

IIP3 Measurements

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GENERAL DESCRIPTION

The IIP3 measurements in the Typical Performance Characteristics section of the datasheet are produced using a specific setup that may not apply for all uses of the transceiver. These measurements capture the IIP3 when large blockers are present in the neighboring bands. This is a common scenario for public cellular radios such as those supporting 4G LTE. A general purpose radio could have large blockers within the same band as the desired signal, and that setup will produce different IIP3 values. When designing a system, the proper IIP3 data should be used for determining system receiver specs.

OUT-OF-BAND IIP3 MEASUREMENT

For LTE, GSM, and other commercial systems, the largest blockers come from out-of-band signals. To measure the linearity impact of these signals the test setup in Figure 1 is used.

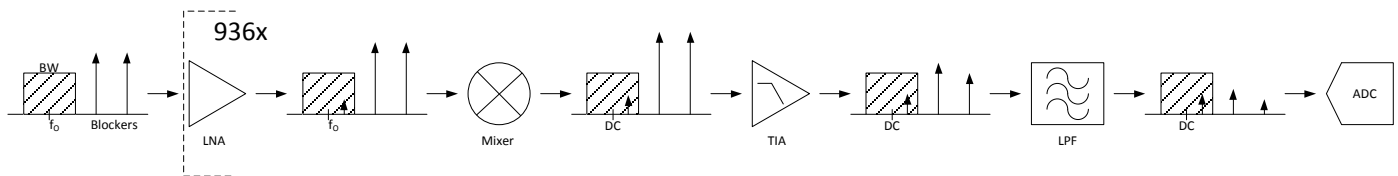


Figure 1 Out-of-Band IIP3 Setup

The blockers are at full strength when arriving at the LNA and mixer, but the rejection of the TIA and low pass filter ensure that the final stages of the receiver will not be subjected to large signal levels. This measurement setup does not account for the linearity of the filter or ADC, and produces an IIP3 typical to the one in Figure 2.

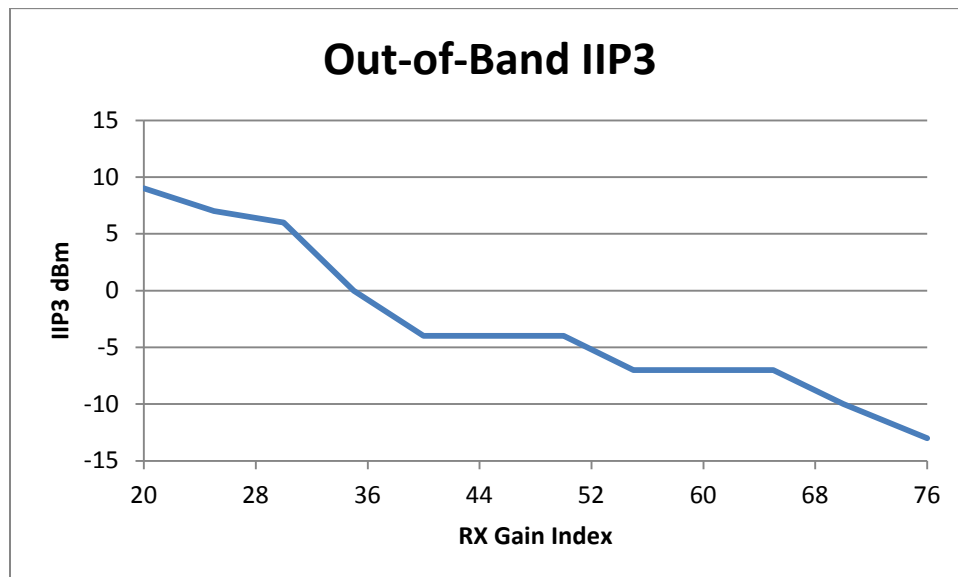


Figure 2 Out-of-Band IIP3 Results

IN-BAND IIP3 MEASUREMENT

General purpose radios may be used in environments where the blocking signals are in the band of interest. The test setup for this scenario moves the blocker frequencies so that they fall into the 9361 bandwidth, and are presented to the entire receiver chain. This setup is in Figure 3.

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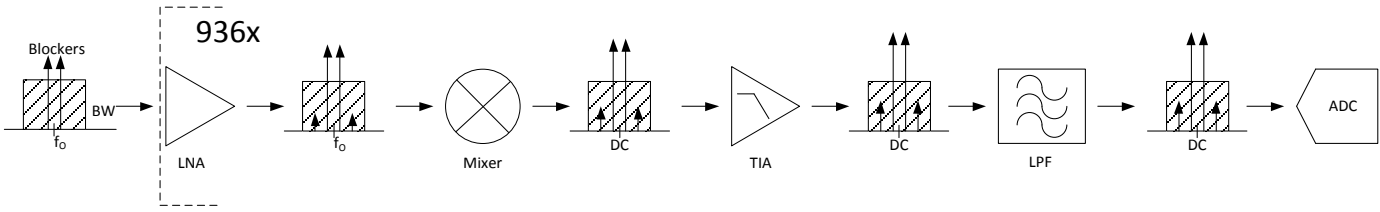


Figure 3 In-Band IIP3 Setup

Because the blocking signals are presented to the final elements of the receiver chain, the in-band IIP3 measurement will produce degraded results compared to the out-of-band IIP3 test. Typical in-band IIP3 measurements are in Figure 4, and are overlaid with the out-of-band results in Figure 5.

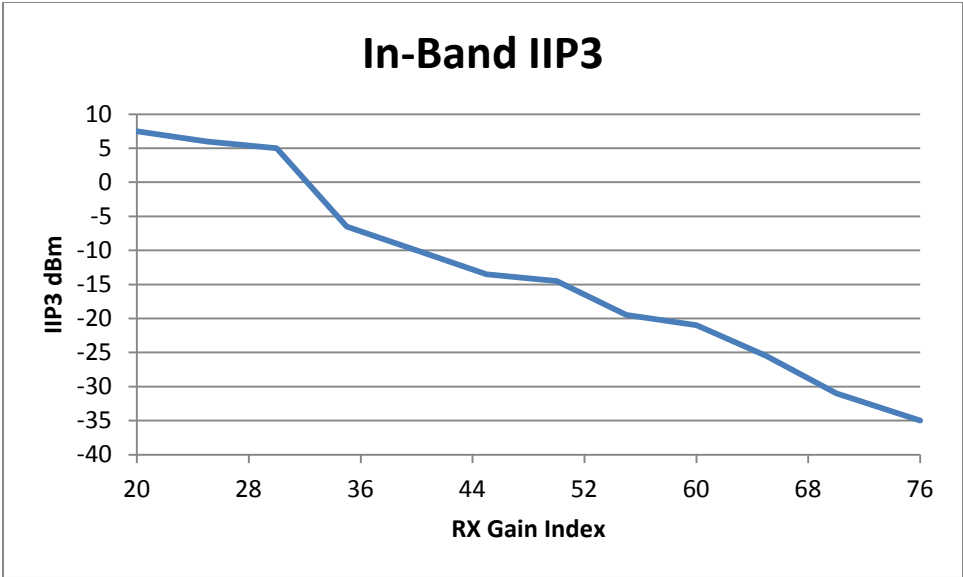


Figure 4 In-Band IIP3 Results

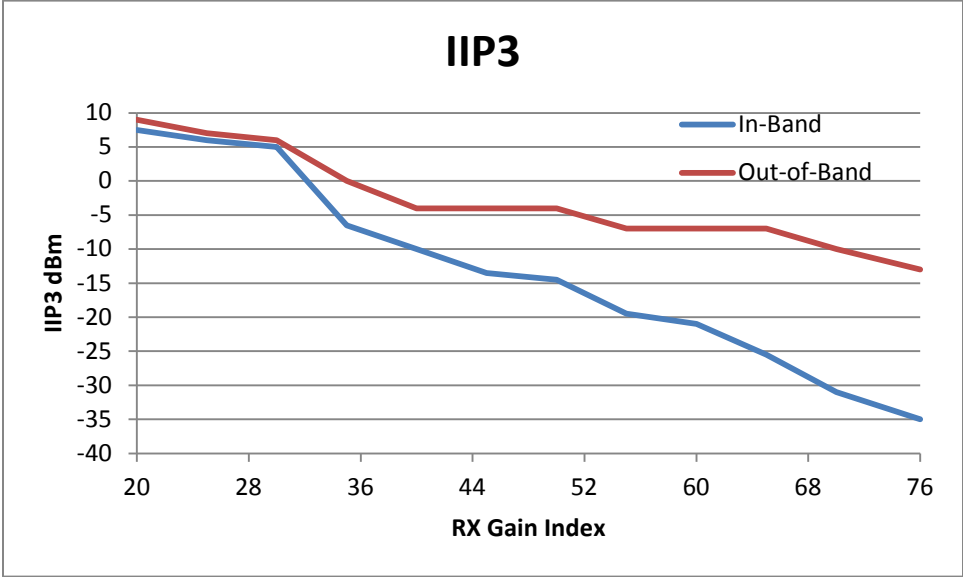


Figure 5 Out-of-Band and In-Band IIP3 Comparison