

ST25TB series tags

April 2017





- 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
 - 2*32-bit counters with anti-tearing mechanism
 - OTP locks
 - 40 years data retention & 1Mcycles erase/write



Main ST25TB market segments

Smart Industry



Maintenance repair, Asset Tracking

Smart City



Transport, Mass transit



Key use cases

Mass transit Ticketing



- One/multiple trip ticket



Event ticketing



Traceability





ST25TB RFID tags



ST25TB512 / ST25TB02K / ST25TB04K

RF Tag	ISO 14443-B	EEPROM 512bit / 2K / 4K-bit
	Short Range 106kb/s	<pre>010011011100001 101010101111101 001101010011100</pre> 64-bit UID 32-bit counter x2

 **SBN12: sawn and bumped inked 8" wafer, 120µm thickness**

• Use cases

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

• Key features

- Fast data transfer (ISO14443-B)
- UID
- Write-Protected memory blocks
- One Time Programmable memory blocks

• Key benefits

- Large and flexible counting capability with anti-tearing feature
- Temperature range -40°C to +85°C
- 40 years data retention, 1M cycles erase/write



ST25TB product features

ST25TB512-AC
ST25TB02K-AC
ST25TB04K-AC

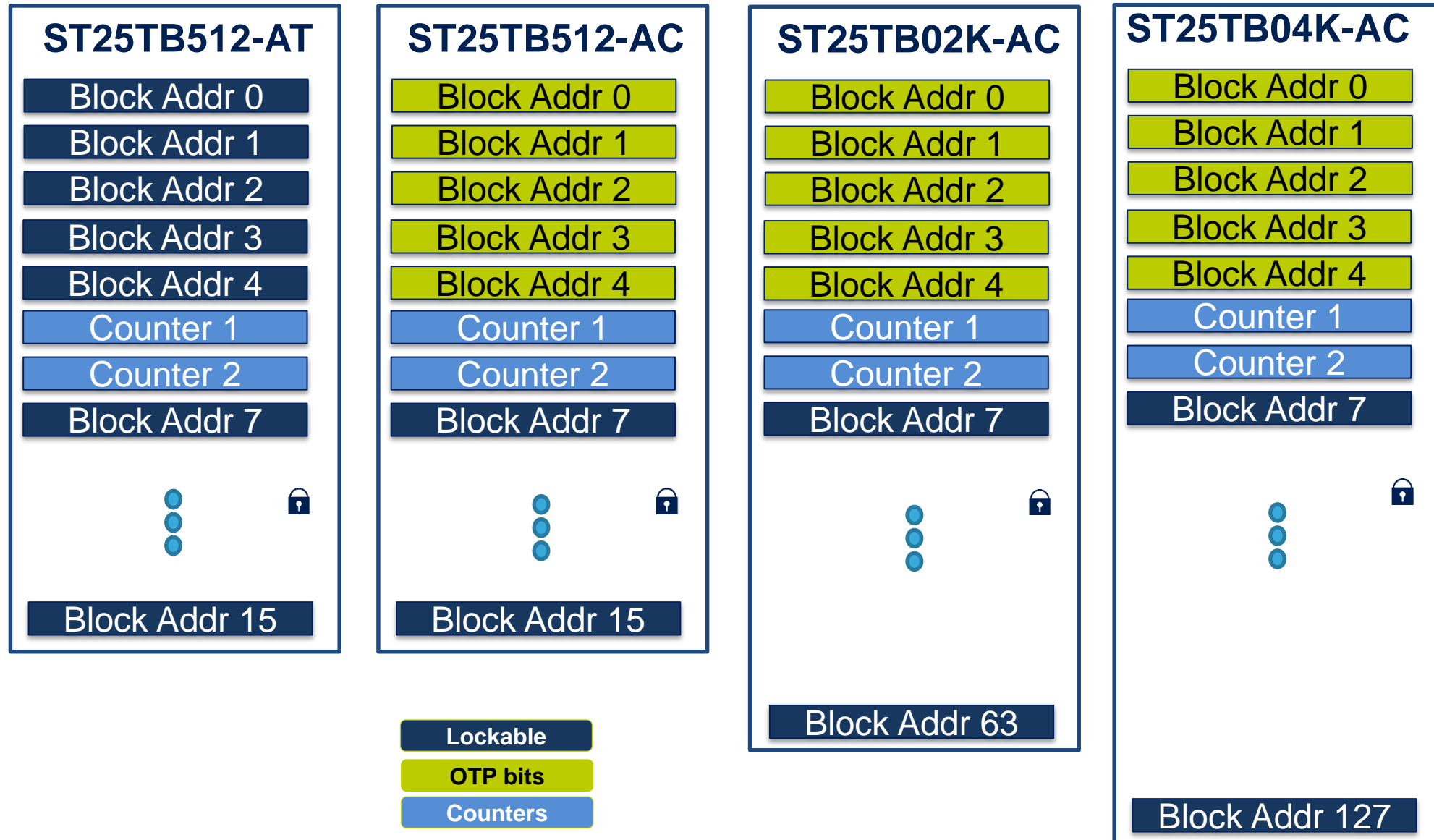
ST25TB512-AT

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
Unique ID	64-bit	
Memory size	512-bit / 2-Kbit / 4-Kbit	512-bit
Counter	2x 32-bit counters	
Security	OTP lock	
RF tuning capacitor	68pF ²	
Temperature range	-40°C to +85°C	
Package	SBN12 (Sawn and Bumped, 120µm thickness, inkless)	

²: 68pF internal RF tuning capacitor, equivalent to the 64pF value of current SRI/SRT chips.



Memory organization





Reliable

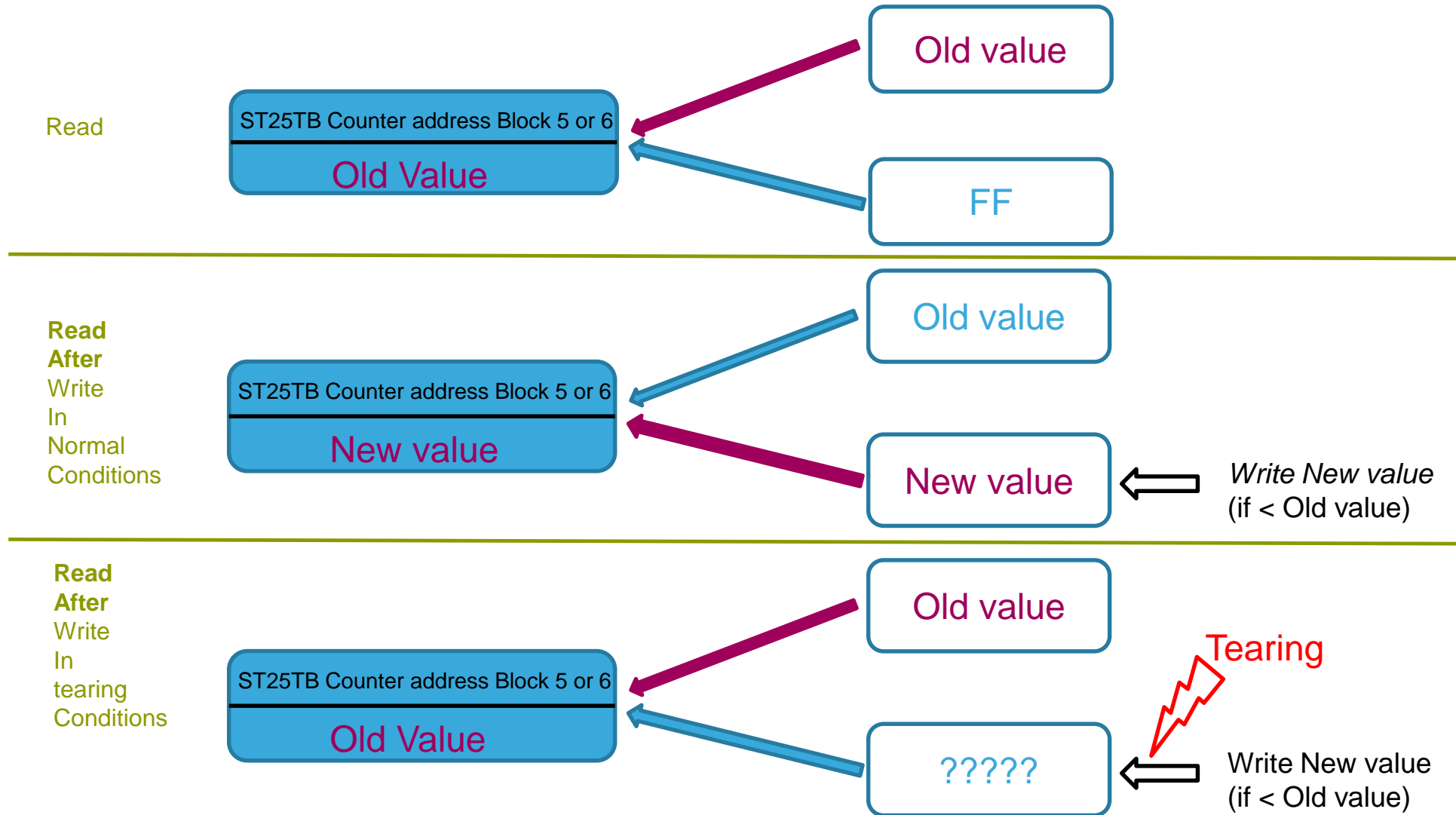
- **Two** 32-Bits Counter
 - means more than 4 billion events
- **Count down** only by step of 1 or more
 - can not be reloaded once reached 00000000h
- Anti-tearing mechanism ensures the consistency of the counter
 - **New value** only lower than the stored one.
 - Previous value **restored** in case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





ST25TB Anti tearing mechanism

Write New value < Old value





RF tuning capacitance

68pF

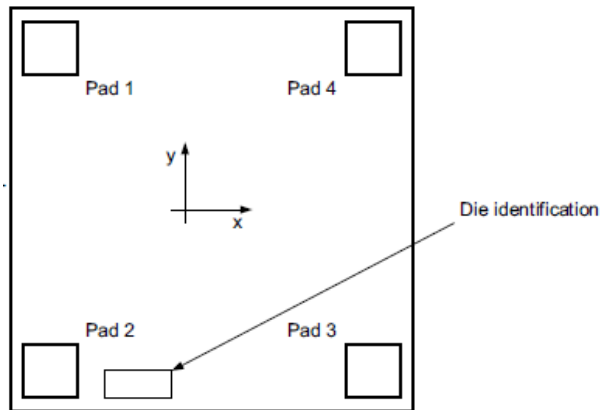
- The internal RF tuning capacitance is 68pF which is allowing antenna design from Class 1 to Class 6 form factor.

	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



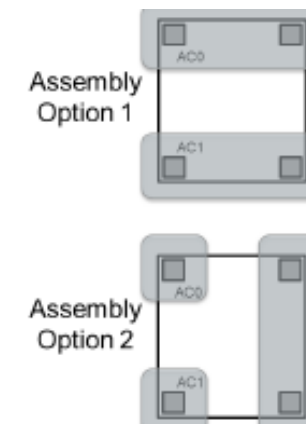
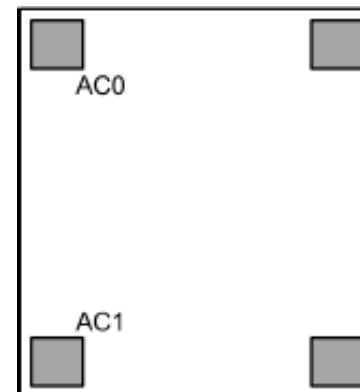
Different package

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



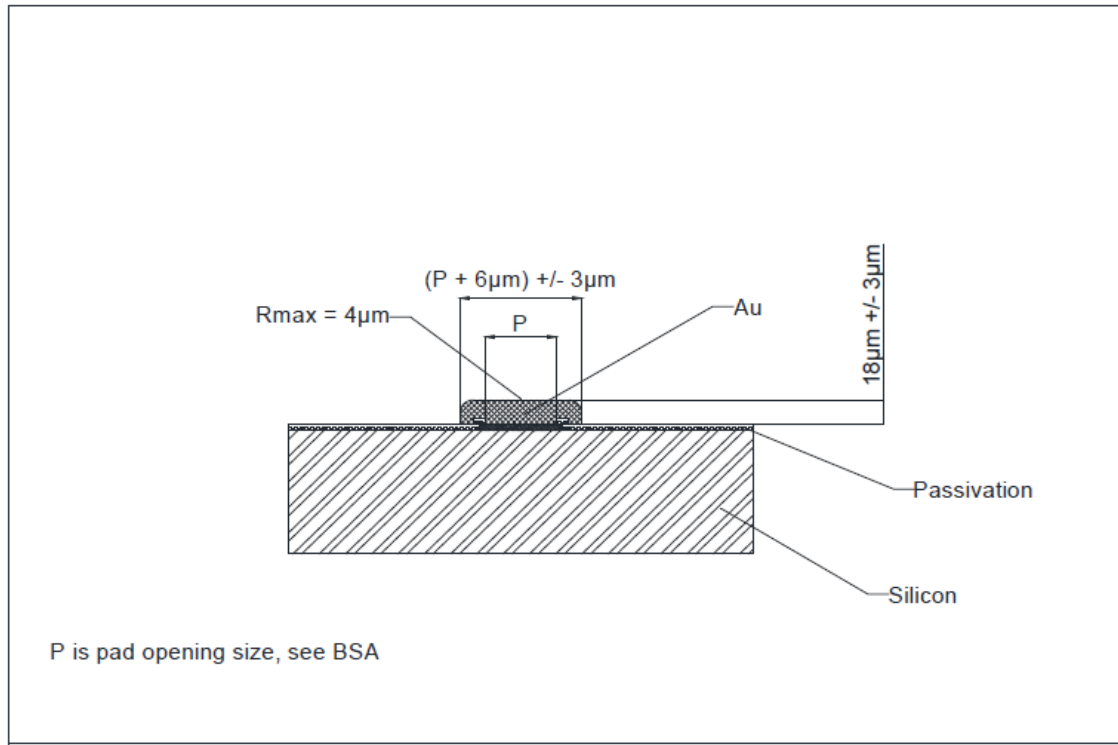
Bump	Signal name
1	AC0
2	AC1
3	NC
4	NC

- Assembly option on inlay





News



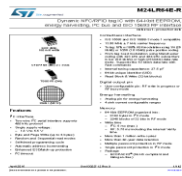
	New subcon ChipBond	Previous subcon PacTech
Bump thickness (nom.)	18 µm	20 µm
Bump dimension (nom.)	Passivation opening + 6 µm	Passivation opening + 40 µm
Bump material	Au	Ni (+ Au flash)



ST25TB support eco-system

Customer oriented

Documentation



e2e community



Antenna Design suite



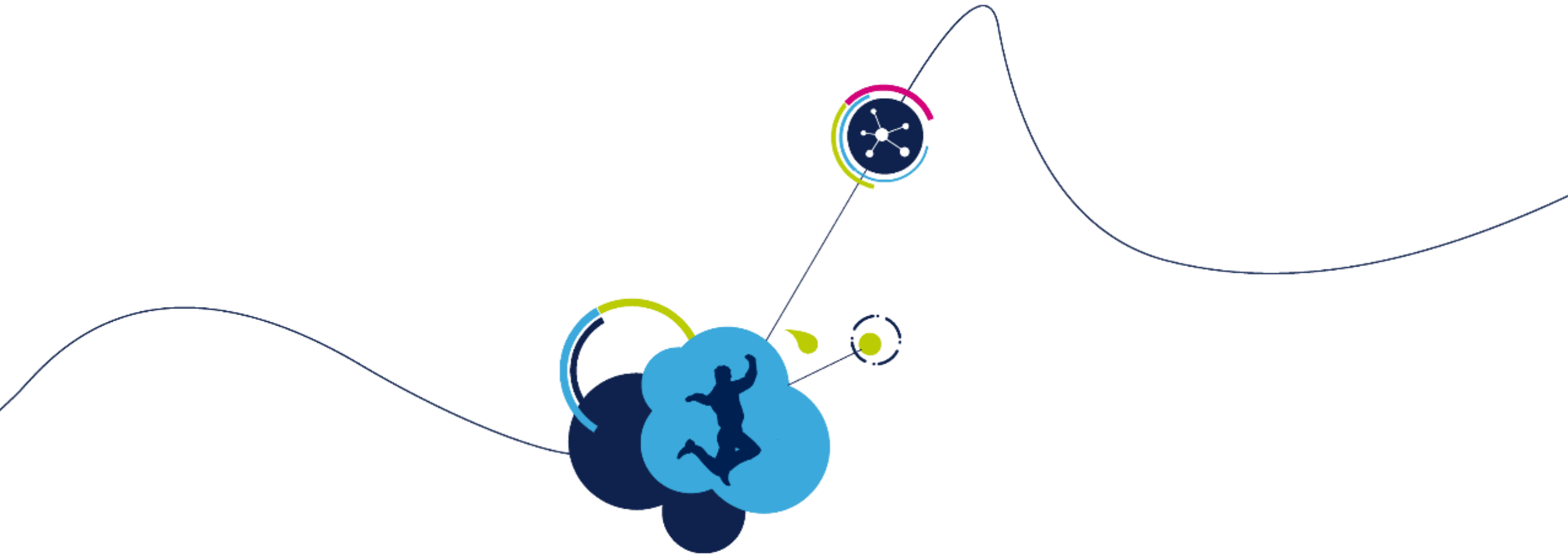
PC SW tools





To Remind

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



Thank You !