MGFC38V5964

5.9~6.4GHz BAND 6W INTERNALLY MATCHED GaAs FET

DESCRIPTION

The MGFC38V5964 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} = 6W (TYP) @ 5.9~6.4GHz
- High power gain
  G_{LP} = 10dB (TYP) @5.9~6.4GHz
- High power added efficiency
  η_{add} = 32%(TYP) @5.9~6.4GHz, P_{1dB}
- Hermetically sealed metal-ceramic package
- Low distortion [Item: -51]
  IM_3 = -45 dBc (TYP) @ P_o = 27 (dBm) S.C.L.

APPLICATION

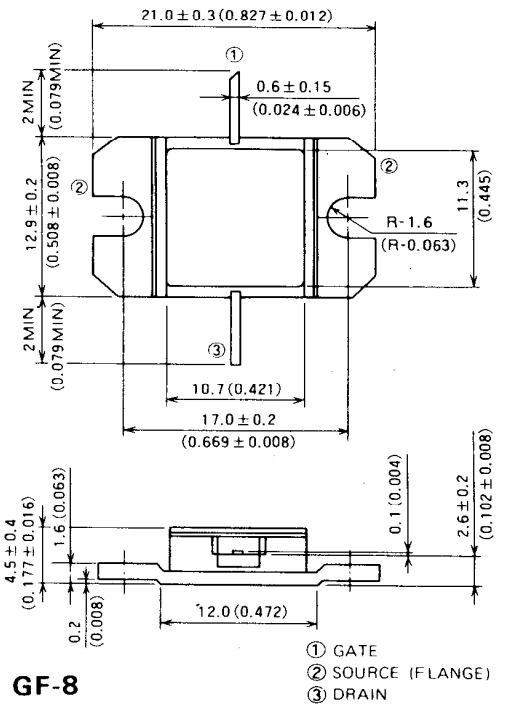
Item-01: 5.9~6.4GHz band power amplifier
Item-51: Digital radio communication

QUALITY GRADE

- IG

OUTLINE DRAWING

Unit: millimeters (inches)



GF-8

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	5.0	A
I_{GR}	Reverse gate current	−15	mA
I_{GF}	Forward gate current	31.5	mA
P_T	Total power dissipation *1	30	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=1.8A
- Rg=100Ω
- 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	—	—	5.0	A
g_m	Transconductance	V_{DS}=3V, I_D=1.5A	—	2	—	S
$V_{GS(off)}$	Gate to source cut-off voltage	V_{DS}=3V, I_D=15mA	—	−3.5	−5.0	V
P_{1dB}	Output power at 1dB gain compression	V_{DS}=10V, I_D=1.8A, f=5.9~6.4GHz	37	38	—	dBm
G_{LP}	Linear power gain		9	10	—	dB
I_D	Drain current		—	1.7	—	A
η_{add}	Power added efficiency		—	32	—	%
IM_3	3rd order IM distortion *1		−42	−45	—	dBc
$R_{th(ch-c)}$	Thermal resistance *2	△V_f method	—	—	5.0	°C/W

*1: Item-51, 2-tone test P_o = 27 dBm Single Carrier Level f = 6.4GHz Δf = 10 MHz. *2: Channel to case

MITSUBISHI ELECTRIC

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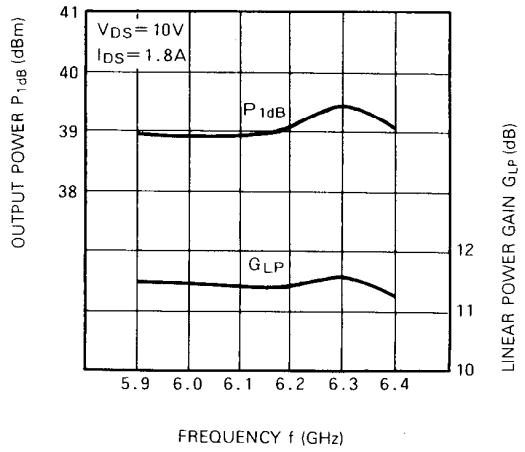
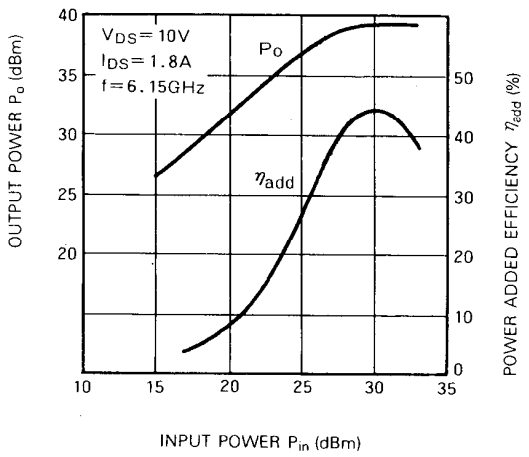
TYPICAL CHARACTERISTICS (Ta=25℃)

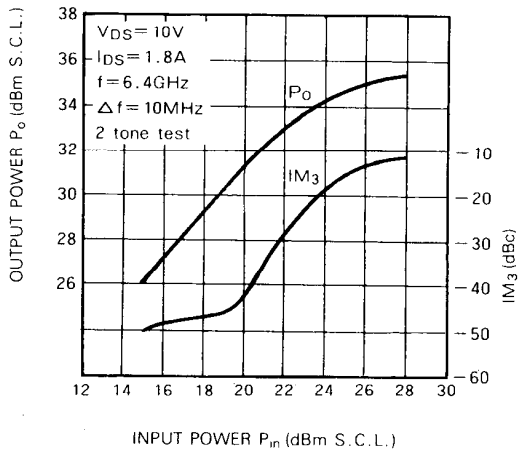
P_{1dB}, G_{LP} vs. f



P_o, η_{add} vs. P_{in}



P_o, IM_3 vs. P_{in}



S PARAMETERS (Ta=25°C, VDS=10V, IDS=1.8A)

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	0.33	−140	3.39	23	0.037	− 3	0.38	−113
6.0	0.28	−172	3.40	6	0.044	− 26	0.35	−135
6.1	0.26	156	3.44	−11	0.047	− 49	0.35	−157
6.2	0.25	127	3.36	−29	0.051	− 67	0.35	−178
6.3	0.25	99	3.27	−46	0.049	− 91	0.39	164
6.4	0.26	74	3.15	−62	0.054	−106	0.41	147