

# GEN2 Reader IC

[www.ams.com/AS3993](http://www.ams.com/AS3993)



## AS3993 – GEN2 Reader IC with DRM

- Selectable receive sensitivity of -90dBm
- Internal power amplifier to 20dBm
- ISO18000-6C (EPC Gen2) protocol support
- ISO18000-6A/B easily implemented in Transparent mode
- 3.3V supply voltage (2.7V to 3.6V)

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

## General Description

The AS3993 UHF reader chip is the first in the next generation of EPC Class 1 Gen2 RFID Reader ICs from ams. It has a completely new low power architecture, down to 2.7V with 65mA, enabling battery powered, small form factor handheld and embedded applications.

The AS3993 now delivers high performance Gen 2 in a small QFN48 7x7, while retaining the flexibility, integration and simplicity of the previous generations. The small size combined with the low power operation makes it ideal for embedded or mobile applications.

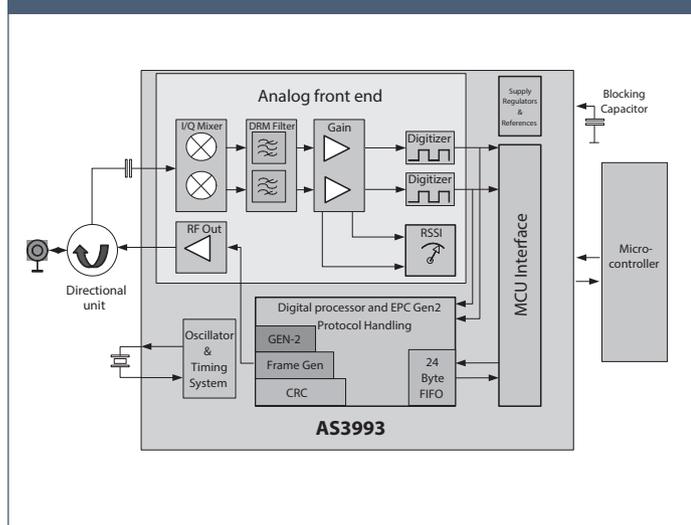
The AS3993 supports ISO29143 Air Interface protocol for mobile RFID Interrogators. Adding a simple low cost 8-bit microcontroller completes a portable UHF Reader system. In embedded systems, the low amount of code load required means the AS3993 can share a common CPU with the rest of the system, hence reducing the BOM further. The AS3993 has improved -90dBm sensitivity, whilst continuing to be robust against

antenna reflections or a self-jammer. This is critical for mobile or embedded applications, where the antenna design is challenged and the additional sensitivity/robustness is critical. This allows for a simpler and cheaper antenna to be used reducing overall BOM cost further. In addition, improved sensitivity ensures high reading quality. AS3993 includes on board, programmable, dense reader mode filters functionality, which prevents reading conflicts in a multi-reader environment. The internal PA has been optimized and delivers up to 20dBm reliably under all conditions. The improved integrated VCO now generates only -124dBc/Hz of noise. Complying with with EPC Class 1 Generation 2 protocol (ISO 18000-6C), ISO 29143 and ISO 18000-6A/B (in direct mode). The reader configuration is achieved by selecting the desired protocol settings in the control registers. Direct access to all control registers also allows fine-tuning of different reader parameters, meaning the AS399x family remains the most flexible UHF Reader IC on the market.

## Applications

- Embedded consumer/Industrial: beverage dispensing
- UHF mobile applications: product authentication

## AS3993 Block Diagram



## Features

- Selectable receive sensitivity of -90dBm
- Internal power amplifier to 20dBm
- ISO18000-6C (EPC Gen2) protocol support
- ISO18000-6A/B easily implemented in Transparent mode
- 3.3V supply voltage (2.7V to 3.6V)
- Filters dedicated to 250kHz and 320kHz M4 and M8 DRM operation
- Support of ISO29143 (Air Interface for Mobile RFID Interrogators)
- Antenna driver using ASK or PR-ASK modulation
- AM & PM demodulation eliminating communication holes through automatic I/Q selection
- On-board VCO -124dBc/Hz at 250kHz
- Significant increase of PSRR through on-chip RF output supply regulators
- Power-down, standby and active mode
- Frequency hopping support
- MCU using 24 bytes FIFO
- Selectable clock output for MCU
- Large peripheral communication supply range from 1.65V to 5.5V
- Integrated regulators with automatic setting to boost system PSRR

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