
Replacing ATA5567/T5557/TK5551 with ATA5577

The ATA5577 is designed to be backwards compatible with the existing versions ATA5567/T5557 and TK5551 (most common modes).

It offers the customer an improved R/W performance and enables more flexibility for advanced applications by using the features of the Analog Front-End (AFE) option register.

In the initial state from production the AFE features of the ATA5577 are set to default values, making the ATA5577 performing similar to ATA5567, T5552 and TK5551.



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Application Note

4991A-RFID-02/08



Figure 0-1. ATA5577 Analog Front-End (AFE) Block 0, Page 1 Initial Configuration

| | | MSB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | LSB | | |
|--------------|----------|------------|---|---|-----------------|---|---|---------------|---|---|--------------------|----|----|---------------------------|----|----|-------------------------|----|----|---------------|----|----|--------------------|----|----|-------------------|----|----|----------|----|----|-----|----|---|
| Trans.-Order | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | |
| Content HEX | 0 | 0 | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | | |
| Content BIN | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Function | Lock Bit | Option Key | | | Soft Modulation | | | Clamp Voltage | | | Modulation Voltage | | | Clock Detection threshold | | | Gap Detection threshold | | | Write Damping | | | Demodulation Delay | | | Downlink Protocol | | | Reserved | | | | | |

Compatibility check:

The ATA5577 compatibility was checked using the ATAk2270 RFID kit for the operation modes supported by the kit:

- Standard write
- Protected write
- Answer-ON-Request (AOR)
- Direct access
- Standard read page 0/1 for RF/32, Manchester and Biphase

Both tag version ATA5567/T5557/Tk5551 and ATA5577 have the same initial configuration for block 0 after leaving production.

Please consider that the operation mode for replacing, specified by block 0 set, is differently named in the datasheets of these transponder types.

For ATA5577 the setting is called “Basic Mode”

For ATA5567/T5557/TK5551 the setting is called “Compatible Mode”

Most of existing applications with the older versions can easily be replaced by ATA5577. But, there are some functional differences which may restrict the replacement for special applications.

Note: For any further questions about functional differences as listed by [Table 0-1](#), please contact our local Atmel® sales office or distributor.

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Table 0-1. Functional Differences within Basic Mode

| Transponder Type Function | ATA5577/ATA5567/T5557 | TK5551/T5551 |
|---|-------------------------|--------------------------|
| Sequence terminator at Maxblock = 0 | No | Yes |
| Block terminator | No | Yes |
| Stop Mode command | No | Yes |
| Block-read Mode (direct access) with terminator | Yes | No |
| Modulation stage | One | Two |
| After programming | Enters Block-read Mode | Enters Regular-read Mode |
| After reset or direct access | Precedes a "0" bit once | Precedes no bit |

Differences in configuration (Table 0-1 position 1 to 4) are performed in detail by block 0 setting Figure 0-2 and Figure 0-3.

For replacement, ATA5577 needs to be operated in Basic Mode, therefore X-mode (bit 15) and OTP (bit 24) of configuration block 0 have to be "0" (see Figure 0-2 and Figure 0-3).

Figure 0-2. ATA5577/ATA5567/T5557 Block 0 Initial Configuration Setting

| | | MSB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | LSB | | | | | |
|--------------|-------------------|-----------|---|---|---|----------|---|---|---|---------------|----|----|----|--------|------------|----|----|----|-------|---------------------------------|-----|--------|----|----|-----|-----------|------------|--------------|-----------|----|-----|----|----|---|---|---|
| Trans.-Order | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | | | |
| HEX | 0 | 0 | | | | 0 | | | | 0 | | | | 8 | | | | 8 | | | | 0 | | | | 4 | | | | 0 | | | | | | |
| BIN | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Function | Lock Bit | Safer Key | | | | Reserved | | | | Data Bit Rate | | | | X-Mode | Modulation | | | | PSKCF | AOR | OTP | MAXBLK | | | PWD | SST-Term. | Fast Write | Inverse Data | POR-Delay | | | | | | | |
| | never transmitted | | | | | | | | | RF/ 8 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | RF/ 16 | 0 | 0 | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | RF/ 32 | 0 | 1 | 0 | | | | | | | | | | | | | 0 | 1 | 0 | | | | | | | | |
| | | | | | | | | | | RF/ 40 | 0 | 1 | 1 | | | | | | | | | | | | | 0 | 1 | 1 | | | | | | | | |
| | | | | | | | | | | RF/ 50 | 1 | 0 | 0 | | | | | | | | | | | | | 1 | 0 | 0 | | | | | | | | |
| | | | | | | | | | | RF/ 64 | 1 | 0 | 1 | | | | | | | | | | | | | 1 | 0 | 1 | | | | | | | | |
| | | | | | | | | | | RF/ 100 | 1 | 1 | 0 | | | | | | | | | | | | | 1 | 1 | 0 | | | | | | | | |
| | | | | | | | | | | RF/ 128 | 1 | 1 | 1 | | | | | | | | | | | | | 1 | 1 | 1 | | | | | | | | |
| | | | | | | | | | | | | | | | | | | 0 | 0 | PSK-sub carrier frequency RF/ 2 | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | 0 | 1 | PSK-sub carrier frequency RF/ 4 | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | 1 | 0 | PSK-sub carrier frequency RF/ 8 | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | 1 | 1 | reserved | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | | | | | | | | | | | | | | | | | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | | | | | | | | | | | | | | | | | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | | | | | | | | | | | | | | | | | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | | | | | | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | | | | | | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | | | | | | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | | | | | | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | | | | | | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | | | | | | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | | | | | | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | | | | | | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | | | | | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | | | | | | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | | | | | | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Lock Bit (active "1")
 AOR Answer-ON-Request mode (active "1")
 PWD Password mode (active "1")
 SST Sequence Start Terminator (active "1")
 BR Bit Rate
 PSKCF PSK Clock Frequency
 MAXBLK see Maxblock Feature
 Reserved do not use
 X-Mode Bit 15 has to be "0"
 OTP Bit 24 has to be "0"



Figure 0-3. TK5551 Block 0 Initial Configuration Setting

| | MSB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | LSB | | | | | | | | | | | | | | | | | | | | | | | |
|--------------|--|---------------------|---|---|---|---|---|---|----------|----|---------|-----|-----|-------|-----|---------|--------|-----|----|----|------|----------|----|----|---------------------------------|---------------|--------------------|----|----|--|---------------------------------|-----|---|---|-------------------------|---|---------------------------------|---|-------------------------|---|---|---|-------------------------|---|---|---|-------------------------|---|---|---|-------------------------|---|---|---|-------------------------|
| Trans.-Order | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | | | | | | | | | | | | | | | | | | | | | | | |
| Content HEX | E | | | 6 | | | | 0 | | | | 8 | | | | 8 | | | | 0 | | | | 4 | | | | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Content BIN | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | |
| Function | Lock Bit | Auxiliary Header E6 | | | | | | | Reserved | BR | * Fixed | MS1 | MS2 | PSKCF | AOR | * Fixed | MAXBLK | PWD | ST | BT | STOP | Reserved | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | never transmitted | | | | | | | | | | | | | | | | | | | | | | 0 | 0 | 0 | trans. block no. 0 | 0 | 0 | 1 | trans. block no. 1 | 0 | 1 | 0 | trans. block no. 1 to 2 | 0 | 1 | 1 | trans. block no. 1 to 3 | 1 | 0 | 0 | trans. block no. 1 to 4 | 1 | 0 | 1 | trans. block no. 1 to 5 | 1 | 1 | 0 | trans. block no. 1 to 6 | 1 | 1 | 1 | trans. block no. 1 to 7 |
| STOP | Stop mode | (active "1") | | | | | | | | | | | | | | | | | | | | | 0 | 0 | PSK-sub carrier frequency RF/ 2 | | | | 0 | 1 | PSK-sub carrier frequency RF/ 4 | | | | 1 | 0 | PSK-sub carrier frequency RF/ 8 | | | | | | | | | | | | | | | | | | |
| AOR | Answer-On-Request Mode | (active "1") | | | | | | | | | | | | | | | | | | | | | 0 | 0 | reserved | | | | 1 | 1 | reserved | | | | | | | | | | | | | | | | | | | | | | | | |
| PWD | Password Mode | (active "1") | | | | | | | | | | | | | | | | | | | | | 0 | 0 | 0 | direct | 0 | 0 | 1 | PSK1 (phase change when input changes) | 0 | 1 | 0 | PSK2 (phase change on bitclk if input high) | 0 | 1 | 1 | PSK3 (phase change on rising edge of input) | | | | | | | | | | | | | | | | | |
| BT | Block Terminator | (active "1") | | | | | | | | | | | | | | | | | | | | | 0 | 0 | 0 | direct | 0 | 0 | 1 | PSK1 (phase change when input changes) | 0 | 1 | 0 | PSK2 (phase change on bitclk if input high) | 0 | 1 | 1 | PSK3 (phase change on rising edge of input) | | | | | | | | | | | | | | | | | |
| ST | Sequence Terminator | (active "1") | | | | | | | | | | | | | | | | | | | | | 0 | 0 | 0 | direct | 0 | 0 | 1 | PSK1 (phase change when input changes) | 0 | 1 | 0 | PSK2 (phase change on bitclk if input high) | 0 | 1 | 1 | PSK3 (phase change on rising edge of input) | | | | | | | | | | | | | | | | | |
| BR | Bit Rate | (active "1") | | | | | | | | | | | | | | | | | | | | | 0 | 0 | 0 | direct | 0 | 0 | 1 | PSK1 (phase change when input changes) | 0 | 1 | 0 | PSK2 (phase change on bitclk if input high) | 0 | 1 | 1 | PSK3 (phase change on rising edge of input) | | | | | | | | | | | | | | | | | |
| MS1 | Modulator Stage 1 | (active "1") | | | | | | | | | | | | | | | | | | | | | 0 | 0 | 1 | FSK 1 RF/ 8 | 0 | 0 | 1 | FSK 2 RF/ 8 | 0 | 1 | 0 | FSK 1a RF/ 5 | 1 | 0 | 0 | FSK RF/ 5 | | | | | | | | | | | | | | | | | |
| MS2 | Modulator Stage 2 | (active "1") | | | | | | | | | | | | | | | | | | | | | 0 | 0 | 1 | FSK 1 RF/ 8 | 0 | 0 | 1 | FSK 2 RF/ 8 | 1 | 0 | 1 | FSK RF/ 8 | 1 | 0 | 1 | FSK RF/ 10 | | | | | | | | | | | | | | | | | |
| PSKCF | PSK Clock Frequency | (active "1") | | | | | | | | | | | | | | | | | | | | | 0 | 1 | 0 | RF/ 32 | 1 | 0 | 0 | RF/ 40 | 1 | 0 | 0 | RF/ 50 | 1 | 0 | 1 | RF/ 64 | | | | | | | | | | | | | | | | | |
| MAXBLK | see Maxblock Feature | (active "1") | | | | | | | | | | | | | | | | | | | | | 0 | 1 | 1 | RF/ 100 | 1 | 1 | 0 | RF/ 128 | 1 | 1 | 0 | RF/ 100 | 1 | 1 | 1 | RF/ 128 | | | | | | | | | | | | | | | | | |
| Reserved | do not use | (active "1") | | | | | | | | | | | | | | | | | | | | | 0 | 0 | 0 | RF/ 8 | 0 | 0 | 1 | RF/ 16 | 0 | 0 | 1 | RF/ 32 | 0 | 1 | 1 | RF/ 40 | | | | | | | | | | | | | | | | | |
| * Fixed | Bit 15 and 24 have to be "0", otherwise malfunction will appear. | (active "1") | | | | | | | | | | | | | | | | | | | | | 0 | 1 | 0 | RF/ 32 | 0 | 1 | 1 | RF/ 40 | 1 | 0 | 0 | RF/ 50 | 1 | 0 | 1 | RF/ 64 | | | | | | | | | | | | | | | | | |
| | | (active "1") | | | | | | | | | | | | | | | | | | | | | 0 | 1 | 0 | RF/ 32 | 0 | 1 | 1 | RF/ 40 | 1 | 0 | 0 | RF/ 50 | 1 | 0 | 1 | RF/ 64 | | | | | | | | | | | | | | | | | |
| | | (active "1") | | | | | | | | | | | | | | | | | | | | | 0 | 1 | 1 | RF/ 100 | 1 | 1 | 0 | RF/ 128 | 1 | 1 | 0 | RF/ 100 | 1 | 1 | 1 | RF/ 128 | | | | | | | | | | | | | | | | | |
| | | (active "1") | | | | | | | | | | | | | | | | | | | | | 0 | 0 | 0 | RF/ 8 | 0 | 0 | 1 | RF/ 16 | 0 | 0 | 1 | RF/ 32 | 0 | 1 | 1 | RF/ 40 | | | | | | | | | | | | | | | | | |
| | | (active "1") | | | | | | | | | | | | | | | | | | | | | 0 | 1 | 0 | RF/ 32 | 0 | 1 | 1 | RF/ 40 | 1 | 0 | 0 | RF/ 50 | 1 | 0 | 1 | RF/ 64 | | | | | | | | | | | | | | | | | |
| | | (active "1") | | | | | | | | | | | | | | | | | | | | | 0 | 1 | 1 | RF/ 100 | 1 | 1 | 0 | RF/ 128 | 1 | 1 | 0 | RF/ 100 | 1 | 1 | 1 | RF/ 128 | | | | | | | | | | | | | | | | | |
| | | (active "1") | | | | | | | | | | | | | | | | | | | | | 0 | 1 | 0 | Manchester | 1 | 0 | 0 | Biphase | 1 | 1 | 0 | reserved | 1 | 1 | 1 | reserved | | | | | | | | | | | | | | | | | |
| | | (active "1") | | | | | | | | | | | | | | | | | | | | | 0 | 0 | 0 | direct | 0 | 1 | 0 | Manchester | 1 | 0 | 0 | Biphase | 1 | 1 | 0 | reserved | | | | | | | | | | | | | | | | | |
| | | (active "1") | | | | | | | | | | | | | | | | | | | | | 0 | 1 | 1 | FSK 2a RF/ 10 | 1 | 1 | 1 | FSK RF/ 8 | 0 | 0 | 0 | direct | 0 | 0 | 1 | PSK1 (phase change when input changes) | | | | | | | | | | | | | | | | | |
| | | (active "1") | | | | | | | | | | | | | | | | | | | | | 0 | 1 | 0 | FSK 2a RF/ 10 | 1 | 1 | 1 | FSK RF/ 8 | 0 | 0 | 0 | direct | 0 | 0 | 1 | PSK1 (phase change when input changes) | | | | | | | | | | | | | | | | | |



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
rfd@atmel.com

Sales Contact
www.atmel.com/contacts

Literature Requests
www.atmel.com/literature

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