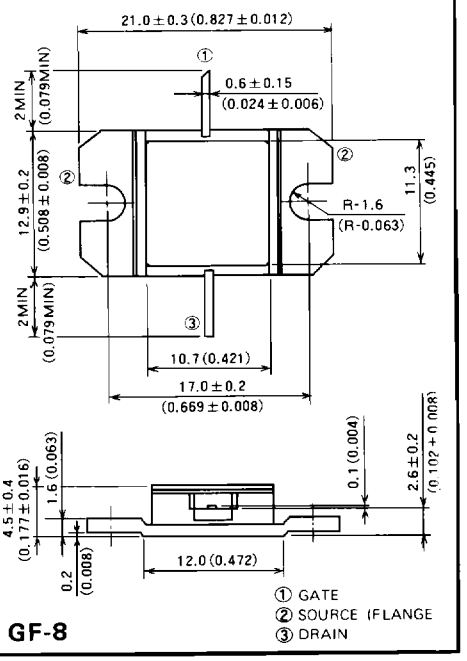
Item-01: 5.9~6.4 GHz band power amplifier
Item-51: Digital radio communication

QUALITY GRADE

- IG

OUTLINE DRAWING

Unit: millimeters (inches)



GF-8

RECOMMENDED BIAS CONDITIONS

- V_{DS} = 10V
- I_D = 2.4A
- Rg = 50Ω
- Refer to Bias Procedure

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

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 = 5.9~6.4GHz	38	39	—	dBm
G_{LP}	Linear power gain		8	9	—	dB
I_D	Drain current		—	2.2	2.8	A
η_{add}	Power added efficiency		—	30	—	%
IM_3	3rd order IM distortion *1		−42	−45	—	dBc
Rth(ch-c)	Thermal resistance *2	ΔV_f method	—	—	3.5	°C/W

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

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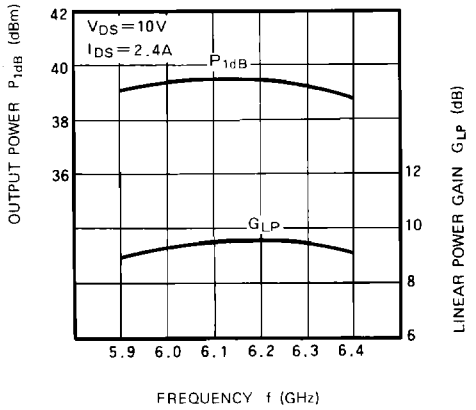
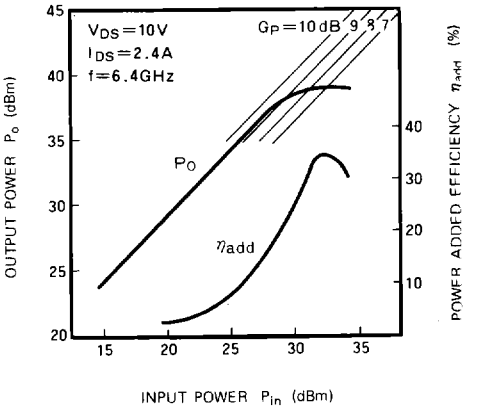
TYPICAL CHARACTERISTICS (T_a=25°C)

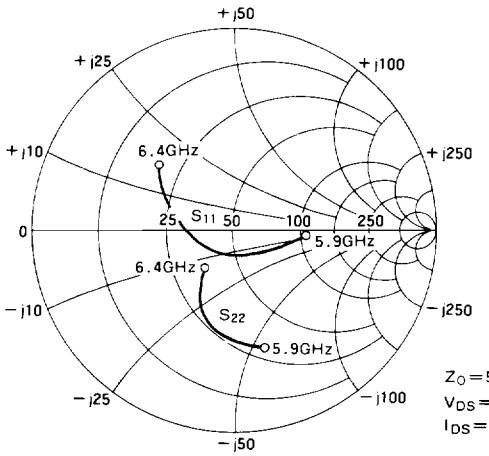
P_{1dB}, G_{LP} vs. f



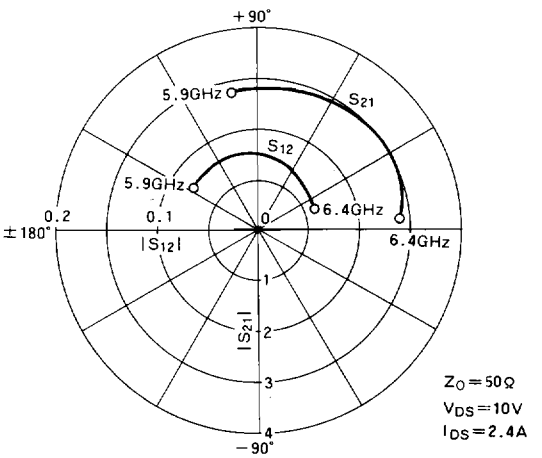
P_o, η_{add} vs. P_{in}



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



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



S PARAMETERS (T_a=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.)
5.9	0.36	−4	2.75	102	0.077	144	0.58	−75
6.0	0.19	−30	2.80	80	0.077	122	0.54	−87
6.1	0.13	−95	2.85	63	0.073	101	0.51	−98
6.2	0.21	−163	2.99	45	0.075	78	0.46	−111
6.3	0.35	161	3.03	25	0.068	53	0.35	−120
6.4	0.48	138	2.81	4	0.059	26	0.24	−130

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