

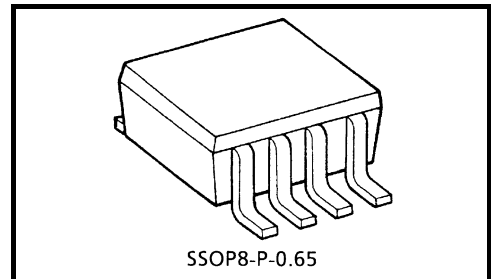
TOSHIBA Bipolar Linear Integrated Circuit Silicon Monolithic

TA4022F

VHF-UHF Wide Band Amplifier Applications

Features

- Low distortion: IM3 = 58dBc (@45 MHz)
- Operating supply voltage: $V_{CC} = 4.75\text{ V} \sim 5.25\text{ V}$



Weight: 0.02g (typ.)

Absolute Maximum Ratings (Ta = 25°C)

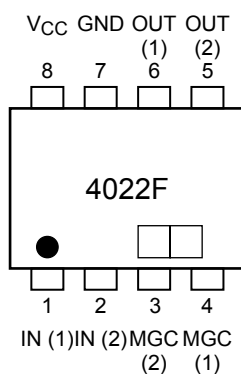
Characteristics	Symbol	Rating	Unit
Supply voltage	V_{CC}	5.5	V
Total power dissipation	P_D (Note 1)	550	mW
Operating temperature	T_{opr}	-40~85	°C
Storage temperature	T_{stg}	-55~150	°C

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings and the operating ranges.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Note 1: When mounted on a glass epoxy PCB (35 x 30 x 0.4 t mm).

Pin Assignment



Electrical Characteristics ($T_a = 25^\circ\text{C}$, $V_{CC} = 5\text{ V}$, $Z_s = 50\Omega$)

Characteristics	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Circuit current	I_{cc}	Fig1	Non carrier	26	35	42	mA
Gain (1)	V Gain(1)		$f=45\text{MHz}$, $Z_L=250\Omega$, MGC=Short	16	19	22	dB
Gain (2)	V Gain(2)	Fig2	$f=45\text{MHz}$, $Z_L=250\Omega$, MGC=Open	—	10	—	dB
Noise figure	NF	Fig3	$f = 45\text{MHz}$	—	11	14	dB
Band width	BW	Fig4	(Note 2)	—	700	—	MHz
Input return loss	$ S_{11} ^2$		$f = 45\text{MHz}$	—	-0.3	—	dB
Isolation	$ S_{12} ^2$		$f = 45\text{MHz}$	—	-51	—	dB
Output return loss	$ S_{22} ^2$		$f = 45\text{MHz}$	—	-4	—	dB
3 rd order inter modulation	IM3	Fig1	$f_1 = 45\text{ MHz}$, $f_2 = 44\text{ MHz}$, $P_{in} = -21\text{dBmW}$, $Z_L=250\Omega$	52	58	—	dBc

Note 2: BW is 3dB lower than $|S_{21}|^2$ at 45 MHz.

CAUTION:

This device is sensitive to electrostatic discharge.

Please ensure equipment and tools are adequately earthed when handling.

Test Circuit

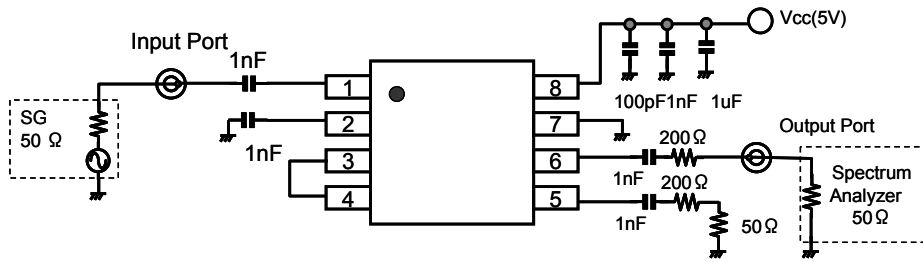


Figure 1 Measurement circuit (MGC:Short)

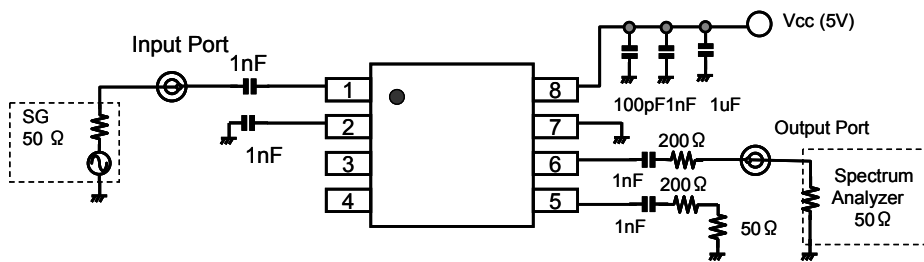


Figure 2 Measurement circuit (MGC:Open)

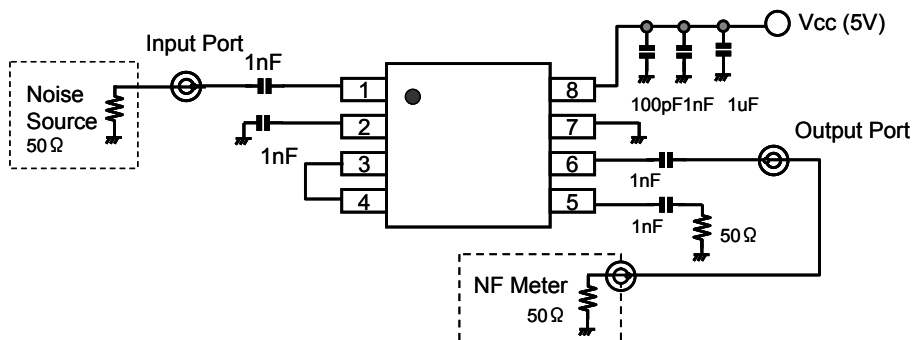


Figure 3 Measurement circuit

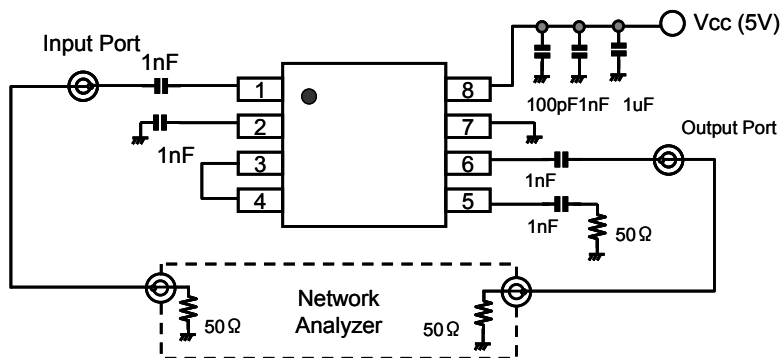


Figure 4 Measurement circuit

Equivalent Circuit

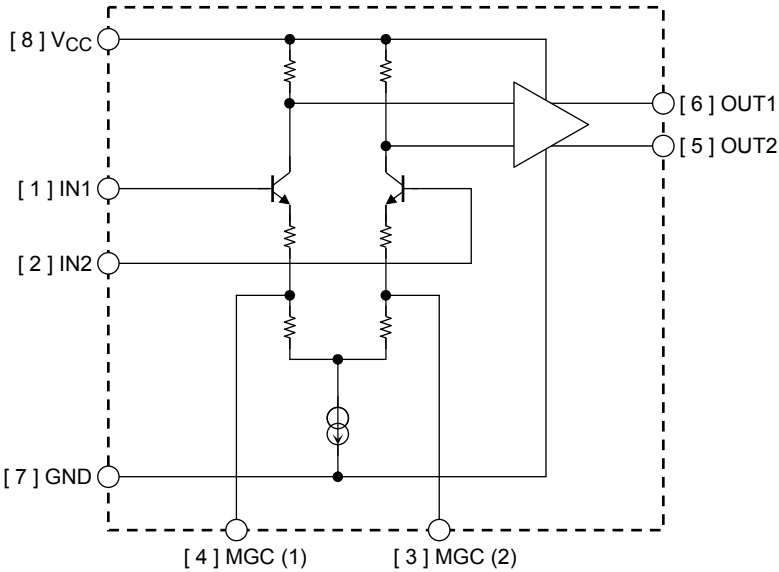


Figure 5 Equivalent circuit

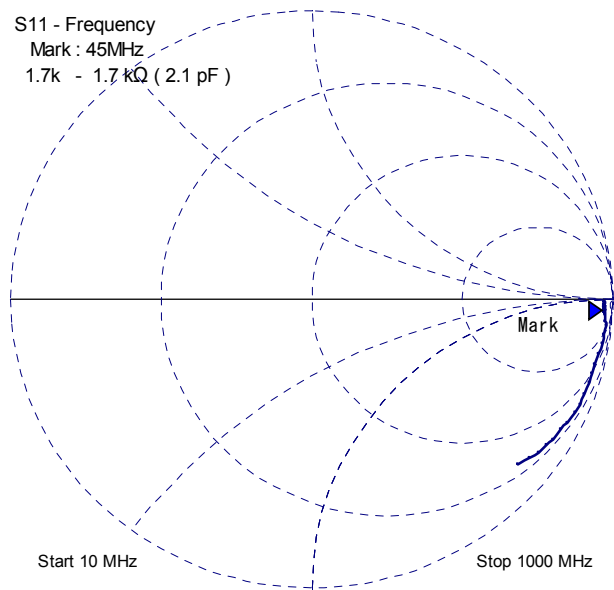
Input / Output Impedance (Ta= 25°C, V_{CC}=5 V, Measurement circuit : Fig 4)

ITEM	Symbol	Test circuit	Test Condition	Typ.	Unit
Input Impedance	Z _{in}	Fig 4	f = 45MHz	1.7k - j 1.7k	Ω
Output Impedance	Z _{out}	Fig 4	f = 45MHz	13.2 - j 1.7	Ω

S Parameter (Ta=25 °C, V_{CC}=5 V, Measurement circuit : Fig 4)

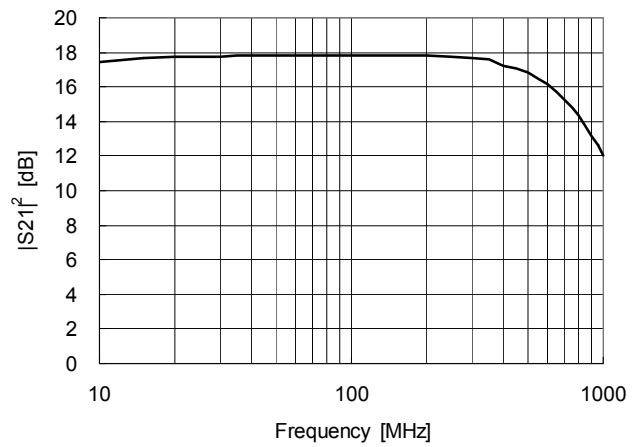
S11

S11 - Frequency
Mark : 45MHz
1.7k - 1.7kΩ (2.1 pF)



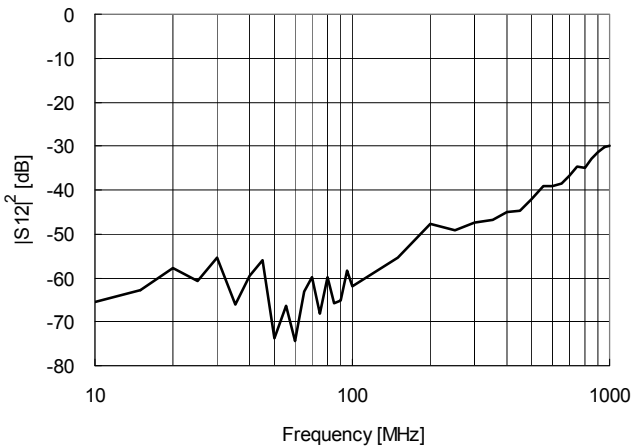
|S21|²

|S21|² (1)
MGC=Short



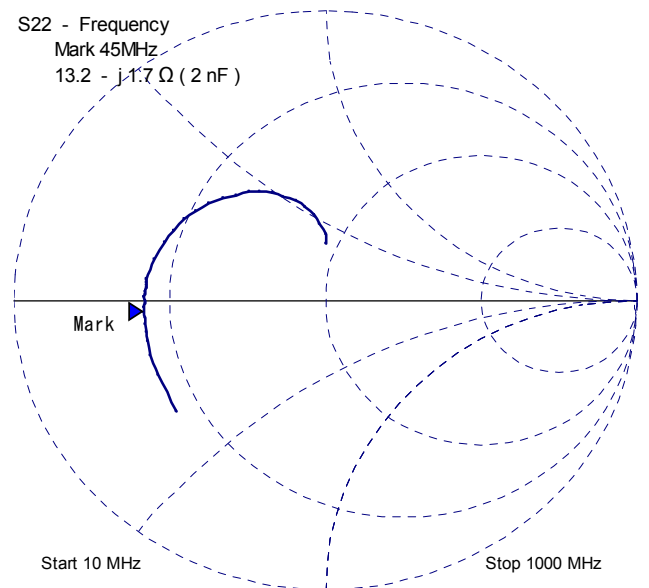
|S12|²

|S12|²
MGC=Short

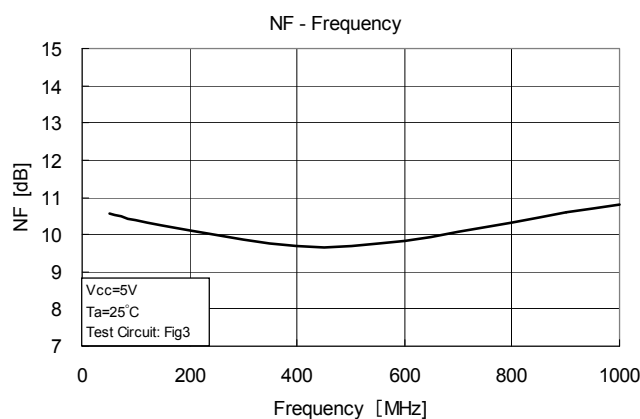
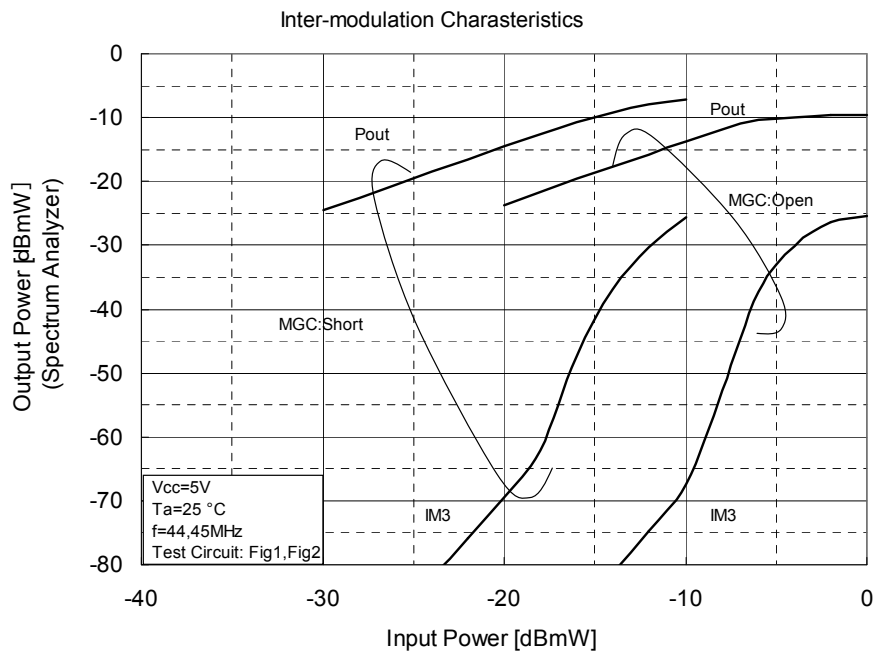
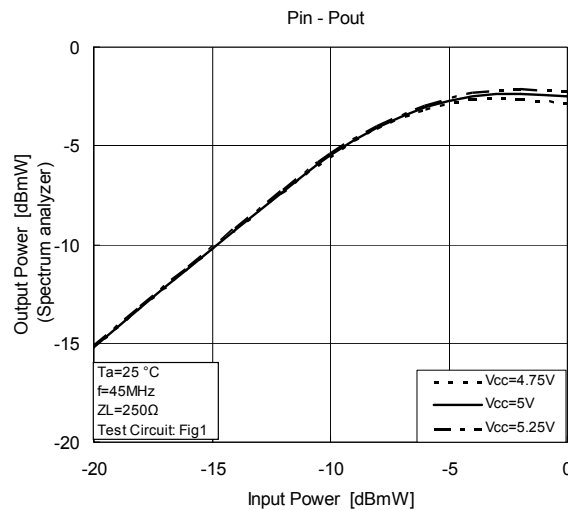


S22

S22 - Frequency
Mark 45MHz
13.2 - j 1.7 Ω (2 nF)



Typical Characteristics



Notice

The circuits and measurements contained in this document are given only as examples of applications for these products.

Moreover, these example application circuits are not intended for mass production, since the high-frequency characteristics (the AC characteristics) of these devices will be affected by the external components which the customer uses, by the design of the circuit and by various other conditions.

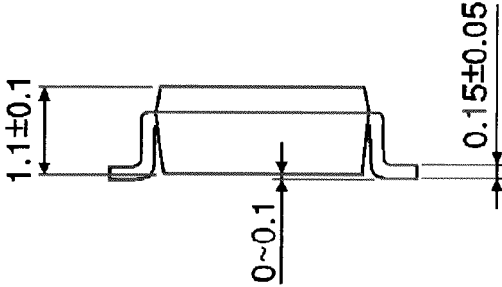
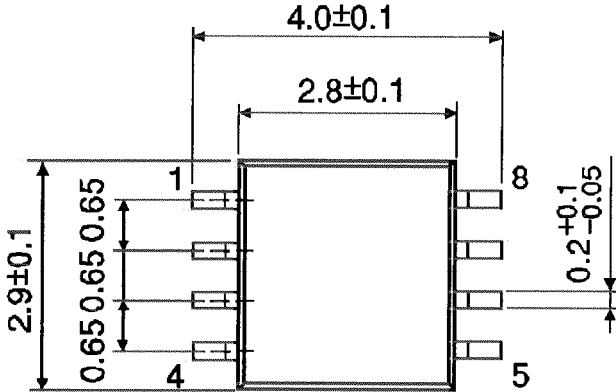
It is the responsibility of the customer to design external circuits which correctly implement the intended application, and to check the characteristics of the design.

TOSHIBA assume no responsibility for the integrity of customer circuit designs or applications.

Package Dimensions

SSOP8-P-0.65

Unit : mm



Weight: 0.02g (typ.)

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