

# 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  
 $\eta_{add} = 28\%$  (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.
- Low thermal resistance  $R_{th} \leq 2.8^\circ C/W$

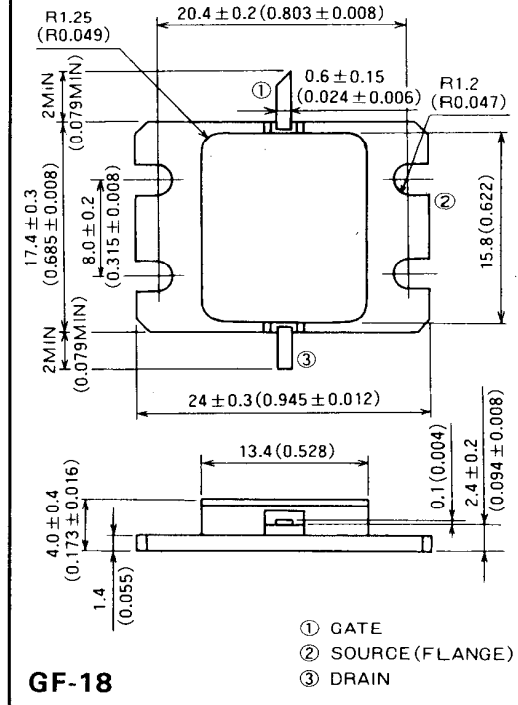
### APPLICATION

- 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	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
$T_{ch}$	Channel temperature	175	°C
$T_{stg}$	Storage temperature	-65 ~ +175	°C

\*1:  $T_c = 25^\circ C$

### RECOMMENDED BIAS CONDITIONS

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

### ELECTRICAL CHARACTERISTICS (Ta = 25°C)

Symbol	Parameter	Test conditions	Limits			Unit	
			Min	Typ	Max		
$I_{DSS}$	Saturated drain current	$V_{DS} = 3V, V_{GS} = 0V$	—	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	$V_{DS} = 10V, I_D = 2.4A, f = 7.1 \sim 7.7GHz$	38.0	40.0	—	dBm	
$G_{LP}$	Linear power gain		8	9	—	dB	
$I_D$	Drain current		—	3.0	—	A	
$\eta_{add}$	Power added efficiency		—	28	—	%	
$IM_3$	3rd order IM distortion *1		-42	-45	—	dBc	
$R_{th(ch-c)}$	Thermal resistance *2		$\Delta V_f$ method	—	—	2.8	°C/W

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

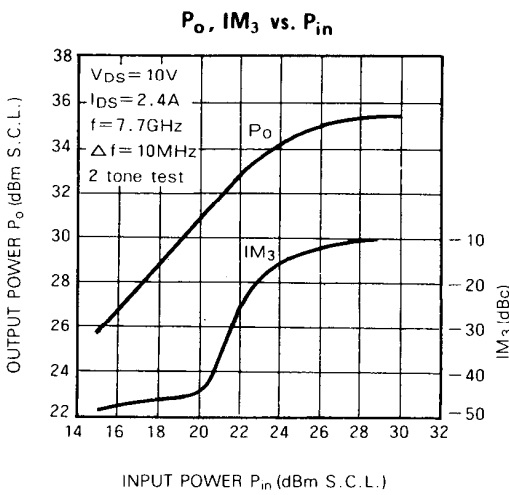
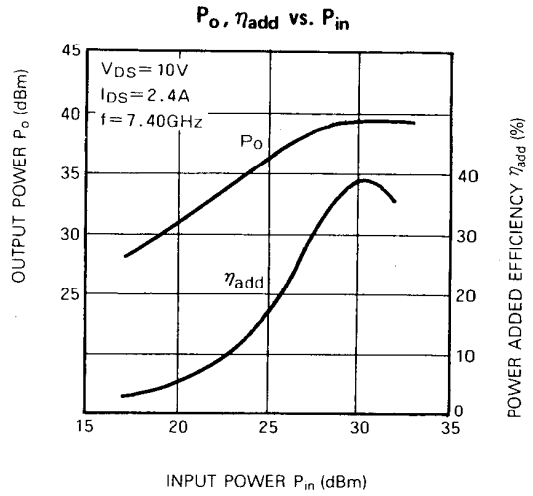
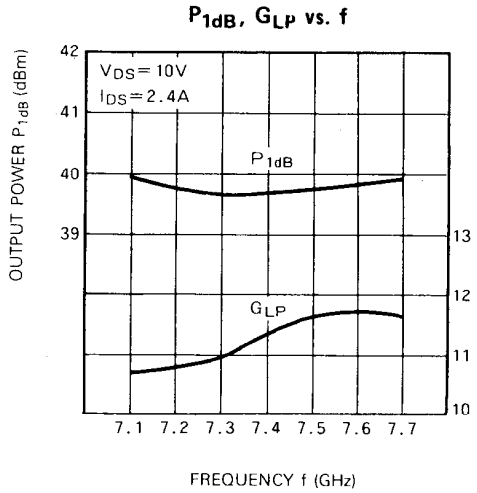
\*2: Channel to case

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**TYPICAL CHARACTERISTICS (Ta=25°C)**



**S PARAMETERS (Ta=25°C, VDS=10V, IDS=2.4A)**

f (GHz)	S Parameters (TYP.)							
	S11		S21		S12		S22	
	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

