

< C band internally matched power GaAs FET >

# MGFC40V7177

7.1 – 7.7 GHz BAND / 10W

## DESCRIPTION

The MGFC40V7177 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 50(ohm) system

- High output power  
P1dB=10W (TYP.) @f=7.1 – 7.7GHz
- High power gain  
GLP=8dB (TYP.) @f=7.1 – 7.7GHz
- High power added efficiency  
P.A.E.=32% (TYP.) @f=7.1 – 7.7GHz
- Low distortion [item -51]  
IM3=-45dBc (TYP.) @Po=29dBm S.C.L

## APPLICATION

- item 01 : 7.1 – 7.7 GHz band power amplifier
- item 51 : 7.1 – 7.7 GHz band digital radio communication

## QUALITY

- IG

## RECOMMENDED BIAS CONDITIONS

- VDS=10V • ID=2.4A • RG=50ohm Refer to Bias Procedure

## Absolute maximum ratings (Ta=25°C)

Symbol	Parameter	Ratings	Unit
VGDO	Gate to drain breakdown voltage	-15	V
VGSO	Gate to source breakdown voltage	-15	V
ID	Drain current	6	A
IGR	Reverse gate current	-20	mA
IGF	Forward gate current	42	mA
PT *1	Total power dissipation	42.8	W
Tch	Channel temperature	175	°C
Tstg	Storage temperature	-65 to +175	°C

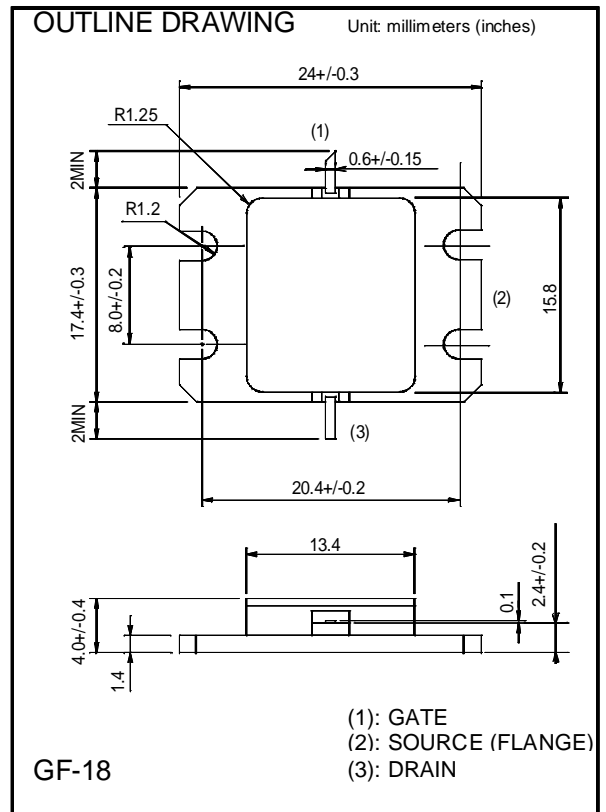
\*1 : Tc=25°C

## Electrical characteristics (Ta=25°C)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
IDSS	Saturated drain current	VDS=3V, VGS=0V	-	4.5	6	A
gm	Transconductance	VDS=3V, ID=2.2A	-	2	-	S
VGS(off)	Gate to source cut-off voltage	VDS=3V, ID=40mA	-2	-3	-4	V
P1dB	Output power at 1dB gain compression	VDS=10V, ID(RF off)=2.4A f=7.1 – 7.7GHz	39.0	40.0	-	dBm
GLP	Linear Power Gain		7	8	-	dB
ID	Drain current		-	2.4	-	A
P.A.E.	Power added efficiency		-	32	-	%
IM3 *2	3rd order IM distortion		-42	-45	-	dBc
Rth(ch-c) *3	Thermal resistance		delta Vf method	-	-	3.5

\*2 : item -51 , 2 tone test, Po=29dBm Single Carrier Level , f=7.7GHz, delta f=10MHz

\*3 : Channel-case



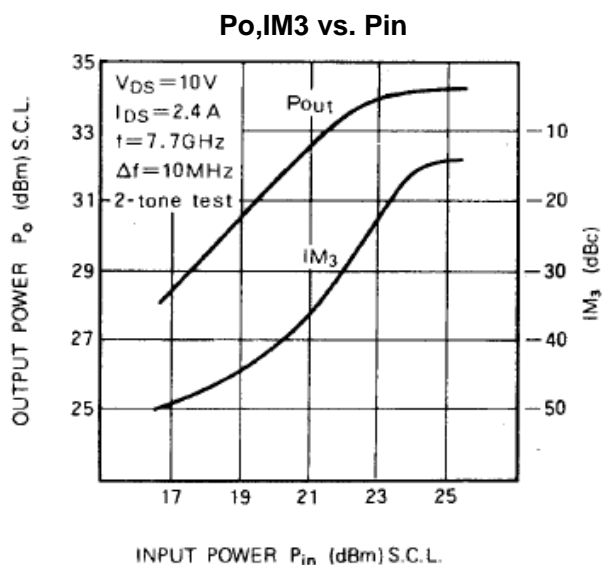
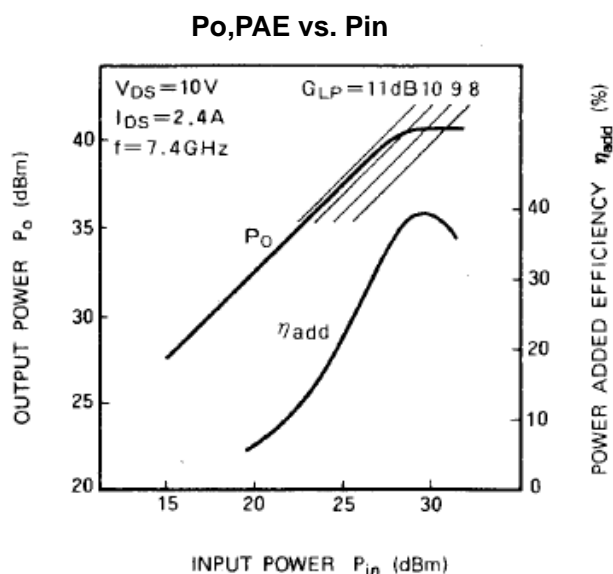
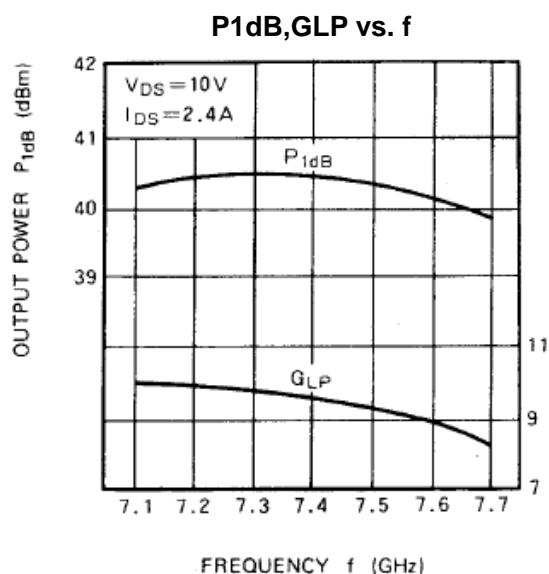
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## MGFC40V7177 TYPICAL CHARACTERISTICS (Ta=25deg.C)



## MGFC40V7177 S-parameters (Ta=25deg.C, VDS=10(V), IDS=2.4(A))

f (GHz)	S Parameters(Typ.)							
	S11		S21		S12		S22	
	Magn.	Angle(deg.)	Magn.	Angle(deg.)	Magn.	Angle(deg.)	Magn.	Angle(deg.)
7.1	0.40	-170.9	3.16	34.3	0.071	-24.8	0.32	-134.4
7.2	0.41	140.3	3.13	-6.5	0.072	-65.4	0.31	-171.2
7.3	0.40	92.6	3.09	-47.4	0.073	-106.6	0.29	-155.1
7.4	0.39	41.3	3.05	-88.0	0.073	-147.2	0.26	123.6
7.5	0.40	-15.1	3.02	-129.5	0.073	171.2	0.21	95.4
7.6	0.44	-76.5	2.82	-173.5	0.071	127.6	0.14	77.0
7.7	0.45	-90.0	2.63	175.0	0.071	90.0	0.19	60.0

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