

MGFC39V7177

7.1~7.7GHz BAND 8W INTERNALLY MATCHED GaAs FET

DESCRIPTION

The MGFC39V7177 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
 $P_{1dB} = 8\text{ W (TYP) @ } 7.1 \sim 7.7\text{ GHz}$
- High power gain
 $G_{LP} = 8\text{ dB (TYP) @ } 7.1 \sim 7.7\text{ GHz}$
- High power added efficiency
 $\eta_{add} = 28\% \text{ (TYP) @ } 7.1 \sim 7.7\text{ GHz, } P_{1dB}$
- Hermetically sealed metal-ceramic package

APPLICATION

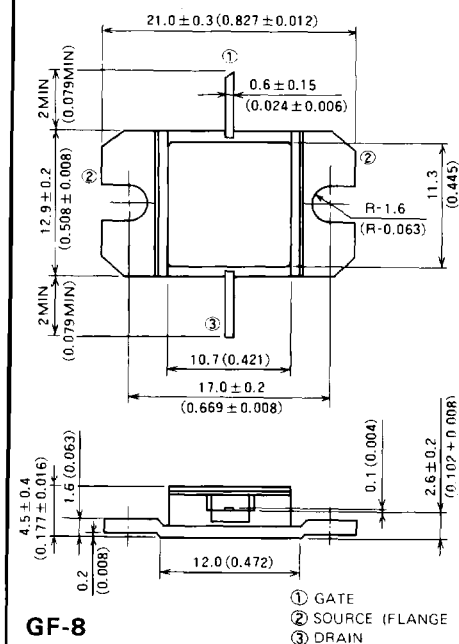
Item-01: 7.1~7.7 GHz band power amplifier
 Item-51: Digital radio communication

QUALITY GRADE

- IG

OUTLINE DRAWING

Unit: millimeters (inches)



ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

Symbol	Parameter	Rating	Unit
V_{GD0}	Gate to drain voltage	-15	V
V_{GS0}	Gate to source voltage	-15	V
I_D	Drain current	5.6	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 $T_C = 25^\circ\text{C}$

RECOMMENDED BIAS CONDITIONS

- $V_{DS} = 10\text{V}$
- $I_D = 2.4\text{A}$
- $R_g = 50\Omega$
- Refer to Bias Procedure

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

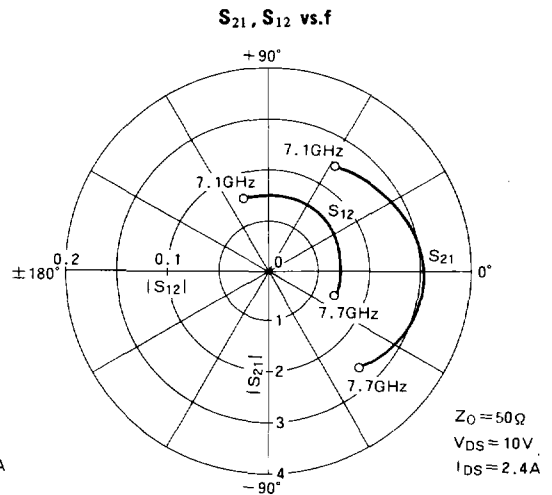
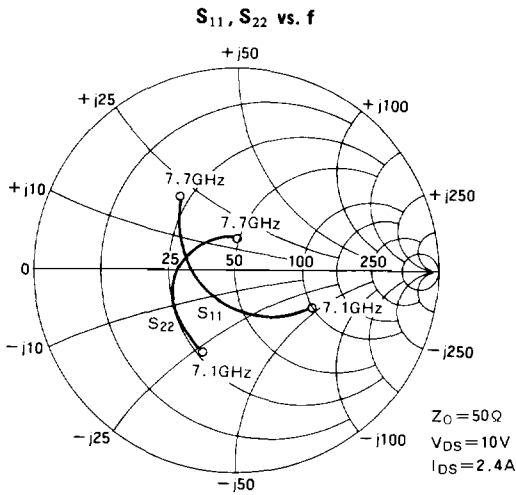
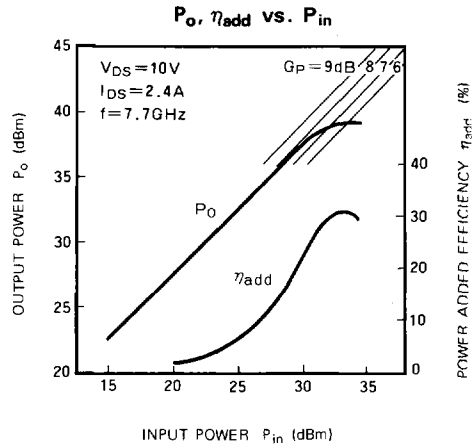
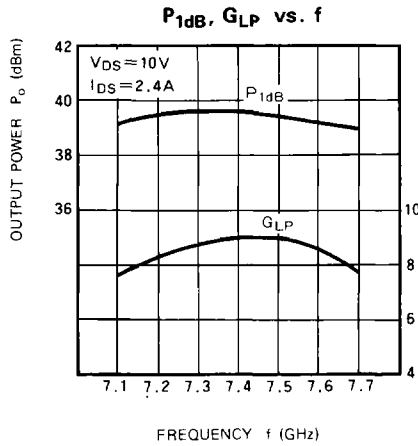
Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
I_{DSS}	Saturated drain current	$V_{DS} = 3\text{V}, V_{GS} = 0\text{V}$	—	4.0	5.6	A
g_m	Transconductance	$V_{DS} = 3\text{V}, I_D = 2.2\text{A}$	—	2.0	—	S
$V_{GS(off)}$	Gate to source cut-off voltage	$V_{DS} = 3\text{V}, I_D = 20\text{mA}$	-2	-3	-4	V
P_{1dB}	Output power at 1dB gain compression	$V_{DS} = 10\text{V}, I_D = 2.4\text{A}, f = 7.1 \sim 7.7\text{GHz}$	38	39	—	dBm
G_{LP}	Linear power gain		7	8	—	dB
I_D	Drain current		—	2.2	2.8	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_T method	—	—	3.5	°C/W

*1: Item-51, 2-tone test $P_O = 28\text{ dBm}$ Single Carrier Level $\Delta f = 10\text{ MHz}$

*2: Channel to case

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



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

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.)
7.1	0.42	-26	2.57	58	0.078	108	0.44	-112
7.2	0.30	-48	2.74	40	0.078	88	0.38	-128
7.3	0.20	-82	2.92	24	0.077	69	0.34	-148
7.4	0.18	-140	3.05	6	0.077	48	0.29	-173
7.5	0.22	165	3.01	-14	0.073	26	0.24	152
7.6	0.35	139	2.79	-28	0.068	7	0.18	121
7.7	0.46	125	2.53	-45	0.064	-13	0.16	85