

# 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 <sub>GD0</sub>	Gate to drain voltage	-15	V
V <sub>GS0</sub>	Gate to source voltage	-15	V
I <sub>D</sub>	Drain current	5.0	A
I <sub>GR</sub>	Reverse gate current	-15	mA
I <sub>GF</sub>	Forward gate current	31.5	mA
P <sub>T</sub>	Total power dissipation *1	30	W
T <sub>ch</sub>	Channel temperature	175	°C
T <sub>stg</sub>	Storage temperature	-65 ~ +175	°C

\*1: T<sub>c</sub> = 25°C

### ELECTRICAL CHARACTERISTICS (Ta=25°C)

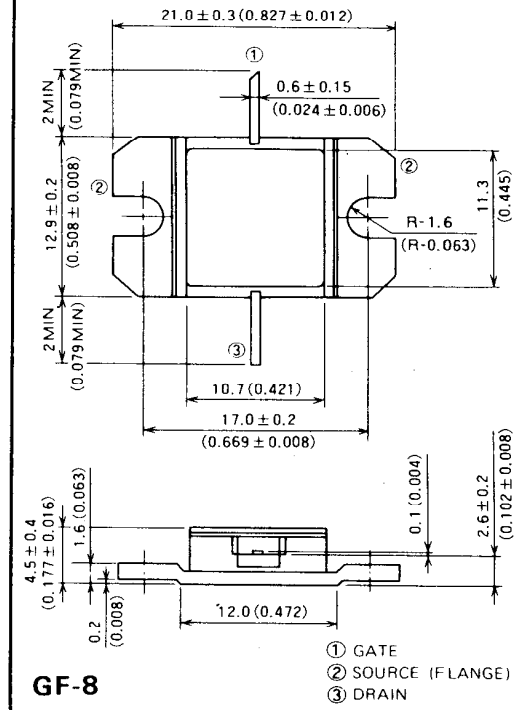
Symbol	Parameter	Test conditions	Limits			Unit	
			Min	Typ	Max		
I <sub>DSS</sub>	Saturated drain current	V <sub>DS</sub> = 3V, V <sub>GS</sub> = 0V	—	—	5.0	A	
g <sub>m</sub>	Transconductance	V <sub>DS</sub> = 3V, I <sub>D</sub> = 1.5A	—	2	—	S	
V <sub>GS(off)</sub>	Gate to source cut-off voltage	V <sub>DS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

\*1: Item-51, 2-tone test P<sub>o</sub> = 27 dBm Single Carrier Level f = 6.4GHz Δf = 10 MHz.

\*2: Channel to case

### OUTLINE DRAWING

Unit: millimeters (inches)



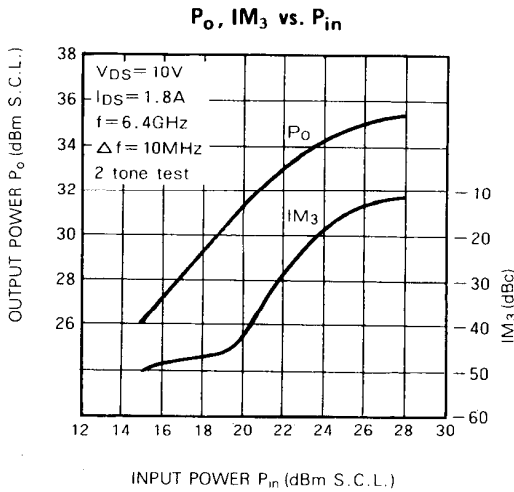
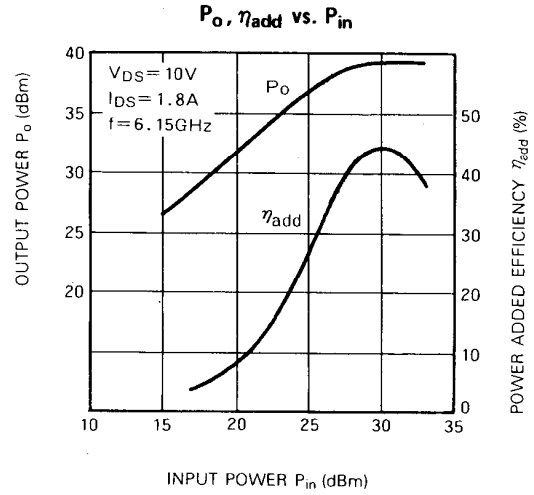
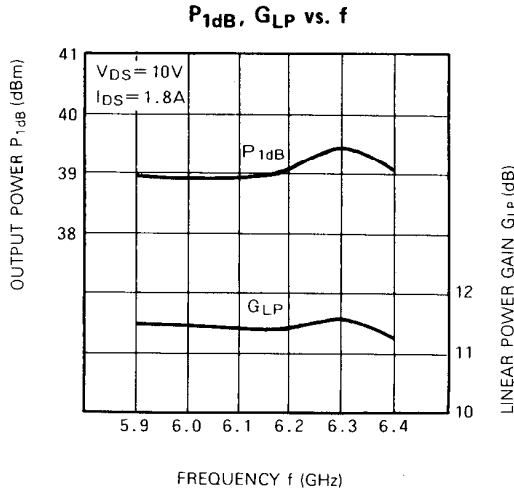
GF-8

### RECOMMENDED BIAS CONDITIONS

- V<sub>DS</sub> = 10V
- I<sub>D</sub> = 1.8A
- R<sub>g</sub> = 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 <sub>11</sub>		S <sub>21</sub>		S <sub>12</sub>		S <sub>22</sub>	
	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

MITSUBISHI SEMICONDUCTOR <GaAs FET>

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