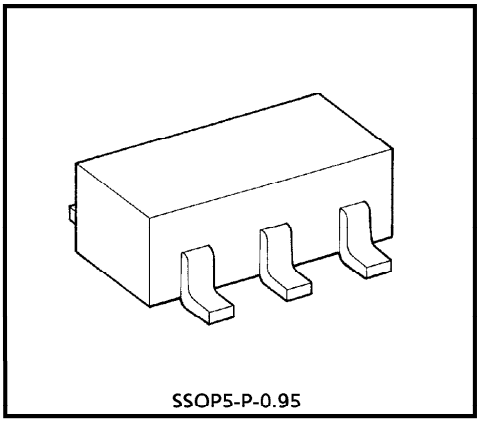
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA4004F

VHF~UHF WIDE BAND AMPLIFIER

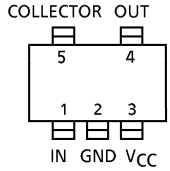
FEATURES

- Band Width 1.2GHz (Typ.) (3dB down, V_{CC} = 2V)
- High Gain : $|S_{21}|^2$ = 10.5dB (Typ.) (f = 500MHz, V_{CC} = 2V)
- Operating Supply Voltage : V_{CC} = 2~5V
- Low Current Operation : I_{CC} = 3.1mA (Typ.) (V_{CC} = 2V)
- Small Package

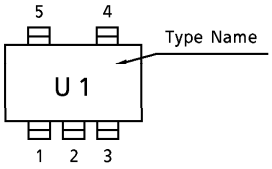


Weight : 0.014g (Typ.)

PIN ASSIGNMENT (TOP VIEW)



Marking



MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	6	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 2.5cm² × 1.6t

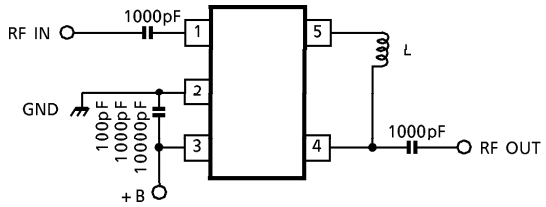
961001EBA2

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

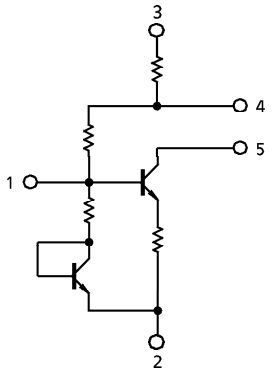
CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Circuit Current	I_{CC}	—	V_{CC} = 2V, Non carrier	2.5	3.1	4	mA
			V_{CC} = 5V, Non carrier	10	12.5	16	
Insertion Gain	$\|S_{21}\|^2$	1	V_{CC} = 2V, f = 500MHz	8.5	10.5	13.5	dB
			V_{CC} = 5V, f = 500MHz	13	15	18	
Band Width	BW	1	V_{CC} = 2V (Note 2)	0.9	1.2	—	GHz
			V_{CC} = 5V (Note 2)	0.7	1	—	
Noise Figure	NF	1	V_{CC} = 2V, f = 500MHz	—	4.2	6	dB
			V_{CC} = 5V, f = 500MHz	—	4.7	6.5	
Input Return Loss	$\|S_{11}\|^2$	1	V_{CC} = 2V, f = 500MHz	—	−7	—	dB
			V_{CC} = 5V, f = 500MHz	—	−9	—	
Output Return Loss	$\|S_{22}\|^2$	1	V_{CC} = 2V, f = 500MHz	—	−7	—	dB
			V_{CC} = 5V, f = 500MHz	—	−9	—	
Isolation	$\|S_{12}\|^2$	1	V_{CC} = 2V, f = 500MHz	—	−23	—	dB
			V_{CC} = 5V, f = 500MHz	—	−24	—	
Maximum Output Level	P_O	1	V_{CC} = 2V, f = 500MHz, Pin = 0dBmW	—	0	—	dBmW
			V_{CC} = 5V, f = 500MHz, Pin = 0dBmW	—	8	—	

Note 1 : Have use for connect inductance between terminal 4 and 5 9nH at V_{CC} = 2V
Note 2 : BW is frequency of 3dB down from $|S_{21}|^2$ at 500MHz. 10.5nH at V_{CC} = 5V

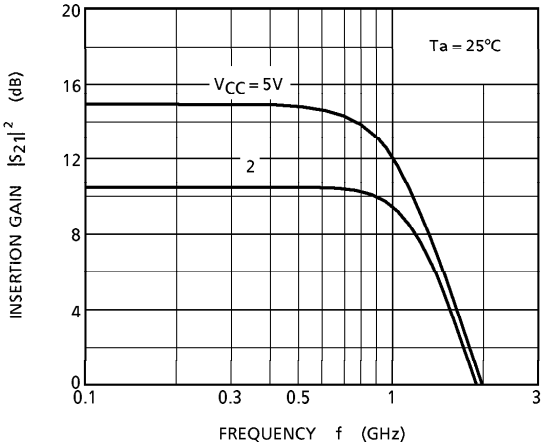
TEST CIRCUIT 1. (TOP VIEW)



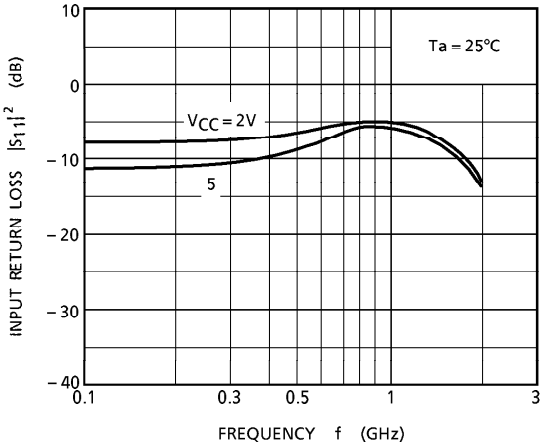
EQUIVALENT CIRCUIT



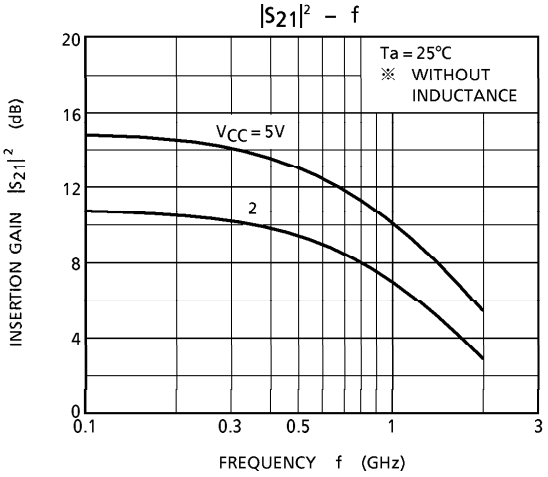
$|S_{21}|^2$ – f



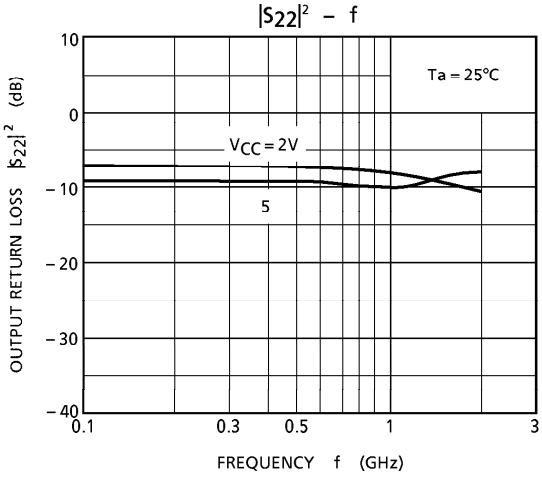
$|S_{11}|^2$ – f



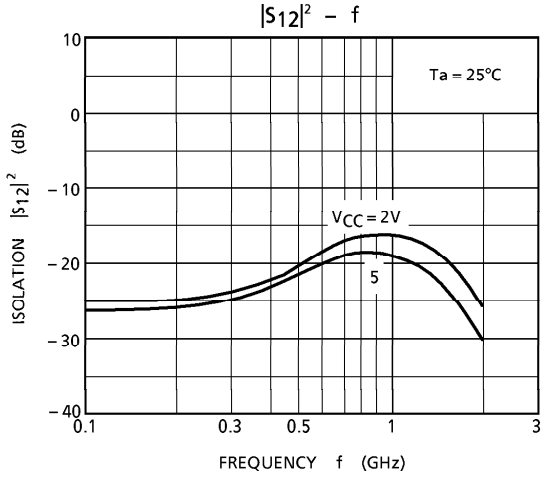
$|S_{21}|^2$ – f



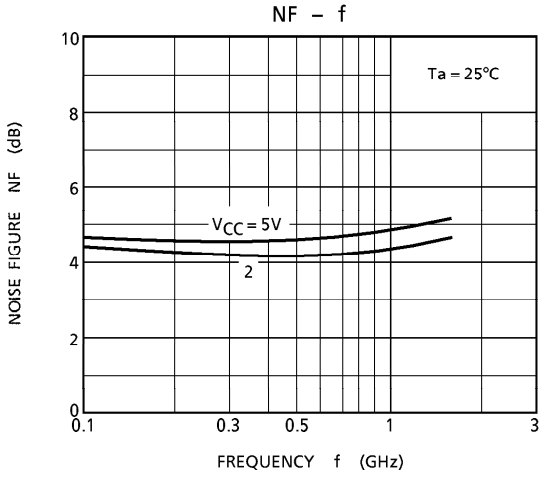
$|S_{22}|^2$ – f



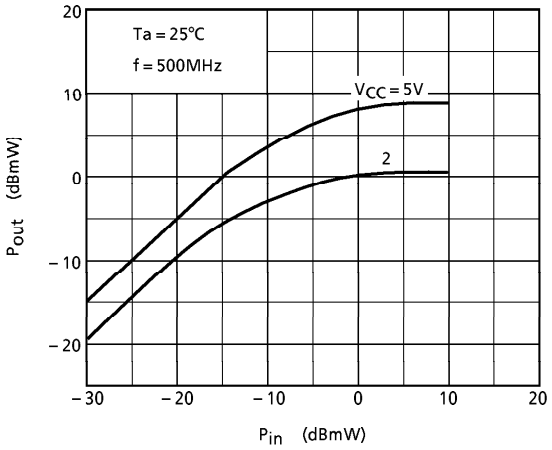
$|S_{12}|^2$ – f



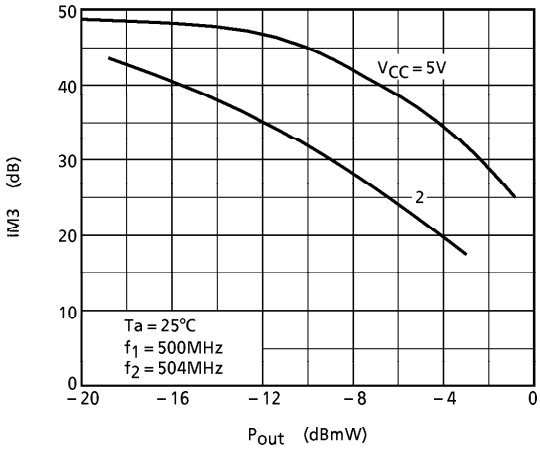
NF – f



P_{out} – P_{in}



IM3 – P_{out}



I_{CC} – V_{CC}