

NFC tag IC family overview – 13,56 MHz (HF)

Product features	NTAG® 210µ	NTAG® 210/212	NTAG® 213/213F	NTAG® 215	NTAG® 216/216F	NTAG® i²C 1K/2K	NTAG® i²C plus 1K/2K	NTAG® 213 TagTamper	NTAG® 424 DNA	NTAG® 424 DNA TagTamper
Memory										
NFC Forum type	NFC Type 2 Tag	NFC Type 2 Tag	NFC Type 2 Tag	NFC Type 2 Tag	NFC Type 2 Tag	NFC Type 2 Tag	NFC Type 2 Tag	NFC Forum Type 2 Tag	NFC Forum Type 4 Tag	NFC Forum Type 4 Tag
EEPROM size [byte]	80 (20 pages à 4 byte)	80 (20 pages à 4 byte) 164 (41 pages à 4 byte)	180 (45 pages à 4 byte)	540 (135 pages à 4 byte)	924 (231 pages à 4 byte)	1024/2048	1024/2048	184 (46 pages à 4 byte)	416	416
User memory [byte]	48	48/128	144	504	888	888/1904	888/1912	144	416	416
Write endurance [cycles]	100.000	100.000	100.000	100.000	100.000	200.000	500.000	100.000	200.000	200.000
Data retention [yrs]	10	10	10	10	10	20	20	10	50	50
RF-Interface										
According to	ISO14443A (up to layer 3) NFC Forum Type 2 Tag	ISO14443A (up to layer 3) NFC Forum Type 2 Tag	ISO14443A (up to layer 3) NFC Forum Type 2 Tag	ISO14443A (up to layer 3) NFC Forum Type 2 Tag	ISO14443A (up to layer 3) NFC Forum Type 2 Tag	ISO14443A (up to layer 3) NFC Forum Type 2 Tag	ISO14443A (up to layer 3) NFC Forum Type 2 Tag	ISO/IEC14443A (up to layer 3) NFC Forum Type 2 Tag	ISO/IEC14443A (up to layer 4) NFC Forum Type 4 Tag	ISO/IEC14443A (up to layer 4) NFC Forum Type 4 Tag
Frequency [MHz]	13.56	13.56	13.56	13.56	13.56	13.56	13.56	13.56	13.56	13.56
Baud-rate[KBit/s]	106	106	106	106	106	106	106	106	106/212/424/848	106/212/424/848
Anticollision	bit-wise	bit-wise	bit-wise	bit-wise	bit-wise	bit-wise	bit-wise	bit-wise	bit-wise	bit-wise
Security										
Unique serial number [byte]	7, cascaded	7, cascaded	7, cascaded	7, cascaded	7, cascaded	7, cascaded	7, cascaded	7, cascaded	7, cascaded	7, cascaded
Access keys	-	32 bit	32 bit	32 bit	32 bit	-	32 bit	32 bit	5 x 128 bit	5 x 128 bit
Access conditions	-	write, read and write	write, read and write	write, read and write	write, read and write	write, read and write	write, read and write	write, read and write	read, write, read & write	read, write, read & write
Write protection	-	blockwise	blockwise	blockwise	blockwise	blockwise	blockwise	blockwise	-	-
Security	-	password	password	password	password	-	password	password	128-bit AES, LRP	128-bit AES, LRP
Special features										
Field detection pin	-	-	✓ 1 (configurable)	-	✓ 1 (configurable)	✓ 1 (configurable)	✓ 1 (configurable)	-	-	-
i²C interface	-	-	-	-	-	✓	✓	-	-	-
Others	• Originality check with customizable (reprogrammable) originality signature	• UID ASCII mirror • Originality check • Fast Read	• UID ASCII mirror • NFC counter • NFC counter ASCII mirror • Originality check • Fast Read • Sleep mode via FD pin ¹	• UID ASCII mirror • NFC counter • NFC counter ASCII mirror • Originality check • Fast Read	• UID ASCII mirror • NFC counter • NFC counter ASCII mirror • Originality check • Fast Read • Sleep mode via FD pin ¹	• Passthrough mode 64 bytes SRAM buffer • Energy harvesting	• Passthrough mode 64 bytes SRAM buffer • Energy harvesting • T _{amb} = 105° C	• UID ASCII mirror • NFC counter • NFC counter ASCII mirror • Programmable Originality Signature • Fast Read • Tag Tamper detection • Current loop status command	• SUN (Secure Unique NFC) message • NFC counter • Flexible mirroring offset for UID, NFC tap counter, CMAC • File encryption and mirroring • 128-byte Proprietary file • Originality Signature • Anti brute-force attack design	• SUN (Secure Unique NFC) message • NFC counter • Flexible mirroring offset for UID, NFC tap counter, CMAC • File encryption and mirroring • 128-byte Proprietary file • Originality Signature • Tag Tamper detection and mirroring
Certification	NFC Forum	-	NFC Forum	NFC Forum	NFC Forum	-	NFC Forum	NFC Forum	NFC Forum, CC EAL4	NFC Forum, CC EAL4
Packages & capacitance types										
Sawn wafer (Au-Bumped)	NT2L1001G0DUD NT2H1001G0DUD	NT2L1011G0DUD	NT2H1311G0DUD	NT2H1511G0DUD	NT2H1611G0DUD	NT3H1101W0FUG NT3H1201W0FUG	NT3H2111W0FUG NT3H2211W0FUG	-	NT4H2421G0DUD NT4H2421G0DUF	NT4H2421TTDUD NT4H2421TTDUF
HXS0N4 (SOT1192-1)	-	-	NT2H1311F0DTL ¹	-	NT2H1611F0DTL ¹	-	-	-	-	-
XQFN8	-	-	-	-	-	NT3H1101FHK NT3H1201FHK	NT3H2111W0FHK NT3H2211W0FHK	-	-	-
TSSOP8	-	-	-	-	-	NT3H1101FTT NT3H1201FTT	NT3H2111W0FTT NT3H2211W0FTT	-	-	-
MOA8	-	-	NT2H1311G0DA8	NT2H1511G0DA8	NT2H1611G0DA8	-	NT3H2111W0FT1 NT3H2211W0FT1	-	NT4H2421G0DA8	-
Cres Capacitance [pF]	17/50	17	50	50	50	50	50	50	50	50

¹ NTAG 21x F version only

Low frequency IC family overview – 100-150 KHz (LF)

Product features	HITAG® 1	HITAG® 2	HITAG® S 256	HITAG® S 2048	HITAG® µ	HITAG® µ Advanced	HITAG® µ Advanced +
Memory							
Size [bit]	2048	256	256	2048	128	512	1760
Write endurance [cycles]	100.000	100.000	100.000	100.000	100.000	100.000	100.000
Data retention [yrs]	10	10	10	10	10	10	10
Organisation	64 blocks à 4 bytes	8 blocks à 4 bytes	8 blocks à 4 bytes	64 blocks à 4 bytes	4 blocks à 4 bytes	16 blocks à 4 bytes	55 blocks à 4 bytes
RF Interface							
According to	HITAG 1	HITAG 2 ISO 11784/85	HITAG 1+ ISO 11784/85	HITAG 1+ ISO 11784/85	ISO 11784/85	ISO 11784/85 ISO 14223	ISO 11784/85 ISO 14223
Frequency	100-150 kHz	100-150 kHz	100-150 kHz	100-150 kHz	100-150 kHz	100-150 kHz	100-150 kHz
Baud-rate[KBit/s]	up to 4	up to 4	up to 8	up to 8	up to 8	up to 8	up to 8
Anti-collision	collision detection	-	collision detection	collision detection	-	collision detection	collision detection
Security							
Unique ID [byte]	4	4	4	4	6	6	6
Access keys	32 bit	48 bit	48 bit	48 bit	32 bit	32 bit	32 bit
Access conditions	Encrypted mutual authentication or plain	Encrypted mutual authentication or plain	Authentication or plain	Authentication or plain	Plain, password	Plain, password	Plain, password
Encryption algorithm	✓	✓	for authentication only	for authentication only	-	-	-
Special features							
TTF modes	-	✓	✓	✓	✓	✓	✓
RTF modes	✓	✓	✓	✓	-	✓	✓
Write ISO 11785	-	-	-	-	✓	✓	✓
Delivery types							
Sawn wafer (Au Megabump)	-	-	HTS IC C56 01EW/C7	HTS IC C48 01EW/C7	✓	✓	✓
Sawn wafer (Au bump)	HT1 IC S30 02W/V6F	HT2 IC S2002W/V6F/R	HTS IC H56 01EW/V7	HTS IC H48 01EW/V7	-	-	-
MOA4	HT1 MOA4 S30/E/3	HT2 MOA4 S20/E/3/R	HTS MO H56 02EV	HTS MO H48 02EV	-	-	-
SOT385-1 (Stick)	-	HT2 DC20 S20/F/R	-	-	-	-	-
SOT1122	-	-	-	-	HTMS8001FTB/AF	HTMS8101FTB/AF	HTMS8201FTB/AF
HVSON2	-	-	HTS H56 01 ETK	HTS H48 01 ETK	HTMS8001FTK/AF	HTMS8101FTK/AF	HTMS8201FTK/AF
Capacitance 210pF +/- 10%	✓	✓	-	-	-	-	-
Capacitance 210pF +/- 5%	-	-	✓	✓	-	-	-
Capacitance 280pF +/- 5%	-	-	-	-	HTMS8001FUG/AM	HTMS8101FUG/AM	HTMS8201FUG/AM



Smart label IC family overview – 13.56 MHz (HF)

Product features	ICODE® SLIX-L	ICODE® SLIX	ICODE® SLIX-S	ICODE® SLIX 2	ICODE® ILT	ICODE® ILT-M	ICODE® DNA
Standard	ISO 18000-3M1 ISO 15693	ISO 18000-3M1 ISO 15693	ISO 18000-3M1 ISO 15693	ISO 18000-3M1 ISO 15693	EPC Class-1 HF ¹ ISO 18000-3M3	EPC Class-1 HF ¹ ISO 18000-3M3	ISO 18000-3M1 ISO 15693-2, 3
User memory [bit]	256	896	1280	2528	-	512	2016
EPC code size [bit]	-	-	-	-	up to 240	up to 240	-
UID (TID) ¹ size [bit]	64	64	64	64	96 (TID)	96 (TID)	64
Data retention [Years]	50	50	50	50	50	50	50
Write endurance [cycles]	100.000	100.000	100.000	100.000	100.000	100.000	100.000
Anticollision speed	up to 60 units/s	up to 60 units/s	up to 60 units/s	90 units/s ³	up to 700 units/s	up to 700 units/s	up to 90 units/s ³
Fast inventory	✓	✓	✓	✓	-	-	✓
Security functions							
EAS protection	✓	✓	✓	✓	✓	✓	✓
EAS password protection	32 bit password	32 bit password	32 bit password	32 bit password	32 bit password	32 bit password	AES - 128 bit
EAS selective	✓	-	✓	✓	-	-	✓
AFI protection	✓	✓	✓	✓	-	-	AES - 128 bit
AFI password protection	32 bit password	32 bit password	32 bit password	32 bit password	-	-	✓
Persistent quiet	-	-	-	✓	-	-	✓
Memory write lock	✓	✓	✓	✓	✓	✓	✓
Memory access password protection	-	-	32 bit password	32 bit password	-	-	AES - 128 bit
Privacy password protection	32 bit password	-	32 bit password	32 bit password	32 bit password	32 bit password	AES - 128 bit
Destroy password protection	32 bit password	-	32 bit password	32 bit password	-	-	AES - 128 bit
Counter	-	-	-	✓	-	-	✓
Originality signature	-	-	-	✓	-	-	re-programmable
Cres capacitance [pF]	23.5/97	no/23.5/97	23.5/97	23.5	0/23.5/97	0/23.5/97	23.5
Delivery types							
Wafer FCC	SL2S5002FUD	SL2S2002FUD	SL2S5302FUD	SL2S2602FUD/BG	SL2S1502FUD	SL2S1512FUD	SL2S6002FUD/BG
Wafer FCC – HC	SL2S5102FUD	SL2S2102FUD	SL2S5402FUD	-	SL2S1602FUD	SL2S1612FUD	-
Wafer FCC-NC	-	SL2S2202FUD	-	SL2S2602FTB	SL2S1402FUD	SL2S1412FUD	-
SOT1122	SL2S5002FTB	SL2S2002FTB	SL2S5302FTB	-	SL2S1502FTB	SL2S1512FTB	-
SOT1122- HC	-	SL2S2102FTB	-	-	-	SL2S1612FTB	-
SOT1122- NC	-	-	-	SL2S2602FA8	-	SL2S1412FTB	-
MOA8	-	SL2S2002FA8	-	-	-	-	-



For further details
please refer to:

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¹ EPCglobal Specification: EPC Class-1 HF RFID Air Interface Protocol

² EPCglobal/Auto-ID Center Specification: 13.56 MHz ISM Band Class 1 Radio Frequency Identification Tag Interface

³ With extended fast inventory read