

AN11736

Maximum RF Input Power BGU6104

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Application note

Document information

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Keywords	BGU6104, MMIC LNA, Maximum RF Input Power
Abstract	This document provides RF and DC test results by applying large RF input power.



Revision history

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1	20150910	First publication

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1. Introduction

This document provides application examples and measurement results for large RF input signals using the BGU6104.

2. RF input power test on BGU6104

The test circuit shown in this document is using the BGU6104 and the input is matched between 1.8 – 2.2GHz (output is not matched). The Supply voltage is 4V and the bias current is set to 19.5mA via series resistor of 50 ohm (MMIC Vcc is 3V)

The input power is swept at 2 GHz from -20dBm up to 20dBm and kept for 2 hours at 20dBm in gain (Venable = Vcc) and 2 hours in off mode (Venable = 0V)

After the test with 20dBm input power at 2GHz (14.5dB input return loss) the MMIC is tested on the Network analyzer on functionality.

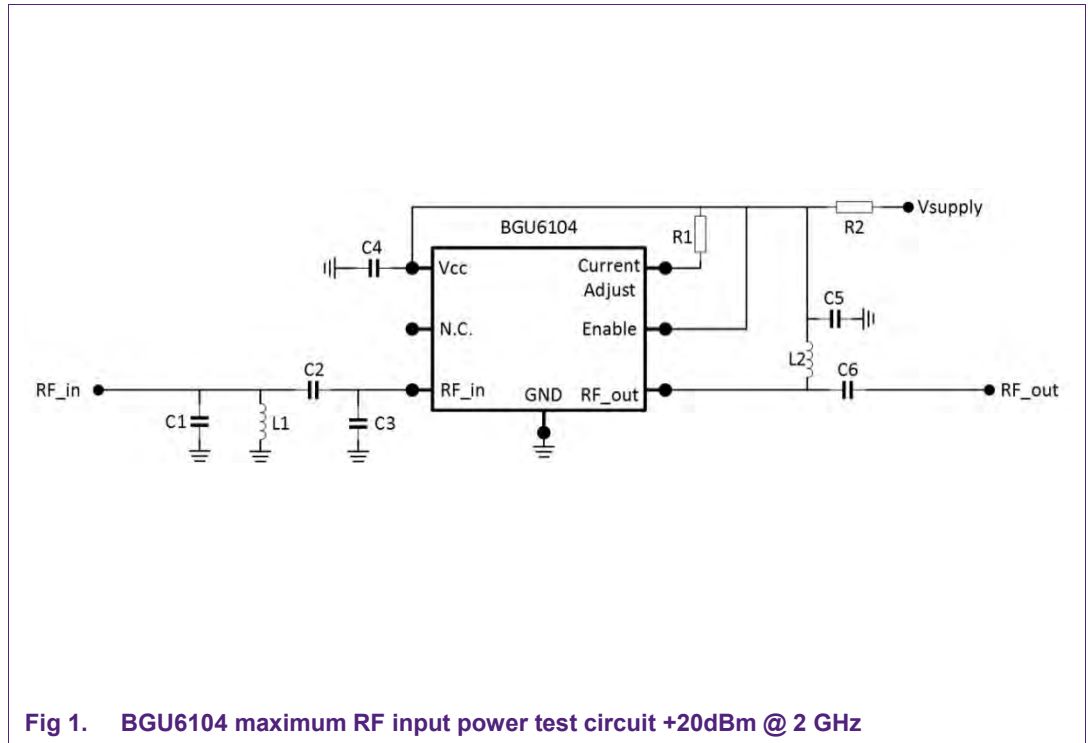


Fig 1. BGU6104 maximum RF input power test circuit +20dBm @ 2 GHz

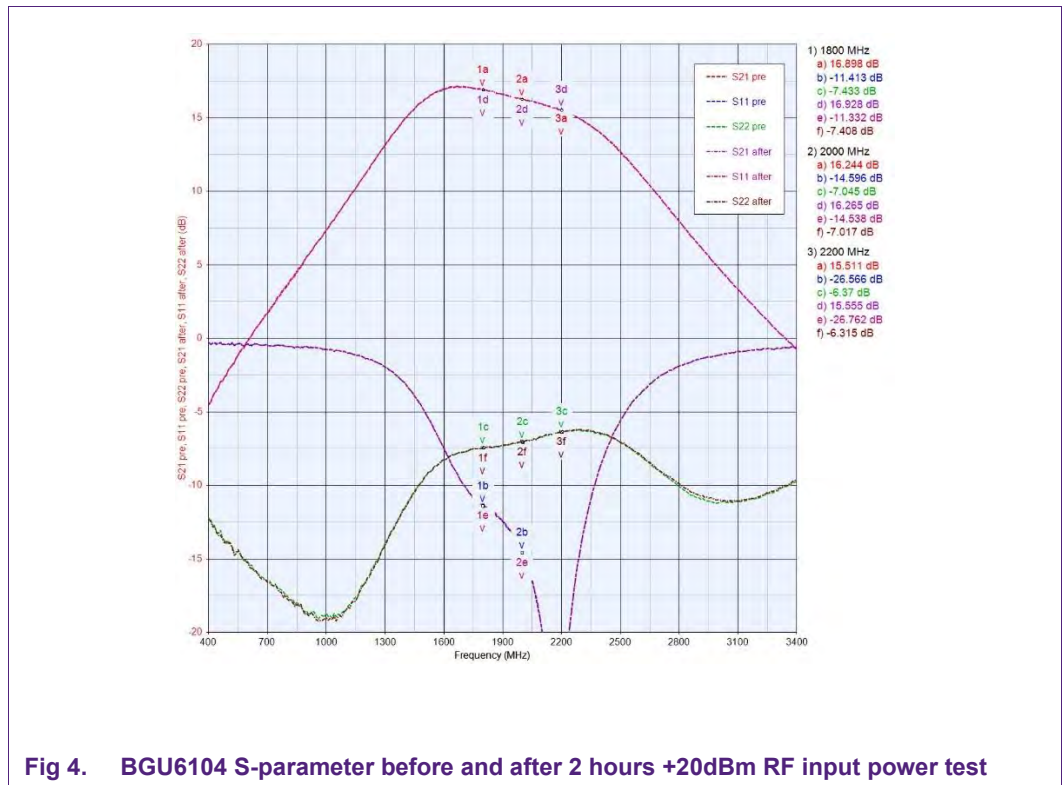
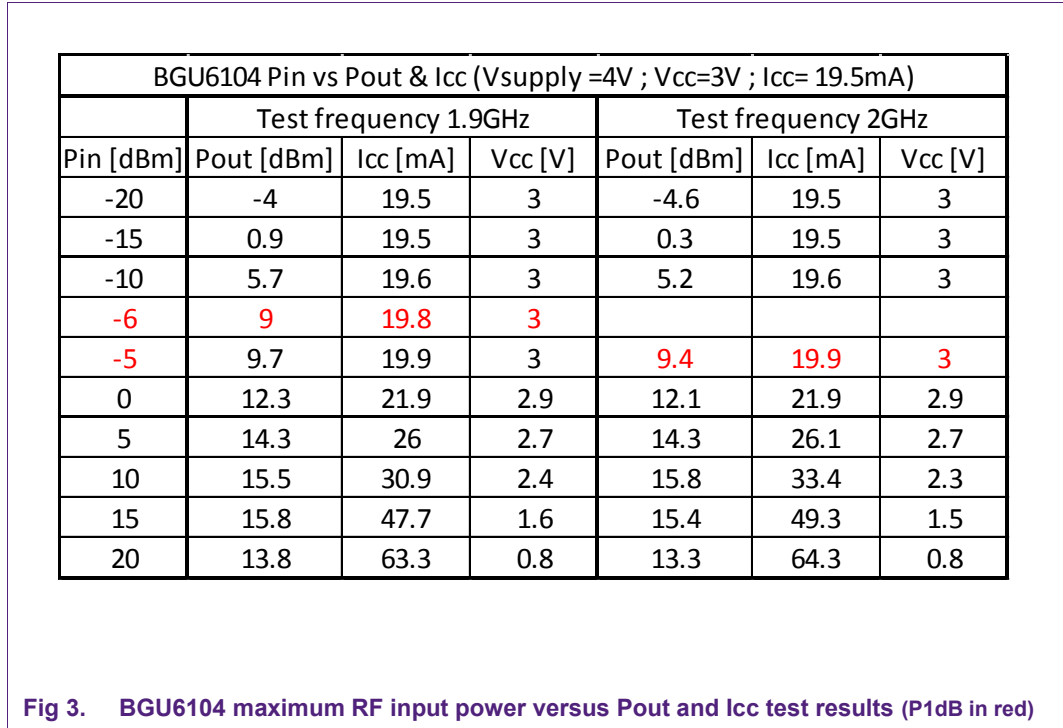
The input of the BGU6104 is matched on the test frequency ($R_{L_in} > 10\text{dB}$), output is not matched.

Additional resistor (R2) is used to reduce the current caused by self-biasing at large input power.

BOM BGA6104 input match at 2GHz		
COMPONENT	Value	Function
C1	1.1pF	matching
C2	1.1pF	matching
C3	0.5pF	matching
C4	4.7nF	decoupling
C5	4.7nF	decoupling
C6	47pF	dc-block
L1	3.3nH	matching
L2	27nH	bias
R1	4k	Rbias
R2	50R	Icc limit

Fig 2. BGA6104 BOM for 2GHz input matching

3. Test results with R2 = 50 ohm



4. Conclusion

After 2 hours stress with 20dBm at RF input using the input matched BGU6104, no changes on S-parameter and DC-biasing observed.

To minimize the self-biasing (increase of I_{cc}) we recommend additional series resistor R2 at the Vsupply, for details see the test schematic Fig.1.

In case of using the 50 ohm series resistors at the Vsupply and different control voltage at the Venable can lead to voltage difference between Vcc and Venable higher than 1.8V (Venable max. = Vcc + 1.8V) and internal ESD protection diodes can start to conduct.

To protect the ESD diodes we recommend to use series resistor to limit the current on the Venable pin to max 20mA (5mA recommended) or limit the Venable voltage for gain mode to max. 2V (min. 1.2V)

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