AN11339

Maximum RF Input Power BFU730LX

Rev. 1.0 — 05 March 2013 Application note

Document information

Info	Content
Keywords	BFU730LX, LNA, WiFi (WLAN), Maximum RF Input Power
Abstract	This document provides the h_{FE} degradation of the BFU730LX by applying large RF input power.

Revision history

Rev	Date	Description
1.0	20130305	Initial document

Contact information

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1. Introduction

In WLAN applications, RF isolation between the transmitter PA and the receiver LNA can be limited.

Therefore, large RF signal can appear on the input of the LNA.

When this LNA uses a bipolar transistor, two degradation mechanisms can occur:

- Hot carrier / Reverse base emitter voltage
- Mixed mode / High collector base voltage

The degradation depends on:

- RF input power level & duration
- Input impedance of the transistor
- Voltage swing at the transistor base
- Operation class and the Vce

2. RF input power stress test on BFU730LX

The test circuit shown in this document is a broadband LNA using the BFU730LX, the transistor biasing (Vce=3V) is chosen for worst case situation. The LNA is tested with an RF signal (+10dBm CW-signal @5.5GHz) for 1000 hours. The input return loss of the device is 13 dB, while the output is terminated by 50 ohm during the test.

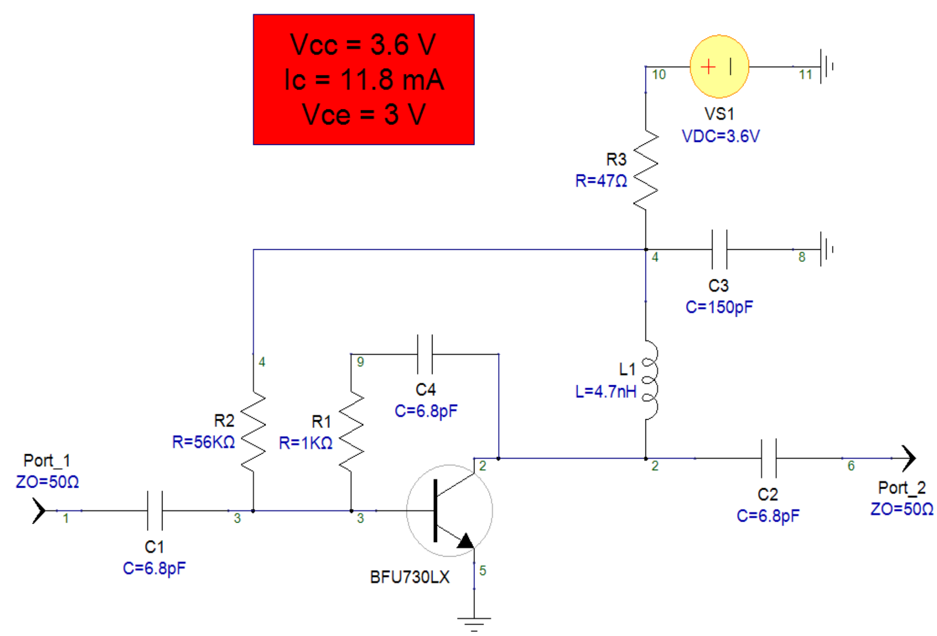

Fig 1. BFU730LX maximum RF input power test circuit +10dBm @ 5.5 GHz

3. Stress test results up to 1000 hours on the BFU730LX

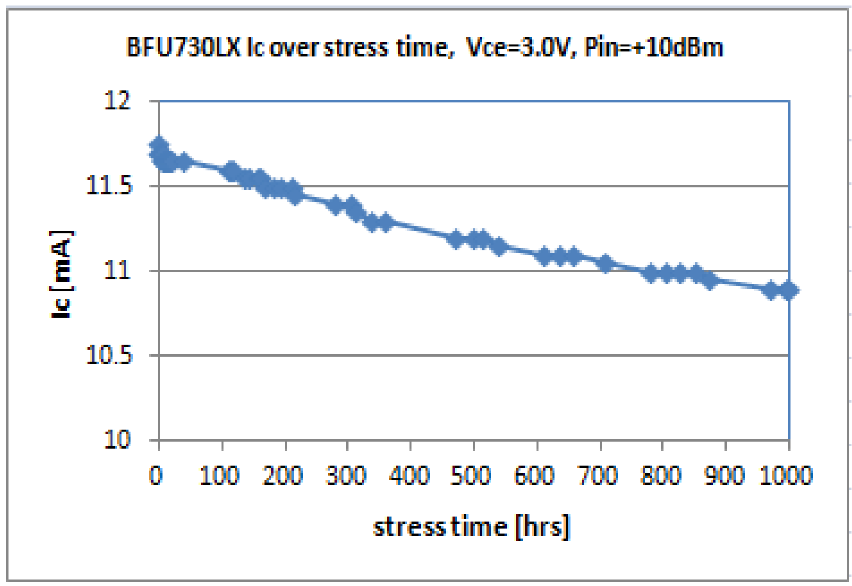

Fig 2. BFU730LX Ic over stress time

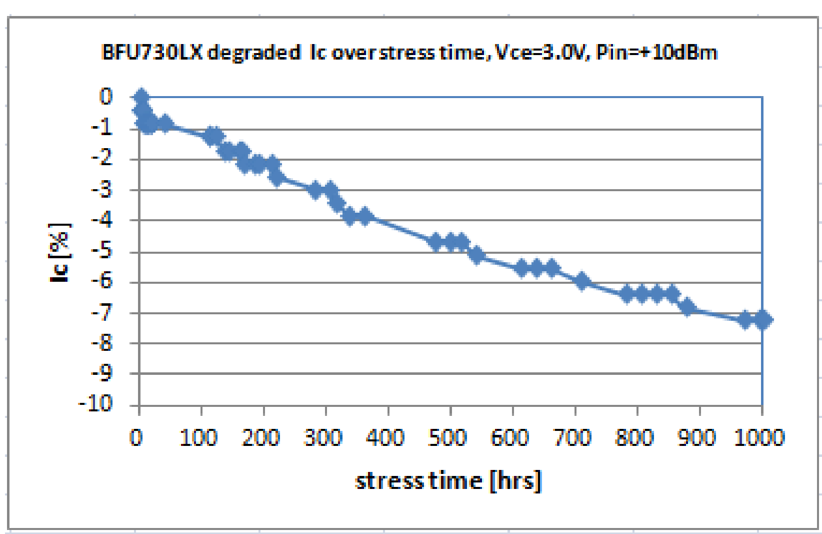

Fig 3. BFU730LX Ic [%] degradation over stress time

After 1000 hours stress test, the Ic current drops from 11.75mA to 10.9mA.

The h_{FE} degrades by 7.2% after 1000 hours stress test.

The DC current gain is well within the 10% failure criterion after 1000 hours stress test. Our target on DC current gain change is max 10% degradation.

We recommend to set the Vce equal or lower than 2.5V to have more rugged circuit against large input signals.

This is due to the risk of mixed mode degradation because of high collector base voltage.

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