

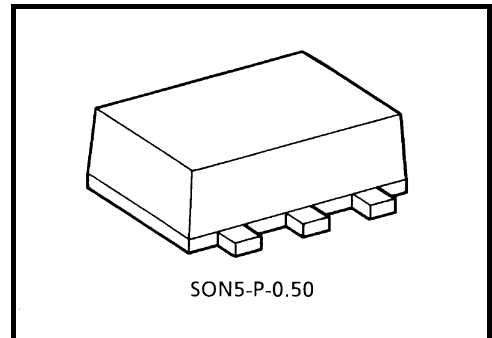
TOSHIBA Bipolar Linear Integrated Circuit Silicon Monolithic

# TA4012AFE

## UHF Wide Band Amplifier Applications

### Features

- Low current:  $I_{CC} = 6.5 \text{ mA}$
- Wide band:  $f = 2.0 \text{ GHz}$  (3dB down)
- Operating supply voltage:  $V_{CC} = 1.5\sim 2.2 \text{ V}$



SON5-P-0.50

Weight: 0.003 g (typ.)

### Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

Characteristics	Symbol	Rating	Unit
Supply voltage 1	$V_{CC1}$	2.2	V
Supply voltage 2 (Note 1)	$V_{CC2}$	3	V
Total power dissipation (Note 2)	$P_D$	300	mW
Operating temperature	$T_{opr}$	-40~85	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55~150	$^\circ\text{C}$

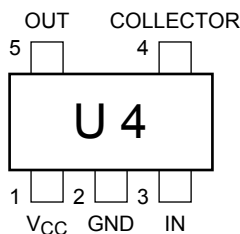
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) 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  $V_{CC}$  is operated at less than 1/4 duty cycle

Note 2: When mounted on the glass epoxy of  $2.5 \text{ cm}^2 \times 1.6 \text{ t}$

### Marking



**Electrical Characteristics (Ta = 25°C, Zg = Zl = 50 Ω)**

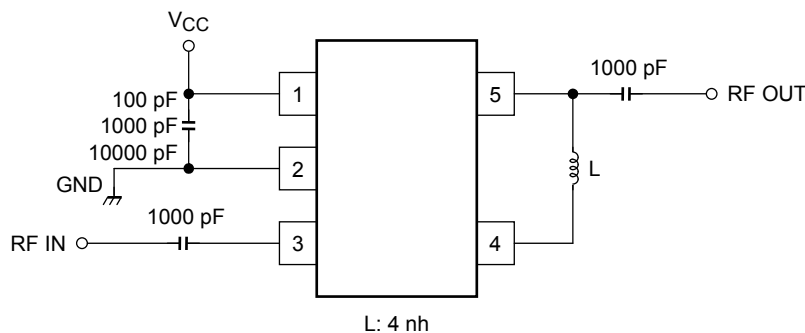
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Circuit current	I <sub>CC</sub>	V <sub>CC</sub> = 2 V, non carrier	4.5	6.5	8.5	mA
Band width	BW	V <sub>CC</sub> = 2 V (Note3)	1.8	2.0	—	GHz
Insertion gain	S <sub>21</sub>   <sup>2</sup>	V <sub>CC</sub> = 2 V, f = 1.5 GHz	10	12	—	dB
Noise figure	NF	V <sub>CC</sub> = 2 V, f = 1.5 GHz	—	6	7.5	dB
Isolation	S <sub>12</sub>   <sup>2</sup>	V <sub>CC</sub> = 2 V, f = 1.5 GHz	—	-22	—	dB
Input return loss	S <sub>11</sub>   <sup>2</sup>	V <sub>CC</sub> = 2 V, f = 1.5 GHz	—	-6.5	—	dB
Output return loss	S <sub>22</sub>   <sup>2</sup>	V <sub>CC</sub> = 2 V, f = 1.5 GHz	—	-7.5	—	dB
Output power at 1 dB gain compression	Po1dB	V <sub>CC</sub> = 2 V, f = 1.5 GHz	—	0	—	dBmW

Note3: BW is the frequency of 3dB down from |S<sub>21</sub>|<sup>2</sup> at 1.5 GHz.

**Caution**

This device is sensitive to electrostatic discharge. When using this device, please ensure that all tools and equipment are earthed.

**RF Test Circuit (top view)**



**Notice**

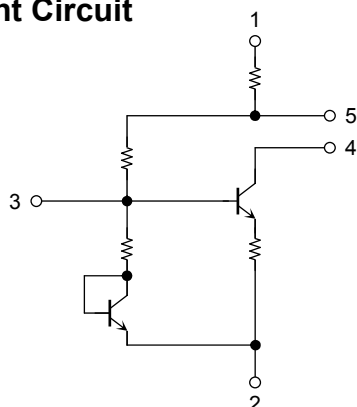
The circuits and measurements contained in this document are given only in the context of as examples of applications for these products.

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.

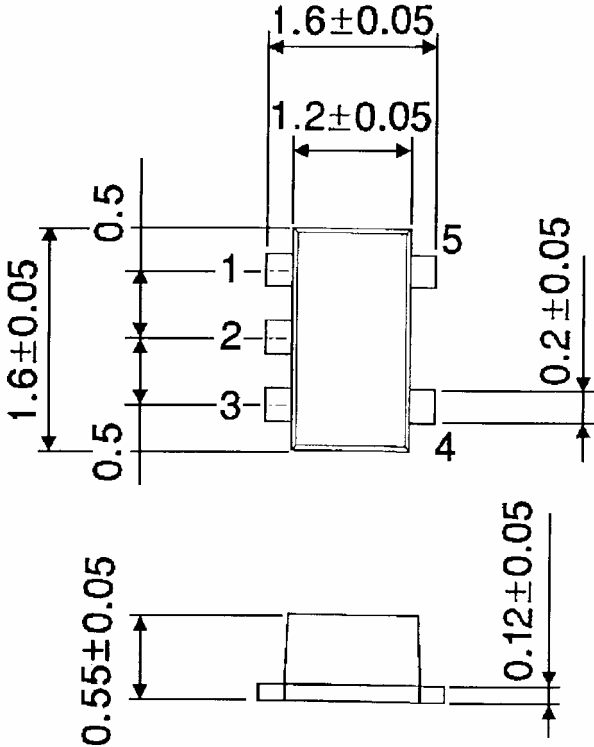
**Equivalent Circuit**



**Package Dimensions**

SON5-P-0.50

Unit : mm



Weight: 0.003 g (typ.)

**RESTRICTIONS ON PRODUCT USE**

20070701-EN GENERAL

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