

Features

- High FSK Sensitivity: -105.5 dBm at 20 Kbits/s, -109 dBm at 2.4 Kbits/s (433.92 MHz)
- High ASK Sensitivity: -111.5 dBm at 10 Kbits/s, -116 dBm at 2.4 Kbits/s (100% ASK Carrier Level, 433.92 MHz)
- Low Supply Current: 10.5 mA in RX Mode
- Data Rate 1 to 20 Kbits/s Manchester FSK, 1 to 10 Kbits/s Manchester ASK
- ASK/FSK Receiver Uses a Low IF Architecture with High Selectivity, Blocking, and Low Intermodulation (Typical 3-dB Blocking 55.5 dBC at ± 750 kHz/60.5 dBC at ± 1.5 MHz and 67 dBC at ± 10 MHz, System I1dBCP = -30 dBm/System IIP3 = -20 dBm)
- Wide Bandwidth AGC to Handle Large Outband Blockers above the System I1dBCP
- 226-kHz IF (Intermediate Frequency) with 30-dB Image Rejection and 220-kHz System Bandwidth to Support TPM Transmitters using ATA5756/ATA5757 Transmitters with Standard Crystals
- XTAL Tolerances Compensated by Fractional-N Synthesizer with 800 Hz RF Resolution
- Single-ended RF Input
- RSSI (Received Signal Strength Indicator)
- Communication to Microcontroller with SPI Interface Working at 500 Kbits/s Maximum
- Configurable Self Polling and RX/TX Protocol Handling with FIFO-RAM Buffering of Received Data
- 1 Push Button Input and 1 Wake-up Input are Active in Power-down Mode
- Integrated XTAL Capacitors
- Low In-band Sensitivity Change of Typically ± 2.0 dB within ± 75 -kHz Center Frequency Change in the Complete Temperature and Supply Voltage Range
- Fully Integrated PLL with Low-phase-noise VCO, PLL Loop Filter and Full Support of Multi-channel Operation with Arbitrary Channel Distance due to Fractional-N Synthesizer
- Sophisticated Threshold Control and Quasi-peak Detector Circuit in the Data Slicer
- 315 MHz and 433.92 MHz without External VCO and PLL Components
- Efficient XTO Start-up Circuit (> -1.5 -k Ω Worst-case Start Impedance)
- Changing of Modulation Type ASK/FSK and Data Rate without Component Changes to Allow Different Modulation Schemes in TPM and RKE
- Minimal External Circuitry Requirements for Complete System Solution
- Clock and Interrupt Generation for Microcontroller
- ESD Protection at all Pins (± 2.5 kV HBM, ± 200 V MM, ± 500 V FCDM)
- Supply Voltage Range: 2.15V to 3.6V or 4.4V to 5.25V
- Typical Power-down Current < 10 nA
- Temperature Range: -40°C to +105°C
- Small 7 mm $\times$ 7 mm QFN48 Package



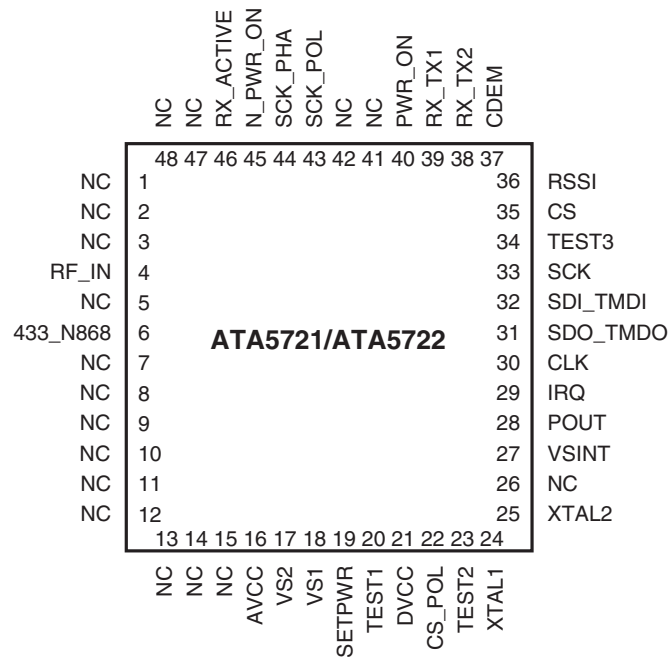
UHF ASK/FSK Receiver

ATA5721
ATA5722



1. Pin Configuration

Figure 1-1. Pinning QFN48



2. Change Notice Based on Datasheet ATA5823/ATA5824 -- UHF ASK/FSK Transceiver Rev. 4829D-RKE-06/06

This change notice is based on the datasheet of the UHF transceiver ATA5823/ATA5824 and describes the changes and extensions of the receiver ATA5721/ATA5722.

The receiver contains the same silicon as the transceiver, a UHF front-end die ATA5890 or ATA5891 (depending on the frequency version 433.92 MHz or 315 MHz) and the signal processing die ATA5889.

Unlike the transceiver, the receiver does not have the transmit functionality, and pins 8, 9 and 10 are not connected. The only change to the receiver is that it has a different bonding inside to disable the TX functionality.

All described specifications and parameters of the transmit functionality in the transceiver datasheet are not valid for the receiver. If the device is programmed to operate in receive mode, there will be no difference between the transceiver and receiver. The user has the ability to program the dedicated registers for transmit mode and switch the receiver into transmit mode; if this is done, the receiver will not work.

In addition to the removed transmitter functionality, the receiver ATA5721/ATA5722 is also not specified or released for the use in the 867-MHz to 870-MHz frequency band. All described specifications and parameters of the 868.3 MHz receive functionality in the transceiver datasheet are also not valid for the receiver.

The receive functionality will be fully tested according to the Electrical Characteristics of the transceiver to guarantee the same performance of the 315-MHz version ATA5721 and 433.92-MHz version ATA5722.

Below, all changes and extensions of the receiver functionality are described in detail with cross references to the transceiver datasheet. The feature list is completely adapted for the receiver.

3. Changes and Extensions of the Receiver ATA5721/ATA5722 Compared to the Transceiver Datasheet ATA5823/ATA5824

- IC changed from transceiver to receiver due to removed TX functionality
- Device type numbers changed from ATA5823 to ATA5721 (313-MHz to 316-MHz version) and from ATA5824 into ATA5722 (433-MHz to 435-MHz version)
- No TX operation mode available due to removed bondwires of pins 8, 9 and 10
- Pins 8, 9 and 10 are NC (not connected) and have to be soldered to GND on the PCB
- No full-duplex operation mode possible
- All descriptions of TX operation in half-duplex mode are not valid
- The receiver type ATA5722 is only specified and tested in the frequency range of 433 MHz to 435 MHz, receive functionality in the 867-MHz to 870-MHz frequency band is neither specified nor tested.
- All descriptions of 867-MHz to 870-MHz applications are not valid.

Table 3-1. Changes and Extensions of the Receiver ATA5721/ATA5722 Compared to the Transceiver Datasheet ATA5823/ATA5824

Page	Note	Category of Change ⁽¹⁾
2	Benefit is a less demanding specification for the microcontroller due to handling of power-down mode, delivering of clock, and complete handling of receive protocol and polling	CH
3/4	Figure 2-1 "Pinning QFN48" and Table 2-1 "Pin Description" contains 3 pins (8, 9 and 10) changed to NC (Not Connected). Pin 6 (433_N868) still selects the input frequency range, but 868 MHz is not supported	CH CH
3/5	Figure 1-1 "System Block Diagram" and figure 2-2 "Block Diagram" contain an RF rReceiver section without a power amplifier part	CH
5	Figure 2-2 "Block Diagram" contains the input frequency range selection with pin 6, but 868 MHz is not supported.	CH
6/7/8	Application circuits figure 3-1, 4-1 and 5-1 are not valid Application circuit figure 6-1 is still valid, except the transmit application hints and the possibility to select the input frequency range between 433 MHz and 868 MHz	NV CH
18	Section 7.11 is still valid, except the descriptions of transmit operation mode	CH
19	Section 7.12 is not valid	NV
21	Section 7.13 is not valid	NV
23	Section 7.14 is not valid	NV
24	Sections 7.15 and 7.16 are not valid	NV
25	All of section 8 is not valid	NV
30	Table 9-1 is still valid, except the frequency calculation at 868.3 MHz	CH
36	Figure 12-1 is still valid, except the transmit-related bits in control registers 7 and 8.	CH
37	Section 12.2 is still valid for RX operation Table 12-2 is not valid	CH NV

Note: 1. Category of Change means: CH = values or definitions are changed, NV = values or definitions are not valid

Table 3-1. Changes and Extensions of the Receiver ATA5721/ATA5722 Compared to the Transceiver Datasheet ATA5823/ATA5824 (Continued)

Page	Note	Category of Change ⁽¹⁾
38	Table 12-5 is still valid, except the TX and full-duplex modes Table 12-6 is still valid, except the TX operation Table 12-9 is not valid	CH CH NV
39	Table 12-12 is still valid, except the TX and full-duplex modes	CH
40	Table 12-13 is still valid, except the TX mode	CH
41	Table 12-18 is still valid, except the full-duplex mode Table 12-19 and 12-20 are still valid, except the full-duplex mode	CH CH
42	Table 12-21 is not valid, except the TX and full-duplex modes Table 12-22 and 12-24 are not valid	CH NV
43	Table 12-25 is not valid	NV
50	Section 13.8 is valid, except the transmit mode	CH
60	Table 14-3 is still valid, except the Lim_min and Lim_max values for 868.3 MHz	CH
61	Section 14.2 is not valid	NV
64	Section 14.3 is not valid	NV
70	Table 14-8 is still valid, except interrupts caused by TX and full-duplex operation	CH
72	In section 17, Electrical Characteristics, all specifications, parameters, descriptions and conditions of the 868.3-MHz RX/TX application are not valid. Section 17 Electrical Characteristics No. 1.6 is not valid	NV NV
77-79	Section 17 Electrical Characteristics No. 3.1 through 3.11 are not valid	NV
79-81	Section 17 Electrical Characteristics No. 4.1 through 4.18 are not valid	NV
83	Section 17 Electrical Characteristics No. 6.1 and 6.2 are not valid	NV
83-84	Section 17 Electrical Characteristics No. 7.1 through 7.10 are valid except the Electrical Characteristics specified for 868.3 MHz	CH
84-85	Section 17 Electrical Characteristics No. 8.1 and 8.2 are not valid	NV
87	Section 18 Electrical Characteristics No. 10.12 and 10.13 are not valid	NV
87	Section 18 Electrical Characteristics No. 11.1 through 11.4 are not valid	NV
88	Section 19 Electrical Characteristics No. 12.11 and 12.12 are not valid	NV
89	Section 19 Electrical Characteristics No. 13.1 through 13.4 are not valid	NV
91	Section 20 Electrical Characteristics No. 16.1 is not valid	NV
93	Section 20 Electrical Characteristics No. 19.1 through 19.5 are not valid	NV
93	Section 21 Electrical Characteristics No. 20.12 is not valid	NV
96	Ordering information: ATA5721-PLQW QFN48 7 mm × 7 mm, Pb-free ATA5722-PLQW QFN48 7 mm × 7 mm, Pb-free	CH

Note: 1. Category of Change means: CH = values or definitions are changed, NV = values or definitions are not valid



Headquarters

Atmel Corporation
2325 Orchard Parkway
San Jose, CA 95131
USA
Tel: 1(408) 441-0311
Fax: 1(408) 487-2600

International

Atmel Asia
Room 1219
Chinachem Golden Plaza
77 Mody Road Tsimshatsui
East Kowloon
Hong Kong
Tel: (852) 2721-9778
Fax: (852) 2722-1369

Atmel Europe
Le Krebs
8, Rue Jean-Pierre Timbaud
BP 309
78054
Saint-Quentin-en-Yvelines Cedex
France
Tel: (33) 1-30-60-70-00
Fax: (33) 1-30-60-71-11

Atmel Japan
9F, Tonetsu Shinkawa Bldg.
1-24-8 Shinkawa
Chuo-ku, Tokyo 104-0033
Japan
Tel: (81) 3-3523-3551
Fax: (81) 3-3523-7581

Product Contact

Web Site
www.atmel.com

Technical Support
auto_control@atmel.com

Sales Contact
www.atmel.com/contacts

Literature Requests
www.atmel.com/literature

Disclaimer: The information in this document is provided in connection with Atmel products. No license, express or implied, by estoppel or otherwise, to any intellectual property right is granted by this document or in connection with the sale of Atmel products. **EXCEPT AS SET FORTH IN ATMEL'S TERMS AND CONDITIONS OF SALE LOCATED ON ATMEL'S WEB SITE, ATMEL ASSUMES NO LIABILITY WHATSOEVER AND DISCLAIMS ANY EXPRESS, IMPLIED OR STATUTORY WARRANTY RELATING TO ITS PRODUCTS INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT. IN NO EVENT SHALL ATMEL BE LIABLE FOR ANY DIRECT, INDIRECT, CONSEQUENTIAL, PUNITIVE, SPECIAL OR INCIDENTAL DAMAGES (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF PROFITS, BUSINESS INTERRUPTION, OR LOSS OF INFORMATION) ARISING OUT OF THE USE OR INABILITY TO USE THIS DOCUMENT, EVEN IF ATMEL HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.** Atmel makes no representations or warranties with respect to the accuracy or completeness of the contents of this document and reserves the right to make changes to specifications and product descriptions at any time without notice. Atmel does not make any commitment to update the information contained herein. Unless specifically provided otherwise, Atmel products are not suitable for, and shall not be used in, automotive applications. Atmel's products are not intended, authorized, or warranted for use as components in applications intended to support or sustain life.

© 2007 Atmel Corporation. All rights reserved. Atmel®, logo and combinations thereof, and others are registered trademarks or trademarks of Atmel Corporation or its subsidiaries. Other terms and product names may be trademarks of others.