

# Application Note No. 026

A Medium-Power-Amplifier at 1.9 GHz using  
BFP450

RF & Protection Devices



Never stop thinking

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**Previous Version: 2000-07-28**

<b>Page</b>	<b>Subjects (major changes since last revision)</b>
All	Document layout change

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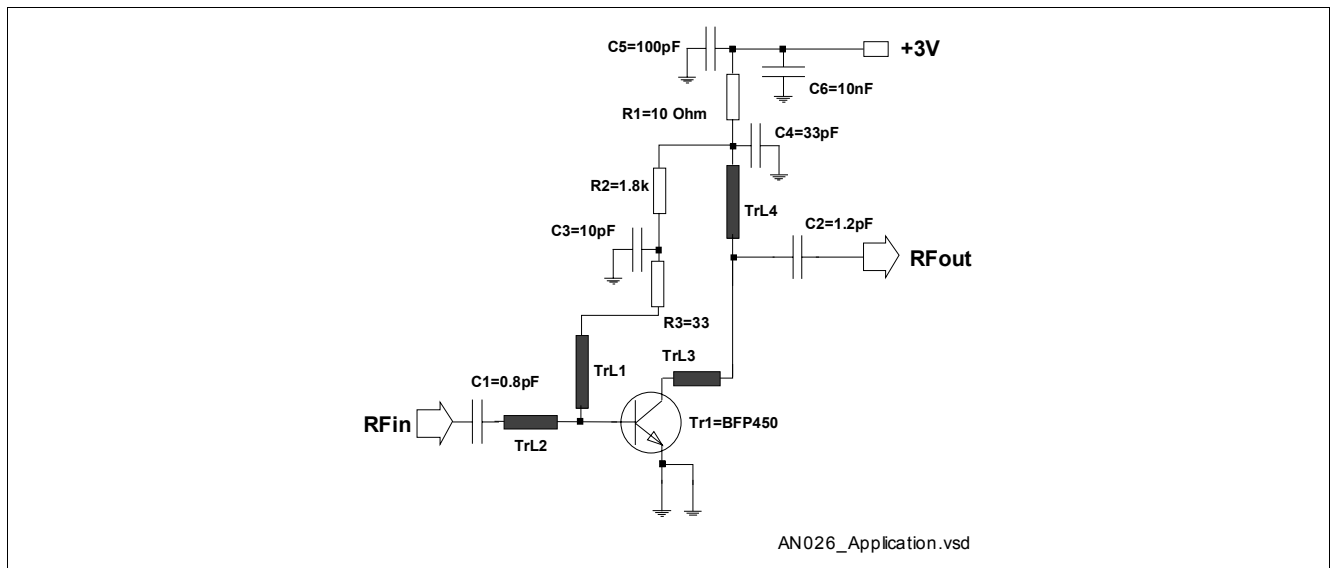
## A Medium-Power-Amplifier at 1.9 GHz using BFP450

## 1 A Medium-Power-Amplifier at 1.9 GHz using BFP450

This application note provides general information, print layout and list of used components, circuit layout and measured data of a medium power amplifier at 1.9 GHz using Siemens SIEGET<sup>®</sup>25 BFP450. The emphasis has been on high  $OIP_3$ -values.

### Data at 1.9 GHz (3 V and 68 mA)

Gain: 13.5 dB     $IP_{3out}$ : 30 dBm     $NF$ : 12.7 dB     $R_{Lin-out}$  >10 dB



**Figure 1 Application**

This amplifier at 1.9 GHz has been realized by using microstrip lines for matching purposes. It offers a good compromise between high gain and high  $OIP_3$  -values. For optimizing and improving the circuit please observe the following abstract:

- The layout size can be reduced by using chip-coils instead of the microstrip lines TrL2 and TrL3.
- Improved stabilization behaviour versus temperature and a reduction of current gain distribution problems can be obtained if you add an Infineon active bias controller BCR400W. This is easily achieved by replacing collector resistor R1 and by adding two capacitors. For further information please refer to application note No.014. The resistors R1 and R3 are however, sufficient in most applications for stabilization purposes.
- The measured figures include losses of SMA-connectors and the relatively high loss of the microstrip lines on the epoxy board.
- Resistor R3 is used to get higher circuit-stability at low frequencies.

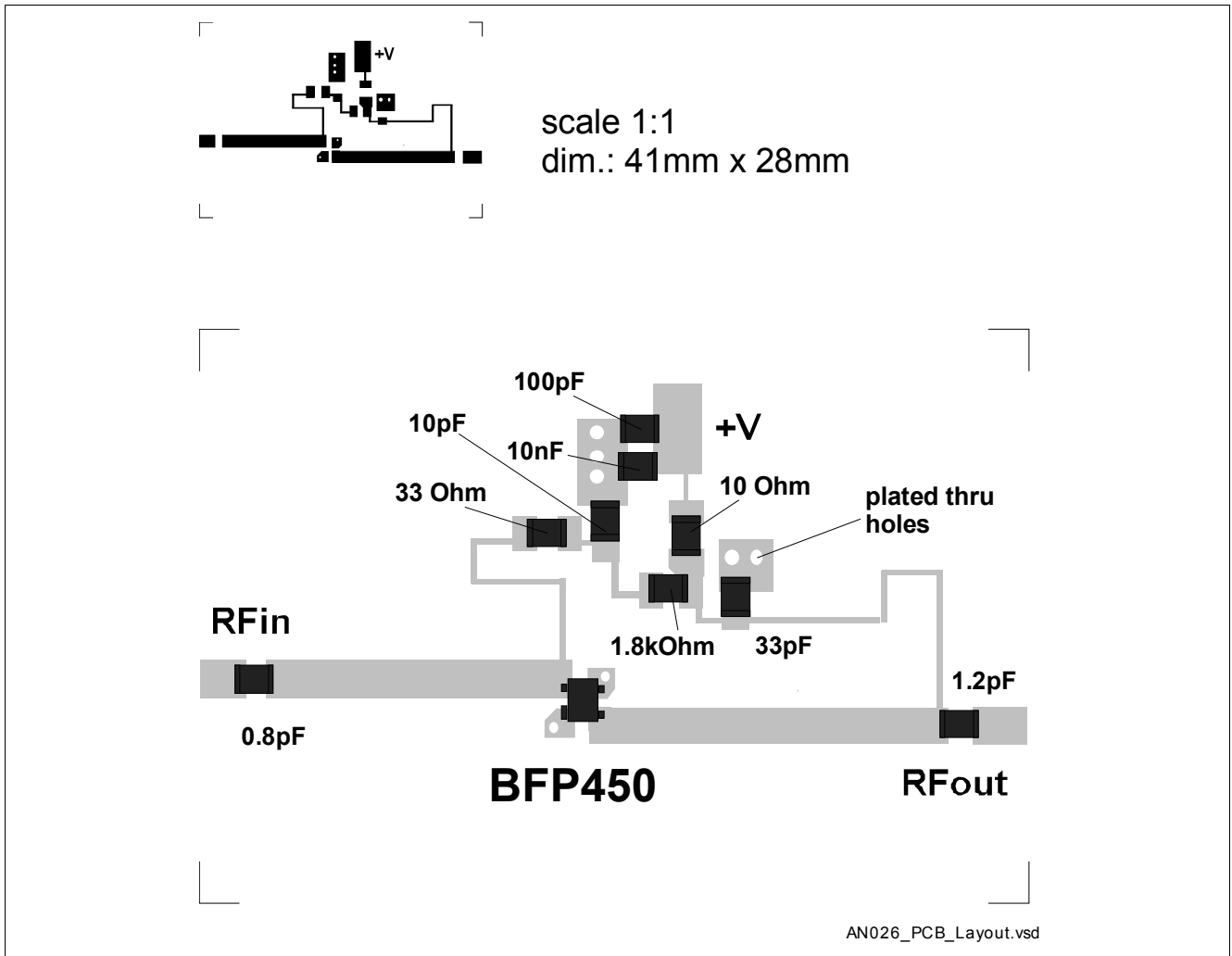


Figure 2 Layout and Component Placement

## A Medium-Power-Amplifier at 1.9 GHz using BFP450

Table 1 Component

Component	Value	Unit	Comment
R1	10	$\Omega$	Bias / collector-resistance / $V_{R1} \cong 0.7$ V 0603
R2	1.8	k $\Omega$	Bias 0603
R3	33	$\Omega$	To improve AF-stability 0603
C1	0.8	pF	Input match 0603
C2	1.2	pF	Output match 0603
C3	10	pF	RF-short 0603
C4	33	pF	RF-short 0603
C5	100	pF	RF-short 0603
C6	10	nF	RF-short 0603
Tr1			SIEGET <sup>®</sup> BFP450 SOT343
TrL1			Input match, w = 0.3 mm
TrL2			Input match, w = 1.9 mm
TrL3			Input match, w = 1.9 mm
TrL4			Output match, w = 0.3 mm
Substrate	FR4		$h = 1$ mm, $\epsilon_r = 4.5$

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Measured data

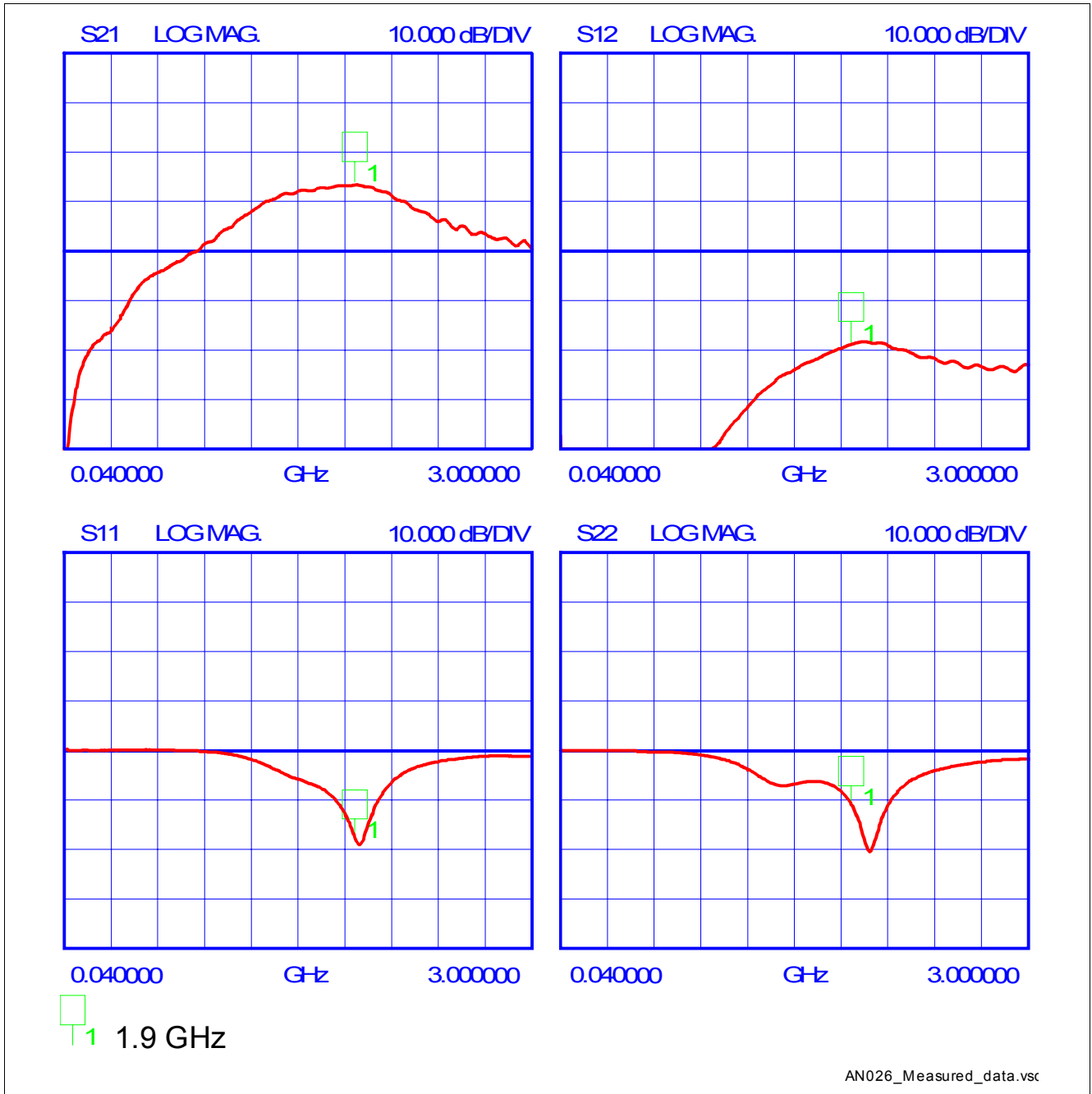


Figure 3 Measured data