

AS3933 3D Low Frequency Wakeup Receiver

1 General Description

The AS3933 is a 3-channel low power ASK receiver that is able to generate a wakeup upon detection of a data signal which uses a LF carrier frequency between 15-150 kHz. The integrated correlator can be used for detection of a programmable 16-bit or 32-bit Manchester wakeup pattern. The device can operate using one, two, or three active channels.

The AS3933 provides a digital RSSI value for each active channel, it supports a programmable data rate and Manchester decoding with clock recovery. The AS3933 offers an internal Clock Generator, which is either derived from a crystal oscillator or the internal RC oscillator. The user can decide to use the external clock generator instead.

The programmable features of AS3933 enable to optimize its settings for achieving a longer distance while retaining a reliable wakeup generation. The sensitivity level of AS3933 can be adjusted in presence of a strong field or in noisy environments.

Antenna tuning is greatly simplified, as the automatic tuning feature ensures perfect matching to the desired carrier frequency.

The device is available in 16 pin TSSOP and QFN 4x4 16LD packages.

2 Key Features

- 3-channel ASK wakeup receiver
- Carrier frequency range 15 - 150 kHz
- One, two, or three channel operation
- Reliable 1-, 2- or 3-D wakeup pattern detection
- Programmable wakeup pattern (16-bit or 32-bit) Manchester
- Doubling of wakeup pattern supported (both for 16 and 32 bits)
- Wakeup without pattern detection supported

- Wakeup sensitivity 80 μ V_{RMS} (typ)
- Adjustable sensitivity level
- Highly resistant to false wakeups
- Easy antenna tuning for perfect matching on the wanted carrier frequency
- Self calibration of the internal RC-oscillator
- False wakeup counter
- Periodical forced wakeup supported (1s – 2h)
- Low power listening modes
- Current consumption in 3-channel listening mode 1.7 μ A (typ)
- Data rate adjustable from 0.5- 4 kbps (Manchester)
- Manchester decoding with clock recovery
- Digital RSSI values available for each channel
- Dynamic range 64 dB
- 5 bit RSSI step (2 dB per step)
- Clock Generator based on 32kHz XTAL, RC-OSC, or External Clock
- Operating temperature range -40 to +85°C
- Operating supply voltage 2.4 - 3.6V (TA = 25°C)
- Bidirectional serial peripheral interface (SPI)
- Package option: 16 pin TSSOP, QFN 4x4 16LD

3 Applications

The AS3933 is ideal for Active RFID tags, Real-time location systems, Operator identification, Access control, and Wireless sensors.