

MGFC42V5964A

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

5.9~6.4GHz BAND 16W INTERNALLY MATCHED GaAs FET

DESCRIPTION

The MGFC42V5964A 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

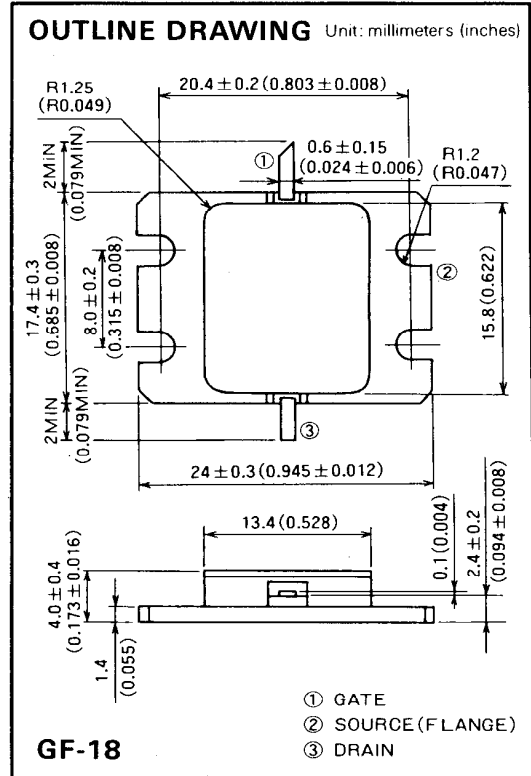
- Class A operation
- Internally matched to 50Ω system
- High output power
 $P_{1dB} = 18W$ (TYP) @ 5.9 ~ 6.4 GHz
- High power gain
 $G_{LP} = 9$ dB (TYP) @ 5.9 ~ 6.4 GHz
- High power added efficiency
 $\eta_{add} = 33\%$ (TYP) @ 5.9 ~ 6.4 GHz, P_{1dB}
- Hermetically sealed metal-ceramic package
- Low distortion [Item: -51]
 $IM_3 = -45$ dBc (TYP) @ $P_o = 31$ (dBm) S.C.L.
- Low thermal resistance $R_{th(ch-c)} \leq 1.6$ (°C/W)

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	93.7	W
T_{ch}	Channel temperature	175	°C
T_{stg}	Storage temperature	-65 ~ +175	°C

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

RECOMMENDED BIAS CONDITIONS

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

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
I_{DSS}	Saturated drain current	$V_{DS} = 3V, V_{GS} = 0V$	—	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
η_{add}	Power added efficiency		—	33	—	%
IM_3	3rd order IM distortion *1		-42	-45	—	dBc
$R_{th(ch-c)}$	Thermal resistance *2		ΔV_f method	—	—	1.6

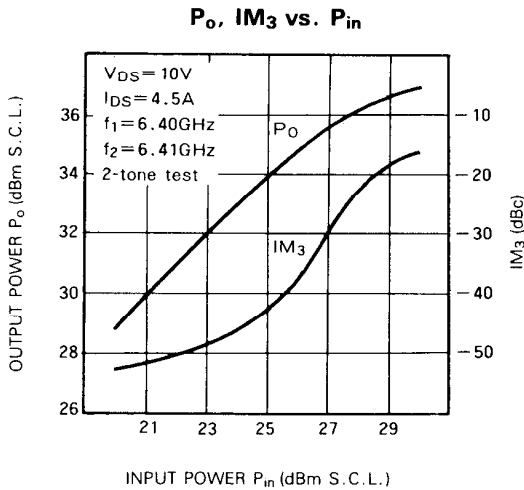
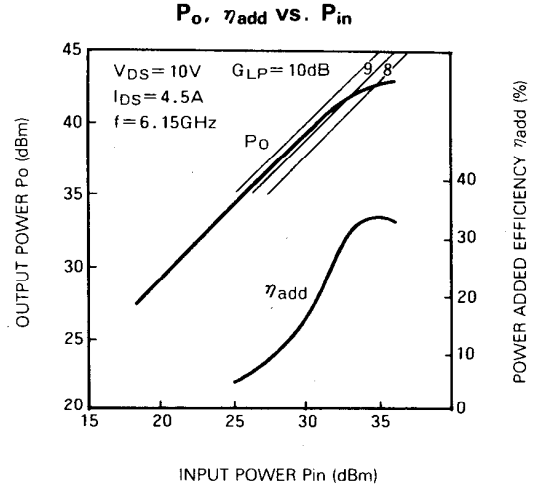
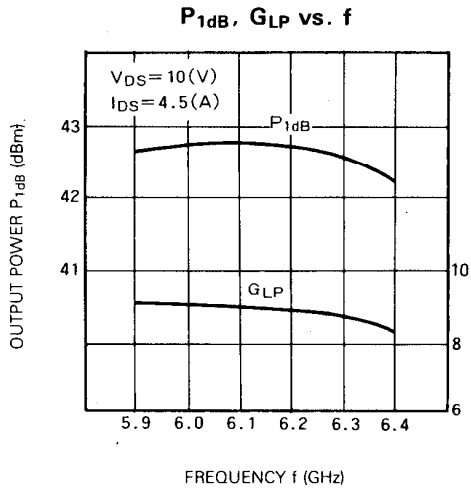
*1: Item-51, 2-tone test $P_o = 31$ dBm Single Carrier Level $f = 6.4$ GHz $\Delta f = 10$ MHz. *2: Channel to case

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TYPICAL CHARACTERISTICS (Ta=25°C)



S PARAMETERS (Ta=25°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