MGFC40V7177B

PRELIMINARY
Notice: This is not a final specification.
Some parametric limits are subject to change.

7.1~7.7GHz BAND 10W INTERNALLY MATCHED GaAs FET

DESCRIPTION

The MGFC40V7177B 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} = 10W (TYP) @ 7.1~7.7 GHz
- High power gain
  G_{LP} = 9 dB (TYP) @7.1~7.7GHz
- High power added efficiency
  η_{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.
- Low thermal resistance Rth≦2.8°C/W

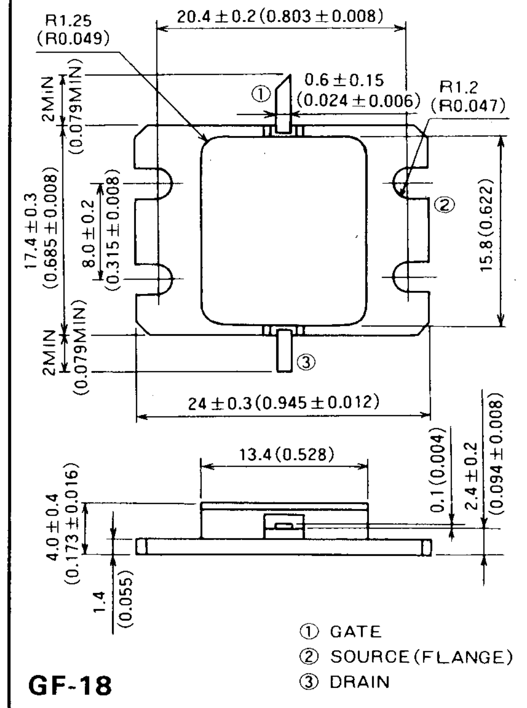
APPLICATION

Item-01: 7.1~7.7GHz 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	6	A
I_{GR}	Reverse gate current	−20	mA
I_{GF}	Forward gate current	42	mA
P_T	Total power dissipation *1	53.5	W
Tch	Channel temperature	175	°C
Tstg	Storage temperature	−65~+175	°C

*1: T_c = 25°C

RECOMMENDED BIAS CONDITIONS

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

ELECTRICAL CHARACTERISTICS (Ta=25°C)

Symbol	Parameter	Test conditions	Limits Min	Limits Typ	Limits Max	Unit
I_{DSS}	Saturated drain current	V_{DS}=3V, V_{GS}=0V	—	4.5	6	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=40mA	−2	−3	−4.5	V
P_{1dB}	Output power at 1dB gain compression	V_{DS}=10V, I_D=2.4A, f=7.1~7.7GHz	38.0	40.0	—	dBm
G_{LP}	Linear power gain		8	9	—	dB
I_D	Drain current		—	3.0	—	A
η_{add}	Power added efficiency		—	28	—	%
IM_3	3rd order IM distortion *1		−42	−45	—	dBc
Rth(ch-c)	Thermal resistance *2	ΔV_f method	—	—	2.8	°C/W

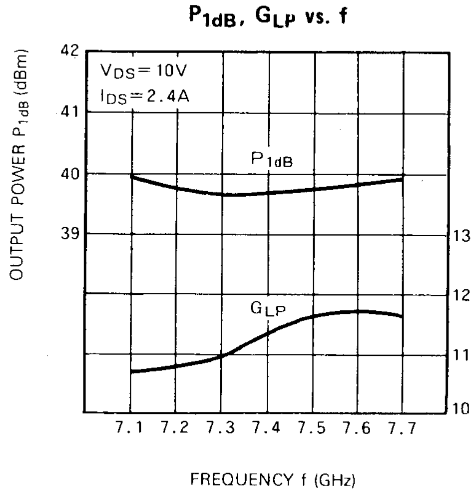
*1: Item-51, 2-tone test P_o = 28 dBm Single Carrier Level f = 7.7GHz Δf = 10 MHz. *2: Channel to case

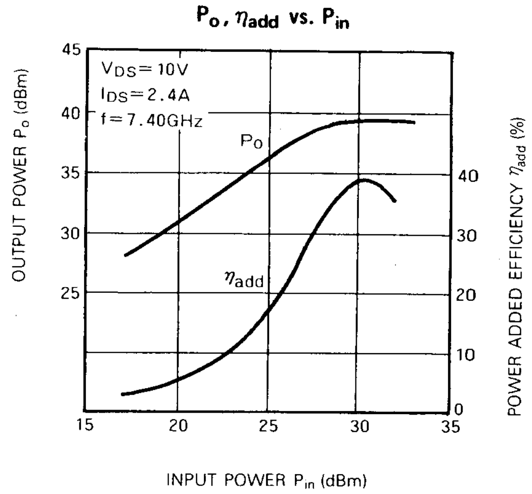
NOV. '97

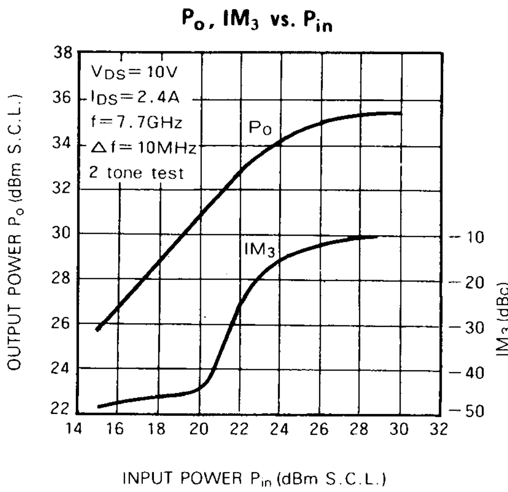
PRELIMINARY
Notice: This is not a final specification
Some parametric limits are subject to change.

7.1~7.7GHz BAND 10W INTERNALLY MATCHED GaAs FET

TYPICAL CHARACTERISTICS (Ta=25℃)







S PARAMETERS (Ta=25°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	0.66	49	2.96	131	0.094	72	0.36	-86
7.2	0.63	32	3.04	115	0.099	59	0.30	-106
7.3	0.63	14	3.10	99	0.107	39	0.23	-128
7.4	0.61	-4	3.13	82	0.112	23	0.19	-155
7.5	0.55	-18	3.14	66	0.107	7	0.18	173
7.6	0.52	-36	3.16	49	0.113	-7	0.19	133
7.7	0.45	-51	3.20	31	0.114	-26	0.21	98