MGFC44V5964

5.9~6.4GHz BAND 24W INTERNALLY MATCHED GaAs FET

DESCRIPTION

The MGFC44V5964 is an internally impedance-matched GaAs power FET especailly 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
  η_{add} = 33% (TYP) @ 5.9 ~ 6.4 GHz
- Hermetically sealed metal-ceramic package
- Low distortion [Item: -51]
  IM_3 = -42dBc(MIN) @Po = 33.5(dBm) S.C.L.

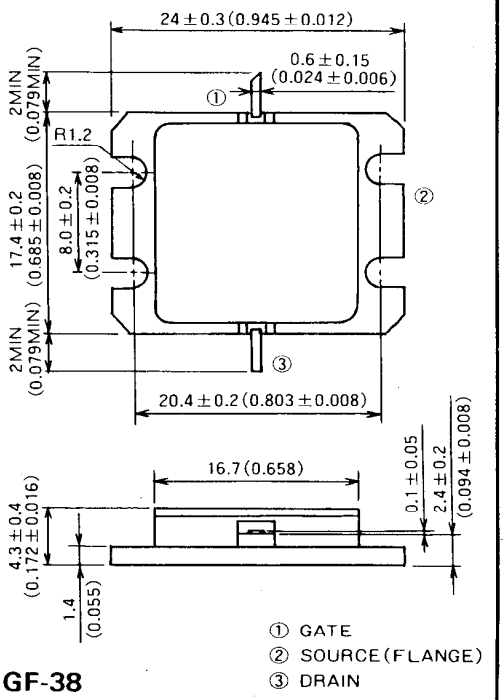
APPLICATION

Item -01: 5.9 ~ 6.4 GHz band power amplifier
Item -51: Digital radio communication

QUALITY GRADE

- IG

OUTLINE DRAWING Unit: millimeters (inches)



GF-38

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°C

RECOMMENDED BIAS CONDITIONS

- V_{DS} = 10V
- I_D = 6.4A
- Rg = 25Ω
- 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 ~ 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 Δf = 10 MHz, *2: Channel to case

MITSUBISHI ELECTRIC

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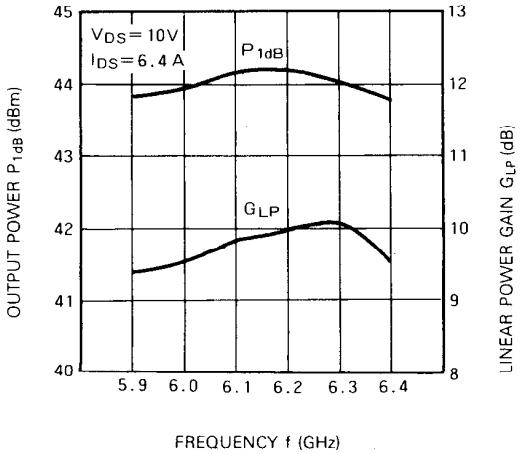
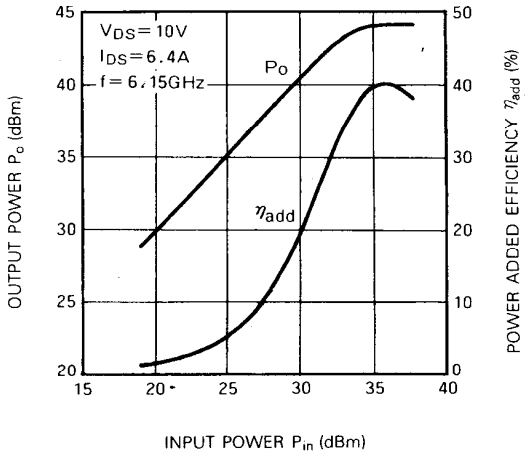
TYPICAL CHARACTERISTICS (Ta=25℃)

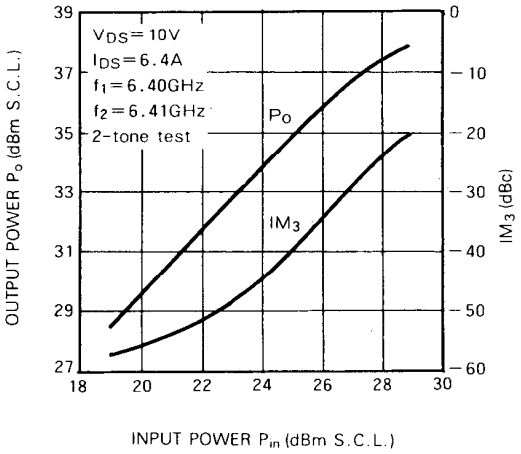
P_{1dB}, G_{LP} vs. f



P_o, η_{add} vs. P_{in}



P_o, IM_3 vs. P_{in}



S PARAMETERS (Ta=25℃, 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

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