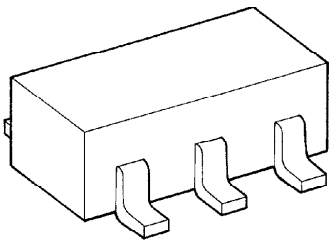
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA4003F

VHF~UHF WIDE BAND AMPLIFIER

FEATURES

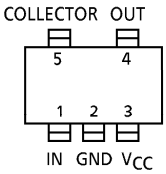
- Band Width 1.5CHz (Typ.) (3dB down, $V_{CC}=2V$)
- High Gain : $|S_{21}|^2=11dB$ (Typ.), (f = 500MHz, $V_{CC}=2V$)
- Operating Supply Voltage : $V_{CC}=2\sim3V$
- Low Current Operation : $I_{CC}=3.5mA$ (Typ.) ($V_{CC}=2V$)
- Small Package



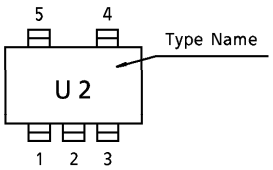
SSOP5-P-0.95

Weight : 0.014g (Typ.)

PIN ASSIGNMENT (TOP VIEW)



Marking



MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	4	V
Total Power Dissipation	P_D*	300	mW
Operating Temperature	T_{opr}	−40~85	°C
Storage Temperature	T_{stg}	−55~125	°C

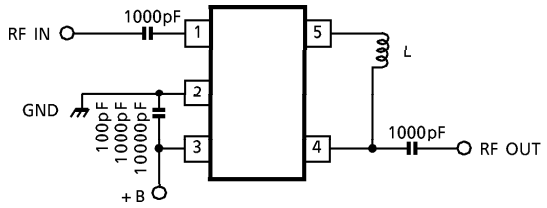
* When mounted glass epoxy of $2.5cm^2 \times 1.6t$

ELECTRICAL CHARACTERISTICS (Ta = 25°C) (Note 1)

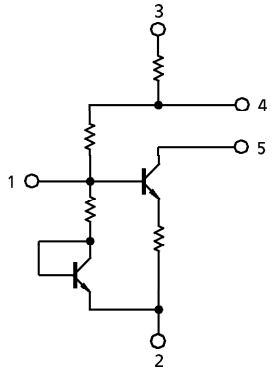
CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Circuit Current	I_{CC}	—	V_{CC} = 2V, Non carrier	2.5	3.5	4.5	mA
Insertion Gain	$\|S_{21}\|^2$	1	V_{CC} = 2V, f = 500MHz	9	11	14	dB
Band Width	BW	1	V_{CC} = 2V (Note 2)	1.2	1.5	—	GHz
Noise Figure	NF	1	V_{CC} = 2V, f = 500MHz	—	5.2	7	dB
Input Return Loss	$\|S_{11}\|^2$	1	V_{CC} = 2V, f = 500MHz	—	−7.5	—	dB
Output Return Loss	$\|S_{22}\|^2$	1	V_{CC} = 2V, f = 500MHz	—	−7.5	—	dB
Isolation	$\|S_{12}\|^2$	1	V_{CC} = 2V, f = 500MHz	—	−24	—	dB
Maximum Output Level	P_o	1	V_{CC} = 2V, f = 500MHz, Pin = 0dBmW	—	0	—	dBmW

Note 1 : Have use for connect inductance between terminal 4 and 5 8nH at V_{CC} = 2V
Note 2 : BW is frequency of 3dB down from $|S_{21}|^2$ at 500MHz.

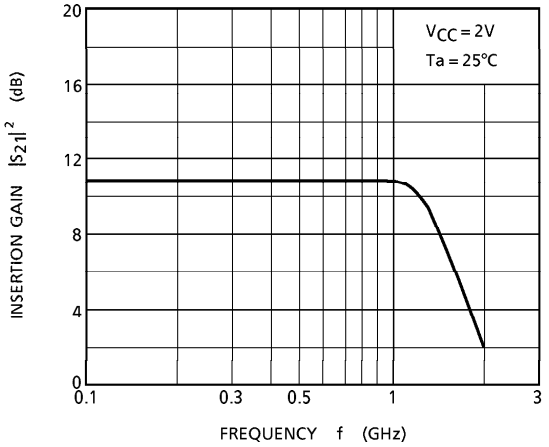
TEST CIRCUIT 1. (TOP VIEW)



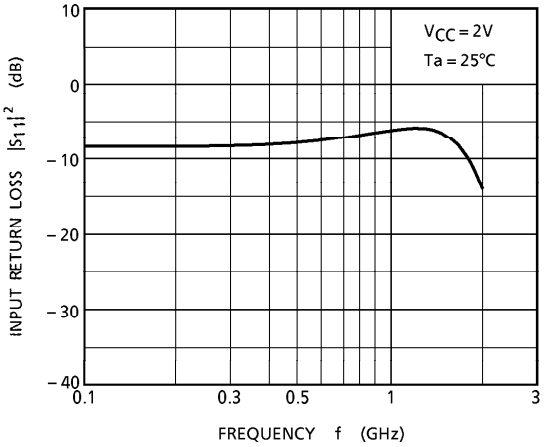
EQUIVALENT CIRCUIT



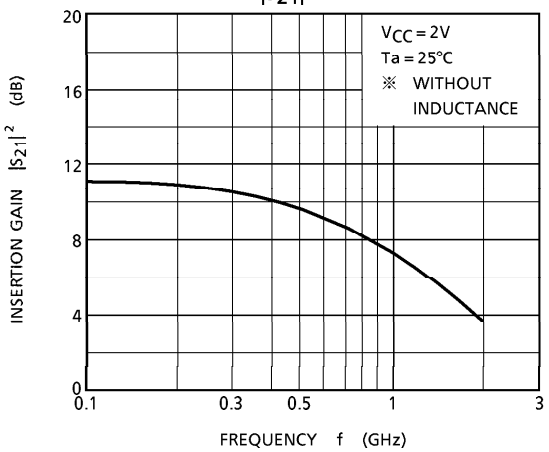
$|S_{21}|^2$ – f



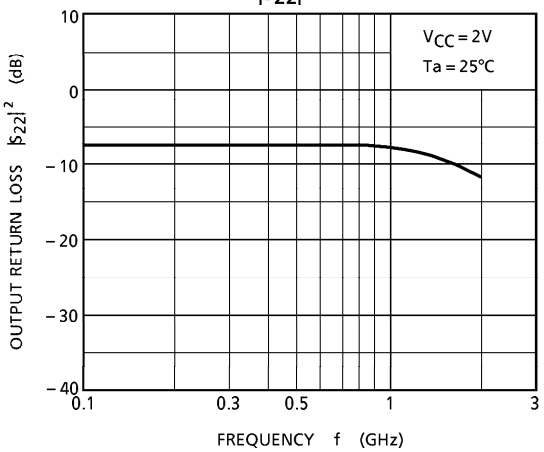
$|S_{11}|^2$ – f



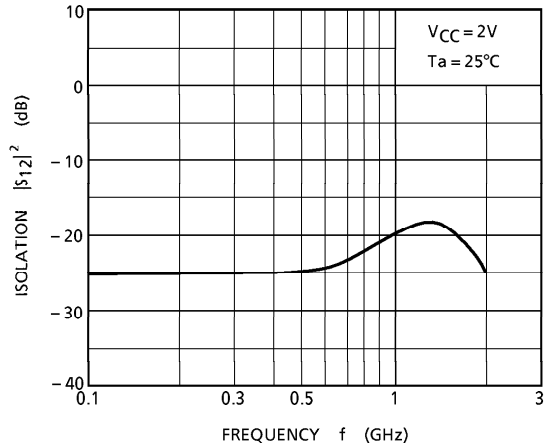
$|S_{21}|^2$ – f



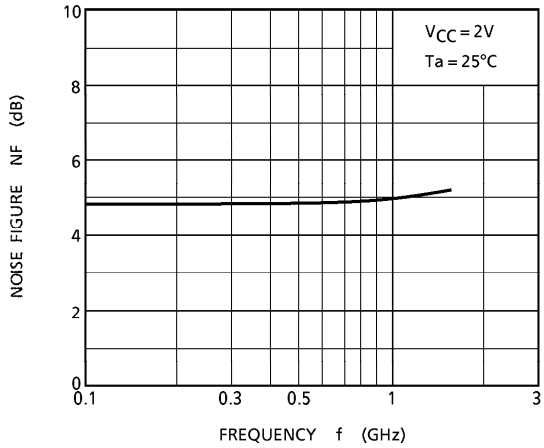
$|S_{22}|^2$ – f

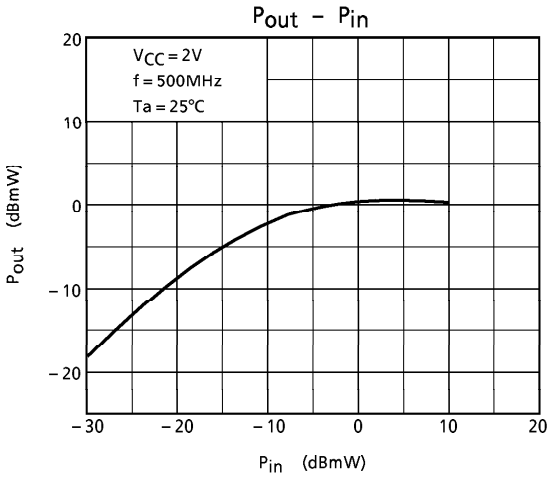


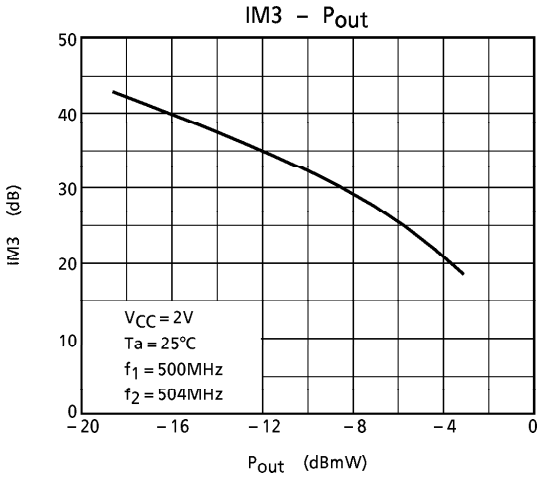
$|S_{12}|^2$ – f

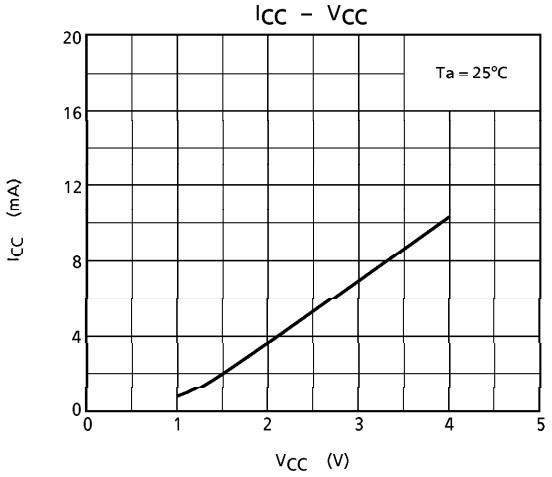


NF – f




Pout – Pin
VCC = 2V
f = 500MHz
Ta = 25°C
Pout (dBmW)
Pin (dBmW)
20
10
0
– 10
– 20
– 30
– 20
– 10
0
10
20


IM3 – Pout
VCC = 2V
Ta = 25°C
f1 = 500MHz
f2 = 504MHz
IM3 (dB)
Pout (dBmW)
50
40
30
20
10
0
– 20
– 16
– 12
– 8
– 4
0


ICC – VCC
Ta = 25°C
ICC (mA)
VCC (V)
20
16
12
8
4
0
0
1
2
3
4
5