NXP RFID/NFC Portfolio

MIFARE® CONTACTLESS TAG IC FAMILY OVERVIEW

PRODUCT	MIFARE Ultralight®			MIFARE Classic®		MIFARE Plus®			MIFARE® DESFire®			
	EV1		AES	EV1		SE	EV2		Light	EV3		
RF Interface	ISO/IEC 14443-2, Type A 13.56 MHz											
Protocol	ISO/IEC 14443-3					ISO/IEC 14443-3&4			ISO/IEC 14443-4			
UID - unique identifier	7-byte UID		7-byte UID, Random ID	7-byte UID, 4-byte NUID, Random ID					7-byte UID, Random ID			
Communication speed	106 Kbps								106-848 Kbps			
Memory size [Bytes]	48	128	144	1K	4K	1K	2K	4K	640	2K	4K	8K
Memory model	Compact, 4-byte pages			Compact, sectors & 16-byte blocks					Pre-configured file system	Flexible file system		
Crypto	-		AES	Crypto-1		Crypto-1, AES			AES/LRP	DES/2K3DES/3K3DES/AES		
Key length	-		128-bit	48-bit		48-bit Crypto-1, 128-bit AES			128-bit AES	128-bit AES, up to 168-bit DES		
Authentication	Password			3-pass mutual								
Communication security	-		Plain, CMAC	Encrypted		Plain, CMACed, encrypted w. CMAC						
MIsmartApp	-			-					-	✓		
Transaction MAC	-					-	✓		✓			
Transaction Timer	-					-	✓		-	✓		
Security Level upgrade	-					card	sector per sector			-		
SL1SL3MixMode	-					-	✓			-		
Multi key sets	-			-					-	✓		
Proximity check	-						✓		-	✓		
Virtual card concept	-						✓		-	✓		
Restrict update operations in SL1	-						✓			-		
Originality check features	ECC signature		AES originality keys, ECC signature	ECC signature	-	AES originality keys	AES originality keys, ECC signature		✓	AES originality keys, ECC signature		
CC Certification	-		EAL3+	-			EAL5+		EAL4	EAL5+		
ISO 7816-4 APDU	-						✓			✓		
NFC compliance	NFC Forum type 2 tag compliant			Not supported by majority of NFC devices		NFC capable in SL3	NFC capable in SL1 and SL3		NFC Forum type 4 tag V2.0 compliant			
Target applications	Public transport, event ticketing, loyalty programs, limited use tickets			Single application – not recommended for new design		Public transport/ campus cards/ access management			Smart city platform/ advanced mobility multi-applications/ micropayment/ loyalty programs/ access management			
Input capacitance [pF]	17/50			17		17/70			17/50	17/70		
Multi applications	-		Fixed, single application	Supported via MAD		Supported via MAD			Fixed, single application	Dynamic		
Delivery types – 7 Byte UID												
Wafer 120µm/17 pF	MF0UL 1101DUD *	MF0UL 2101DUD *	MF0AES2001DUD	MF1S 5001XDUD*	MF1S 7001XDUD*	MF1SEP 1001DUD	MF1P 2201DUD	MF1P 4201DUD	MF2DL 1001DUD	MF3D 2301DUD	MF3D 4301DUD	MF3D 8301DUD
Wafer 120 µm/high cap	MF0ULH 1101DUD	MF0ULH 2101DUD	MF0AESH2001DUD	-	-	MF1SEP H1001DUD	MF1PH 2201DUD	MF1PH 4201DUD	MF2DLH 1001DUD	MF3DH 2301DUD	MF3DH 4301DUD	MF3DH 8301DUD
Wafer 75 µm/17pF	MF0UL 1101DUF	MF0UL 2101DUF	MF0AES2001DUF	MF1S 5001XDUF	MF1S 7001XDUF	-	-	-	MF2DL 1001DUF	-	-	-
Wafer 75 µm/high cap	MF0ULH 1101DUF	MF0ULH 2101DUF	MF0AESH2001DUF	-	-	-	-	-	MF2DLH 1001DUF	-	-	-
MOA4/17pF	-	-	-	MF1S 5000XDA4	MF1S 7000XDA4	MF1SEP 1001DA4	MF1P 2200DA4	MF1P 4200DA4	MF2DL 1000DA4	MF3D 2300DA4	MF3D 4300DA4	MF3D 8300DA4
MOA4/high cap	-	-	-	-	-	MF1SEP H1001DA4	MF1PH 2200DA4	MF1PH 4200DA4	MF2DLH 1000DA4	MF3DH 2300DA4	MF3DH 4300DA4	MF3DH 8300DA4
MOA8/17 pF	-	MF0UL 2101DA8	MF0AES2000DA8	MF1S 5000XDA8	MF1S 7000XDA8	MF1SEP 1001DA8	MF1P 2200DA8	MF1P 4200DA8	MF2DL 1000DA8	MF3D 2300DA8	MF3D 4300DA8	MF3D 8300DA8
MOA8/high cap	-	-	MF0AESH2000DA8	-	-	MF1SEP H1001DA8	MF1PH 2200DA8	MF1PH 4200DA8	MF2DLH 1000DA8	MF3DH 2300DA8	MF3DH 4300DA8	MF3DH 8300DA8
MOB6/17pF	-	-	-	-	-	-	-	-	-	-	-	-
MOB6/high cap	-	-	-	-	-	-	-	-	-	-	-	-

* MIFARE Ultralight EV1 and MIFARE Classic EV1 wafer deliveries are next to 8 inch as well available on 12 inch

For further details please refer to:

www.MIFARE.net

MIFARE AND NFC READER/WRITER IC SOLUTIONS SELECTION

PRODUCT	NFC FRONTEND SOLUTIONS							NFC CONTROLLER SOLUTIONS		HITAG
	SLRC610 *plus*	MFRC630 *plus*	MFRC631 *plus*	CLRC661 *plus*	CLRC663 *plus*	PN5180	PN5190	PN7160	PN7462	HTRC110
	High-performance ICODE frontend	High-performance NTAG, DESFire, MIFARE frontend	High-performance ISO/IEC 14443 A/B frontend	High-performance NTAG, ICODE, DESFire, MIFARE frontend	High-performance multi-protocol NFC frontend	High-performance multi-protocol NFC frontend	Outstanding performance smart NFC front end	Full NFC Forum- compliant controller with integrated FW and NCI interface	Full NFC open microcontroller Cortex M0 - with contact smartcard interface and 160K Flash for user's application	Highly integrated optimized HITAG short range reader writer
Integrated microcontroller	-	-	-	-	-	-	-	Integrated FW	Open microcontroller Cortex M0	-
Carrier frequency [MHz]	13.56									0.125
Standards & protocols										
Reader/ writer	ISO/IEC 15693 ISO/IEC 18000-3M3	ISO/IEC 14443 A	ISO/IEC 14443 A/B	ISO/IEC 14443 A ISO/IEC 15693 ISO/IEC 18000-3M3	ISO/IEC 14443 A/B ISO/IEC 15693 ISO/IEC 18000-3M3 FeliCa	ISO/IEC 18092 ISO/IEC 14443 ISO/IEC 15693 ISO/IEC 18000-3M3 FeliCa	ISO14443-A/B ISO/IEC15693 ISO/IEC 18000-3M3 FeliCa	ISO/IEC 18092 ISO/IEC 14443 ISO/IEC 15693 FeliCa	ISO/IEC 18092 ISO/IEC 14443 ISO/IEC 15693 ISO/IEC 18000-3M3 FeliCa	HITAG
NFC tag type reader	5	1, 2, 4A	1, 2, 4	1, 2, 4A, 5	1, 2, 3, 4, 5	1, 2, 3, 4, 5	1, 2, 3, 4, 5	1, 2, 3, 4, 5	1, 2, 3, 4, 5	-
ISO/IEC 14443 Bit- rate [KBit/s]	-	106/212/424/848								-
FeliCa Bit-rate [KBit/s]	-	-	-	-	212/424	212/424	212/424	212/424	212/424	-
MIFARE Classic support (license included)	-	✓	✓	✓	✓	✓	✓	✓	✓	-
ISO/IEC 15693 Bit-rate [KBit/s]	26.5/53	-	26.5/53	26.5/53	26.5/53	26.5/53	26.5/53/106	26.5	26.5/53	-
EPC class-1 HF/ ISO/IEC 18000-3M3	✓	-	-	✓	✓	✓	✓	-	✓	-
EMVCo compliance	-	-	✓	-	✓	✓	✓	-	✓	-
Card emulation	-	-	-	-	-	✓	✓	✓	✓	-
NFC tag type emulation	-	-	-	-	-	4A	4A	3, 4A, 4B	4A	-
NFC tag type Bit-rate [KBit/s]	-	-	-	-	-	Up to 848	Up to 848	106/212/424	106/212/424/848	-
Peer-to-peer (ISO/IEC 18092)	-	-	-	-	✓	✓	✓	✓	✓	-
Passive communication	-	-	-	-	Initiator	Initiator/Target	Initiator/Target	Initiator/Target	Initiator/Target	-
Active communication	-	-	-	-	-	Initiator/Target	Initiator/Target	Initiator/Target	Initiator/Target	-
Operating distance up to [mm]	160	120	120	120/160	120/160	120/160	120/160	120/160	120/160	Up to 200 w.o. booster
RF transmitter supply voltage [V]	2.5 to 5.5	2.5 to 5.5	2.5 to 5.5	2.5 to 5.5	2.5 to 5.5	2.7 to 5.5	2.4 to 5.7	2.5 to 5.8	3.0 to 5.5	5
Transmitter supply current, typ [mA]	350	350	350	350	350	250	350	250	250	200
Host interface	SPI, I²C, UART	SPI, I²C, UART	SPI, I²C, UART	SPI, I²C, UART	SPI, I²C, UART	SPI	SPI	I²C, SPI	USB, HSUART, SPI, I²C	Serial 2/3 wire
Supply voltage host interface [V]	2.5 to 5.5	2.5 to 5.5	2.5 to 5.5	2.5 to 5.5	2.5 to 5.5	1.8 and 3.3	1.8 and 3.3	1.8 and 3.3	1.8 and 3.3	5
Standby mode current, typ [µA]	3	3	3	3	3	15	40	21	18	200
Power-down mode current, type [µA]	0.008	0.008	0.008	0.008	0.008	10	5	11	12	7
Dynamic power contr./ Adaptive modulation contr.	-	-	-	-	-	✓	✓	✓	✓	-
Lower-power card detection mode	✓	✓	✓	✓	✓	✓	✓	✓	✓	-
Temperature range [°C]	-40 to +105	-40 to +105	-40 to +105	-40 to +105	-40 to +105	-30 to +85	-40 to +85	-25 to +85	-40 to +85	-40 to +85
Security features										
MIFARE SAM support	✓	✓	✓	✓	✓	-	-	-	Via UART ISO 7816	-
MIFARE Classic security (CRYPTO1 HW)	-	✓	✓	✓	✓	✓	✓	✓	✓	-
Product support & ordering information										
Package	HVQFN32	HVQFN32	HVQFN32	HVQFN32	HVQFN32	VFBGA36	HVQFN40	TFBGA64	HVQFN40, VFBGA64	HVQFN64, VFBGA64	SO14
Product type	SLRC61003HN	MFRC63003HN	MFRC63103HN	CLRC66103HN	CLRC66303HN	CLRC66303EV	PN5180A0HN	PN5180A0ET	PN5190A0HN	PN5190A0ET	PN7160A1EV/C100 PN7160A1HN/C100 PN7160B1EV/C100 PN7160B1HN/C100	PN7462AUHN/C300 PN7462AUEV/C300	HTRC11001T/02EE
Software										
NFC Reader library	NFC Reader Library NFC Cockpit	NFC Reader Library NFC Cockpit	NFC Reader Library NFC Cockpit	NFC Reader Library NFC Cockpit	NFC Reader Library NFC Cockpit	NFC Reader Library NFC Cockpit	NFC Reader Library NFC Cockpit	Support for Android, Linux, MCU	NFC Reader Library NFC Cockpit	-

For further details please refer to:

www.nxp.com/products/identification-and-security/reader-ics:READERS-ICS

MIFARE EMBEDDED CARD FUNCTIONALITY ON SmartMX®

PRODUCT	MIFARE IMPLEMENTATIONS							FEATURES						
	Available card IC functionality							UID options			Parameters	Exit on		MIFARE select
	MIFARE Classic 1K	MIFARE Classic 4K	MIFARE Plus X 2K	MIFARE Plus X 4K	MIFARE DESFire EV1 2K	MIFARE DESFire EV1 4K	MIFARE DESFire EV1 8K	7 Byte UID	4 Byte NUID	4 Byte Random ID		Incomplete SAK	Time out UART RF-Field	
P5Cx145														
CD128Cx081														
CD051	✓	✓	-	-	-	-	-	✓	✓	✓	ATQA,SAK,ATS	-	✓	N/A
CD041														
CD021/CD016														
P5Cx081V1D/CD041V1D														
CD021V1D	-	-	-	-	✓	✓	✓	✓	-	-	ATS	-	-	N/A
CD016V1D														
P5Cx144														
Cx080/CD040	✓	✓	-	-	-	-	-	✓	-	-	ATQA,SAK,ATS	-	✓	N/A
CD020/CD012														
P5Cx145	✓	✓	-	-	✓	✓	✓	✓	✓	✓	ATQA,SAK,ATS	-	✓	N/A
CD128														
P60D144M	✓	✓	✓	✓	-	-	-	✓	✓	✓	ATQA,SAK,ATS	✓	✓	-
P60D080M	✓	✓	✓	✓	-	-	-	✓	✓	✓	ATQA,SAK,ATS	✓	✓	-
P60D024M	✓	✓	✓	✓	-	-	-	✓	✓	✓	ATQA,SAK,ATS	✓	✓	-
P60D144D	-	-	-	-	✓	✓	✓	✓	✓	✓	ATQA,SAK,ATS	✓	✓	-
P60D080D	-	-	-	-	✓	✓	✓	✓	✓	✓	ATQA,SAK,ATS	✓	✓	-
P60D024D	-	-	-	-	✓	✓	✓	✓	✓	✓	ATQA,SAK,ATS	✓	✓	-
P60N144J	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	ATQA,SAK,ATS	✓	✓	✓
P60D144J	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	ATQA,SAK,ATS	✓	✓	✓
P60D080J	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	ATQA,SAK,ATS	✓	✓	✓

MIFARE – SAM (SECURE ACCESS MODULES)

PRODUCT	MIFARE SAM AV3
Communication interface	Host Interface: ISO/IEC 7816, Class A, B and C, T=1, up to 1.5 Mbps Optional I^2C slave Standard and Fast Mode (HVQFN32 only) X-Mode Interface: MFRC52x, PN51x and CLRC6xx
Cryptographic algorithms	TDEA 112-bit and 168-bit key MIFARE Crypto-1 AES-128, AES-192 and AES-256 RSA up to 2048-bit key, ECDSA up to 256-bit key
Public key infrastructure (PKI)	✓
Hash function	SHA-1, SHA-224 and SHA-256
Supported cryptography	MIFARE Classic, MIFARE Ultralight, MIFARE Plus (up to EV1), MIFARE DESFire (up to EV2), NTAG DNA, ICODE DNA, UCODE DNA
Secure host communication	✓
X- functionalities	✓
Unique serial number [Bytes]	7
True random number generator	✓
No of symmetric key entry	128 (3 keys per key entry)
No of RSA key entry	2 key pairs, 1 public key
No of ECC key and curve entry	8 keys, 4 curves
No of EMV key entry and RID	24 keys, 4 RIDs
Access conditions	Per entry
Key usages counter	16
Key diversification	Encryption based, CMAC based
RSA	MACing/ Encipherment/ Signature
ECC	Signature
DES/3DES security	MACing/ Encipherment
AES 128 security	MACing/ Encipherment
Programmable Logic	✓
Delivery types	
Contact module	PCM1.5
HVQFN	HVQFN32
Part Type	MF4SAM3

DEVELOPMENT AND TESTING TOOLS

PRODUCT	SHORT DESCRIPTION	SUPPORTED NXP PLATFORMS
NXP Originality Checker reader (Windows)	Enables anyone in the supply chain to check the originality of NXP contactless ICs	MIFARE NTAG ICODE SLIX2
MIFARE Reader-Writer Kit (Windows)	Consists of the Pegoda II MIFARE reference design reader-writer, a set of MIFARE family tag samples and the RFID Discover tool	MIFARE NTAG ICODE
RFID Discover (Windows)	Allows easy access to the commands of any NXP 13.56Mhz contactless IC with the click of a button	MIFARE NTAG ICODE
TapLinx	Facilitates App Development by providing a JAVA API for MIFARE, NTAG, ICODE families	MIFARE NTAG ICODE
Card Test Framework (Windows)	Allows easy access to the commands of any NXP 13.56Mhz contactless IC and provides the intuitive drag & drop generation of scripts for card personalization and transaction execution	MIFARE NTAG

NFC TAG IC FAMILY OVERVIEW – 13,56 MHZ (HF)

PRODUCT	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	NTAG® 426Q DNA	NTAG® 223/224 DNA	NTAG® 223/224 DNA StatusDetect	NTAG® 5 switch	NTAG® 5 link	NTAG® 5 boost
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	NFC Forum Type 4 Tag	NFC Forum Type 2 Tag	NFC Forum Type 2 Tag	NFC Forum Type 5 Tag	NFC Forum Type 5 Tag	NFC Forum Type 5 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	928	144/208[2]	144/208[2]	2048	2048	2048
User memory [byte]	48	48/128	144	504	888	888/1904	888/1912	144	416	416	928	144/208[2]	144/208[2]	2048	2048	2048
Write endurance [cycles]	100.000	100.000	100.000	100.000	100.000	200.000	500.000	100.000	200.000	200.000	200.000	100.000	100.000	1.000.000	1.000.000	1.000.000
Data retention [yrs]	10	10	10	10	10	20	20	10	50	50	50	10	10	50	50	50
RF Interface																
According to	ISO/IEC 14443A (up to layer 3) NFC Forum Type 2 Tag	ISO/IEC 14443A (up to layer 3) NFC Forum Type 2 Tag	ISO/IEC 14443A (up to layer 3) NFC Forum Type 2 Tag	ISO/IEC 14443A (up to layer 3) NFC Forum Type 2 Tag	ISO/IEC 14443A (up to layer 3) NFC Forum Type 2 Tag	ISO/IEC 14443A (up to layer 3) NFC Forum Type 2 Tag	ISO/IEC 14443A (up to layer 3) NFC Forum Type 2 Tag	ISO/IEC 14443A (up to layer 3) NFC Forum Type 2 Tag	ISO/IEC 14443A (up to layer 4) NFC Forum Type 4 Tag	ISO/IEC 14443A (up to layer 4) NFC Forum Type 4 Tag	ISO/IEC 14443A (up to layer 4) NFC Forum Type 4 Tag	ISO/IEC 14443A (up to layer 3) NFC Forum Type 2 Tag	ISO/IEC 14443A (up to layer 3) NFC Forum Type 2 Tag	ISO/IEC 15693 NFC Forum Type 5 Tag	ISO/IEC 15693 NFC Forum Type 5 Tag	ISO/IEC 15693 NFC Forum Type 5 Tag
Frequency [MHz]	13.56	13.56	13.56	13.56	13.56	13.56	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	106/212/424/848	106	106	26/52/106	26/52/106	26/52/106
Anticollision	Bit-wise	Bit-wise	Bit-wise	Bit-wise	Bit-wise	Bit-wise	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	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 × 128 bit	5 × 128 bit	5 × 128 bit	32/128[2] bit	32/128[2] bit	32/64 bit	32/64 bit	32/64 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	Read, write, read & write	Write, read and write	Write, read and write	Write, read and write	Write, read and write	Write, read and write
Write protection	-	Blockwise	Blockwise	Blockwise	Blockwise	Blockwise	Blockwise	Blockwise	-	-	-	Blockwise	Blockwise	Blockwise	Blockwise	Blockwise
Security	-	Password	Password	Password	Password	-	Password	Password	128-bit AES, LRP	128-bit AES, LRP	128-bit AES, LRP	Password/128-bit AES[2]	Password/128-bit AES[2]	128-bit AES, password	128-bit AES, password	128-bit AES, password
Special features																
Field detection pin	-	-	✓[1] (configurable)	-	✓[1] (configurable)	✓[1] (configurable)	✓[1] (configurable)	-	-	-		-	-	✓[1] (configurable)	✓[1] (configurable)	✓[1] (configurable)
I²C interface	-	-	-	-	-	✓	✓	-	-	-		-	-	No	Yes	Yes
Others	• Originality check with customizable (reprogrammable) originality signature	• UID mirror • Originality check • Fast Read	• UID mirror • NFC counter and mirror • Originality check • Fast Read • Sleep mode via FD pin[1]	• UID mirror • NFC counter and mirror • Originality check • Fast Read	• UID mirror • NFC counter and 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 mirror • NFC counter and 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 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 counter, CMAC • File encryption and mirroring • 128-byte Proprietary file • Originality Signature • Anti brute-force attack design • Tag Tamper detection and mirroring	• SUN (Secure Unique NFC) message • NFC counter • Mirroring of UID, NFC tap counter, CMAC • File encryption and mirroring • 128-byte Proprietary file • Originality Signature • Anti brute-force attack design • Enhanced privacy • Quiet mode (Non-discoverable)	• SUN (Secure Unique NFC) message • NFC counter • Mirroring of UID, NFC counter and CMAC • Originality Signature	• SUN (Secure Unique NFC) message • NFC counter • Mirroring of UID, NFC counter, StatusDetect and CMAC • Originality Signature • Conductive and capacitive Tag Tamper Detection • Capacitive condition sensing	• 2 configurable GPIOs or 2 configurable PWM outputs • Energy harvesting from RF field up to 30mA • Programmable event detection output • Programmable originality signature • Sleep and power down mode	• I²C target or controller interface • Energy harvesting from RF field up to 30mA • Programmable event detection output • Programmable originality signature • Sleep and power down mode	• I²C target or controller interface • Active Load Modulation: larger comm range at 10 × 10 mm antenna • Programmable event detection output • Programmable originality signature • Sleep and power down mode
Certification	NFC Forum	NFC Forum	NFC Forum	NFC Forum	NFC Forum	-	NFC Forum	NFC Forum	NFC Forum, CC EAL4	NFC Forum, CC EAL4	-	NFC Forum, CC EAL3+	NFC Forum, CC EAL3+	NFC Forum	NFC Forum	NFC Forum
Packages & capacitance types																
Sawn wafer (Au-Bumped)	NT2L1001G0DUD NT2H1001G0DUD NT2H1001G0DUF	NT2L1011G0DUD NT2L1211G0DUD	NT2H1311G0DUD NT2H1311G0DUF	NT2H1511G0DUD NT2H1511G0DUF	NT2H1611G0DUD NT2H1611G0DUF	NT3H1101W0FUG NT3H1201W0FUG	NT3H2111W0FUG NT3H2211W0FUG	NT2H1311TTDUD NT2H1311TTDUF	NT4H2421G0DUD NT4H2421G0DUF	NT4H2421TTDUD NT4H2421TTDUF	NT4H2621G0DUD NT4H2621G0DUF	NT2H2331G0DUD NT2H2331G0DUF NT2H2421G0DUD NT2H2421G0DUF	NT2H2331S0DUD NT2H2421S0DUD	NTP52101G0JUA	NTP53101G0JUA NTP53121G0JUA	NTA53321G0FUA
HXSON4 (SOT1192-1)	-	-	NT2H1311F0DTL[1]	-	NT2H1611F0DTL[1]	-	-	-	-	-		-	-	-	-	-
XQFN8	-	-	-	-	-	NT3H1101FHK NT3H1201FHK	NT3H2111W0FHK NT3H221W01FHK	-	-	-		-	-	XQFN16: NTP52101G0JHK	XQFN16: NTP53101G0JHK NTP53121G0JHK	XQFN16: NTA53321G0FHK
TSSOP8	-	-	-	-	-	NT3H1101FTT NT3H1201FTT	NT3H2111W0FTT NT3H2211W0FTT	-	-	-		-	-	TSSOP16: NTP52101G0JTT	TSSOP16: NTP53101G0JTT NTP53121G0JTT	TSSOP16: NTA53321G0FTT
MOA8	-	-	NT2H1311G0DA8	NT2H1511G0DA8	NT2H1611G0DA8	-	NT3H2111W0FT1 NT3H2211W0FT1	-	NT4H2421G0DA8	-		-	-	-	-	-
Cres Capacitance [pF]	17/50	17	50	50	50	50	50	50	50	50	50	50	50	50	50	50

[1] NTAG 21x F version only
[2] Only available on NTAG 224 DNA variants

NTAG

NXP

LOW FREQUENCY IC FAMILY OVERVIEW – 100-150 KHZ (LF)

PRODUCT	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	ICODE® SLIX-L	ICODE® SLIX	ICODE® SLIX-S	ICODE® SLIX 2	ICODE® ILT	ICODE® ILT-M	ICODE® DNA
Standard	ISO/IEC 18000-3M1 ISO/IEC 15693	ISO/IEC 18000-3M1 ISO/IEC 15693	ISO/IEC 18000-3M1 ISO/IEC 15693	ISO/IEC 18000-3M1 ISO/IEC 15693	EPC Class-1 HF [1] ISO/IEC 18000-3M3	EPC Class-1 HF [1] ISO/IEC 18000-3M3	ISO/IEC 18000-3M1 ISO/IEC 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 [yrs]	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 [2]	Up to 700 units/s	Up to 700 units/s	Up to 90 units/s [2]
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 qiet	-	-	-	✓	-	-	✓
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 FFC	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	-	-	-	-	-
SOT1122- NC	-	-	-	SL2S2602FA8	-	SL2S1412FTB	-
MOA8	-	SL2S2002FA8	-	-	-	-	-

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

[2] With extended fast inventory read