

General Description

A7108 is a monolithic low-IF architecture CMOS FSK/GFSK TRX for wireless applications in the 315/433/470/510/868/ 915MHz ISM bands. In addition, this device is especially suitable for the 470MHz ~ 510MHz wireless AMR (Auto Meter Reading) in China.

A7108 is one of AMICCOM's high performance Sub 1GHz family chips. This device offers a low cost solution with advanced radio features such as high output power amplifier up to 20 dBm (433MHz band, excluding LPF and HPF) and low phase noise receiver (- 114 dBm @ 10Kbps, -110dBm @50Kbps). Therefore, A7108 is very suitable for long LOS (line-of-sight) applications without the need to add an external LNA or PA.

The on-chip data rate divider supports programmable on-air data rates from 2K to 250Kbps to satisfy different system requirements. For a battery powered system, A7108 supports fast PLL settling time (35 us), Xtal settling time (500 us) and on-chip Regulator settling time (450 us) to reduce average power consumption.

For packet handling, A7108 supports direct mode as well as FIFO mode. In the RX direct mode, GIO1 or GIO2 can be serially output the raw data from the digital demodulator. In the TX direct mode, MCU can serially feed the digital data to GIO1 or GIO2 which is connected to the modulator. In the other hand, a packet in FIFO mode, the preamble is self generated and the physical packet ID is programmable up to 8 bytes. The built-in separated 64-bytes TX/RX FIFO is treated as payload for data buffering including CRC of error detection, FEC of error correction, data whitening for data encryption / decryption, and Manchester encoding.

Additional device features such as on-chip regulator, low battery detect, carrier detect, preamble detect, frame sync in FIFO mode, AGC (Auto Gain Control), AFC (Auto Frequency compensation), Auto calibration (VCO and IF Filter), programmable IF Filter, multi Xtal sources, on-chip Xtal compensated capacitors, and RSSI for the clear channel assistance are used to simplify system development and cost. Overall, A7108 is a high performance and a highly integrated ISM bands TRX with low BOM cost.

Feature:

Small size (QFN 4X4, 20 pins).

Frequency band: 315/433/470/868/915 MHz.

FSK and GFSK modulation.

Supports 3-wire or 4-wire SPI.

Deep sleep current (0.2uA).

Low sleep current (2 uA).

TX Current consumption 433MHz: 30mA @ 10dBm, 70mA @ 17dBm.

TX Current consumption 868MHz: 37mA @ 10dBm, 52mA @ 13dBm.

RX Current consumption (AGC Off) 434MHz: 13.5 mA and 868MHz: 14 mA.

On chip regulator, supports input voltage 2.0 ~ 3.6 V.

Programmable data rate from 2Kbps to 250Kbps.

Physical 64 bytes TX/RX FIFO buffers.

FIFO extension up to 256 bytes.

High RX sensitivity 433.92MHz.

-117dBm at 2Kbps on-air data rate.

-114dBm at 10Kbps on-air data rate.

-110dBm at 50Kbps on-air data rate.

-107dBm at 100Kbps on-air data rate.

-106dBm at 150Kbps on-air data rate.

-103dBm at 250Kbps on-air data rate.

Fast PLL settling time (35 us).

On-chip full range VCO and Fractional-N PLL synthesizer.

On-chip low power RC oscillator for WOR (Wake on RX) function.

AFC (Auto Frequency Compensation) for frequency drift due to Xtal aging.

Supports low cost crystal (12,8 / 16 MHz).

On chip 8-bit ADC and RSSI (Received Signal Strength Indicator).

Programmable IF filter bandwidth (50K / 100K / 150KHz / 250KHz).

Programmable threshold of carrier detect.

Frame synchronization recognition in FIFO mode.

FEC / Manchester / data whitening / CRC-16 (CRC-CCITT).

Application:

Wireless ISM band data communication

Remote Control

RKE (Remote Keyless Entry)

Wireless Energy Management

Home Automation

AMR (Auto Meter Reading)

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