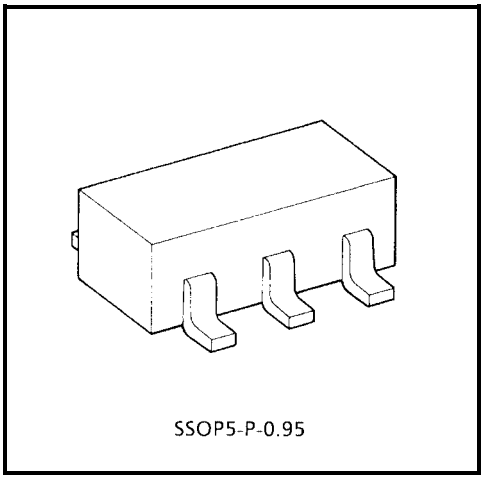
TOSHIBA Bipolar Linear Integrated Circuit Silicon Monolithic

TA4004F

VHF~UHF Wide Band Amplifier

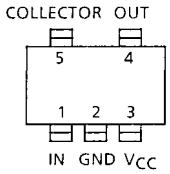
Features

- Band width: 1.2 GHz (typ.) (3dB down, V_{CC} = 2 V)
- High gain: $|S_{21}|^2$ = 10.5dB (typ.) (f = 500 MHz, V_{CC} = 2 V)
- Operating supply voltage: V_{CC} = 2~5 V
- Low current operation: I_{CC} = 3.1 mA (typ.) (V_{CC} = 2 V)
- Small package

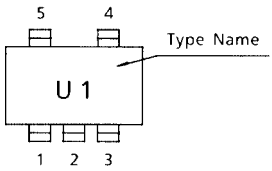


Weight: 0.014 g (typ.)

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 (Note1)	300	mW
Operating temperature	T_{opr}	−40~85	°C
Storage temperature	T_{stg}	−55~125	°C

Note 1: When mounted glass epoxy of 2.5 cm^2 × 1.6 t

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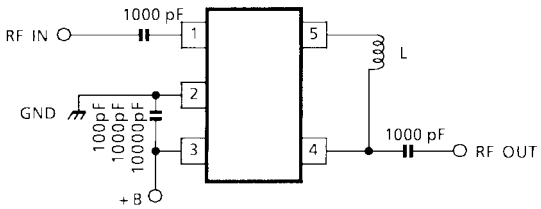
Electrical Characteristics (Ta = 25°C) (Note2)

Characteristics	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Circuit current	I_{CC}	—	V_{CC} = 2 V, non carrier	2.5	3.1	4	mA
			V_{CC} = 5 V, non carrier	10	12.5	16	
Insertion gain	$\|S_{21}\|^2$	1	V_{CC} = 2 V, f = 500 MHz	8.5	10.5	13.5	dB
			V_{CC} = 5 V, f = 500 MHz	13	15	18	
Band width	BW	1	V_{CC} = 2 V (Note 3)	0.9	1.2	—	GHz
			V_{CC} = 5 V (Note 3)	0.7	1	—	
Noise figure	NF	1	V_{CC} = 2 V, f = 500 MHz	—	4.2	6	dB
			V_{CC} = 5 V, f = 500 MHz	—	4.7	6.5	
Input return loss	$\|S_{11}\|^2$	1	V_{CC} = 2 V, f = 500 MHz	—	−7	—	dB
			V_{CC} = 5 V, f = 500 MHz	—	−9	—	
Output return loss	$\|S_{22}\|^2$	1	V_{CC} = 2 V, f = 500 MHz	—	−7	—	dB
			V_{CC} = 5 V, f = 500 MHz	—	−9	—	
Isolation	$\|S_{12}\|^2$	1	V_{CC} = 2 V, f = 500 MHz	—	−23	—	dB
			V_{CC} = 5 V, f = 500 MHz	—	−24		
Maximum output level	P_O	1	V_{CC} = 2 V, f = 500 MHz, P_{in} = 0dBmW	—	0	—	dBmW
			V_{CC} = 5 V, f = 500 MHz, P_{in} = 0dBmW	—	8	—	

Note 2: Have use for connect inductance between terminal 4 and 5 9 nH at V_{CC} = 2 V

Note 3: BW is frequency of 3dB down from $|S_{21}|^2$ at 500 MHz. 10.5 nH at V_{CC} = 5 V

Test Circuit 1 (top view)



Notice

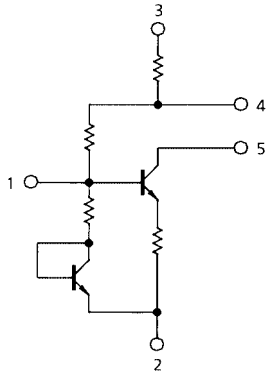
The circuits and measurements contained in this document are given only in the context of as examples of applications for these products.

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.

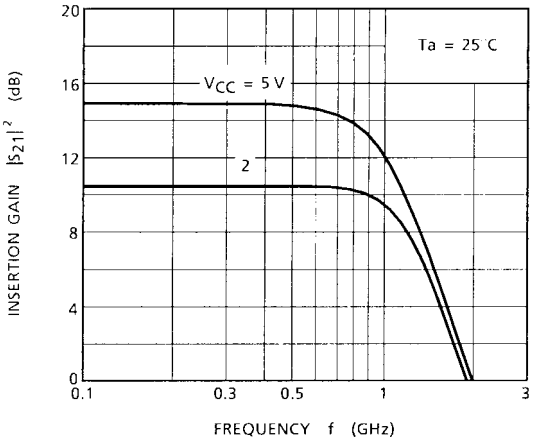
It is the responsibility of the customer to design external circuits which correctly implement the intended application, and to check the characteristics of the design.

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

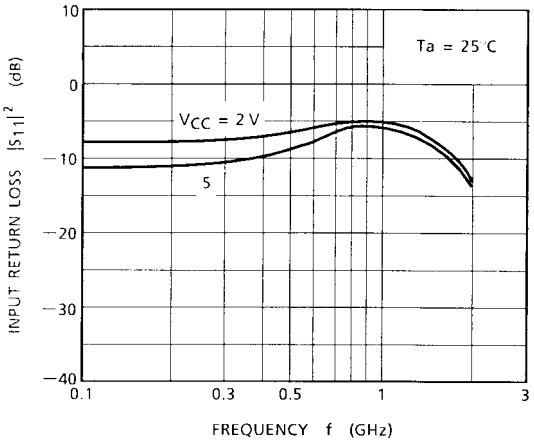
Equivalent Circuit



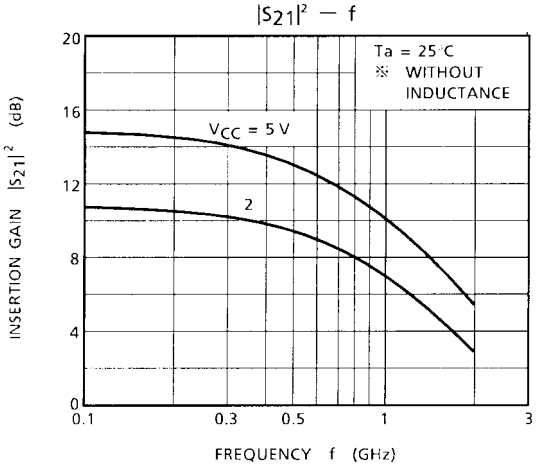
$|S_{21}|^2$ — f



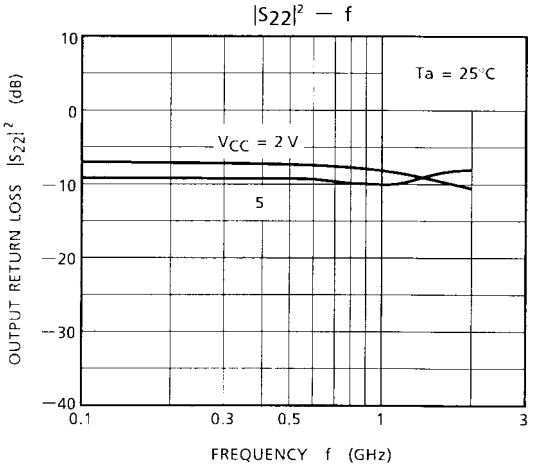
$|S_{11}|^2$ — f



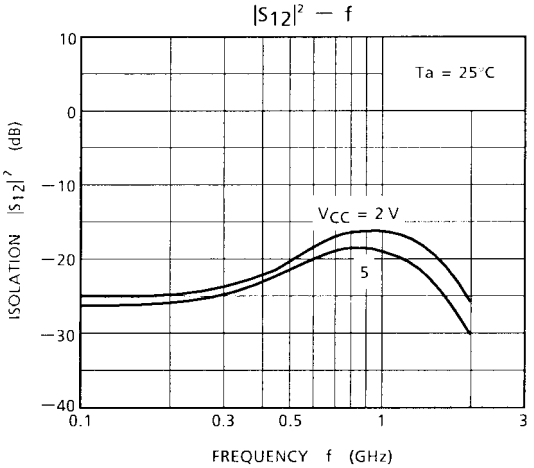
$|S_{21}|^2$ — f



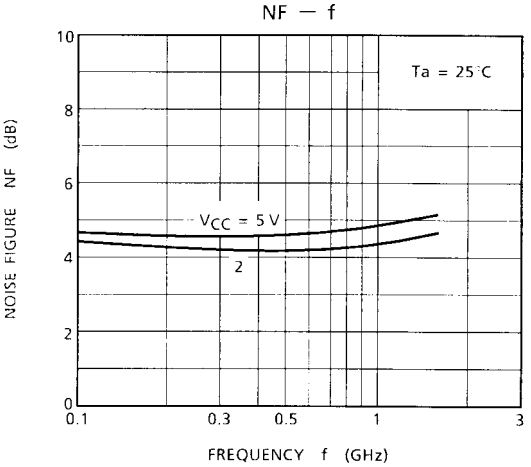
$|S_{22}|^2$ — f



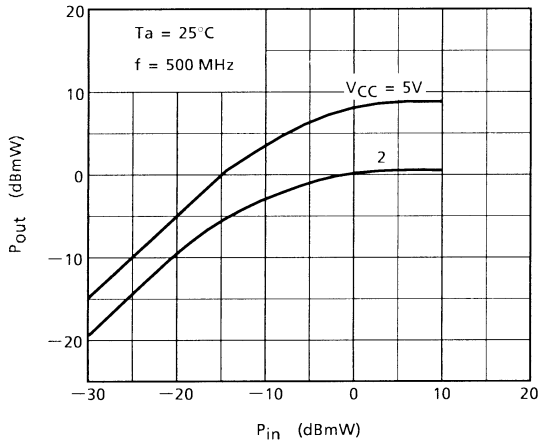
$|S_{12}|^2$ — f



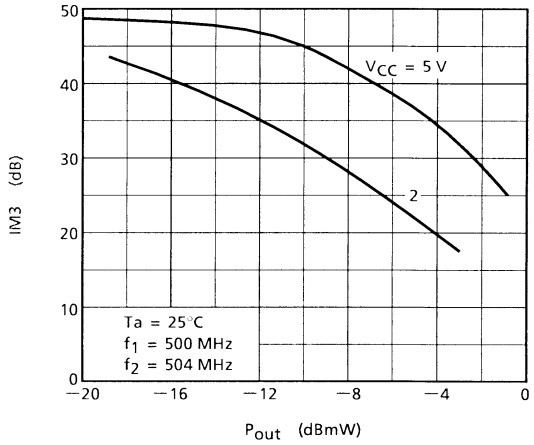
NF — f



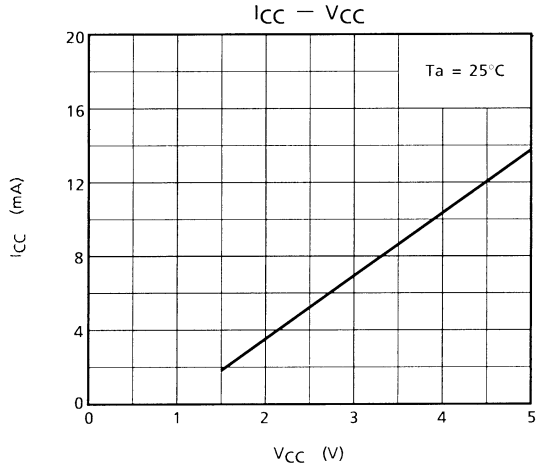
P_{out} — P_{in}



IM3 — P_{out}

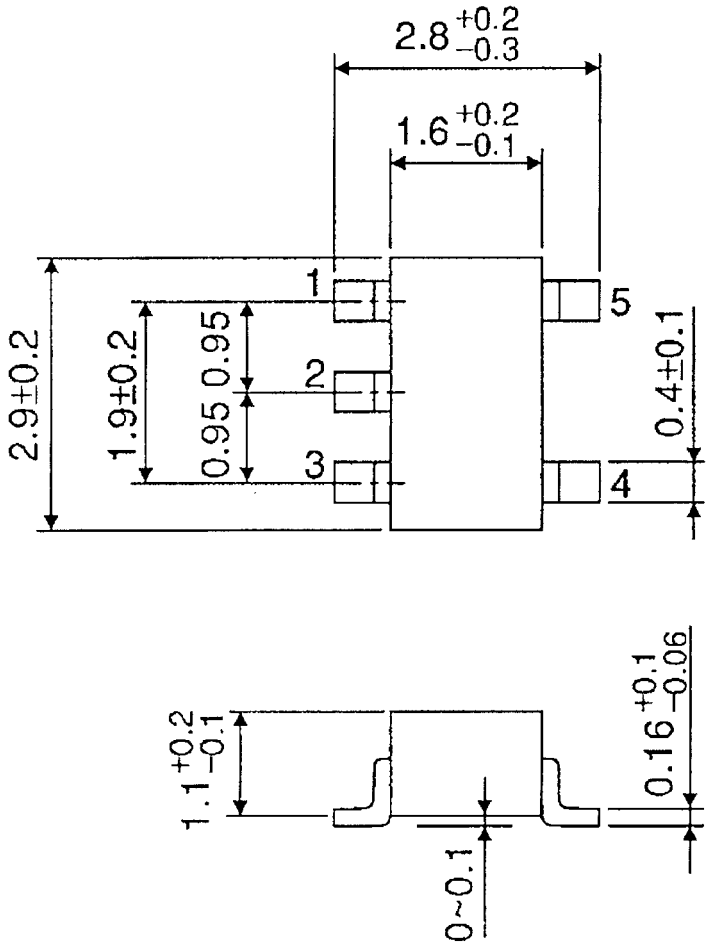


I_{CC} — V_{CC}



Package Dimensions

SSOP5-P-0.95 Unit : mm



Weight : 0.014 g (Typ.)