

MGF7003

GaAs MONOLITHIC MICROWAVE IC

DESCRIPTION

The MGF7003 is a monolithic microwave integrated circuit for use in UHF-band low noise amplifiers.

FEATURES

- Low noise figure, High gain
 - NF = 2.5 dB (TYP.) @ f = 0.2 ~ 1.8 GHz
 - G_p = 9 dB (TYP.) @ f = 0.2 ~ 1.8 GHz
- 70 mil package

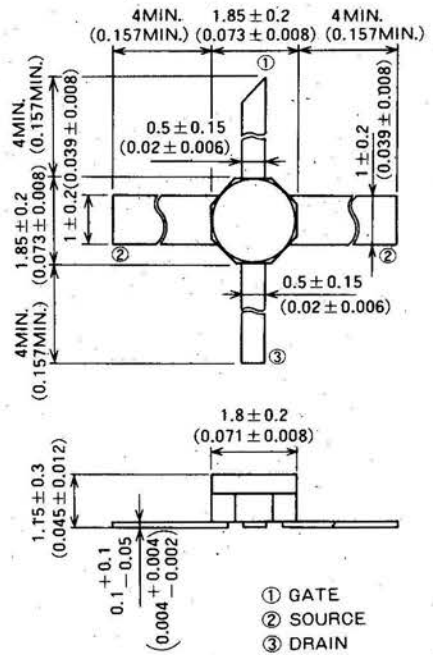
APPLICATION

UHF-band Amplifiers

QUALITY GRADE

- GG

OUTLINE DRAWING Unit: millimeters (inches)



ABSOLUTE MAXIMUM RATINGS (T_a = 25°C)

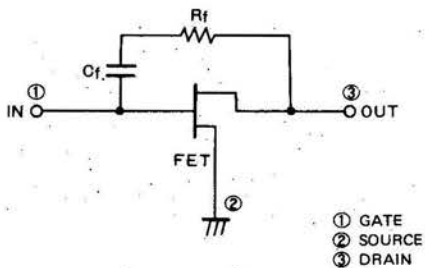
Symbol	Parameter	Rating	Unit
V _{GDO}	Gate to drain voltage	-6	V
V _{GSO}	Gate to source voltage	-6	V
I _D	Drain current	120	mA
P _T	Total power dissipation	300	mW
T _{ch}	Channel temperature	150	°C
T _{stg}	Storage temperature	-55 ~ +150	°C

ELECTRICAL CHARACTERISTICS (T_a = 25°C)

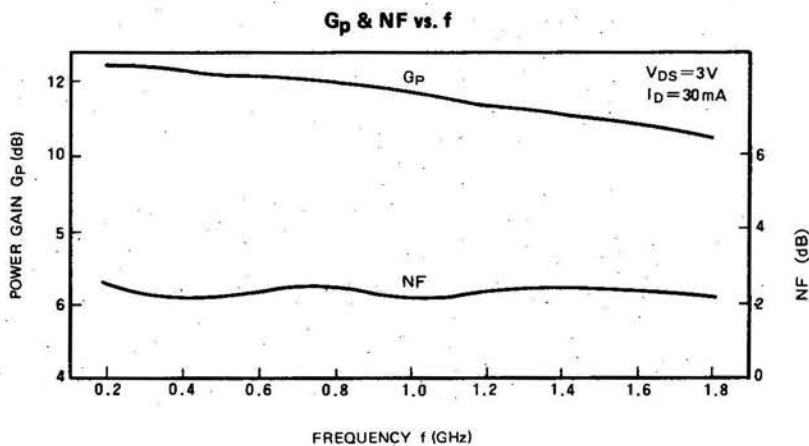
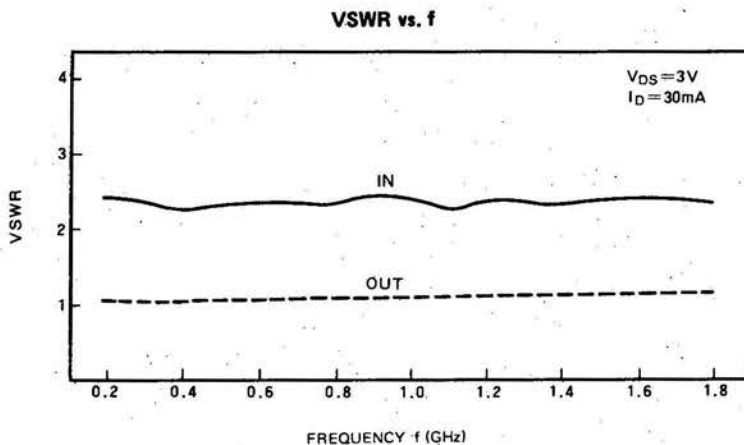
Symbol	Parameter	Conditions	Limits			Unit
			Min	Typ	Max	
I _D	Drain operating current	V _{DS} = 3V, V _{GS} = 0V	30	50	120	mA
V _{GS(off)}	Gate cut-off voltage	V _{DS} = 3V, I _D = 0.1mA	-0.5		-4	V
G _p	Power gain	V _{DS} = 3V I _D = 30mA Z _G = 50 Ω Z _L = 50 Ω f = 0.2 ~ 1.8 GHz	8	9		dB
NF	Noise figure			2.5	3.5	dB
A _{in}	Input VSWR			2.5	3.0	—
A _{out}	Output VSWR			1.5	2.0	—
P _{1dB}	Output power at 1dB gain compression				10	dBm

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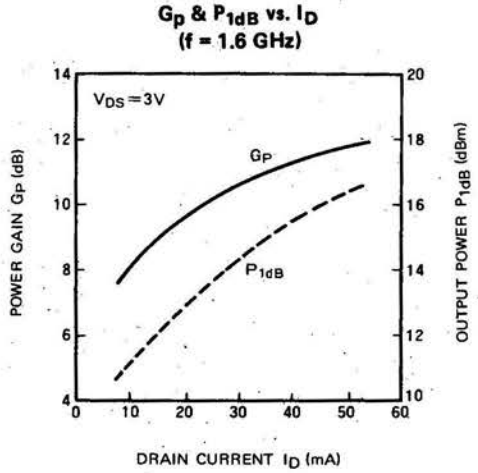
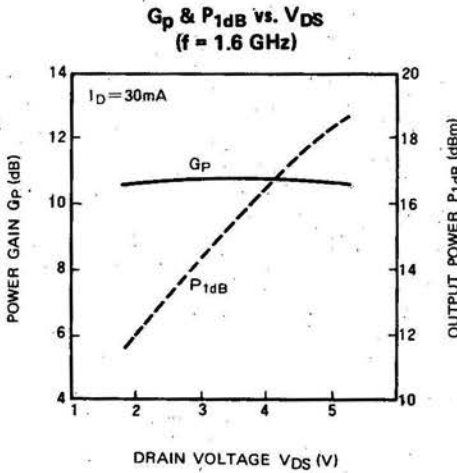
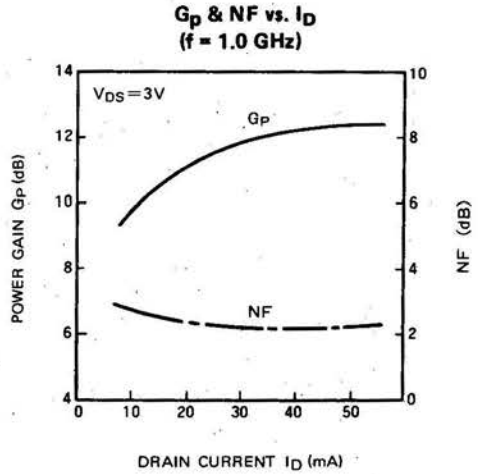
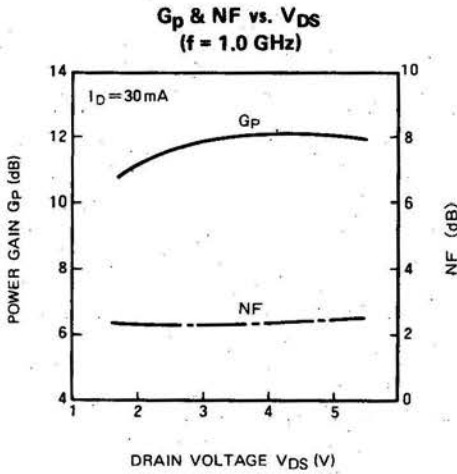
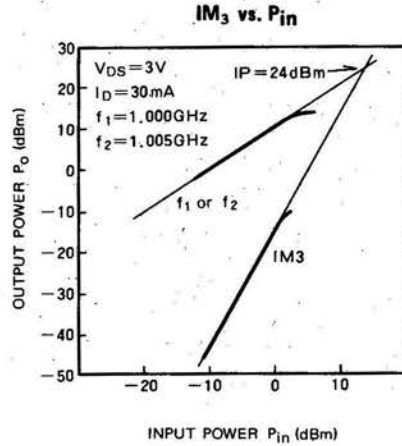
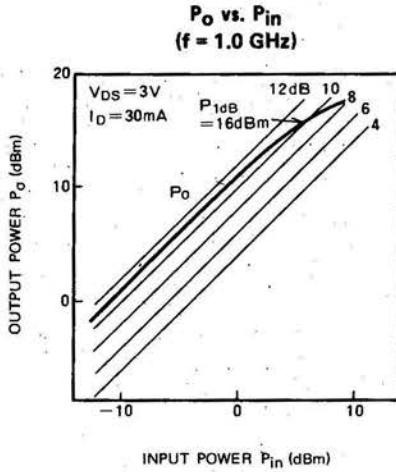
EQUIVALENT CIRCUIT



TYPICAL CHARACTERISTICS (Ta = 25°C)



GaAs MONOLITHIC MICROWAVE IC



HANDLING PRECAUTIONS

1. Check of Electrical Characteristics

(1) Measurement of DC Characteristics by Curve Tracer

Many curve tracers, if not properly grounded, exhibit a high leakage current from the high-voltage transformer, which can be a prime cause of failure or degradation of the MMIC. Measurement of the DC characteristics using a curve tracer is therefore not recommended. However, when tests using a curve tracer are required, first of all, check that the curve tracer is grounded to earth.

(2) Measurement of RF Characteristics

Before measurement, check that the measuring instruments are grounded to earth. Many instruments to measure RF characteristics such as RF power meters, network analyzers and so on, if not properly grounded to earth, sometimes allow a high AC leakage of up to 20 or more volts, which can be a cause of failure or degradation of the MMIC.

2. Installation of GaAs MMIC

When GaAs MMIC is soldered on a microstrip circuit, the following should be attended to,

(1) Properly ground the soldering iron to earth.

Leakage current from the soldering iron could cause failure or degradation of the MMIC.

(2) Solder the MMIC as promptly as possible at a low temperature. For a criterion, soldering in less than 8 seconds at a temperature of less than 250°C is recommended for each soldering process.

3. Bias Procedure and Conditions

When a GaAs MMIC is biased, the following procedure is recommended.

(1) Slowly adjust the gate to source voltage, V_{GS} , to about $-1V$.

(2) Gradually increase the drain to source voltage, V_{DS} , from zero to the desired value.

(3) Adjust the drain current, I_D , to the desired value by controlling the gate to source voltage, V_{GS} .

When bias is released, the reverse procedure is recommended.

Be careful that the MMIC is not operated under conditions exceeding the absolute maximum ratings.

4. Guaranteed Characteristics

All the graphic characteristics illustrated in this catalog are typical examples. The characteristics of individual devices as specified in the tables of absolute maximum ratings and electrical characteristics are guaranteed under the specified conditions.