

AS3911 NFC Initiator / HF Reader IC

1 General Description

The AS3911 is a highly integrated NFC Initiator / HF Reader IC. It includes the analog front end (AFE) and a highly integrated data framing system for ISO 18092 (NFCIP-1) initiator, ISO 18092 (NFCIP-1) active target, ISO 14443 A and B reader (including high bit rates) and Felica™ reader. Implementation of other standard and custom protocols is possible through using the AFE and implementing framing in the external microcontroller (Transparent mode).

Compared with concurrent NFC devices designed for the mobile phone in mind, the AS3911 is positioned perfectly for the infrastructure side of the NFC system, where users need optimal RF performance and flexibility combined with low power.

With *austriamicrosystems'* unique AAT technology, it is optimized for applications with directly driven antennas. The AS3911 is alone in the domain of HF Reader ICs in that it contains two differential low impedance (1Ω) antenna drivers.

The AS3911 includes several features, which make it incomparable for low power applications. It contains a low power capacitive sensor, which can be used to detect a presence of a card without switching on the reader field. Additionally, a presence of a card can be detected by performing a measurement of amplitude or phase of signal on antenna LC tank and comparing it to stored reference. It also contains a low power RC oscillator and wake-up timer which can be used to wake system after defined time period and check for a presence of a tag using one or more techniques of low power detection of card presence (capacitive, phase or amplitude).

The AS3911 is also qualified for use in automotive applications which makes it ideal for car access, ignition and diagnostic functions.

The AS3911 is designed for operation from wide power supply range from 2.4V to 5.5V, peripheral interface IO pins support power supply range from 1.65V to 5.5V.

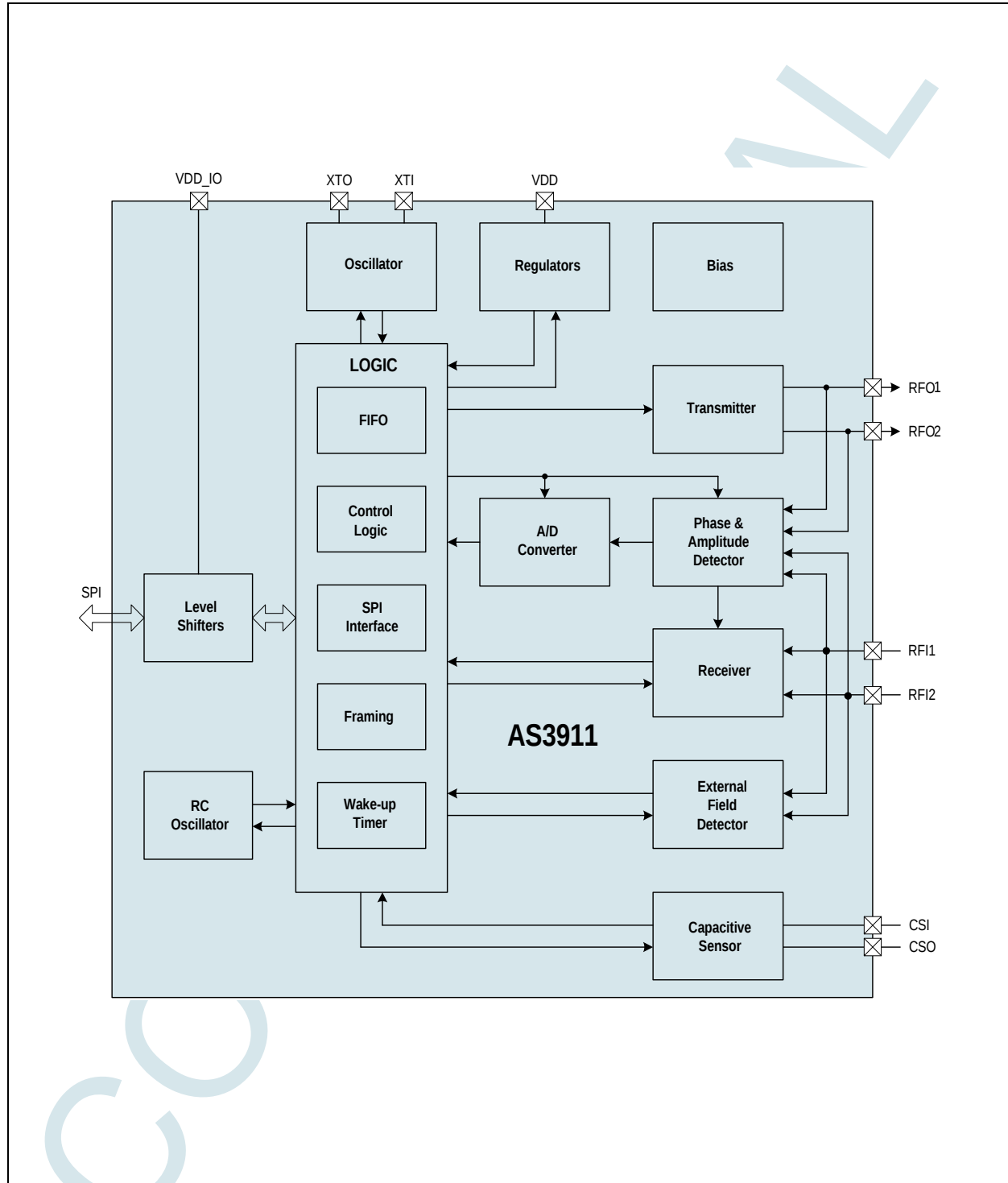
2 Key Features

- AAT system providing tuning of antenna LC tank
- Integrated capacitive sensing system for low power detection of tag presence (5 μ A consumption at sensing every 100ms)
- ISO 18092 (NFCIP-1) initiator
- ISO 18092 (NFCIP-1) target (only active mode)
- ISO 14443 A and B reader
- Felica™ reader
- Wide supply voltage range from 2.4V to 5.5V (3.3V and 5V modes)
- Support of VHBR (3.4 Mbit/s PICC to PCD framing, 6.8 Mbit/s AFE and PCD to PICC framing)
- Integrated system of low power detection of tag presence using phase or amplitude measurement
- Low power RC oscillator and configurable wake-up timer which controls low power detection of tag presence
- Close loop adjustment of ASK modulation for accurate control of modulation depth
- Low power operating mode reduces receiver consumption from 10mA to 4mA
- Low power (3.5 μ A) NFC target mode
- Integrated regulators to boost system PSRR
- AM and PM (I/Q) demodulator channels with automatic selection
- RSSI measurement
- Accurate RF amplitude and phase measurement (8-bit A/D)
- High output power:
 - Up to 1W in case of differential output
 - Up to 200mW in case of single ended output and antenna trimming is used
- Squelch feature which performs gain reduction to compensate for noise generated by transponder processing
- User selectable and automatic gain control
- Transparent and Stream modes to implement other standard and custom protocols
- Quartz oscillator capable of operating with 13.56MHz or 27.12MHz crystal with fast start-up
- Strong diagnostic features using the on board 8-bit A/D converter
- Serial peripheral interface (SPI) with 96 byte FIFO
- Large peripheral communication supply range from 1.65V to 5.5V
- Wide temperature range: -40°C to 85°C
- 32-pin QFN (5x5mm) package

3 Applications

The AS3911 is suitable for a wide range of applications including EMV Payment, Access Control, Automotive, NFC Infrastructure, and Ticketing.

Figure 1. AS3911 Block Diagram



Copyrights

Copyright © 1997-2011, austriamicrosystems AG, Tobelbaderstrasse 30, 8141 Unterpremstaetten, Austria-Europe. Trademarks Registered ®. All rights reserved. The material herein may not be reproduced, adapted, merged, translated, stored, or used without the prior written consent of the copyright owner.

All products and companies mentioned are trademarks or registered trademarks of their respective companies.

Disclaimer

Devices sold by austriamicrosystems AG are covered by the warranty and patent indemnification provisions appearing in its Term of Sale. austriamicrosystems AG makes no warranty, express, statutory, implied, or by description regarding the information set forth herein or regarding the freedom of the described devices from patent infringement. austriamicrosystems AG reserves the right to change specifications and prices at any time and without notice. Therefore, prior to designing this product into a system, it is necessary to check with austriamicrosystems AG for current information. This product is intended for use in normal commercial applications. Applications requiring extended temperature range, unusual environmental requirements, or high reliability applications, such as military, medical life-support or life-sustaining equipment are specifically not recommended without additional processing by austriamicrosystems AG for each application. For shipments of less than 100 parts the manufacturing flow might show deviations from the standard production flow, such as test flow or test location.

The information furnished here by austriamicrosystems AG is believed to be correct and accurate. However, austriamicrosystems AG shall not be liable to recipient or any third party for any damages, including but not limited to personal injury, property damage, loss of profits, loss of use, interruption of business or indirect, special, incidental or consequential damages, of any kind, in connection with or arising out of the furnishing, performance or use of the technical data herein. No obligation or liability to recipient or any third party shall arise or flow out of austriamicrosystems AG rendering of technical or other services.



Contact Information

Headquarters

austriamicrosystems AG
Tobelbaderstrasse 30
A-8141 Unterpremstaetten, Austria
Tel: +43 (0) 3136 500 0
Fax: +43 (0) 3136 525 01

For Sales Offices, Distributors and Representatives, please visit:

<http://www.austriamicrosystems.com/contact>