

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 _{GS0}	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

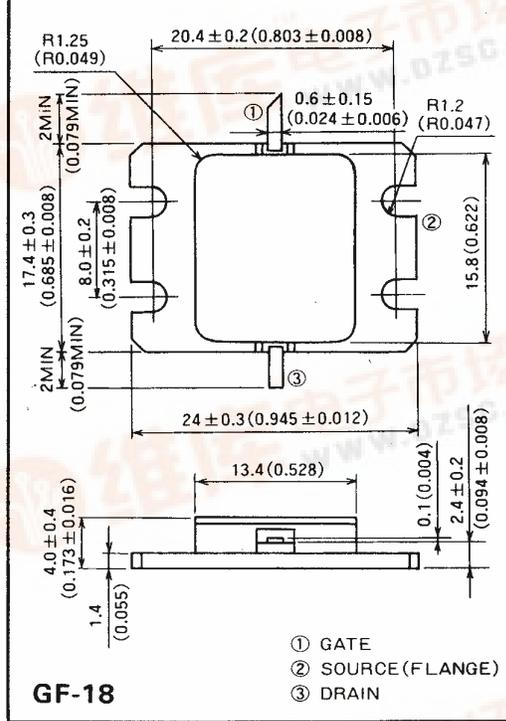
*1: T_c = 25°C

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=5.9~6.4GHz	41.5	42.5	—	dBm
G _{LP}	Linear power gain		8	9	—	dB
I _D	Drain current		—	4.5	—	A
η _{add}	Power added efficiency		—	31	—	%
IM ₃	3rd order IM distortion *1		-42	-45	—	dBc
R _{th(jc-c)}	Thermal resistance *2	ΔV _f method	—	—	1.9	°C/W

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

OUTLINE DRAWING Unit: millimeters (inches)

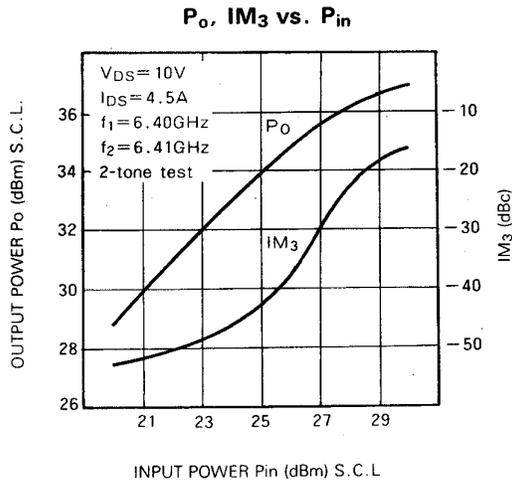
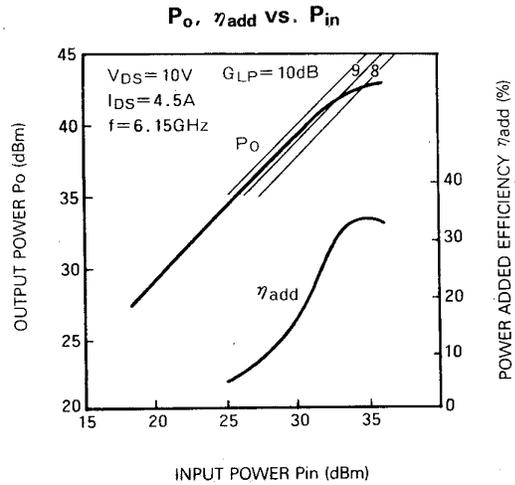
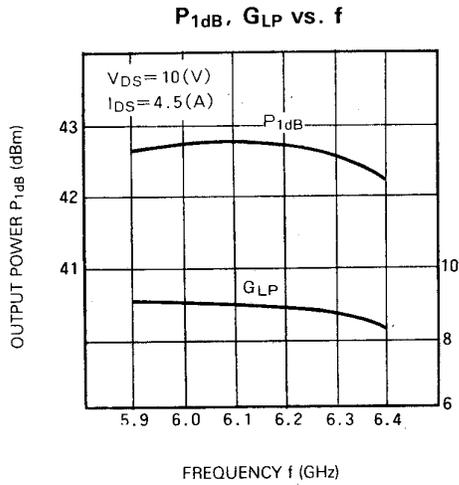


RECOMMENDED BIAS CONDITIONS

- V_{DS} = 10V
- I_D = 4.5A
- R_g = 25 Ω
- 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