

MGFC38V5964

5.9~6.4GHz BAND 6W INTERNALLY MATCHED GaAs FET

DESCRIPTION

The MGFC38V5964 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
 $P_{1dB} = 6W$ (TYP) @ 5.9~6.4GHz
- High power gain
 $G_{LP} = 10dB$ (TYP) @ 5.9~6.4GHz
- High power added efficiency
 $\eta_{add} = 32%$ (TYP) @ 5.9~6.4GHz, P_{1dB}
- Hermetically sealed metal-ceramic package
- Low distortion [Item: -51]
 $IM_3 = -45$ dBc (TYP) @ $P_o = 27$ (dBm) S.C.L.

APPLICATION

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

QUALITY GRADE

- IG

ABSOLUTE MAXIMUM RATINGS (Ta=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	5.0	A
I _{GR}	Reverse gate current	-15	mA
I _{GF}	Forward gate current	31.5	mA
P _T	Total power dissipation *1	30	W
T _{ch}	Channel temperature	175	°C
T _{stg}	Storage temperature	-65 ~ +175	°C

*1: T_c = 25°C

ELECTRICAL CHARACTERISTICS (Ta=25°C)

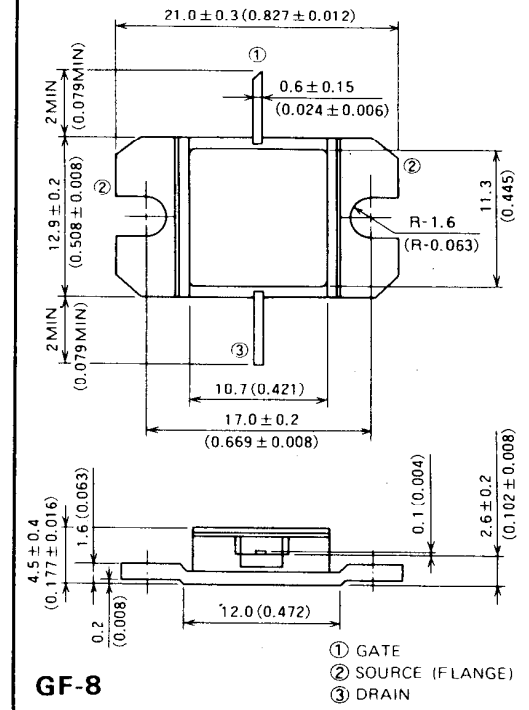
Symbol	Parameter	Test conditions	Limits			Unit	
			Min	Typ	Max		
I _{DSS}	Saturated drain current	V _{DS} = 3V, V _{GS} = 0V	—	—	5.0	A	
g _m	Transconductance	V _{DS} = 3V, I _D = 1.5A	—	2	—	S	
V _{GS(off)}	Gate to source cut-off voltage	V _{DS} = 3V, I _D = 15mA	—	-3.5	-5.0	V	
P _{1dB}	Output power at 1dB gain compression	V _{DS} = 10V, I _D = 1.8A, f = 5.9~6.4GHz	37	38	—	dBm	
G _{LP}	Linear power gain		9	10	—	dB	
I _D	Drain current		—	1.7	—	A	
η _{add}	Power added efficiency		—	32	—	%	
*IM ₃	3rd order IM distortion *1		-42	-45	—	dBc	
R _{th(ch-c)}	Thermal resistance *2		ΔV _f method	—	—	5.0	°C/W

*1: Item-51, 2-tone test P_o = 27 dBm Single Carrier Level f = 6.4GHz Δf = 10 MHz.

*2: Channel to case

OUTLINE DRAWING

Unit: millimeters (inches)



GF-8

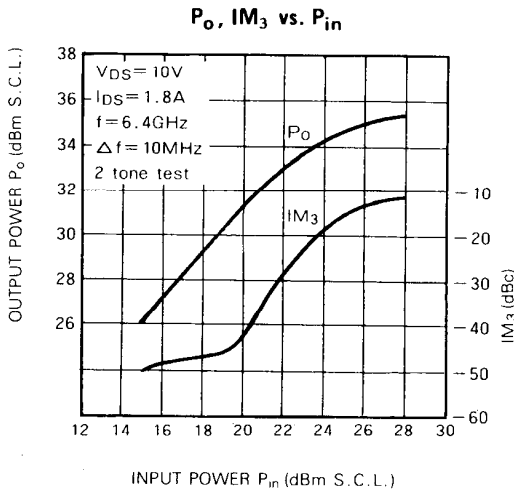
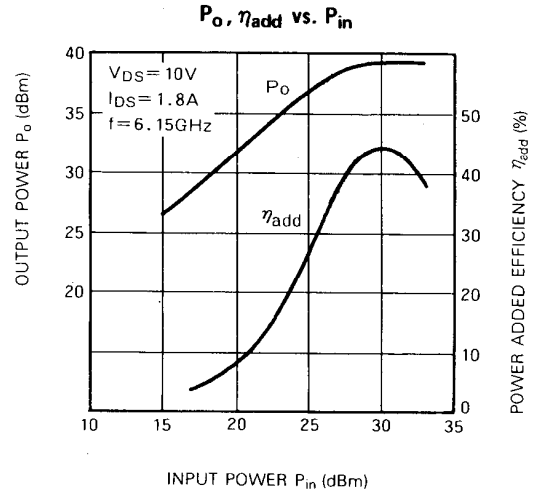
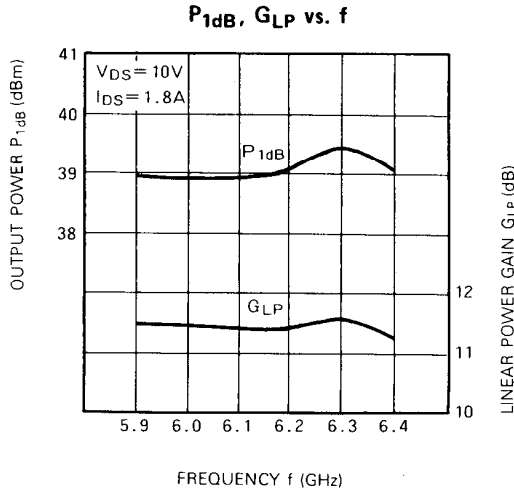
- ① GATE
- ② SOURCE (FLANGE)
- ③ DRAIN

RECOMMENDED BIAS CONDITIONS

- V_{DS} = 10V
- I_D = 1.8A
- R_g = 100Ω
- Refer to Bias Procedure

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TYPICAL CHARACTERISTICS ($T_a=25^\circ\text{C}$)



S PARAMETERS ($T_a=25^\circ\text{C}$, $V_{DS}=10\text{V}$, $I_{DS}=1.8\text{A}$)

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	0.33	-140	3.39	23	0.037	-3	0.38	-113
6.0	0.28	-172	3.40	6	0.044	-26	0.35	-135
6.1	0.26	156	3.44	-11	0.047	-49	0.35	-157
6.2	0.25	127	3.36	-29	0.051	-67	0.35	-178
6.3	0.25	99	3.27	-46	0.049	-91	0.39	164
6.4	0.26	74	3.15	-62	0.054	-106	0.41	147