ANALOG DEVICES

High Performance, Low Power, ISM Band FSK/GFSK/OOK/MSK/GMSK Transceiver IC

Silicon Anomaly

ADF7023-J

This anomaly sheet describes the known bugs, anomalies, and workarounds for the ADF7023-J transceiver and relates to Silicon Revision 2.2, which has corresponding silicon revision readback codes of 0x70, 0x23, 0x02, and 0x02. See the ADF7023-J data sheet for details on how to read the silicon revision codes.

Analog Devices, Inc., is committed, through future silicon revisions, to continuously improve silicon functionality. Analog Devices tries to ensure that these future silicon revisions remain compatible with your present software/systems by implementing the recommended workarounds outlined here.

ADF7023-J FUNCTIONALITY ISSUES

Silicon Revision Readback	Chip Marking	Silicon Status	Anomaly Sheet	No. of Reported Anomalies
Product Code MSB = 0x70 Product Code LSB = 0x23 Silicon Revision Code MSB = 0x02 Silicon Revision Code LSB = 0x02	ADF7023-JBCPZ	Release	Rev. A	3

FUNCTIONALITY ISSUES

Table 1. Receiver Sensitivity at 910 MHz [er005]

Background	The 910 MHz channel falls exactly on the 35th harmonic of the 26 MHz crystal reference.
Issue	When the ADF7023-J receiver is configured for reception at 910 MHz ± (IF bandwidth × 2), the receiver sensitivity can be degraded by up to 10 dB.
Workaround	The degradation in receiver sensitivity at 910 MHz ± (IF bandwidth × 2) can be further improved by using the following configuration: 1. Disable the AGC by setting AGC_LOCK_MODE (in Register RADIO_CFG_7, Address 0x113) = 0x01. 2. Set the receiver gain to the maximum by setting AGC_MODE (Address 0x35D) = 0x36. 3. Disable the ADC by writing 0x0F to MCR Register POWERDOWN_RX (Address 0x324).
Related Issues	None.

Table 2. Receiver Sensitivity at 923 MHz[er006]

Background	The 923 MHz channel falls exactly on the 71st harmonic of 13 MHz.
Issue	When the ADF7023-J receiver is configured for reception at 923 MHz ± (IF bandwidth × 2), the receiver sensitivity can be degraded by up to 5 dB.
Workaround	The degradation in receiver sensitivity at 910 MHz ± (IF bandwidth × 2) can be minimized by using the separate match configuration.
Related Issues	None.

Table 3. Crystal Oscillator Low Frequency Spurs [er007]

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Background	Under certain conditions, low frequency spurs can be induced in the crystal oscillator of the ADF7023-J.
Issue	The crystal oscillator circuit of the ADF7023-J can exhibit spurs under certain conditions. These spurs are evident at RF at an offset frequency of approximately 7 kHz to 8 kHz. The spurs are more likely to occur with - Reduced C_{LOAD} - Reduced Temperature - Increased XOSC_CAP_DAC value These spurs do not occur in the condition where the crystal input XOSC26N is driven by an external source. See the ADF7023-J data sheet for details on configuring for crystal oscillator operation.
Workaround	Introducing a series 150 Ω resistor on Pin 13 XOSC26P (R_S in Figure 1), together with limiting the XOSC_CAP_DAC setting to a maximum value of 4, will eliminate these spurs over the temperature range of the device.
Related Issues	None.
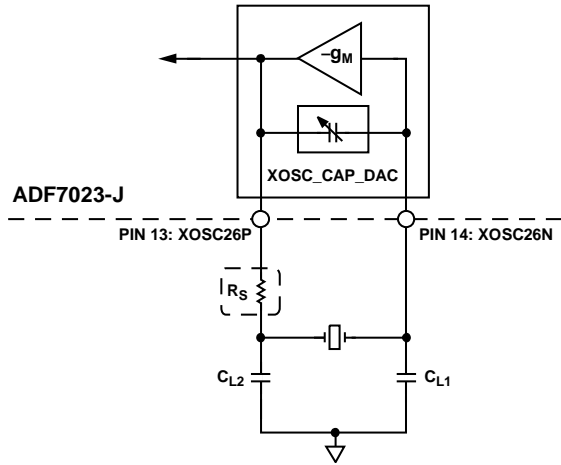
Figure 1. Recommended Crystal Oscillator Configuration

SECTION 1. ADF7023-J FUNCTIONALITY ISSUES

Reference Number	Description	Status
er001	RC oscillator accuracy	Fixed
er002	External PA and LNA enable on ADCIN_ATB3 and ATB4	Fixed
er003	External PA and LNA enable on XOSC32KP_GP5_ATB1 and XOSC32KN_ATB2	Fixed
er004	Optimum uncalibrated image attenuation	Feature: Refer to ADF7023-J data sheet (Rev. A or later)
er005	Receiver sensitivity at 910 MHz	Improved
er006	Receiver sensitivity at 923 MHz	Open
er007	Crystal oscillator low frequency spurs	Open

NOTES

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