



上海华虹集成电路有限责任公司
Shanghai Huahong Integrated Circuit Co., Ltd.

SHC1104

Short Form Specifications

Revision 1.0

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Short Product Information

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1 General Description

SHC1104, contactless IC card chip, consists of RF communication interface, security control unit and 8K bits EEPROM. It has been specially designed to meet the requirements of different systems and comparable applications such as personal certificates, e-purse, auto-payment system and AFC system in public transport. SHC1104 is fully accepted by SHHIC's SHC1506 (CDM) embedded in the reader.

2 Architecture

SHHIC's IC card application system consists of reader and contactless IC card.

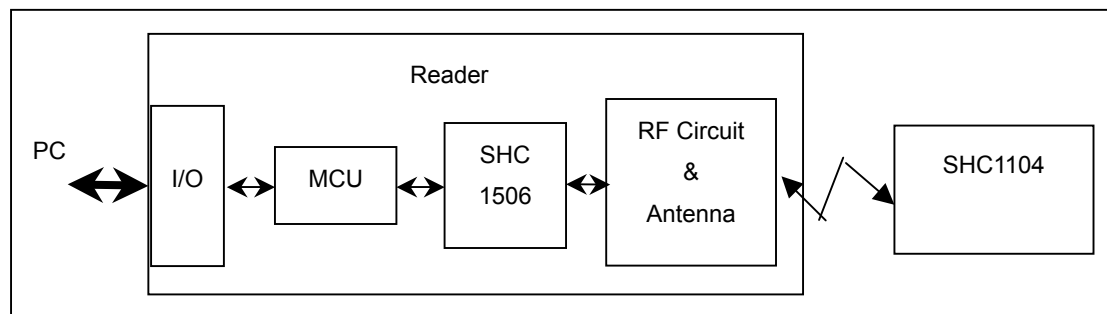


Figure 1 SHC1104 Application System

3 Block Description

SHC1104 is classified as SHHIC contactless IC card product family. SHC1104 altogether combines RF interface circuit, power supply circuit, logic control circuit, and EEPROM memory unit circuit.

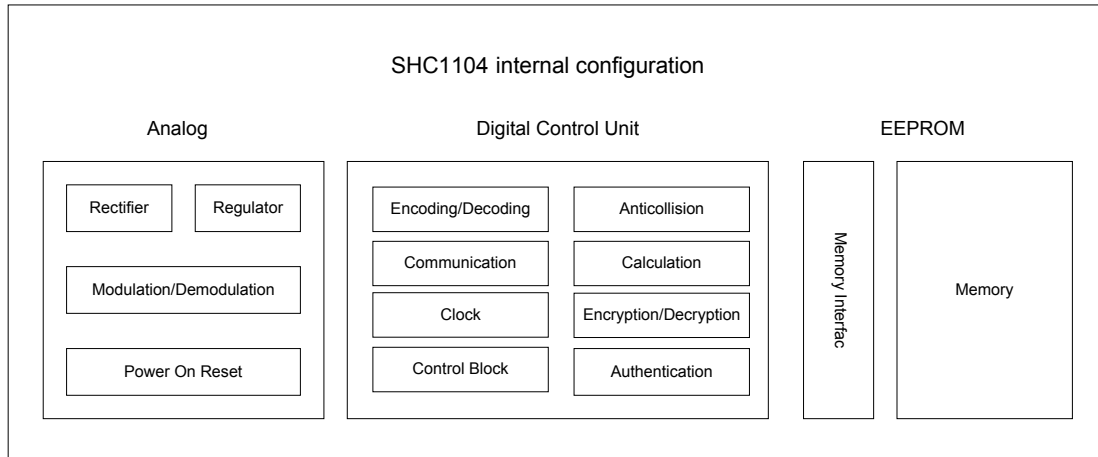


Figure 2 SHC1104 Internal Configuration

4 Features

- Operating frequency: 13.56 MHz
- Communication speed: 106k bps
- Modulation: ISO/IEC 14443 Type A
- Operating temperature: -20°C to 50°C
- EEPROM: 8K bits
- Card dimension: Conform to ISO10536 standard
- No battery needed: Contactless transmission of data and supply energy
- Anticollision: Operate more than one card in the field simultaneously
- Operating distance: 0 up to 100mm (depending on antenna geometry and field density)
- Operable when card moving
- Semi-duplex communication protocol
- Data integrity guaranteed by mechanisms below:
 - True anticollision
 - 16-bit CRC checking for each block
 - Parity check bit for each byte
 - Bit counting checking

- Bit coding to distinguish between '1', '0', and no information
- Channel monitoring (by protocol sequence and bit stream analysis)
- Supporting multi-card operation
 - True anticollision
- Operating more than one card in the field simultaneously to prevent data corruption resulting from sudden read, write or interrupt
 - Dynamic read or write
- When one card is selected, other cards can either enter or leave the RF field.
 - Fast anticollision protocol
- For each card, only 1ms is required to deal with anticollision.
- Data security
 - 3 pass mutual authentication (ISO / IEC DIS9798-2)
 - All data should be encrypted after authentication to prevent signal interception
 - Sole serial number for each card
 - Transfer key protection
- Memory organization supporting multi-functioning card
 - 8K bits EEPROM (16 Sectors x 4 Blocks x 16 Bytes x 8 Bits)
 - 16 Sectors with 4 blocks each
 - Block is minimum access unit with 16 bytes each
 - Individual set of keys for each block
 - User definable access condition for each block
 - Calculation: increment/decrement
- Data retention of 10 years
- Erase/write endurance of 100,000 times
- Card identification: 3.0ms + 1.0ms (Request/Answer + Anticollision)
- Authentication: 2.0ms
- Read block: 2.5ms
- Write block: 6.0ms
- Transfer: 4.5ms

- Typical transaction time less than 100ms
Including: Card identification + Read 6 blocks (2 sectors authentication) + Write 2 blocks (including backup management)

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