

# MGFC42V5964

## 5.9~6.4GHz BAND 16W INTERNALLY MATCHED GaAs FET

### DESCRIPTION

The MGFC42V5964 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  
 $P_{1dB} = 18W$  (TYP) @ 5.9 ~ 6.4 GHz
- High power gain  
 $G_{LP} = 9$  dB (TYP) @ 5.9 ~ 6.4 GHz
- High power added efficiency  
 $\eta_{add} = 31\%$  (TYP) @ 5.9 ~ 6.4 GHz,  $P_{1dB}$
- Hermetically sealed metal-ceramic package
- Low distortion [Item: -51]  
 $IM_3 = -45$  dBc (TYP) @  $P_o = 31$  (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
$V_{GD0}$	Gate to drain voltage	-15	V
$V_{GSO}$	Gate to source voltage	-15	V
$I_D$	Drain current	12	A
$I_{GR}$	Reverse gate current	-40	mA
$I_{GF}$	Forward gate current	84	mA
$P_T$	Total power dissipation *1	78.9	W
$T_{ch}$	Channel temperature	175	°C
$T_{stg}$	Storage temperature	-65 ~ +175	°C

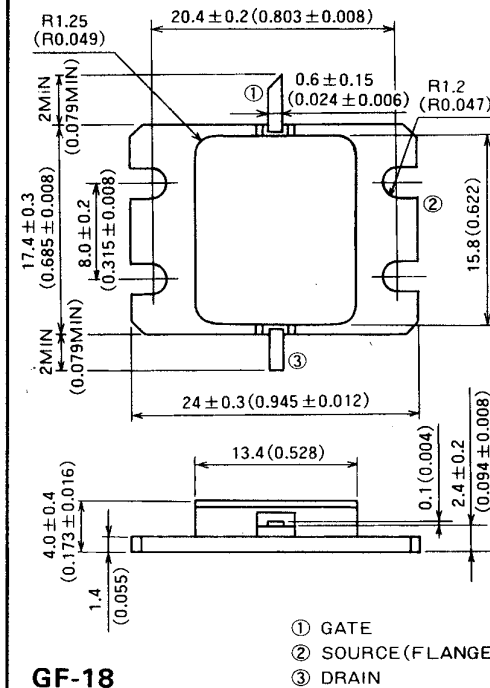
\*1:  $T_c = 25^\circ C$

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

Symbol	Parameter	Test conditions	Limits			Unit	
			Min	Typ	Max		
$I_{DSS}$	Saturated drain current	$V_{DS}=3V, V_{GS}=0V$	—	9	12	A	
$g_m$	Transconductance	$V_{DS}=3V, I_D=4.4A$	—	4	—	S	
$V_{GS(off)}$	Gate to source cut-off voltage	$V_{DS}=3V, I_D=80mA$	-2	-3	-4	V	
$P_{1dB}$	Output power at 1dB gain compression	$V_{DS}=10V, I_D=4.5A, f=5.9\sim 6.4GHz$	41.5	42.5	—	dBm	
$G_{LP}$	Linear power gain		8	9	—	dB	
$I_D$	Drain current		—	4.5	—	A	
$\eta_{add}$	Power added efficiency		—	31	—	%	
$IM_3$	3rd order IM distortion *1		-42	-45	—	dBc	
$R_{th(ch-c)}$	Thermal resistance *2		$\Delta V_f$ method	—	—	1.9	°C/W

\*1: Item -51, 2-tone test  $P_o = 31$  dBm Single Carrier Level  $f = 6.4$  GHz  $\Delta f = 10$  MHz. \*2: Channel to case

### OUTLINE DRAWING Unit: millimeters (inches)



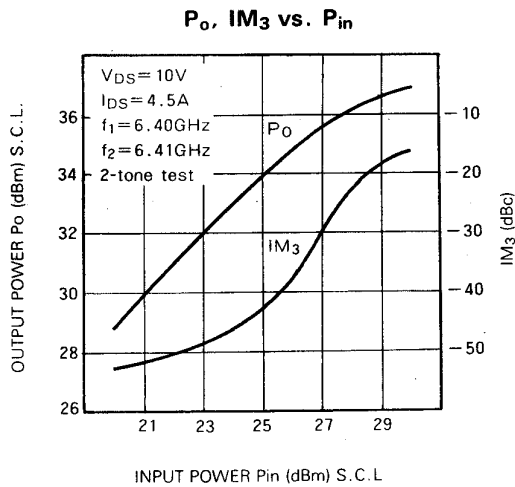
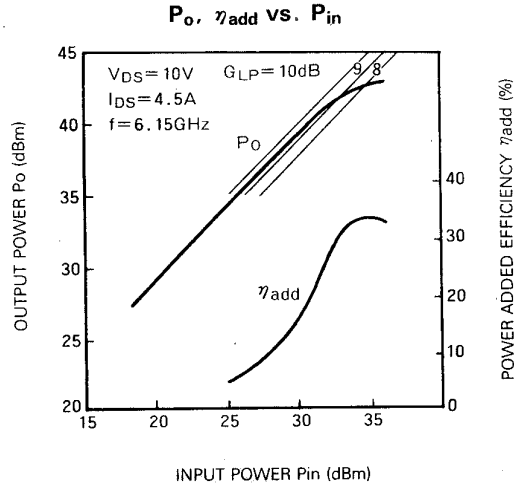
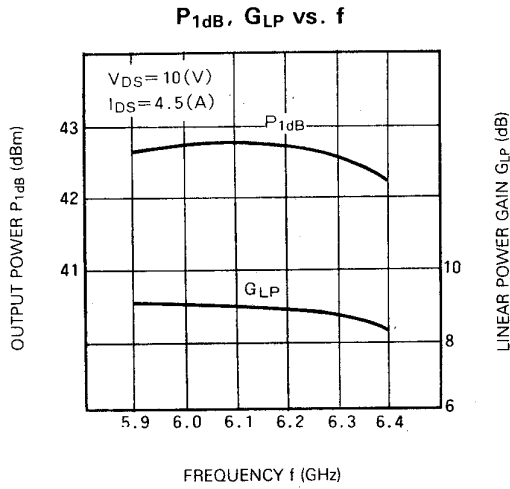
GF-18

### RECOMMENDED BIAS CONDITIONS

- $V_{DS} = 10V$
- $I_D = 4.5A$
- $R_g = 25 \Omega$
- Refer to Bias Procedure

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**TYPICAL CHARACTERISTICS**



**S PARAMETERS** ( $T_a=25^\circ C$ ,  $V_{DS}=10V$ ,  $I_{DS}=4.5A$ )

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	82	2.99	-74	0.071	-133	0.26	80
6.0	0.35	56	2.95	-91	0.071	-151	0.32	72
6.1	0.35	34	2.91	-108	0.072	-167	0.35	65
6.2	0.35	14	2.88	-124	0.078	177	0.37	58
6.3	0.34	-4	2.81	-140	0.079	161	0.41	53
6.4	0.33	-23	2.72	-157	0.079	146	0.43	48