ST25TB product presentation

May 2020

Main ST25TB market segments

Smart Industry

Maintenance repair, asset tracking

Smart City

Transport, mass transit

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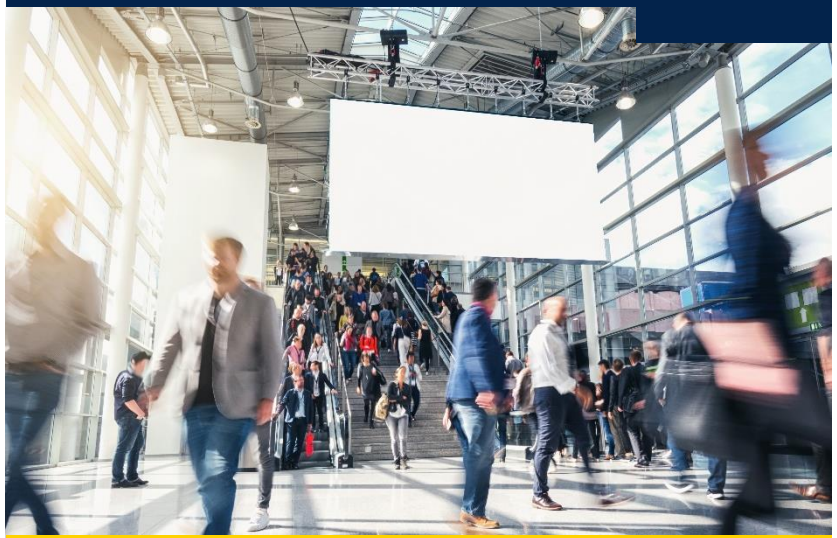
Key use cases

Mass transit ticketing

- One / multiple trip ticket

Event ticketing



- Event ticket or badge

Traceability

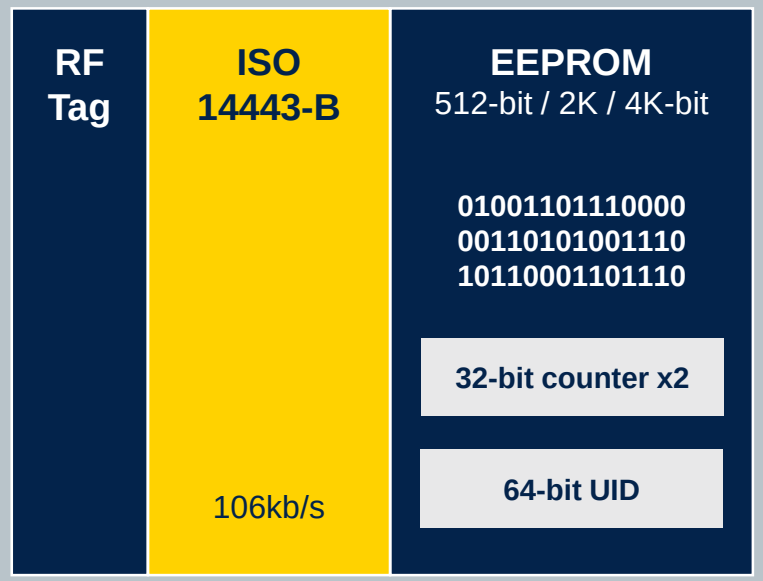
- RFID tag

ST25TB product

- The ST25TB chip belongs to ST25 NFC / RFID Tags
- The ST25TB product is HF Tag based on ISO14443 Type B standard with following main features:
  - ISO14443 RF interface
  - Up to 4kbit EEPROM memory with lock
  - 2x 32-bit counters with HW anti-tearing mechanism
  - OTP locks
  - 40 years data retention & 1Mcycles erase/write
  - SBN12: sawn and bumped wafer format, with 120µm die thickness

ST25TB RFID tag

ST25TB512 / 02K / 04K



SBN12
Die form, sawn and Bumped inkless 8" wafer, 120µm thickness

Use cases

- Mass transit and **transport**
- Event ticketing
- Asset tracking
- Brand protection, identification

Key Features

- Fast data transfer (ISO14443-B)
- Large and flexible counting capability with anti-tearing feature
- ST25TB512-AT version dedicated to transport
- 2x counters 32-bit with anti-tearing

Key Benefits

- Temperature range **-40°C to +85°C**
- 40 years data retention, **1M cycles** erase/write

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ST25TB product features

	ST25TB512-AC ST25TB02K-AC ST25TB04K-AC	ST25TB512-AT
Contactless Interface	ISO14443B Proprietary (No NFC compliancy)	
RF range	Short range, up to 10cm	
RF speed	Up to 106kbps	
Memory format	User EEPROM + Resettable OTP	User EEPROM
Memory size	512-bit / 2-Kbit / 4-Kbit	512-bit
Unique ID	64-bit	
Counter	2x 32-bit counters	
Security	OTP lock	
RF tuning capacitor	68pF	
Temperature range	-40°C to +85°C	
Package	SBN12 (Sawn and Bumped, 120µm thickness, inkless)	

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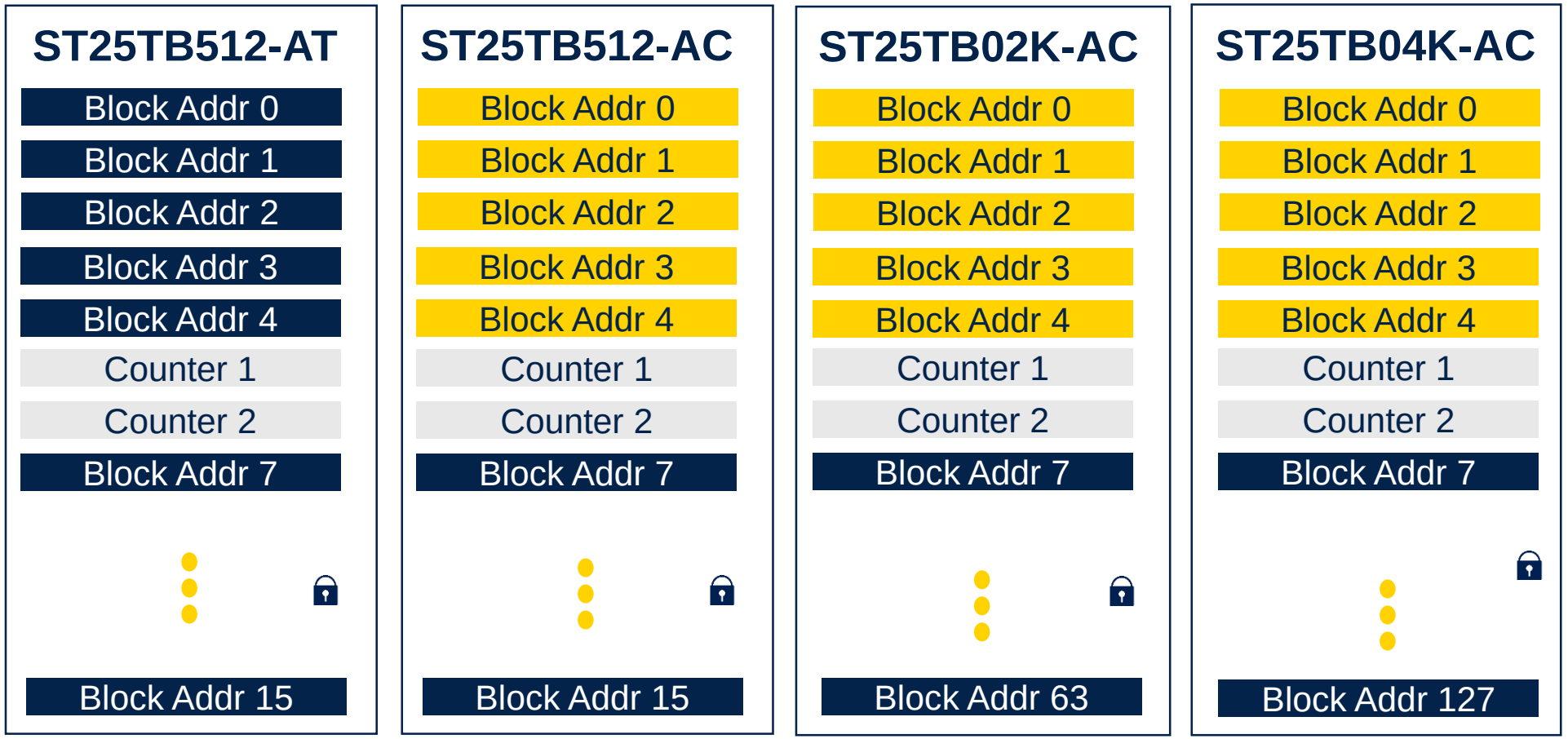
Memory organization



Lockable

OTP bits

Counters

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ST25TB counters

Reliable

- Two 32-Bits Counter
  - Means more than 4 billion events
- Count down only by step of 1 or more
  - Can not be reloaded once reached 00000000h
- HW Anti-tearing mechanism ensures the consistency of the counter
  - New value only lower than the stored one.
  - Previous value restored in case of power loss
- Write protected
  - Once protected, cannot be unprotected
- On ST25TBxxx-AC version
  - One counter is used to Reset OTP pages

0123456

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ST25TB anti tearing mechanism

Write New value < Old value

RF tuning capacitance

RF tuning capacitor value at 68pF

- The internal RF tuning capacitance is 68pF which is allowing antenna design from Class 1 to Class 6 form factor

	ST25TB
Standard	ISO14443
Main carrier frequency	13.56MHz
Data sub-carrier frequency	848kHz
Optimal frequency tuning	14.2MHz
Internal capacitor	68pF
Targeted coil value	1.9uH

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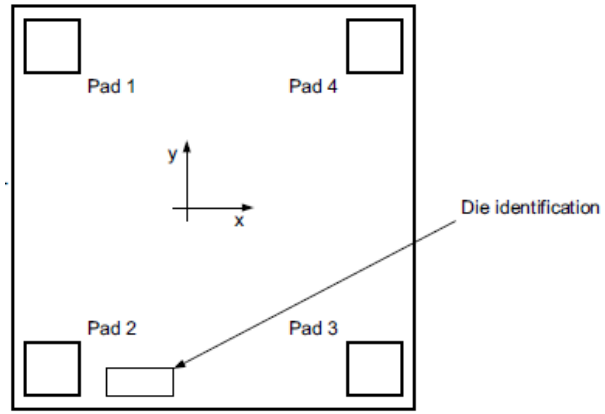
ST25TB package

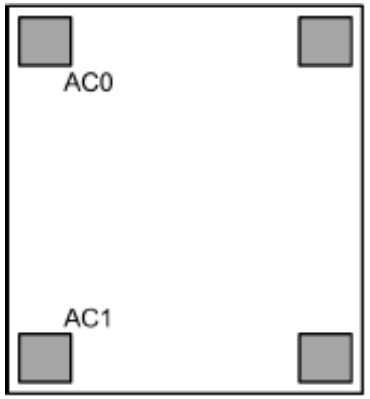
Sawn and bumped wafer

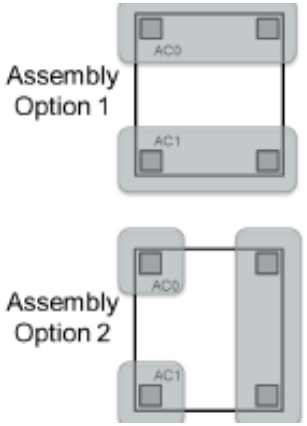
- Die form named SBN12
  - Sawn and Bumped wafer, 120µm thickness, inkless wafer format



Bump	Signal name
1	AC0
2	AC1
3	NC
4	NC

- Assembly option on inlay





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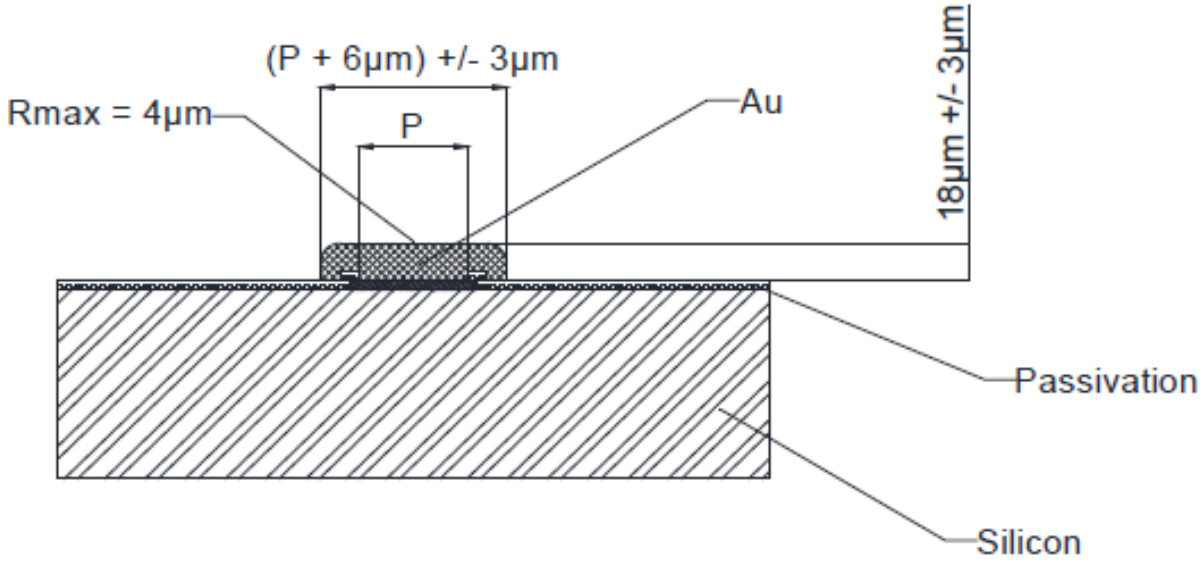
ST25TB bumped information

Bumps managed by Chipbond



P is pad opening size, see BSA

	New subcon ChipBond
Bump thickness (nom.)	18 µm
Bump dimension (nom.)	Passivation opening + 6 µm
Bump material	Au

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ST25TB rich eco-system

- Antenna e-design tool
- Inlay antenna samples

- PC software tool based on ST25 SDK

- Documentation
- Training
- Webinar / MOOC
- E2E community

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ST25TB in brief

To remind

- 512-bit, 2K-bit and 4K-bit user memory with write protect features
- Large and flexible counting capability with HW anti-tearing mechanism
- Flexible and easy scalable solution
  - EEPROM / One Time Programmable memory
  - Counters
  - Protections
- Established chips compatible with most popular contactless ticketing systems

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Solutions for NFC / RFID Tags & Readers

ST25

ST25 SIMPLY MORE CONNECTED

Thank you

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