

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

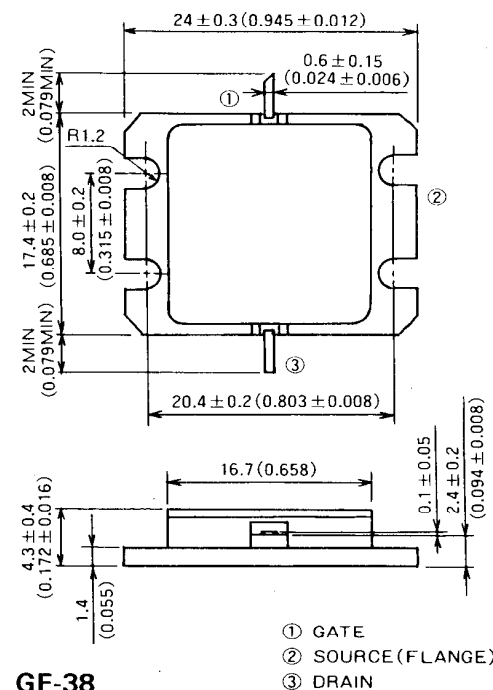
Item -01: 5.9 ~ 6.4 GHz band power amplifier

Item -51: Digital radio communication

QUALITY GRADE

- IG

OUTLINE DRAWING Unit: millimeters (inches)



ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

Symbol	Parameter	Ratings	Unit
V_{GDO}	Gate to drain voltage	-15	V
V_{GSO}	Gate to source voltage	-15	V
I_D	Drain current	20	A
I_{GR}	Reverse gate current	-60	mA
I_{GF}	Forward gate current	126	mA
P_T	Total power dissipation *1	93	W
T_{ch}	Channel temperature	175	°C
T_{stg}	Storage temperature	-65 ~ +175	°C

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

RECOMMENDED BIAS CONDITIONS

- $V_{DS} = 10V$
- $I_D = 6.4A$
- $R_g = 25\Omega$
- Refer to Bias Procedure

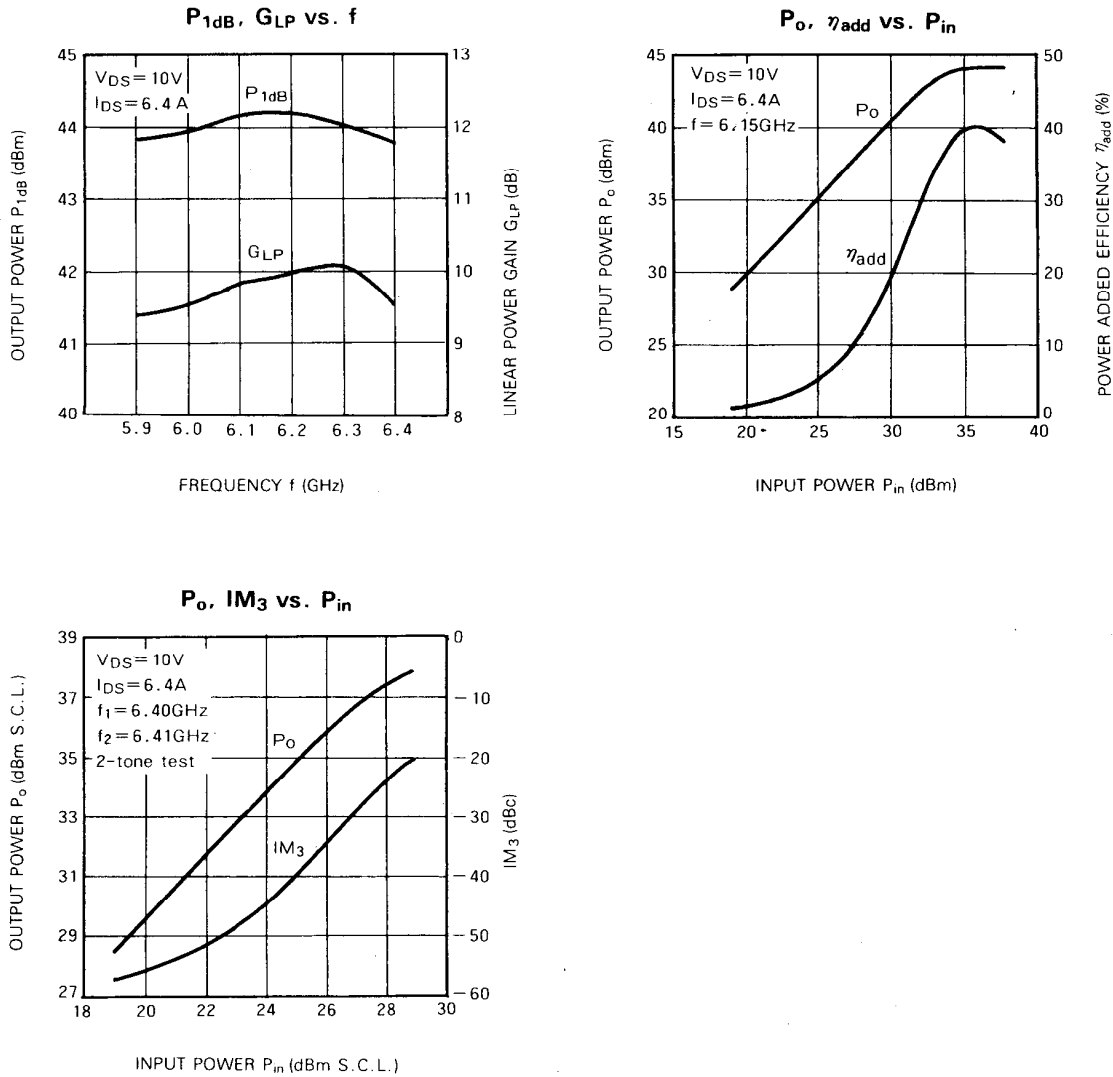
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
I_{DSS}	Saturated drain current	$V_{DS} = 3V, V_{GS} = 0V$	—	18	—	A
g_m	Transconductance	$V_{DS} = 3V, I_D = 6.4A$	—	6.5	—	S
$V_{GS(off)}$	Gate to source cut-off voltage	$V_{DS} = 3V, I_D = 120mA$	-2	—	-5	V
P_{1dB}	Output power at 1dB gain compression	$V_{DS} = 10V, I_D = 6.4A, f = 5.9 \sim 6.4GHz$	43	44	—	dBm
G_{LP}	Linear power gain		8	9	—	dB
η_{add}	Power added efficiency		—	33	—	%
IM_3	3rd order IM distortion *1		-42	—	—	dBc
$R_{th(ch-c)}$	Thermal resistance *2	ΔV_f method	—	—	1.6	°C/W

*1: Item -51, 2-tone test $P_o = 33.5$ dBm Single Carrier Level $f = 6.4$ GHz $\Delta f = 10$ MHz. *2: Channel to case

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TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)



S PARAMETERS ($T_a = 25^\circ\text{C}$, $V_{DS} = 10V$, $I_{DS} = 6.4A$)

f (GHz)	S Parameter (TYP.)							
	S_{11}		S_{21}		S_{12}		S_{22}	
	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