

# MGFC44V5964

## 5.9~6.4GHz BAND 24W INTERNALLY MATCHED GaAs FET

### DESCRIPTION

The MGFC44V5964 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  
 $P_{1dB} = 24W$  (TYP) @ 5.9 ~ 6.4 GHz
- High power gain  
 $G_{LP} = 9$  dB (TYP) @ 5.9 ~ 6.4 GHz
- High power added efficiency  
 $\eta_{add} = 33\%$  (TYP) @ 5.9 ~ 6.4 GHz
- Hermetically sealed metal-ceramic package
- Low distortion [Item: -51]  
 $IM_3 = -42dBc$ (MIN) @  $P_o = 33.5$ (dBm) S.C.L.

### APPLICATION

- Item -01: 5.9 ~ 6.4 GHz 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>GSO</sub>	Gate to source voltage	-15	V
I <sub>D</sub>	Drain current	20	A
I <sub>GR</sub>	Reverse gate current	-60	mA
I <sub>GF</sub>	Forward gate current	126	mA
P <sub>T</sub>	Total power dissipation *1	93	W
T <sub>ch</sub>	Channel temperature	175	°C
T <sub>stg</sub>	Storage temperature	-65 ~ +175	°C

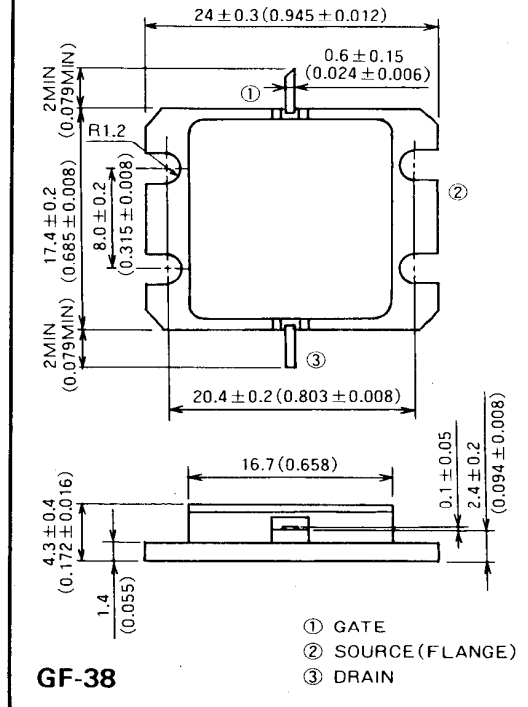
\*1: T<sub>c</sub> = 25°C

### 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	—	18	—	A
g <sub>m</sub>	Transconductance	V <sub>DS</sub> = 3V, I <sub>D</sub> = 6.4A	—	6.5	—	S
V <sub>GS(off)</sub>	Gate to source cut-off voltage	V <sub>DS</sub> = 3V, I <sub>D</sub> = 120mA	-2	—	-5	V
P <sub>1dB</sub>	Output power at 1dB gain compression	V <sub>DS</sub> = 10V, I <sub>D</sub> = 6.4A, f = 5.9 ~ 6.4GHz	43	44	—	dBm
G <sub>LP</sub>	Linear power gain		8	9	—	dB
η <sub>add</sub>	Power added efficiency		—	33	—	%
IM <sub>3</sub>	3rd order IM distortion *1		-42	—	—	dBc
R <sub>th(ch-c)</sub>	Thermal resistance *2		ΔV <sub>f</sub> method	—	—	1.6

\*1: Item-51, 2-tone test P<sub>o</sub> = 33.5 dBm Single Carrier Level f = 6.4 GHz Δf = 10 MHz. \*2: Channel to case

### OUTLINE DRAWING Unit: millimeters (inches)

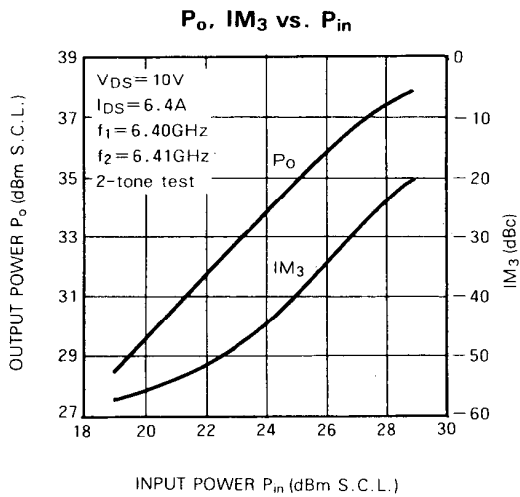
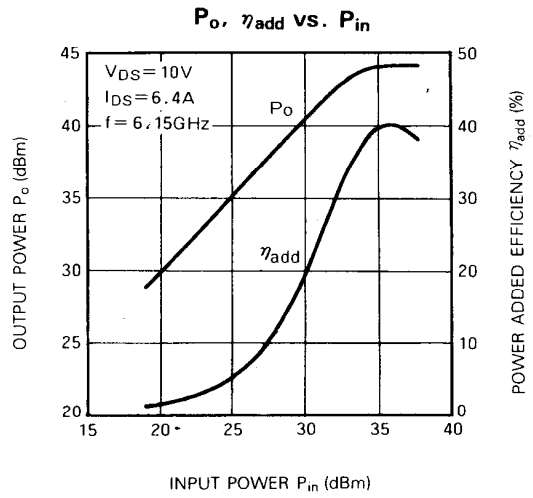
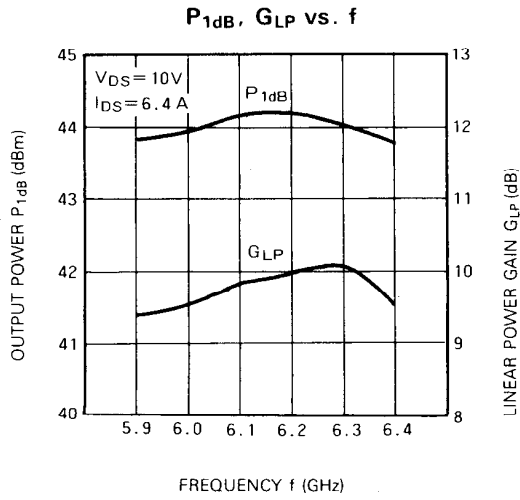


### RECOMMENDED BIAS CONDITIONS

- V<sub>DS</sub> = 10V
- I<sub>D</sub> = 6.4A
- R<sub>g</sub> = 25 Ω
- Refer to Bias Procedure

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**TYPICAL CHARACTERISTICS (Ta=25°C)**



**S PARAMETERS (Ta=25°C, V<sub>DS</sub>=10V, I<sub>DS</sub>=6.4A)**

f (GHz)	S Parameter (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	0.48	117	2.79	- 61	0.033	- 114	0.32	164
6.0	0.43	98	2.81	- 79	0.046	- 141	0.35	145
6.1	0.36	78	2.84	- 97	0.052	- 152	0.37	127
6.2	0.28	54	2.81	- 115	0.062	- 174	0.38	108
6.3	0.21	27	2.79	- 132	0.070	167	0.39	96
6.4	0.13	-9	2.77	- 150	0.078	149	0.40	80

MITSUBISHI SEMICONDUCTOR <GaAs FET>

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