For further details, please check out:
www.nxp.com/identification
or e-mail info.bli@nxp.com

NXP Contactless Reader Systems

Product Features	MF RC500	MF RC530	MF RC531	CL RC632	SL RC400	MF RC522	MF RC523	CL RC663	CL RD701	MF EV710	MF EV852
	Reader ICs								Evaluation kits		
Operating distance up to [mm] [1]	100	100	100	100 / 150 [3]	150	70	70	120	100 / 150 [3]	100 [4]	100 [4]
FIFO depth [byte]	64	64	64	64	64	64	64	512	64	64	64
Host interface	8-bit parallel	8-bit parallel	SPI 8-bit parallel	SPI 8-bit parallel	SPI 8-bit parallel	SPI I²C RS232	SPI I²C RS232	SPI 2x I²C RS232	USB	USB; Ethernet, Jtag (with additional connection board)	USB; Ethernet, JTag (with additional connection board)
RF Interface											
Analog interface	fully integrated	fully integrated	fully integrated	fully integrated	fully integrated	fully integrated	fully integrated	fully integrated	CLRC632	RC523	RX852
Carrier frequency [MHz]	13.56	13.56	13.56	13.56	13.56	13.56	13.56	13.56	13.56	13.56	13.56
Modulation	100% ASK	100% ASK	10% & 100% ASK	10% & 100% ASK	10% & 100% ASK	100% ASK	10% & 100% ASK	10% & 100% ASK	10% & 100% ASK	10% & 100% ASK	10% & 100% ASK
Baudrate ISO 14443 [kbit/s]	106	106/212/424	106/212/424	106/212/424		106/212/424/848	106/212/424/848	106/212/424/848	106/212/424	106/212/424/848	106/212/424/848
Baudrate ISO 15693 [kbit/s]	-	-	-	1.66/26.5/53	1.66/26.5/53	-	-	1.66/26.5/53	1.66/26.5/53	-	-
Standards & Protocols											
NFC Tag Type Reader	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
ISO 14443 A	yes	yes	yes	yes	-	yes	yes	yes	yes	yes	yes
ISO 14443 B	-	-	yes	yes	-	-	yes	yes	yes	yes	yes
ISO 15693	-	-	-	yes	yes	-	-	yes	yes	-	-
MIFARE Classic support	yes	yes	yes	yes		yes	yes	yes	yes	yes	yes
ICODE 1 protocol	-	-	-	yes	yes	-	-	yes	yes	-	-
HF EPC protocol	-	-	-	yes	yes	-	-	yes	yes	-	-
ISO 18092 (NFC)	-	-	-	-	-	-	-	yes [2]	-	-	-
Security Features											
MIFARE Classic	yes	yes	yes	yes	-	yes	yes	yes	yes	yes	yes
Additional Product Information											
Supply voltage digital [V]	5	3.3 or 5	3.3 or 5	3.3 or 5	5	3.3	3.3	3.3…5	5	5	5
Supply voltage analog [V]	5	5	5	5	5	3.3	3.3	3.3…5	-	-	-
Power down mode current, typ. [µA]	2	2	2	2	2	1	1	1	n.a.	n.a.	n.a.
Temperature range [°C]	-25/+85	-25/+85	-25/+85	-25/+85	-25/+85	-25/+85	-25/+85	-25/+85	0/+70	0/+70	0/+70
Package	SO32	SO32	SO32	SO32	SO32	HVQFN32	HVQFN32	HVQFN32	-	-	-
Approvals											
EMC	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	CE, FCC	CE, FCC	CE, FCC

[1] Depending on antenna, coil size, tuning, and environment [2] Only passive mode initiator support [3] For ISO15693 [4] With external booster
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NXP Contact Smart Card Reader ICs

Product Features	TDA8020	TDA8023	TDA8024	TDA8025	TDA8026	TDA8034	TDA8035	TDA8007B	TDA8029
	Analog Interface							Analog & UART	Analog & UART & CPU
Analog interfaces	2	1	1	1	5	1	1	2	1
ISO 7816 UART	no	no	no	no	no	no	no	yes	yes
ISO 7816 dedicated timers	no	no	no	no	no	no	no	yes	yes
µC-core	-	-	-	-	no	-	-	no	80C51RB+
ROM[kbyte] / RAM[byte]	-	-	-	-	-	-	-		16/768
Flexible sequencer programmation	no	yes	no	no	yes	no	no	no	no
Host interface	I²C	I²C	I/O lines	I/O lines	I²C	I/O lines	I/O lines	8 bit parallel	serial or I²C
ESD protection on ISO pads [kV]	6	6	6	6	7	6	8	6	6
Auxiliary protected lines for C4 and C8 contacts	0	2	2	2	2 (on slot 1)	2	2	2x2	0
Vcc card power supply [V]	3 & 5	1.8 & 3 & 5	3 & 5	1.2 & 1.8 & 3	1.8 & 3 & 5	1.8 & 3 & 5	1.8 & 3 & 5	1.8 & 3 & 5	1.8 & 3 & 5
Card supply current @ 5 V Vcc [mA]	2x55	55	80	-	55	65	65	55	65
Card supply current @ 3 V Vcc [mA]	2x50	55	65	65	55	65	65	55	50
Card supply current @ 1.8 V Vcc [mA]	-	35	-	65	35	65	35	35	30
Card supply voltage @1.2 V Vcc [mA]	-	-	-	30	-	-		-	-
Card clock frequency max. [MHz]	20	20	26	26	20	26	26	26	20
Card activation time max. [µs]	135	135	225	240	135	3500	3400	135	225
Card deactivation time max. [µs]	110	110	100	100	100	250	90	100	100
Protocol Support									
Synchronous card management	-	yes	-	-	yes	yes	yes	yes	yes
Asynchronous protocol T=0 and T=1	yes	yes	yes	yes	yes	yes	yes	yes	yes
Security Features									
Voltage supervisor and over current detection	yes	yes	yes	yes	yes	yes	yes	yes	yes
Current protection on VCC, I/O, RST, CLK	yes	yes	yes	yes	yes	yes	yes	yes	yes
Additional Product Information									
Power supply interface VDDI (V)	-	1.5 - 6.5	-	1.6 - 3.3	-	1.6 - 3.6	1.6 - 3.6	-	-
Power supply (V)	2.5 - 6.5	2.7 - 6.5	2.7 - 6.5	3.6 - 5.5	2.7 - 5.5	2.7 - 5.5	2.7 - 5.5	2.7 - 6.0	2.7 - 6.0
Power down current max (µA)	150	2	-	100	25	12	1	350	20
Temperature range (°C)	-25/85	-40/85	-40/85	-25/85	-25/85	-25/85	-25/85	-40/85	-25/85
Package	LQFP32	TSSOP28	SO28 & TSSOP28	HVQFN32	TFBGA64	HVQFN24 & SO16	HVQFN32	LQFP48	LQFP32
Software libraries (EMV 4.2)	-	-	-	-	-	-	-	yes	yes
NDS compliance	-	-	yes	yes	-	yes	yes	-	yes

NXP MIFARE™ SAMs for Reader Systems

Product Features	MIFARE SAM AV1 MF3 IC D81 SAM	MIFARE SAM AV2	MF RX852
Memory			
EEPROM size [byte]	72 K	81 K	72 K
OTP area [bit]	-		
Write Endurance [cycles]	100 000	100 000	100 000
Data Retention [yrs]	10	10	10
Secure key storage	up to 128 key entries	up to 128 key entries	up to 128 key entries
SAM-Interface			
UART	ISO 7816, T=1	ISO 7816, T=1	ISO 7816, T=1
Frequency [MHz]	1 … 10	1 … 10	1 … 10
Baudrate [kbit/s]	9.6 ... 1500	9.6 … 1500	9.6 ... 1500
Security			
Unique Serial Number [byte]	7	7	7
Random Number Generator	yes	yes	yes
Access Keys	128 key entries	128 key entries	128 key entries
Access Conditions	per key entry	per key entry	per key entry
MIFARE Classic Security	supported	supported	supported
DES & DES3 Security	MACing / Encipherment	MACing / Encipherment	MACing / Encipherment
AES 128 Security	MACing / Encipherment	MACing / Encipherment	MACing / Encipherment
PKI	-	Signature/Encipherment	-
RSA	-	Signature/Encipherment	-
Packaging			
PCM1.1 Module	P5DF072EV2/T0PD4090	P5DF081X0/T1AD2060S	-
HVQFN package	HVQFN32: P5DF072EHN/ TOPD4090	HVQFN32: P5DF081HN/ T1AD2060	HVQFN48

NXP HITAG™ Reader ICs

Product Features	HTRC110 HITAG™ Reader ICs
Modulation Type	100% ASK
Dimensions [mm]	6.2 x 8.75 x 1.45
Interface	CMOS
Supply Voltage [V]	5 ±10%
Antenna Driver Current [mA]	200 continuous
Clock Osc. Frequency [MHz]	4 … 16
Operating Temperature [°C]	-40 … +85
Power Down Current [µA typ.]	7
Supported Products	
HITAG™ 1	yes
HITAG™ 2	yes
HITAG™ S	yes
HITAG™ µ	yes
Security	
HITAG™ 1 data encryption	-
HITAG™ 2 data encryption	-
HITAG™ S data encryption	-
Package	
SO14, Tube	HTRC110 01T/02EE
SO14, Reel	HTRC110 01T/03EE

ISO 15693 ISO 18000 ISO 11784/85 EPCglobal

NXP Smart Label and Tag ICs

Product Features	HITAG™ 1	HITAG™ 2	HITAG™ S	HITAG™ µ	HITAG™ µ Advanced HITAG™ µ Advanced+	HITAG™ µ ISO18000	HITAG™ RO64
Total Memory							
Size [bit]	2048	256	256, 2048	128	512, 1760	1760	64
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 á 4 bytes	8 blocks á 4 bytes	8 blocks á 4 bytes 64 blocks á 4 bytes	4 blocks á 4 bytes	16 blocks á 4 bytes, 55 blocks á 4 bytes	55 blocks á 4 bytes	2 blocks á 4 bytes
RF-Interface							
According to	HITAG 1	HITAG 2, ISO 11784/85	HITAG 1+, ISO 11784/85	ISO 11784/85 acc. HITAG µ	ISO 11784/85 acc. ISO14223	ISO18000	-
Frequency	100 … 150 kHz	100 … 150 kHz	100 … 150 kHz	100 … 150 kHz	100 … 150 kHz	100 … 150 kHz	100 … 150 kHz
Baudrate [kbit/s]	up to 4	up to 4	up to 8	up to 8	up to 8	up to 8	up to 8
Anticollision	yes, collision detection	-	yes, collision detection	-	yes, collision detection	yes, collision detection	-
Operating Distance [m]	up to 1.5	up to 1.5	up to 2.0	up to 2.0	up to 2.0	up to 2.0	up to 2.0
Security							
Unique Serial Number [byte]	4	4	4	6	6	6	5
Write Protection	blockwise	blockwise	blockwise, multi user mode	blockwise	blockwise	blockwise	-
Access Keys	32-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	Plain, Password	Plain, Password	Plain, Password	-
Encryption Algorithm	yes	yes	yes, for authentication only	-	-	-	-
Special Features							
EAS	-	-	-	-	-	-	-
AFI	-	-	-	-	-	-	-
EPC	-	-	-	-	-	-	-
User Memory [bit]	1792	128	192, 1984	128	512, 1760	1760	
TTF Modes	-	yes	yes	yes	yes	-	yes
Destroy Command	-	-	-	-	-	-	-
Privacy Command	-	-	-	-	-	-	-
Others	RTF	RTF & TTF	RTF & TTF	RTF & TTF, Fast Write	RTF & TTF, Fast Write	RTF	TTF
Packaging							
Sawn Wafer	HT1ICS3002W/V9F	HT2ICS2002W/V9F	HTSICH5601EW/V1 HTSICH4801EW/V1	HTMS1001FUG/ AM [1] HTMS8001FUG/ AM [2]	HTMS1101FUG/ AM [1] HTMS8101FUG/ AM [2] HTMS1201FUG/ AM [1] HTMS8201FUG/ AM [2]	HTMS1301FUG/ AM [1] HTMS8301FUG/ AM [2]	HTCIC6402FUG/ AM [1] HTCIC6403FUG/ AM [2]
Other Packages	MOA2	MOA2, SOT 385-1	FCP2, HVSON2, MOA2	HVSON2, SOT-1122	HVSON2, SOT-1122	SOT-1122	-

Product Features	ICODE SLI-S ICODE SLI-SY	ICODE SLI	ICODE SLI-L	ICODE SLIX	ICODE SLIX-S	ICODE SLIX-L	ICODE UID-OTP	ICODE UID	ICODE EPC	UCODE HSL	UCODE G2XL	UCODE G2XM	UCODE G2iL / G2iL+
Total Memory													
Size [bit]	2048	1024	512	1024	2048	512	192	192	136	2048	368	880	256
Write Endurance [cycles]	100 000	100 000	100 000	100 000	100 000	100 000	-	10 000	-	100 000	100 000	100 000	10 000
Data Retention [yrs]	10 / 40 [6]	10	10	50	50	50	5	5	5	10	50	50	20
Organisation	16 pages each 4 blocks á 4 bytes	32 blocks á 4 bytes	4 pages each 4 blocks á 4 bytes	32 blocks á 4 bytes	16 pages each 4 blocks á 4 bytes	4 pages each 4 blocks á 4 bytes	24 blocks á 1 byte	24 blocks á 1 byte	17 blocks á 1 byte	64 blocks á 4 bytes	23 blocks á 2 bytes	55 blocks á 4 bytes	16 blocks á 2 bytes
RF-Interface													
According to	ISO 15693,ISO 18000, EPC [4]	ISO 15693, ISO 18000	ISO 15693, ISO 18000	ISO 15693, ISO 18000	ISO 15693, ISO 18000	ISO 15693, ISO 18000	EPC [4]	EPC [4]	EPC [4]	ISO18000-6B	EPC Class 1 Gen2	EPC Class 1 Gen2	EPC Class 1 Gen2
Frequency	13.56 MHz	13.56 MHz	13.56 MHz	13.56 MHz	13.56 MHz	13.56 MHz	13.56 MHz	13.56 MHz	13.56 MH	UHF/2.4 GHz	840 - 960 MHz	840 - 960 MHz	840 - 960 MHz
Baudrate [kbit/s]	up to 53	up to 53	up to 53	up to 53	up to 53	up to 53	up to 53	up to 53	up to 53	up to 40	up to 640	up to 640	up to 640
Anticollision	acc. ISO 15693, ISO 18000, EPC [4]	acc. ISO 15693, ISO 18000	acc. ISO 15693, ISO 18000	acc. ISO 15693, ISO 18000	acc. ISO 15693, ISO 18000	acc. ISO 15693, ISO 18000	acc. EPC [4]	acc. EPC [4]	acc. EPC [4]	binary tree	slotted ALOHA	slotted ALOHA	slotted ALOHA
Operating Distance [m]	up to 2.0 [5]	up to 1.5	up to 2.0 [5]	up to 2.0 [5]	up to 2.0 [5]	up to 2.0 [5]	up to 1.5	up to 1.5	up to 1.5	up to 7	up to 10	up to 10	greater 10
Security													
Unique Serial Number [byte]	8	8	8	8	8	8	5	5	-	8	TID:64 bit incl. 32 bit serial number	TID:64 bit incl. 32 bit serial number	TID:64 bit incl. 32 bit serial number
Write Protection	blockwise	blockwise	blockwise	blockwise	blockwise	blockwise	OTP	-	OTP	bytewise	bankwise	bankwise	bankwise
Access Keys	32-bit	-	-	-	32-bit	-	-	-	-	-	32-bit	32-bit	32-bit
Access Conditions	Plain, Password Pagewise configurable password protection read/write	-	-	-	Plain, Password Pagewise configurable password protection read/write	-	-	-	-	-	Plain, Read/Write Password	Plain, Read/Write Password	Plain, Read/Write Password
Encryption Algorithm	-	-	-	-	-	-	-	-	-	-	-	-	-
Special Features													
EAS	yes (Plain, Password)	yes	yes (Plain, Password)	yes (Plain, Password)	yes (Plain, Password)	yes (Plain, Password)	-	-	-	-	yes	yes	yes
AFI	yes	yes	yes	yes (Plain, Password)	yes (Plain, Password)	yes (Plain, Password)	-	-	-	yes	-	-	-
EPC	96 bit	-	-	-	-	-	96 bit	96 bit	96 bit	-	240 bit	240 bit	128 bit
User Memory [bit]	1280	896	256	896	1280	256	-	-	-	1728	-	512	-
TTF Modes	-	-	-	-	-	-	-	-	-	-	-	-	-
Destroy Command	yes	-	yes	-	yes	yes	yes	yes	yes	-	yes	yes	yes
Privacy Command	yes	-	yes	-	yes	yes	-	-	-	-	Read Protect	Read Protect	Read Protect, Real Read Range Reduction (4R)
Others	fast inventory	fast inventory	fast inventory	fast inventory	fast inventory	fast inventory							Tag tamper alarm, digital switch, data transfer, battery assist mode
Packaging													
Sawn Wafer	SL2 ICS5301EW/V7 SL2 ICS5401EW/ V7 [3] SL2 ICS5311EW/ V7 [6]	SL2 ICS2001DW/ V1D	SL2 ICS5001EW/V7 SL2 ICS5101EW/V7 [3]	SL2 S2002FUD SL2 S2102FUD [3]	SL2 S5302FUD SL2 S5402FUD [3]	SL2 S5002FUD SL2 S5102FUD [3]	SL2 ICS1201DW/V1	SL2 ICS1101DW/V1	SL2 ICS1001DW/V1	SL3ICS3001FW/V4	SL3ICS1202FUG/ V7AF	SL3ICS1202FUG/ V7AF	SL3S1203FUF (G2iL) SL3S1213FUF (G2iL+)
Other Packages	FCP2, MOA2	FCP2, MOA2, FCS2-Al, FCS2-Cu	FCP2, MOA2	SOT-1122	-	SOT-1122	-	-	-	TSSOP8	FCS2-Al, FCS2-Cu, SOT1122, TSSOP8	FCS2-Al, FCS2-Cu, SOT1122, TSSOP8	FCS2-Al, FCS2-Cu, SOT886

[1] 210 pF ±3% [2] 280 pF ±5% [3] HC: high capacitance (97 pF) [4] HF EPC Class 1: EPCglobal/Auto-ID Center Specifcation [5] Based on ECC regulations [6] ICODE SLI-SY

ISO 7816 ISO 14443

NXP MIFARE™ Smart Card ICs

Product Features	MIFARE Ultralight™	MIFARE Ultralight™ C	MIFARE™ Classic 1K	MIFARE™ Classic 4K	MIFARE Plus™ S 2 K
	MF0 IC U1X	MF0 IC U2X	MF1 S50	MF1 S70	MF1 SPLUS 60
Memory					
EEPROM size [byte]	64	192	1024	4096	2048
OTP area [bit]	32	32	-	-	-
Write Endurance [cycles]	10 000	10 000	100 000	100 000	200 000
Data Retention [yrs]	5	5	10	10	10
Organization	16 pages à 4 byte	48 pages à 4 byte	16 sectors á 64 byte	32 sectors á 64 byte 8 sectors á 256 byte	32 sectors á 64 byte
RF-Interface					
Acc. to ISO 14443A	yes - up to layer 3	yes – up to layer 3	yes - up to layer 3	yes - up to layer 3	yes - up to layer 4
Frequency [MHz]	13.56	13.56	13.56	13.56	13.56
Baudrate [kbit/s]	106	106	106	106	106 … 848
Anticollision	bit-wise	bit-wise	bit-wise	bit-wise	bit-wise
Operating Distance [mm]	up to 100	up to 100	up to 100	up to 100	up to 100
Security					
Serial Number [byte]	7 B UID	7 B UID	4 B NUID or 7 B UID with optional random ID#	4 B NUID or 7 B UID with optional random ID#	4 B NUID or 7 B UID, optional random ID
Random Number Generator	-	yes	yes	yes	yes
Access Keys	-	1 key	2 keys per sector	2 keys per sector	2 CRYPTO1 or AES keys per sector
Access Conditions	per page	per page	per sector	per sector	per sector
MIFARE Classic™ Security (Crypto1)	-	-	supported	supported	supported in security level 1&2
DES & DES3 Security	-	authentication	-	-	-
AES 128 Security	-	-	-	-	CMACing
Anti-tear supported by chip	-	-	for value blocks	for value blocks	for AES keys, sector trailers and configuration
Special Features					
Multi-application	-	-	supports MAD*	supports MAD2**	supports MAD2**
Special Functionalities	-	-	-	-	Multi-sector authentication
Purse Functionality	-	16-bit counter	Value block format	Value block format	-
Packaging					
Sawn Wafer	-	-	4 B NUID MF1S5035DUH	4 B NUID MF1S7035DUB	-
Sawn Wafer (Au-Bumped)	MF0ICU1001W/S7DL (17 pF, 75 µm) MF0ICU1101W/S7DL (50 pF, 75 µm) MF0ICU1001W/U7DL (17 pF, 120 µm) MF0ICU1101W/U7DL (50 pF, 120 µm)	MF0ICU2001DUD (17 pF) MF0ICU2101DUD (50 pF)	4 B NUID MF1S503y(X)DUD# 7 B UID MF1S500yXDUD##	4 B NUID MF1S703y(X)DUD# 7 B UID MF1S700yXDUD##	7B UID MF1SPLUS6001DUD/03 4B NUID MF1SPLUS6031DUD/03
MOA2 Module	-	-	4 B NUID MF1S5030DA3	4 B NUID MF1S7030DA3	-
MOA4 Module	MF0MOA4U10/D	MF0MOU2001DA4 (17 pF) MF0MOU2101DA4 (50 pF)	7 B UID MF1S5000XDA4# 4 B NUID MF1S5030(X)DA4#	7 B UID MF1S7000XDA4# 4 B NUID MF1S7030(X)DA4#	7B UID MF1SPLUS6001DA4/03 4B NUID MF1SPLUS6031DA4/03
MOA8 Module			7 B UID MF1S5000XDA8# 4 B NUID MF1S5030(X)DA8#	7 B UID MF1S7000XDA8# 4 B NUID MF1S7030(X)DA8#	

Product Features	MIFARE Plus™ S 4K	MIFARE Plus™ X 2K	MIFARE Plus™ X 4K	MIFARE DESFire™ EV1 2K	MIFARE DESFire™ EV1 4K	MIFARE DESFire™ EV1 8K
	MF1 SPLUS 80	MF1 PLUS 60	MF1 PLUS 80	MF3 IC D21	MF3 IC D41	MF3 IC D81
Memory						
EEPROM size [byte]	4096	4096	4096	2048	4096	8192
OTP area [bit]	-	-	-	-	-	-
Write Endurance [cycles]	200 000	200 000	200 000	500 000	500 000	500 000
Data Retention [yrs]	10	10	10	10	10	10
Organization	32 sectors á 64 byte 8 sectors á 256 byte	32 sectors á 64 byte 8 sectors á 256 byte	32 sectors á 64 byte 8 sectors á 256 byte	fexible file system	fexible file system	fexible file system
RF-Interface						
Acc. to ISO 14443A	yes - up to layer 4	yes - up to layer 4	yes - up to layer 4	yes - up to layer 4	yes - up to layer 4	yes - up to layer 4
Frequency [MHz]	13.56	13.56	13.56	13.56	13.56	13.56
Baudrate [kbit/s]	106 … 848	106 … 848	106 … 848	106 … 848	106 … 848	106 … 848
Anticollision	bit-wise	bit-wise	bit-wise	bit-wise	bit-wise	bit-wise
Operating Distance [mm]	up to 100	up to 100	up to 100	up to 100	up to 100	up to 100
Security						
Serial Number [byte]	4 B NUID or 7 B UID, optional random ID	4 B NUID or 7 B UID, optional random ID	4 B NUID or 7 B UID, optional random ID	7 B UID	7 B UID	7 B UID
Random Number Generator	yes	yes	yes	yes	yes	yes
Access Keys	2 CRYPTO1 or AES keys per sector	2 CRYPTO1 or AES keys per secto	2 CRYPTO1 or AES keys per sector	14 keys per application	14 keys per application	14 keys per application
Access Conditions	per sector	per sector	per sector	per file	per file	per file
MIFARE Classic™ Security (Crypto1)	supported in security level 1&2	supported in security level 1&2	supported in security level 1&2	-	-	-
DES & DES3 Security	-	-	-	CMACing / Encipherment	CMACing / Encipherment	CMACing / Encipherment
AES 128 Security	CMACing	CMACing / Encipherment	CMACing / Encipherment	CMACing / Encipherment	CMACing / Encipherment	CMACing / Encipherment
Anti-tear supported by chip	for AES keys, sector trailers and configuration	for AES keys, sector trailers and configuration	for AES keys, sector trailers and configuration	yes	yes	yes
Special Features						
Multi-application	supports MAD2**	supports MAD2**	supports MAD2**	28 applications, MAD3***	28 applications, MAD3***	28 applications, MAD3***
Special Functionalities	Multi-sector authentication	Multi-sector authentication, Proximity Check, full virtual card support	Multi-sector authentication, Proximity Check, full virtual card support	Automatic backup machanism Random ID (optional)	Automatic backup machanism Random ID (optional)	Automatic backup machanism Random ID (optional)
Purse Functionality	-	Value block format	Value block format	Value file	Value file	Value file
Packaging						
Sawn Wafer	-	-	-	-	-	-
Sawn Wafer (Au-Bumped)	7B UID MF1SPLUS8001DUD/03 4B NUID MF1SPLUS8031DUD/03	7B UID MF1PLUS6001DUD/03 4B NUID MF1PLUS6031DUD/03	7B UID MF1PLUS8001DUD/03 4B NUID MF1PLUS8031DUD/03	MF3ICD2101DUD/05 (17 pF) MF3ICDH2101DUD/05 (70 pF)	MF3ICD4101DUD/05 (17 pF) MF3ICDH4101DUD/05 (70 pF)	MF3ICD8101DUD/05 (17 pF) MF3ICDH8101DUD/05 (70 pF)
MOA2 Module				-	-	-
MOA4 Module	7B UID MF1SPLUS8001DA4/03 4B NUID MF1SPLUS8031DA4/03	7B UID MF1PLUS6001DA4/03 4B NUID MF1PLUS6031DA4/03	7B UID MF1PLUS8001DA4/03 4B NUID MF1PLUS8031DA4/03	MF3MOD2101DA4/05 (17 pF) MF3MODH2101DA4/05 (70 pF)	MF3MOD4101DA4/05 (17 pF) MF3MODH4101DA4/05 (70 pF)	MF3MOD8101DA4/05 (17 pF) MF3MODH8101DA4/05 (70 pF)
MOA8 Module						

*MAD: MIFARE Application Directory **MAD2: MAD Extension for 4 kbyte EEPROM size ***MAD3: MAD2 Extension for DESFire
Available from Q1 2011 onwards (sales types including «X») ## «y» indicating the silicon source

ICs with DPA Countermeasures functionality

NXP ICs containing functionality implementing countermeasures to Differential Power Analysis and Simple Power Analysis are produced and sold under applicable license from Cryptography Research, Inc.

Specification subject to change without notice.

Date of Release: October 2010
Document order number: 9397 750 17001

For further details, please check out:
www.nxp.com/identification

or e-mail info.bli@nxp.com

NXP SmartMX
Dual Interface Security/PKI Controllers

Product Features	P5CD012	P5CD016	P5CD020	P5CD021	P5CD040	P5CD041	P5CN080	P5CD080	P5CN081	P5CD081	P5CD128	P5CN144	P5CD144	P5CD145
CPU	Secure_MX51	Secure_MX51	Secure_MX51	Secure_MX51	Secure_MX51	Secure_MX51	Secure_MX51	Secure_MX51	Secure_MX51	Secure_MX51	Secure_MX51	Secure_MX51	Secure_MX51	Secure_MX51
ISO Contact Interface	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816
ISO Contactless Interface	ISO 14443	ISO 14443	ISO 14443	ISO 14443	ISO 14443	ISO 14443	-	ISO 14443	-	ISO 14443	ISO 14443	-	ISO 14443	ISO 14443
NFC Interface type	-	-	-	-	-	-	S2C	-	S2C	-	-	S2C	-	-
ROM [byte]	200 K	264 K	200 K	264 K	200 K	264 K	200 K	200 K	264 K	264 K	264 K	200 K	200 K	264 K
RAM (linear addressable) [byte]	6 K	7.5 K	6 K	7.5 K	6 K	7.5 K	6 K	6 K	7.5 K	7.5 K	7.5 K	6 K	6 K	7.5 K
- Standard RAM [byte]	3.5 K	3.5 K	3.5 K	3.5 K	3.5 K	3.5 K	3.5 K	3.5 K	3.5 K	3.5 K	3.5 K	3.5 K	3.5 K	3.5 K
- RAM accessible by FameXE [byte]	2.5 K	2.5 K	2.5 K	2.5 K	2.5 K	2.5 K	2.5 K	2.5 K	2.5 K	2.5 K	2.5 K	2.5 K	2.5 K	2.5 K
EEPROM [byte]	12 K	16 K	20 K	20 K	40 K	40 K	80 K	80 K	80 K	80 K	128 K	144 K	144 K	144 K
Security Features														
PKI Crypto-Engine (FameXE)	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
(RSA key length up to 8192-bit)	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
RSA (1024 bit) signature generation (CRT)/verifcation, Exponent: 216+1	99 / 2 ms	71 / 2 ms	99 / 2 ms	71 / 2 ms	99 / 2 ms	71 / 2 ms	99 / 2 ms	99 / 2 ms	71 / 2 ms	71 / 2 ms	71 / 2 ms	99 / 2 ms	99 / 2 ms	71 / 2 ms
ECC (192-bit signature) generation/ verifcation	32 / 60 ms	17 / 33 ms	32 / 60 ms	17 / 33 ms	32 / 60 ms	17 / 33 ms	32 / 60 ms	32 / 60 ms	17 / 33 ms	17 / 33 ms	17 / 33 ms	32 / 60 ms	32 / 60 ms	17 / 33 ms
DES-Engine	DES3 < 40 us	DES3 <20 us	DES3 < 40 us	DES3 <20 us	DES3 < 40 us	DES3 <20 us	DES3 < 40 us	DES3 < 40 us	DES3 <20 us	DES3 <20 us	DES3 <20 us	DES3 < 40 us	DES3 < 40 us	DES3 <20 us
AES-Engine key length 128/192/256-bit	< 12/13/15 us	< 10/11/12 us	< 12/13/15 us	< 10/11/12 us	< 12/13/15 us	< 10/11/12 us	< 12/13/15 us	< 12/13/15 us	< 10/11/12 us	< 10/11/12 us	< 10/11/12 us	< 12/13/15 us	< 12/13/15 us	< 10/11/12 us
Exception Sensors	V, f, T, Light	V, f, T, Light	V, f, T, Light	V, f, T, Light	V, f, T, Light	V, f, T, Light	V, f, T, Light	V, f, T, Light	V, f, T, Light	V, f, T, Light	V, f, T, Light	V, f, T, Light	V, f, T, Light	V, f, T, Light
Memory Management Unit (Firewall)	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Additional Product Information														
UART for implemented interfaces	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
CRC-Engine	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Supply voltage [V]	1.62 ... 5.5	1.62 ... 5.5	1.62 ... 5.5	1.62 ... 5.5	1.62 ... 5.5	1.62 ... 5.5	1.62 ... 5.5	1.62 ... 5.5	1.62 ... 5.5	1.62 ... 5.5	1.62 ... 5.5	1.62 ... 5.5	1.62 ... 5.5	1.62 ... 5.5
External Clock [MHz]	1 ... 10 (13,56)	1 ... 10 (13.56)	1 ... 10 (13,56)	1 ... 10 (13.56)	1 -... 10 (13,56)	1 ... 10 (13.56)	1 ... 10	1 ... 10 (13.56)	1 ... 10	1 ... 10 (13,56)	1 ... 10 (13.56)	1 ... 10	1 ... 10 (13,56)	1 ... 10 (13.56)
Internal Clock [MHz]	1 ... 30	1 ... 62	1 ... 30	1 ... 62	1 - ... 30	1 ... 62	1 ... 30	1 ... 62	1 ... 62	1 ... 62	1 ... 62	1 ... 30	1 ... 30	1 ... 62
Temperature range [°C]	-25/+85	-25/+85	-25/+85	-25/+85	-25/+85	-25/+85	-25/+85	-25/+85	-25/+85	-25/+85	-25/+85	-25/+85	-25/+85	-25/+85
EEPROM page mode granularity [byte]	1 ... 128	1 ... 128	1 ... 128	1 ... 128	1 ... 128	1 ... 128	1 ... 128	1 ... 128	1 ... 128	1 ... 128	1 ... 128	1 ... 128	1 ... 128	1 ... 128
16-bit Timer/Counter	2	2	2	2	2	2	2	2	2	2	2	2	2	2
True Random Number Generator	yes, acc. to FIPS 140-2 / AIS 31 (Class P2)	yes, acc. to FIPS 140-2/ AIS 31 (Class P2)	yes, acc. to FIPS 140-2 / AIS 31 (Class P2)	yes, acc. to FIPS 140-2 / AIS 31 (Class P2)	yes, acc. to FIPS 140-2 / AIS 31 (Class P2)	yes, acc. to FIPS 140-2 / AIS 31 (Class P2)	yes, acc. to FIPS 140-2 / AIS 31 (Class P2)	yes, acc. to FIPS 140-2 / AIS 31 (Class P2)	yes, acc. to FIPS 140-2 / AIS 31 (Class P2)	yes, acc. to FIPS 140-2 / AIS 31 (Class P2)	yes, acc. to FIPS 140-2 / AIS 31 (Class P2)	yes, acc. to FIPS 140-2 / AIS 31 (Class P2)	yes, acc. to FIPS 140-2/ AIS 31 (Class P2)	yes, acc. to FIPS 140-2 / AIS 31 (Class P2)
Technology	0.14 µm	0.14 µm	0.14 µm	0.14 µm	0.14 µm	0.14 µm	0.14 µm	0.14 µm	0.14 µm	0.14 µm	0.14 µm	0.14 µm	0.14 µm	0.14 µm
MIFARE** emulation (option)	yes, 1 K or 4 K	yes, 1 K or 4 K	yes, 1 K or 4 K	yes, 1 K or 4 K	yes, 1 K or 4 K	yes, 1 K or 4 K	yes, 1 K or 4 K	yes, 1 K or 4 K	yes, 1 K or 4 K	yes, 1 K or 4 K	yes, 1 K or 4 K	yes, 1 K or 4 K	yes, 1 K or 4 K	yes, 1 K or 4 K
Delivery Type Wafer	sawn (75 µ/150 µ)	sawn (75 µ/150 µ)	sawn (75 µ/150 µ)	sawn (75 µ/150 µ)	sawn (75 µ/150 µ)	sawn (75 µ/150 µ)	sawn (75 µ/150 µ)	sawn (75 µ/150 µ)	sawn (75 µ/150 µ)	sawn (75 µ/150 µ)	sawn (75 µ/150 µ)	sawn (75 µ/150 µ)	sawn (75 µ/150 µ)	sawn (75 µ/150 µ)
Delivery Type Module	Contact, Dual Inter-face, Contactless	Contact, Dual Inter-face, Contactless	Contact, Dual Inter-face, Contactless	Contact, Dual Inter-face, Contactless	Contact, Dual Inter-face, Contactless	Contact, Dual Inter-face, Contactless	-	Contact, Dual Inter-face, Contactless	-	Contact, Dual Inter-face, Contactless	Contact, Dual Inter-face, Contactless	-	Contact, Dual Inter-face, Contactless	Contact, Dual Inter-face, Contactless
Evaluation and Certifcation														
3rd Party Hardware Evaluation	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Security Certificates*	CC EAL5+ EMVCo	CC EAL5 + EMVCo	CC EAL5+ EMVCo	CC EAL5 + EMVCo	CC EAL5+ EMVCo	CC EAL5 + EMVCo	CC EAL5+ EMVCo	CC EAL5 + EMVCo	CC EAL5+ EMVCo	CC EAL5+ EMVCo	CC EAL5 + EMVCo	CC EAL5+ EMVCo	CC EAL5 + EMVCo	CC EAL5 + EMVCo

* Common Criteria (CC), EMVCo, ZKA and other evaluations planned depending on application requirements ** MIFARE is a trademark of NXP Semiconductors N.V.

NXP SmartMX2 Dual Interface and Contact PKI Controllers
NXP SmartMX2 Contact Security/PKI Controllers

Product Features	P60D024	P60D040	P60D080	P60D144	P60N144	P60C040	P60C080	P60C144
CPU	Secure_SMX2	Secure_SMX2	Secure_SMX2	Secure_SMX2	Secure_SMX2	Secure_SMX2	Secure_SMX2	Secure_SMX2
ISO Contact Interface	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816
ISO Contactless Interface	ISO 14443	ISO 14443	ISO 14443	ISO 14443	-	-	-	-
NFC Interface type	-	-	-	-	S2C	-	-	-
Concurrent contactless/contact operation	yes	yes	yes	yes	yes	-	-	-
User ROM [byte]	264 K	300 K	384 K	384 K	384 K	300 K	384 K	384 K
RAM (linear addressable) [byte] *	8.125 K	8.125 K	8.125 K	8.125 K	8.125 K	8.125 K	8.125 K	8.125 K
- Standard RAM accessible by CPU [byte]	5.5 K	5.5 K	5.5 K	5.5 K	5.5 K	5.5 K	5.5 K	5.5 K
- RAM accessible by Fame2 and CPU [byte]	2.625 K	2.625 K	2.625 K	2.625 K	2.625 K	2.625 K	2.625 K	2.625 K
EEPROM [byte] *	24 K	40 K	80 K	144 K	144 K	40 K	80 K	144 K
Security Features								
PKI: New Crypto-Engine (Fame2) for ECC/RSA	yes	yes	yes	yes	yes	yes	yes	yes
SBC: Dual/triple key DES-Engine	yes	yes	yes	yes	yes	yes	yes	yes
SBC: AES-Engine key length 128/192/256-bit	yes	yes	yes	yes	yes	yes	yes	yes
Sensors/Glue Logic/Secure Fetch	yes	yes	yes	yes	yes	yes	yes	yes
Memory Management Unit (Firewall)	yes	yes	yes	yes	yes	yes	yes	yes
Additional Product Information								
UART for implemented interfaces	yes	yes	yes	yes	yes	yes	yes	yes
Copy Machine and 16/32-bit CRC-Engine	yes	yes	yes	yes	yes	yes	yes	yes
Supply voltage [V] (continuos operation)	1.62 ... 5.5	1.62 ... 5.5	1.62 ... 5.5	1.62 ... 5.5	1.62 ... 5.5	1.62 ... 5.5	1.62 ... 5.5	1.62 ... 5.5
External Clock [MHz]	1 ... 10 (13.56)	1 ... 10 (13.56)	1 ... 10 (13.56)	1 ... 10 (13.56)	1 ... 10	1 ... 10	1 ... 10	1 ... 10
Internal Clock (1 CPU cycle/clock) ** [MHz]	1 … 20	1 … 20	1 … 20	1 … 20	1 … 20	1 … 20	1 … 20	1 … 20
Temperature range [°C]	-25/+85	-25/+85	-25/+85	-25/+85	-25/+85	-25/+85	-25/+85	-25/+85
EEPROM page mode granularity [byte]	1 … 128	1 … 256	1 … 256	1 … 256	1 … 256	1 … 256	1 … 256	1 … 256
16-bit Timer/Counter	2	2	2	2	2	2	2	2
True Random Number Generator	yes, acc. to FIPS 140-2 / AIS 31 (Class P2)	yes, acc. to FIPS 140-2 / AIS 31 (Class P2)	yes, acc. to FIPS 140-2 / AIS 31 (Class P2)	yes, acc. to FIPS 140-2 / AIS 31 (Class P2)	yes, acc. to FIPS 140-2 / AIS 31 (Class P2)	yes, acc. to FIPS 140-2 / AIS 31 (Class P2)	yes, acc. to FIPS 140-2 / AIS 31 (Class P2)	yes, acc. to FIPS 140-2 / AIS 31 (Class P2)
Technology	0,09 µm	0,09 µm	0,09 µm	0,09 µm	0,09 µm	0,09 µm	0,09 µm	0,09 µm
MIFARE Plus*** implementation (option)	yes, 2 K or 4 K	yes, 2 K or 4 K	yes, 2 K or 4 K	yes, 2 K or 4 K	yes, 2 K or 4 K	yes, 2 K or 4 K	yes, 2 K or 4 K	yes, 2 K or 4 K
MIFARE DESfire EV1*** implementation (option)	yes, 2 K, 4 K or 8 K	yes, 2 K, 4 K or 8 K	yes, 2 K, 4 K or 8 K	yes, 2 K, 4 K or 8 K	yes, 2 K, 4 K or 8 K	yes, 2 K, 4 K or 8 K	yes, 2 K, 4 K or 8 K	yes, 2 K, 4 K or 8 K
Delivery Type Wafer	12 inch sawn (75 µ/150 µ)	12 inch sawn (75 µ/150 µ)	12 inch sawn (75 µ/150 µ)	12 inch sawn (75 µ/150 µ)	12 inch sawn (150 µ)	12 inch sawn (150 µ)	12 inch sawn (150 µ)	12 inch sawn (150 µ)
Delivery Type Module	Contact, Dual Interface, Contactless	Contact, Dual Interface, Contactless	Contact, Dual Interface, Contactless	Contact, Dual Interface, Contactless	Contact	Contact	Contact	Contact
Evaluation and Certification								
3rd Party Hardware Evaluation	yes	yes	yes	yes	yes	yes	yes	yes
Security Certificates****	CC EAL6+ EMVCo planned	CC EAL6+ EMVCo planned	CC EAL6+ EMVCo planned	CC EAL6+ EMVCo planned	CC EAL6+ EMVCo planned	CC EAL6+ EMVCo planned	CC EAL6+ EMVCo planned	CC EAL6+ EMVCo planned

* Without implemented MIFARE Plus resp. MIFARE DESFire EV1 implementation ** Equivalent to up to 120 MHz in the SmartMX P5 Family
*** MIFARE and DESFire are a trademark of NXP Semiconductors N.V. **** Common Criteria (CC), EMVCo, ZKA and other evaluations planned depending on application requirements

NXP Contactless
Smart eID Products

Product Features	P304G003	P308G003	P310G002	P324G004	P332G004
Pre-installed applications	ICAO-like eID	ICAO-like eID	ICAO-like eID	ICAO-like eID	ICAO-like eID
ICAO 9303 file system types	LDS, BAC	LDS, BAC	LDS, BAC	LDS, BAC	LDS, BAC
Enhanced file system types	BAC+	BAC+	BAC+	BAC+	BAC+
Memory					
EEPROM [byte]	4 K	8 K	11 K	24 K	32 K
Write Endurance [cycles]	500 K	500 K	100 K	500 K	500 K
Data Retention [years]	20	20	20	20	20
RF Interface					
Standard	ISO 14443 A	ISO 14443 A	ISO 14443 A	ISO 14443 A	ISO 14443 A
Frequency [MHz]	13.56	13.56	13.56	13.56	13.56
Baudrate [kbit/s]	106/212/424	106/212/424	106/212/424	106/212/424/848	106/212/424/848
Anticollision	True deterministic	True deterministic	True deterministic	True deterministic	True deterministic
Operating Distance [cm]	10	10	10	10	10
Security					
Unique Serial Number [byte]	7	7	7 (4 for MIFARE 4K emulation)	7	7
DES Engine	DES3 <40ms	DES3 <40ms	DES3 <40ms	DES3 <40ms	DES3 <40ms
Exception Sensors	V, f, T, light	V, f, T, light	V, f, T, light	V, f, T, light	V, f, T, light
General Product Information	eID cards, health cards, corporate ID and loyalty cards, ISO 18013 driver's licenses (BAP, configuration 1)				
Operating Temperature Range [°C]	-25/+85	-25/+85	-25/+85	-25/+85	-25/+85
MIFARE or DESFire implementation (option)	n/a	n/a	MIFARE 4K optional	MIFARE 4K	MIFARE 4K
Packaging					
MOB4 module	P304G003A4	P308G003A4	P310G002A4	P324G004A4	P332G004A4
MOB6 module	P304G003A6	P308G003A6	n/a	P324G004A6	P332G004A6
Sawn wafer (8" on UV irradiated FFC)	P304G003UA	P308G003UA	n/a	n/a	n/a

NXP JCOP Product Range

JCOP Version	JCOP 2.3.1	JCOP 2.3.2			JCOP 2.4.1 R2		JCOP 2.4.1 R3			
JCOP Type	4x	1x	2x	3x	J2A	J3A	J1A	J2A	J3A	J5A
Communication										
ISO 7816, T=0, T=1 (communication speed, kbit/s)	223.2	223.2	223.2	223.2	223.2	223.2	223.2	223.2	223.2	223.2
ISO 14443 T=CL (communication speed, kbit/s)	424	-	-	424	-	848	-	-	848	848
USB 2.0 LS	yes	-	-	-	-	-	-	-	-	-
NFC	S2C	-	-	-	-	-	-	-	-	S2C / PN65
Memory										
Available EEPROM Options KByte	72	10/18	10/18/36	12/36/72	40/80	40/80	20	20/40/80/ 95/128	20/40/80/ 95/128	80
ROM (free for Applets, up to KBytes)	65	17	13	46	76	76	76	76	76	76
APDU Buffer (RAM/Bytes)	261	261	261	261	1462	1462	1462	1462	1462	1462
JC&GP										
Java Card Version	2.2.1	2.2.1	2.2.1	2.2.1	2.2.2	2.2.2	2.2.2	2.2.2	2.2.2	2.2.2
Java Card STATIC Option (EEPROM versions)	-	10	10	12	-	-	-	-	-	-
VGP CIR	2.0.1	2.1.1	2.1.1	2.1.1	-	-	2.1.1	2.1.1	2.1.1	2.1.1
Global Platform	2.1.1	2.1.1	2.1.1	2.1.1	2.1.1	2.1.1	2.1.1	2.1.1	2.1.1	2.1.1
SCP Secure Channel Protocol	SCP01, SCP02	SCP01, SCP02	SCP01, SCP02	SCP01, SCP02	SCP01, SCP02	SCP01, SCP02	SCP01, SCP02	SCP01, SCP02	SCP01, SCP02	SCP01, SCP02
Cryptography										
DES/TDES [bit]	56/112/168	56/112/168	56/112/168	56/112/168	56/112/168	56/112/168	56/112/168	56/112/168	56/112/168	56/112/168
AES [bit]	-	-	256*	-	256	256	256	256	256	256
RSA [bit]	2432	-	2432	2432	2048	2048	-	2048	2048	2048
ECC GF(p) [bit]	-	-	-	-	320	320	-	320	320	320
ECC GF(2n) [bit]	239	-	239	239	-	-	-	-	-	-
SEED [bit]	128	-	128	128	128	128	-	128	128	128
SHA	SHA-1	-	SHA-1	SHA-1	SHA-1 / 2	SHA-1 / 2	-	SHA-1 / 2	SHA-1 / 2	SHA-1 / 2
MD5	yes	-	yes	yes	yes	yes	-	yes	yes	yes
Random Number Generation	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
RSA Key Generation	yes	-	yes	yes	yes	yes	-	yes	yes	yes
Additional Features										
Logical Channels	1	1	1	1	1	1	1	1	1	1
RMI Remote Method Invocation	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
SSD Supplementary Security Domain support	yes	-	yes	yes	yes	yes	-	yes	yes	yes
Mifare™ API	yes	-	-	yes	-	yes	-	-	yes	yes
Extended Length APDU	-	-	-	-	yes	yes	-	yes	yes	yes
Random UID	yes	-	-	yes	yes	yes	-	-	yes	yes
Custom ROM Masking	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Technology	0.18 µm	0.18 µm	0.18 µm	0.18 µm	0.14 µm	0.14 µm	0.14 µm	0.14 µm	0.14 µm	0.14 µm
All Delivery Types Wafer and Module (as available for SmartMX Family)	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
eGov + Banking Features										
BAC Support (ICAO9303)	yes	-	-	yes	yes	yes	-	yes	yes	yes
EAC Support (ICAO9303, BSI TR 03110 v1.1.1)	-	-	-	-	yes	yes	-	yes	yes	yes
BAC/EAC Accelerator API	-	-	-	-	yes	yes	-	yes	yes	yes
BAC Performance (20KByte Read)	7s	-	-	7s	-	1.2s	-	-	1.2s	1.2s
EAC Performance (38KByte Read)	-	-	-	-	-	< 5s	-	-	< 4s	< 4s
PACE Support (BSI TR 03110 v2.0.3)	-	-	-	-	-	-	-	-	yes	yes
eGov + Banking Applets										
EAC / BAC Applet	-	-	-	-	EAC v1.0	EAC v1.0	-	EAC v1.2	EAC v1.2	-
VISA VSDC	-	v2.7.1	v2.7.1	v2.7.1	-	-	2.7.1	2.7.1	2.7.1	-
MCW M/Chip (Contact)	-	-	4 v1.1	-	-	-	4 v1.1	4 v1.1	-	-
MCW PayPass M/Chip (Dual Interface)	-	-	-	4 v1.3.1	-	-	-	-	4 v1.3.1	-
MCW Lite & Select (SDA & DDA)	-	-	yes	yes	-	-	yes (SDA)	yes	yes	-
MCP Paypass Magstripe transaction support	-	-	-	yes	-	-	-	-	yes	-
Certifcation & Approvals										
EMVCo (HW approval)	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
VISA	-	yes	yes	yes	-	-	yes	yes	yes	- **
MasterCard PIC+CAST	-	-	yes	yes	-	-	yes	yes	yes	- **
Common Criteria (EAL)	-	-	-	-	5+	5+	-	5+	5+	-

* Available on 72 K version only ** EMV compliant

NXP NFC IC's

Product Features	PN512	PN532	PN533	PN544
Operating distance up to [mm] (1)	70	70	70	70
Interfaces				
Serial interface [kbits/s]	up to 1228	up to 1228	up to 1228	up to 460
I²C interface [bits/s]	up to 3.4 M	up to 400 K	-	up to 3.4 M
SPI interface [bits/s]	up to 5 M	up to 5 M	-	up to 8 M
8 bits parallel interface	yes (with HVQFN40)	-	-	-
USB 2.0 (full speed) interface	-	-	yes	-
CL FIFO depth [bytes]	64	64	64	-
Serial/SPI FIFO [bytes]	-	180	-	-
SWP Interface	-	-	-	yes
S²C interface	yes	yes	yes	yes
CPU	-	80c51	80c51	80c51
RAM/ROM/EEPROM [K bytes]	-	1.0 / 40 / 0	1.2 / 44 / 0	5 / 128 / 52
RF Interface				
Carrier Frequency [MHz]	13.56	13.56	13.56	13.56
Analog Interface	fully integrated	fully integrated	fully integrated	fully integrated
Standard and Protocols				
ISO 18092 Peer-to-peer (active/passive)	yes	yes	yes	yes
ISO 14443-A Reader/Writer	yes	yes	yes	yes
ISO 14443-B Reader/Writer	yes	yes	yes	yes
FeliCa Reader/Writer	yes	yes	yes	yes
ISO 15693 Reader/Writer	no	no	no	yes
Card emulation in comb. with secure element	FeliCa RF, ISO 14443-A, MIFARE Classic	FeliCa RF, ISO 14443-A, MIFARE Classic	FeliCa RF, ISO 14443-A, MIFARE Classic	FeliCa RF, ISO 14443-A-B-B', MIFARE Classic
Baudrate [kbits/s]	106/212/424	106/212/424	106/212/424	106/212/424/848
Security Features				
MIFARE classic support	yes	yes	yes	yes
Interface to secure element	S²C	S²C	S²C	S²C/SWP
Additionnal Product Information				
Embedded firmware	no	yes	yes	yes
Software support	HAL, NFC forum reference implementation	HAL, NFC forum reference implementation	HAL, NFC forum reference implementation, USB PC/ SC driver	HAL, NFC forum reference implementation
Integrated LDO voltage regulator	no	yes	no	yes
Low battery mode	no	yes	no	yes
Battery off mode	no	no	no	yes
Supply voltage [V]	2.5 - 3.6	2.7 - 5.5	2.5 - 3.6	2.3 - 5.5
Min. Host interface voltage[V]	1.6	1.6	1.6	1.65 - 1.95
USB bus power supply [V]	-	-	4.2 - 5.5	-
Supply voltage for secure device integrated	no	yes	yes	S² C/SWP
Power down mode typ. [uA]	5	5	12	3
Power down mode with RF level detector on [uA]	10	25	30	50
Transmitter supply current typ. [mA]	60*	60*	60*	35*
Temperature range [C]	-25/+85	-25/+85	-25/+85	-25/+85
Package thickness	0.85 mm	0.85 mm	0.85 mm	0.8 mm
Package size	5x5 or 6x6 mm²	6x6 mm²	6x6 mm²	4.5x4.5 mm²
Package type	HVQFN32 or HVQFN40	HVQFN40	HVQFN40	TFBGA64
Design In kit	OM5571	OM5581	OM5588	OM5596

Transceiver: RF front-end Controller: RF front-end + microcontroller on single die * Depends on antenna matching (1) Depending on antenna, coil size, tuning, and environment

NXP SmartMX
Contact Interface Security / PKI Controllers

Product Features	P5CC008V1A**	P5CC012V1A**	P5CC020	P5CC021	P5CC024	P5CC037	P5CC040	P5CC052	P5CC073	P5CC080	P5CC081	P5CC144
CPU	Secure_MX51	Secure_MX51	Secure_MX51	Secure_MX51	Secure_MX51	Secure_MX51	Secure_MX51	Secure_MX51	Secure_MX51	Secure_MX51	Secure_MX52	Secure_MX51
ISO Contact Interface	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816
ROM [byte]	196 K	196 K	160 K	200 K	160 K	200 K	200 K	264 K	200 K	200 K	264 K	200 K
RAM (linear addressable) [byte]	6 K	6 K	6 K	6 K	6 K	6 K	6 K	6 K	6 K	6 K	7,5 K	6 K
- Standard RAM [byte]	3.5 K	3.5 K	3.5 K	3.5 K	3.5 K	3.5 K	3.5 K	3.5 K	3.5 K	3.5 K	5 K	3.5 K
- RAM accessible by FameXE [byte]	2.5 K	2.5 K	2.5 K	2.5 K	2.5 K	2.5 K	2.5 K	2.5 K	2.5 K	2.5 K	2,5 K	2.5 K
EEPROM [byte]	8 K	12 K	20 K	20 K	24 K	36 K	40 K	52 K	72 K	80 K	80 K	144 K
Security Features												
PKI Crypto-Engine (FameXE)	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
(RSA key length up to 8192-bit)	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
RSA (1024 bit) signature generation (CRT)/verifcation,	99 / 2 ms	99 / 2 ms	99 / 2 ms	99 / 2 ms	99 / 2 ms	99 / 2 ms	99 / 2 ms	99 / 2 ms	99 / 2 ms	99 / 2 ms	71 / 2 ms	99 / 2 ms
Exponent: 216+1 ECC (192-bit signature) generation/ verification	32 / 60 ms	32 / 60 ms	32 / 60 ms	32 / 60 ms	32 / 60 ms	32 / 60 ms	32 / 60 ms	32 / 60 ms	32 / 60 ms	32 / 60 ms	17 / 33 ms	32 / 60 ms
DES-Engine	DES3 < 40 µs	DES3 < 40 µs	DES3 < 40 µs	DES3 < 40 µs	DES3 < 40 µs	DES3 < 40 µs	DES3 < 40 µs	DES3 < 40 µs	DES3 < 40 µs	DES3 < 40 µs	DES3 < 20 µs	DES3 < 40 µs
AES-Engine key length 128/192/256-bit	-	-	-	< 12/13/15 µs	-	-	< 12/13/15 µs	-	< 12/13/15 µs	< 12/13/15 µs	< 10/11/12 µs	< 12/13/15 µs
Exception Sensors	V, f, T, Light	V, f, T, Light	V, f, T, Light	V, f, T, Light	V, f, T, Light	V, f, T, Light	V, f, T, Light	V, f, T, Light	V, f, T, Light	V, f, T, Light	V, f, T, Light	V, f, T, Light
Memory Management Unit (Firewall)	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Additional Product Information												
UART for implemented interfaces	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
CRC-Engine	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Supply voltage [V]	2.7 … 5.5	2.7 … 5.5	1.62 ... 5.5	1.62 ... 5.5	1.62 ... 5.5	1.62 ... 5.5	1.62 ... 5.5	1.62 ... 5.5	1.62 ... 5.5	1.62 ... 5.5	1.62 ... 5.5	1.62 ... 5.5
External Clock [MHz]	1 … 10	1 … 10	1 … 10	1 … 10	1 … 10	1 … 10	1 … 10	1 … 10	1 … 10	1 … 10	1 … 10 (13.56)	1 … 10
Internal Clock [MHz]	1 … 62	1 … 62	1 … 30	1 … 30	1 … 30	1 … 30	1 … 30	1 … 30	1 … 30	1 … 30	1 … 62	1 … 30
Temperature range [°C]	-25/+85	-25/+85	-25/+85	-25/+85	-25/+85	-25/+85	-25/+85	-25/+85	-25/+85	-25/+85	-25/+85	-25/+85
EEPROM page mode granularity [byte]	1 … 64	1 … 64	1 … 64	1 … 128	1 … 64	1 … 64	1 … 128	1 … 64	1 … 128	1 … 128	1 … 128	1 … 128
16-bit Timer/Counter	2	2	2	2	2	2	2	2	2	2	2	2
True Random Number Generator	yes, acc. to FIPS 140-2/ AIS 31 (Class P2)	yes, acc. to FIPS 140-2/ AIS 31 (Class P2)	yes, acc. to FIPS 140-2 / AIS 31 (Class P2)	yes, acc. to FIPS 140-2/ AIS 31 (Class P2)	yes, acc. to FIPS 140-2/ AIS 31 (Class P2)	yes, acc. to FIPS 140-2/ AIS 31 (Class P2)	yes, acc. to FIPS 140-2 / AIS 31 (Class P2)	yes, acc. to FIPS 140-2/ AIS 31 (Class P2)	yes, acc. to FIPS 140-2/ AIS 31 (Class P2)	yes, acc. to FIPS 140-2/ AIS 31 (Class P2)	yes, acc. to FIPS 140-2/ AIS 31 (Class P2)	yes, acc. to FIPS 140-2/ AIS 31 (Class P2)
Technology	0.14 µm	0.14 µm	0.14 µm	0.14 µm	0.14 µm	0.14 µm	0.14 µm	0.14 µm	0.14 µm	0.14 µm	0.14 µm	0.14 µm
Delivery Type Wafer	sawn (150 µ)	sawn (150 µ)	sawn (150 µ)	sawn (150 µ)	sawn (150 µ)	sawn (150 µ)	sawn (150 µ)	sawn (150 µ)	sawn (150 µ)	sawn (150 µ)	sawn (150 µ)	sawn (150 µ)
Delivery Type Module	Contact	Contact	Contact	Contact	Contact	Contact	Contact	Contact	Contact	Contact	Contact	Contact
Delivery Type SMD package	-	-	HVQFN32	SSOP20/HVQFN32	HVQFN32	SSOP20/HVQFN32	SSOP20/HVQFN32	HVQFN32	HVQFN32	SSOP20/HVQFN32	HVQFN32	SSOP20/HVQFN32
Evaluation and Certification												
3rd Party Hardware Evaluation	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Security Certifcates*	CC EAL5+ planned EMVCo planned	CC EAL5+ planned EMVCo planned	CC EAL5+EMVCo	CC EAL5+ EMVCo	CC EAL5+ EMVCo	CC EAL5+ EMVCo	CC EAL5+ EMVCo	CC EAL5+ EMVCo	CC EAL5+ EMVCo	CC EAL5+ EMVCo	CC EAL5+ EMVCo	CC EAL5+ EMVCo

* Common Criteria (CC), EMVCo, ZKA and other evaluations planned depending on application requirements ** Available H1 2011

NXP Fast Pay
Secure contactless payment IC

Product Features	
Supported specifcations	Visa Contactless Payment Specifcation v2.0.2 A&C 3.0 PayPass Mag Stripe v3.3
Memory	
Write Endurance [cycles]	100 K
Data Retention [years]	20
RF Interface	
Specifcations	PayPass – ISO/IEC 14443 Implementation Specifcation v1.1 EMV Contactless Communication Protocol Specification v2.0.1
Form factor support	Cards (incl 4-line embossing), stickers, others
Security	
Unique Serial Number [byte]	7
DES Engine	DES3
Exception Sensors	V, f, T, light
Certfcations	EMVCo, CAST
Packaging	
MOA4 module	P3SR009A4
Sawn wafer (Au-bumped), 120 µm	P3SR009UD

NXP Authentication Products

Product Features	J7C081	J7D020
CPU	Secure_MX51	Secure_MX51
Operating System	JCOP 2.4.2	JCOP 2.4.3
Application software	Anti-Cloning, Profile of Service, Device Authentication	Anti-Cloning, Profile of Service, Device Authentication
Certificate pre-programming service	supported	supported
Memory		
Available EEPROM (free for Applets)	75 KB	16 KB
ROM (free for Applets)	100 KB	20 KB
RAM (linear addressable for Applets)	3.8 KB	2.3 KB
Interface		
I²C (Master & Slave)	100 kbit/s	400 kbit/s
SPI		2 Mbit/s
Number of GPIOs (shared with interfaces)	3	4
Cryptography		
DES/TDES [bit]	56/112/168	56/112/168
AES [bit]	256	256
RSA [bit]	2048	2048
ECC GF(p) [bit]	320	320
SEED [bit]	128	128
SHA	SHA-1 / 2	SHA-1 / 2
MD5	yes	yes
RSA Key Generation	yes	yes
True Random Number Generator	yes, acc. to FIPS 140-2/ AIS 31 (Class P2)	yes, acc. to FIPS 140-2/ AIS 31 (Class P2)
Security		
Secure Fetch	yes	yes
Glue Logic	yes	yes
Exception Sensors	V, f, T, Light	V, f, T, Light
Memory Management Unit (Firewall)	yes	yes
General Product Information		
Operating Temperature Range [°C]	-25/+85	-25/+90
Supply voltage [V]	1.62 … 5.6	2.5 … 3.6
Internal Clock [MHz]	1 … 62	1 … 30
Max. sleep mode current (typical)	100 uA	30 uA
Packaging	SSOP20, HVSON-8, HVQFN32	SO8, HVQFN20, HVSON-8