

PRELIMINARY

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

MITSUBISHI SEMICONDUCTOR <GaAs FET>

MGFC39V5964A

5.9~6.4GHz BAND 8W INTERNALLY MATCHED GaAs FET

DESCRIPTION

The MGFC39V5964A 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
 $P_{1dB} = 8W$ (TYP) @ 5.9~6.4GHz
- High power gain
 $G_{LP} = 9$ dB (TYP) @ 5.9~6.4GHz
- High power added efficiency
 $\eta_{add} = 30\%$ (TYP) @ 5.9~6.4GHz, P_{1dB}
- Hermetically sealed metal-ceramic package
- Low distortion [Item: -51]
 $IM_3 = -45$ dBc (TYP) @ $P_o = 28$ (dBm) S.C.L.

APPLICATION

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

QUALITY GRADE

- IG

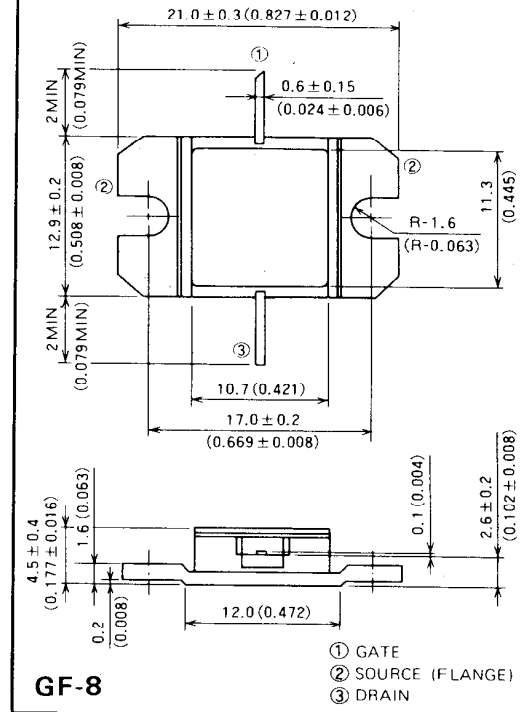
ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

Symbol	Parameter	Ratings	Unit
V _{GD0}	Gate to drain voltage	-15	V
V _{GSO}	Gate to source voltage	-15	V
I _D	Drain current	7.5	A
I _{GR}	Reverse gate current	-20	mA
I _{GF}	Forward gate current	42	mA
P _T	Total power dissipation *1	42.8	W
T _{ch}	Channel temperature	175	°C
T _{stg}	Storage temperature	-65 ~ +175	°C

*1: T_c = 25°C

OUTLINE DRAWING

Unit: millimeters (inches)



RECOMMENDED BIAS CONDITIONS

- V_{DS} = 10V
- I_D = 2.4A
- R_g = 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	—	—	7.5	A	
g _m	Transconductance	V _{DS} = 3V, I _D = 2.2A	—	2	—	S	
V _{GS(off)}	Gate to source cut-off voltage	V _{DS} = 3V, I _D = 20mA	—	—	-4.5	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		—	—	3.0	A	
η _{add}	Power added efficiency		—	30	—	%	
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. f = 6.4GHz. Δf = 10 MHz. *2: Channel to case

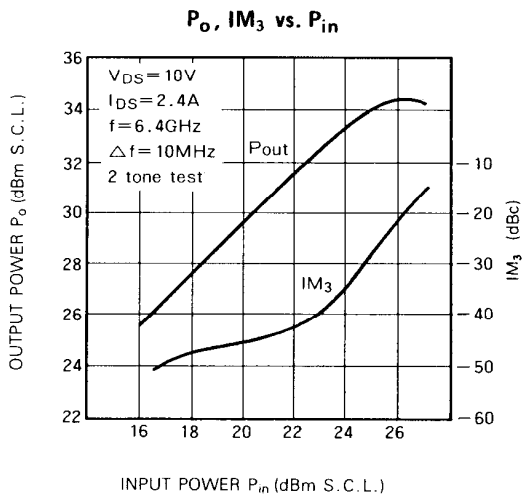
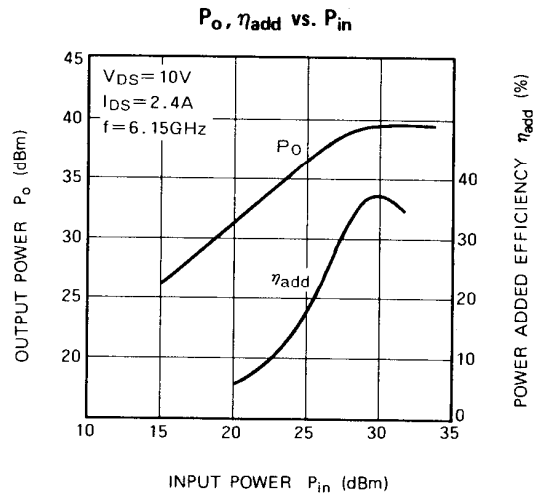
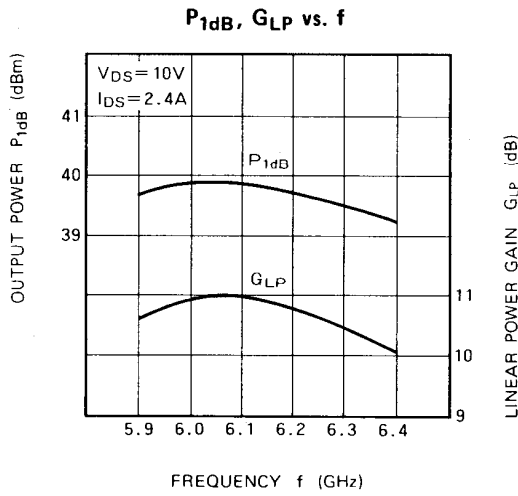
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TYPICAL CHARACTERISTICS (Ta=25°C)



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.)
5.9	0.32	-171	3.388	-23	0.079	-76	0.18	168
6.0	0.23	156	3.516	-41	0.084	-93	0.14	141
6.1	0.18	106	3.548	-58	0.088	-111	0.13	109
6.2	0.21	56	3.479	-75	0.089	-128	0.13	73
6.3	0.29	23	3.330	-92	0.087	-145	0.14	43
6.4	0.38	2	3.170	-108	0.086	-160	0.15	23