

HT1x

HITAG 1 transponder IC

Rev. 3.0 — 16 September 2011
210530

Product short data sheet
COMPANY PUBLIC

1. General description

HITAG 1 based transponders are highly integrated and do not need any additional components beside the external coil.

Data between Key (RWD) and transponder is transmitted bidirectionally, in Half Duplex Mode. The HITAG 1 transponder IC offers also an encrypted data transmission.

The AntiCollision (AC) Mode, which is used mainly in long range operation, allows to handle several transponders that are at the same time in the communication field of the antenna, thus achieving highest operating reliability and permitting to handle several transponders quickly and simultaneously.

The HITAG 1 transponder IC provides two protocol modes, Standard and Advanced Mode. The Advanced Protocol Mode operates compared to the Standard Protocol Mode with an increased number of Startbits and a 8-bit Cyclic Redundancy Check (CRC) sent by the transponder IC at read operations.

HITAG 1 transponder IC offer a memory of 2 kbit.

2. Features and benefits

- Identification transponder for use in contactless applications
- Operating frequency 125 kHz
- Data transmission and energy supply via RF link, no internal battery
- Non-volatile memory of 2 kbit
- Organized in 64 pages, 4 bytes each
- 10 years non-volatile data retention
- 100000 erase/write cycles
- Selective read/write protection of memory content
- Mutual authentication function

3. Applications

- Logistics
- Asset tracking
- Gas cylinder ID
- Industrial automation



4. Quick reference data

Table 1. Quick reference data

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|-------------------------------------|-------------------|---|--------|-----|-----|-------|
| Wafer EEPROM characteristics | | | | | | |
| t_{ret} | retention time | $T_{\text{amb}} \leq 55 \text{ }^{\circ}\text{C}$ | 10 | - | - | year |
| $N_{\text{endu(W)}}$ | write endurance | | 100000 | - | - | cycle |
| Interface characteristics | | | | | | |
| C_i | input capacitance | between LA and LB HT1ICS3002W/V6F | 189 | 210 | 231 | pF |

5. Ordering information

Table 2. Ordering information

| Type number | Package | | Version |
|-----------------|---------|--|-------------------------|
| | Name | Description | |
| HT1ICS3002W/V6F | Wafer | sawn wafer on FFC, 150 μm , 8 inch, UV, inkless | - |
| HT1MOA2S30/E/3 | PLLMC | plastic leadless module carrier package; 35 mm wide tape | SOT500-2 ^[1] |

[1] This package is also known as MOA2

6. Block diagram

The HITAG 1 transponder IC requires no external power supply. The contactless interface generates the power supply and the system clock via the resonant circuitry by inductive coupling to the RWD. The interface also demodulates data transmitted from the RWD to the HITAG 1 transponder IC, and modulates the magnetic field for data transmission from the HITAG 1 transponder IC to the RWD.

Data are stored in a non-volatile memory (EEPROM). The memory has a capacity of 2 kbit and is organized in blocks.

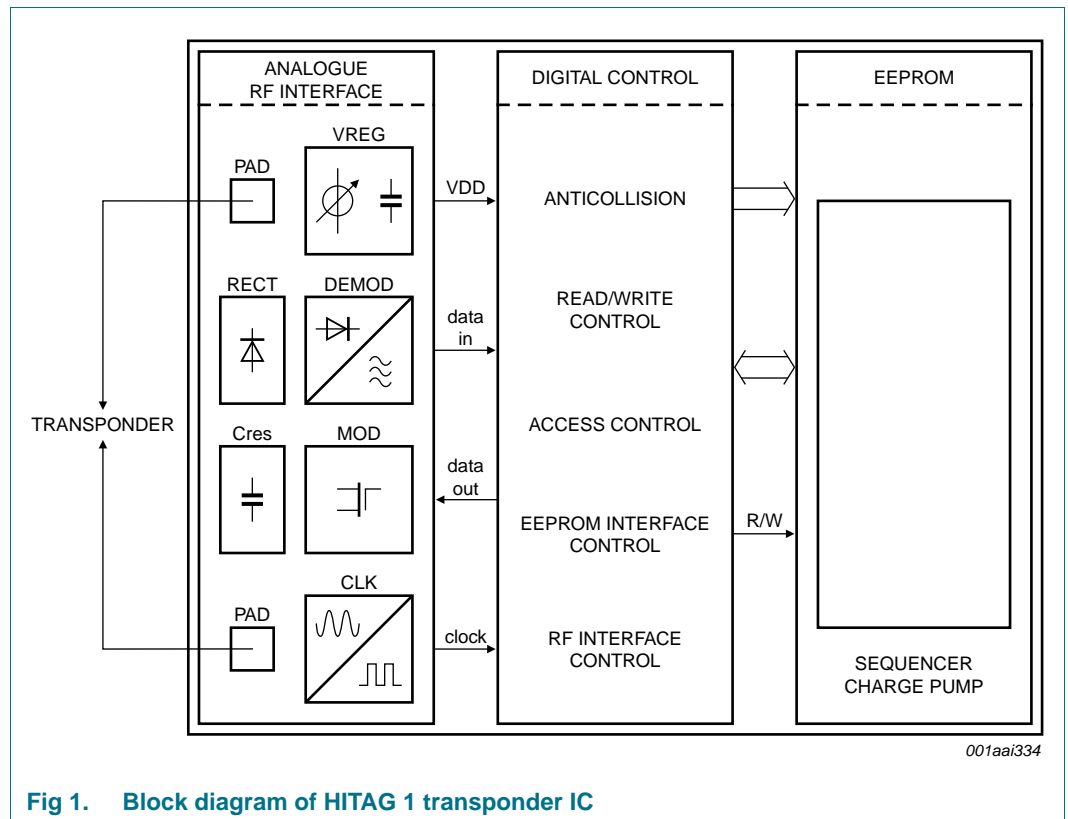


Fig 1. Block diagram of HITAG 1 transponder IC

7. Functional description

7.1 Memory map

The 2 kbit memory area of the HITAG 1 transponder IC is divided into 16 blocks. Each block comprises 4 pages with 4 bytes (1 byte = 8 bits) each. A page is the smallest access unit.

Addressing is done pagewise (page 0 to 63) whereas access is gained either pagewise or blockwise by entering the respective start address.

Block access is only available for blocks 2 to 15, page access is available for pages 0 to 63.

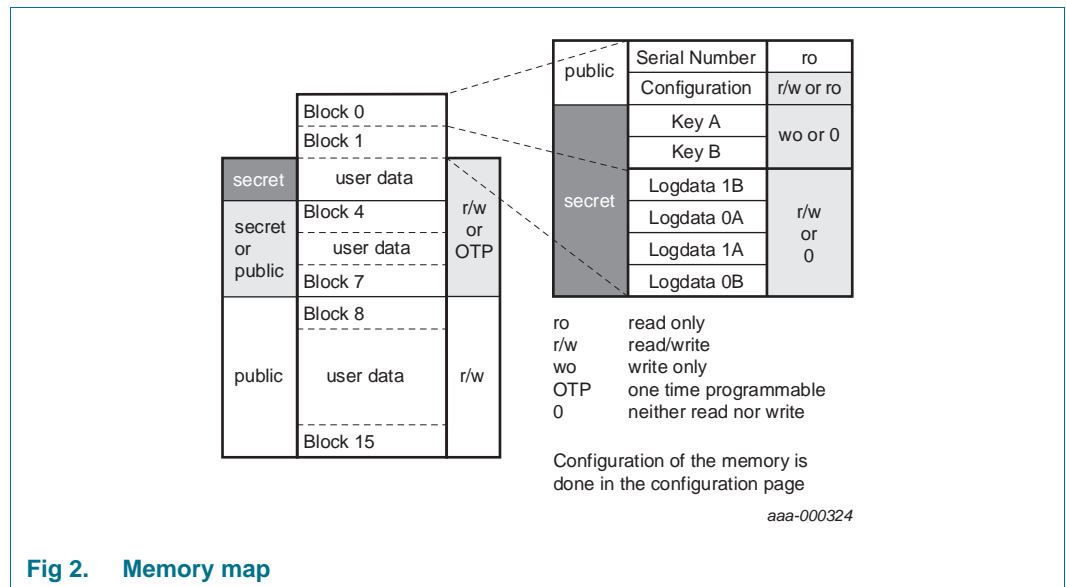


Fig 2. Memory map

Areas (or settings) with light dark background can be configured by the customer within the Configuration Page (page 1 of block 0).

8. Limiting values

Table 3. Limiting values - HT1ICS3002W/V6F^[1]

| Symbol | Parameter | Conditions | Min | Max | Unit |
|---------------------|---------------------------------|---|------|------|------|
| V _{DD} | supply voltage | | -0.5 | 6.5 | V |
| V _{ESD} | electrostatic discharge voltage | MIL-STD 883D, Method 3015.7, Human Body | 2 | - | kV |
| I _{lu} | latch-up current | MIL-STD 883D, Method 3023 | 100 | - | mA |
| I _{i(max)} | maximum input current | IN1-IN2 | - | 30 | mA |
| T _j | junction temperature | | -55 | +140 | °C |

[1] Stresses above those listed under Absolute Maximum Ratings may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any conditions other than those described in the Operating Conditions and Electrical Characteristics section of this specification is not implied.

Table 4. Limiting values - HT1MOA2S30/E/3^[1]

| Symbol | Parameter | Conditions | Min | Max | Unit |
|------------------|---------------------|---|-----|------|------|
| T _{stg} | storage temperature | | -55 | +125 | °C |
| T _{amb} | ambient temperature | R _{th(j-a)} ≤ 30 K/W @ I _{in} = 30 mA | -25 | +85 | °C |

[1] Stresses above those listed under Absolute Maximum Ratings may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any conditions other than those described in the Operating Conditions and Electrical Characteristics section of this specification is not implied.

9. Abbreviations

Table 5. Abbreviations

| Acronym | Description |
|---------|---|
| AC | AntiCollision |
| CRC | Cyclic Redundancy Check |
| EEPROM | Electrically Erasable Programmable Read-Only Memory |
| IC | Integrated Circuit |
| RF | Radio Frequency |
| RWD | Read Write Device |

10. Revision history

Table 6. Revision history

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|----------------|--------------|--------------------------|---------------|------------|
| HT1X_SDS v.3.0 | 20110916 | Product short data sheet | - | - |

11. Legal information

11.1 Data sheet status

| Document status ^{[1][2]} | Product status ^[3] | Definition |
|-----------------------------------|-------------------------------|---|
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13. Contents

| | | |
|-----------|-------------------------------------|----------|
| 1 | General description | 1 |
| 2 | Features and benefits | 1 |
| 3 | Applications | 1 |
| 4 | Quick reference data | 2 |
| 5 | Ordering information | 2 |
| 6 | Block diagram | 3 |
| 7 | Functional description | 4 |
| 7.1 | Memory map | 4 |
| 8 | Limiting values | 5 |
| 9 | Abbreviations | 5 |
| 10 | Revision history | 6 |
| 11 | Legal information | 7 |
| 11.1 | Data sheet status | 7 |
| 11.2 | Definitions | 7 |
| 11.3 | Disclaimers | 7 |
| 11.4 | Licenses | 8 |
| 11.5 | Trademarks | 8 |
| 12 | Contact information | 8 |
| 13 | Contents | 9 |

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