

# UHF RFID single chip reader EPC Class1 Gen2 compatible

## AS3990

Preliminary Information

### General Description

The AS3990 UHF reader chip is an integrated analogue front end and data framing system for a 900MHz RFID reader system. Built in programming options make it suitable for a wide range of applications in UHF RFID systems. Designed to simplify the design and implementation of an EPC Class 1Gen2 reader, this IC requires only a standard 8Bit microcontroller with minimal other components.

The AS3990 comprises the EPC Class 1- Gen2 protocol (ISO 18000-6c) with digital high speed logic up to the framing level and supports the ISO 18000-6a and ISO 18000-6b Protocol with direct data mode. The Interface to the microcontroller can be either a 4 pin serial date Interface (SDI) or alternatively in case of high data rates are necessary an eight Bit parallel. The frame management will be done using a 12 Byte FIFO in order to decrease processor workload and ensure a smooth data stream and correct protocol handling. All low level transmission codec's and CRC generation is done internally.

An on chip level shifter with a special supply pin can be used to adapt microcontroller supply voltages in the range of 1.8- 3.3V for optimized power usage. In order to reduce the BOM, an integrated LDO with driver strength of 20mA can be used to supply the microcontroller. Additional regulators for the RF section suppress disturbances and thus allow noisy main supply.

A 20MHz crystal is used for the reference oscillator. Using this reference, an additional programmable glitch free clock output can be used to clock the microcontroller thus saving costs and current. In addition, by using the integrated power management features modes power-down, standby and active it is possible to shut down or reduce the microcontroller clock and hence save additional power.

### Applications

- Barcode label printers
- Add-on module for handheld computers, PDA
- Point of sales
- Currency reader
- UHF RFID reader systems
- Hand-held UHF RFID readers
- Toll systems
- mobile phones

### Key Features

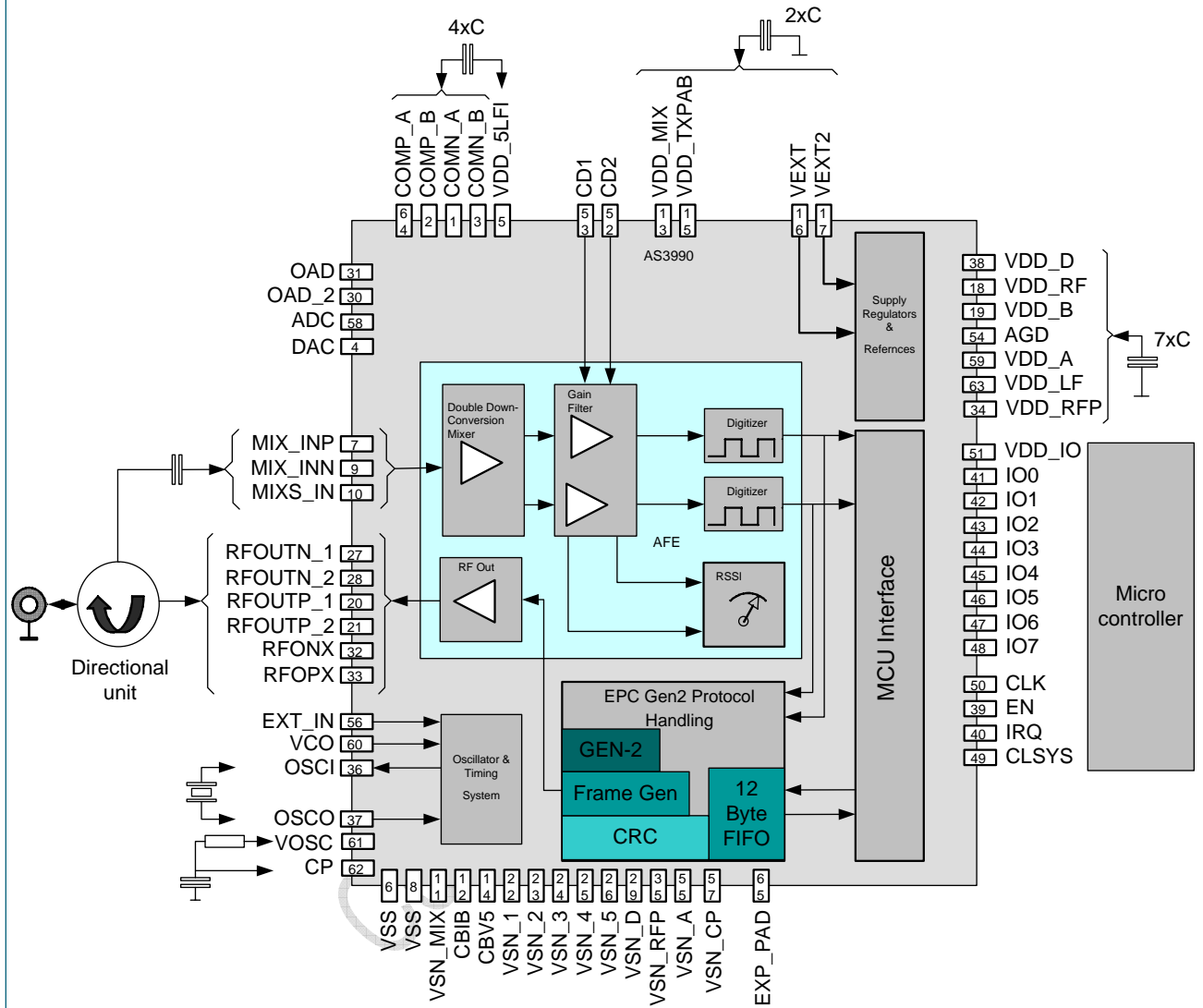
- Fully compliant with ISO 18000 6a, 6b, 6c and EPC Class 1- Gen2 protocol using external MCU
- EPC Class 1 -Gen2 framing support using low cost 8 Bit microcontroller
- Direct data mode in the frequency range of 860 to 960 MHz enables propriety Protocol support
- Internal power amplifier with level controlled 20dBm for short range applications
- Modulator using ASK or PR-ASK modulation
- Adjustable ASK modulation index
- Automatic selection between I and Q Signal ensuring no "communication holes"
- Built-in reception low-pass and high-pass filters having selectable corner frequencies.
- On chip VCO and PLL covering complete RFID frequency range and frequency hopping support
- Selectable receiver gain with AGC
- Supported link frequencies from 40 up to 640kHz

### Package

- 64 pin QFN 9\*9



## Block and Application Diagram



## Contact

austriamicrosystems AG  
 A 8141 Schloss Premstätten, Austria  
 T. +43 (0) 3136 500 0  
 F. +43 (0) 3136 525 01  
[wireless@austriamicrosystems.com](mailto:wireless@austriamicrosystems.com)

## Disclaimer

Preliminary Data Sheet is product information in formative or design phase of development. Characteristic data and other specifications are design goals. austriamicrosystems reserves the right to change or discontinue such products without notice.