NFC for Point of Sale

www.ams.com/AS3911

AS3911 – HF-RFID reader IC

- EMV Compliance
- Antenna Auto Tuning
- Capacitive wakeup – sleep current of 5µA
- 1W output power
- VHBR to 6.8Mbit/s

We provide innovative analog solutions to the most challenging applications in sensor and sensor interfaces, power management, and wireless.

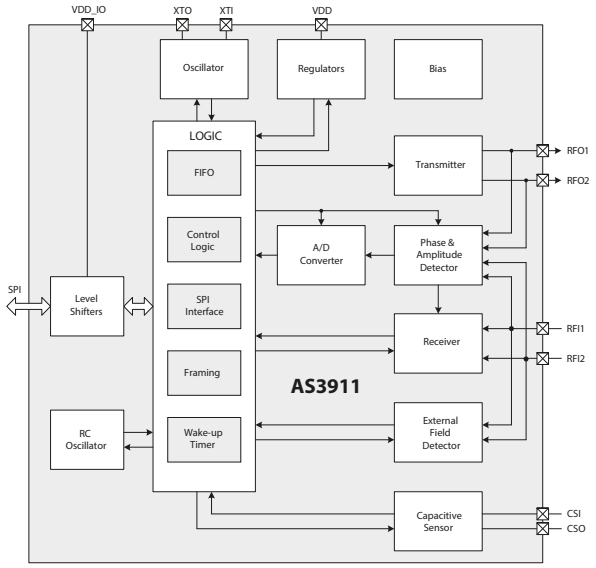
General Description

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 ams' 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.

Applications

- EMV Payment
- Access Control
- Automotive
- NFC Infrastructure
- Ticketing

AS3911 Block Diagram



Features

- AAT system providing tuning of antenna LC tank
- Integrated capacitive sensing system for low power detection of tag presence (5µA 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 (3.5µA) 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
- 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: -40ºC to 85ºC
- 32-pin QFN (5x5mm) package

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