

MGFC39V7177A

7.1~7.7GHz BAND 8W INTERNALLY MATCHED GaAs FET

DESCRIPTION

The MGFC39V7177A is an internally impedance-matched GaAs power FET especially designed for use in 7.1~7.7 GHz band amplifiers. The hermetically sealed metal-ceramic package guarantees high reliability.

FEATURES

- Class A operation
- Internally matched to 50Ω system
- High output power
 $P_{1dB} = 8W$ (TYP) @ 7.1~7.7 GHz
- High power gain
 $G_{LP} = 8$ dB (TYP) @ 7.1~7.7 GHz
- High power added efficiency
 $\eta_{add} = 28\%$ (TYP) @ 7.1~7.7 GHz, P_{1dB}
- Hermetically sealed metal-ceramic package
- Low distortion [Item: -51]
 $IM_3 = -45$ dBc (TYP) @ $P_o = 28$ (dBm) S.C.L.

APPLICATION

Item-01: 7.1~7.7 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	7.5	A
I _{GR}	Reverse gate current	-20	mA
I _{GF}	Forward gate current	42	mA
P _T	Total power dissipation *1	42.8	W
T _{ch}	Channel temperature	175	°C
T _{stg}	Storage temperature	-65 ~ +175	°C

*1: T_c = 25°C

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

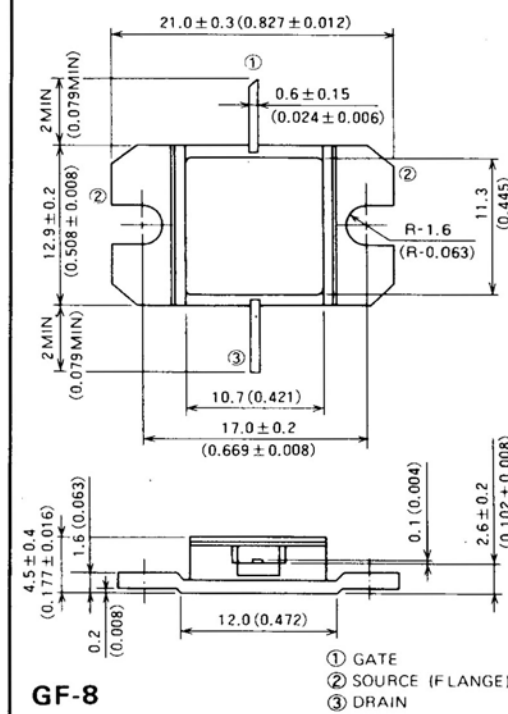
Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
I _{DSS}	Saturated drain current	V _{DS} = 3V, V _{GS} = 0V	—	—	7.5	A
g _m	Transconductance	V _{DS} = 3V, I _D = 2.2A	—	2	—	S
V _{GS(off)}	Gate to source cut-off voltage	V _{DS} = 3V, I _D = 20mA	—	—	-4.5	V
P _{1dB}	Output power at 1dB gain compression	V _{DS} = 10V, I _D = 2.4A, f = 7.1~7.7GHz	38	39	—	dBm
G _{LP}	Linear power gain		7	8	—	dB
I _D	Drain current		—	—	3.0	A
η _{add}	Power added efficiency		—	28	—	%
IM ₃	3rd order IM distortion *1		-42	-45	—	dBc
R _{th(ch-c)}	Thermal resistance *2		ΔV _f method	—	—	3.5

*1: Item-51, 2-tone test P_o = 28 dBm Single Carrier Level f = 7.7 GHz Δf = 10 MHz.

*2: Channel to case

OUTLINE DRAWING

Unit: millimeters (inches)

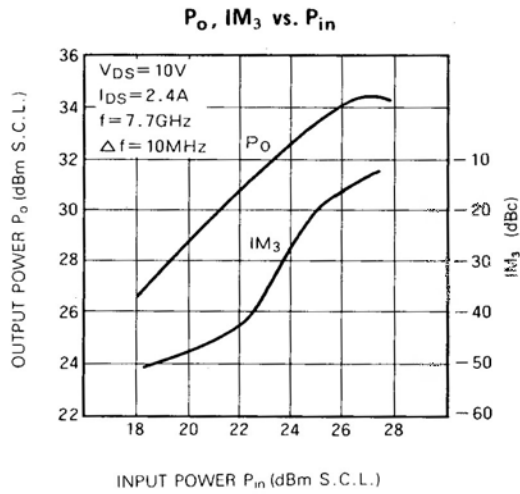
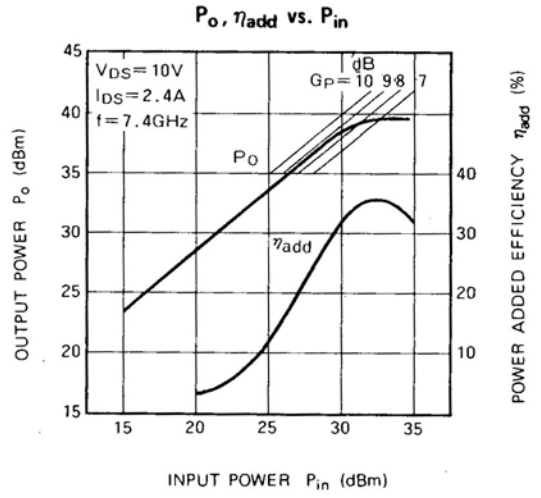
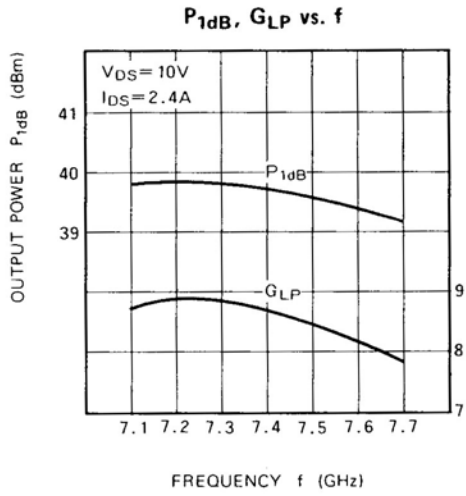


RECOMMENDED BIAS CONDITIONS

- V_{DS} = 10V
- I_D = 2.4A
- R_g = 50Ω
- Refer to Bias Procedure

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



S PARAMETERS ($T_a=25^\circ\text{C}$, $V_{DS}=10\text{V}$, $I_{DS}=2.4\text{A}$)

f (GHz)	S Parameters (TYP.)							
	S11		S21		S12		S22	
	Magn.	Angle (deg.)	Magn.	Angle (deg.)	Magn.	Angle (deg.)	Magn.	Angle (deg.)
7.1	0.43	53	2.69	- 71	0.056	- 103	0.35	- 91
7.2	0.39	35	2.74	- 86	0.061	- 119	0.30	- 103
7.3	0.35	16	2.71	- 101	0.064	- 133	0.25	- 119
7.4	0.26	- 9	2.68	- 118	0.067	- 150	0.21	- 137
7.5	0.22	- 46	2.65	- 134	0.070	- 167	0.19	- 157
7.6	0.21	- 106	2.55	- 153	0.071	175	0.16	- 177
7.7	0.30	- 150	2.49	- 171	0.068	158	0.16	167