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NXP Contactless Reader Systems

	Integrated Reader Modules		High Output Power Reader ICs				«Micore I» Reader IC Family					«Micore II» Reader IC Family	
Product Features	**PRH601 (incl. LPC1227)**	**PR601 (incl. LPC1227)**	**CLRC663**	**MFRC631**	**MFRC630**	**SLRC610**	**CLRC632**	**MFRC531**	**MFRC530**	**MFRC500**	**SLRC400**	**MFRC523**	**MFRC522**
Operating distance up to [mm] [1]	120 / 160 [3]	120 / 160 [3]	120 / 160 [3]	120	120	160	100 / 150 [3]	100	100	100	150	70	70
FIFO depth [byte]	512	512	512	512	512	512	64	64	64	64	64	64	64
Host interface	SPI, I²C, RS232	SPI, I²C, RS232	SPI, I²C, RS232	SPI, I²C, RS232	SPI, I²C, RS232	SPI, I²C, RS232	SPI, 8-bit parallel	SPI, 8-bit parallel	8-bit parallel	8-bit parallel	SPI, 8-bit parallel	SPI, I²C, RS232	SPI, I²C, RS232
RF Interface													
Analog interface	fully integrated	fully integrated	fully integrated	fully integrated	fully integrated	fully integrated	fully integrated	fully integrated	fully integrated	fully integrated	fully integrated	fully integrated	fully integrated
Carrier frequency [MHz]	13.56 and 0.125 [8]	13.56 [7]	13.56	13.56	13.56	13.56	13.56	13.56	13.56	13.56	13.56	13.56	13.56
Modulation	10% & 100% ASK	10% & 100% ASK	10% & 100% ASK	10% & 100% ASK	100% ASK	10% & 100% ASK	10% & 100% ASK	10% & 100% ASK	100% ASK	100% ASK	10% & 100% ASK	10% & 100% ASK	10% & 100% ASK
Baudrate ISO 14443 [kbit/s]	106 / 212 / 424 / 848	106 / 212 / 424 / 848	106 / 212 / 424 / 848	106 / 212 / 424 / 848	106 / 212 / 424 / 848	-	106 / 212 / 424	106 / 212 / 424	106 / 212 / 424	106	-	106 / 212 / 424 / 848	106 / 212 / 424 / 848
Baudrate ISO 15693 [kbit/s]	26.5 / 53	26.5 / 53	26.5 / 53	-	-	26.5 / 53	1.66 / 26.5 / 53	-	-	-	1.66 / 26.5 / 53	-	-
Baudrate FeliCa (kbit/s)	212 / 424	212 / 424	212 / 424	-	-	-	-	-	-	-	-	-	-
Standards & Protocols													
NFC Tag Type Reader	Tag 1, 2, 3 and 4	Tag 1, 2, 3 and 4	Tag 1, 2, 3 and 4	Tag 1, 2 and 4	Tag 1, 2 and 4 [5]	-	Tag 1, 2 and 4	Tag 1, 2 and 4	Tag 1, 2 and 4 [5]	Tag 1, 2 and 4 [5]	-	Tag 1, 2 and 4	Tag 1, 2 and 4 [5]
ISO 14443 A	yes	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	yes	-	-	-	yes	-	-
MIFARE Classic support	yes	yes	yes	yes	yes	-	yes	yes	yes	yes	-	yes	yes
FeliCa	yes	yes	yes	-	-	-	-	-	-	-	-	-	-
EPC Class-1 HF/ ISO 18000-3M3	yes	yes	yes	-	-	yes	-	-	-	-	-	-	-
ISO 18092 (NFC)	yes [2]	yes [2]	yes [2]	-	-	-	-	-	-	-	-	-	-
EMVCo compliance	yes	yes	yes	yes	-	-	yes	yes	-	-	-	yes [9]	-
Security Features													
SAM support in X-Mode	MIFARE SAM AV2.6	MIFARE SAM AV2.6	MIFARE SAM AV2.6	MIFARE SAM AV2.6	MIFARE SAM AV2.6	MIFARE SAM AV2.6	-	-	-	-	-	MIFARE SAM AV1, MIFARE SAM AV2	MIFARE SAM AV1, MIFARE SAM AV2
Additional Product Information													
Supply voltage digital [V]	3.3 ... 5; 5.0 [6]	3.3 ... 5	3.3 ... 5	3.3 ... 5	3.3 ... 5	3.3 ... 5	3.3 or 5	3.3 or 5	3.3 or 5	5	5	2.5 … 3.6	2.5 … 3.6
Supply voltage analog [V]	3.3 ... 5	3.3 ... 5	3.3 ... 5	3.3 ... 5	3.3 ... 5	3.3 ... 5	5	5	5	5	5	2.5 … 3.6	2.5 … 3.6
Power down mode current, typ. [µA]	-	-	0.008	0.008	0.008	0.008	2	2	2	2	2	1	1
Boundary scan interface	-	-	yes	yes	yes	yes	-	-	-	-	-	-	-
Temperature range [°C]	-25 / +70	-25 / +70	-25 / +85	-25 / +85	-25 / +85	-25 / +85	-25 / +85	-25 / +85	-25 / +85	-25 / +85	-25 / +85	-25 / +85	-25 / +85
Package	LQFP100	LQFP100	HVQFN32	HVQFN32	HVQFN32	HVQFN32	SO32	SO32	SO32	SO32	SO32	HVQFN32	HVQFN32
Evaluation Boards	PREV601	PREV601	CLEV663, CLEV663B	CLEV631B	CLEV630B	SLEV610B	MFEV700	-	-	-	-	MFEV710	-
Software Support	NXP Reader Library	NXP Reader Library	NXP Reader Library	NXP Reader Library	NXP Reader Library	NXP Reader Library	NXP Reader Library	NXP Reader Library	NXP Reader Library	NXP Reader Library	NXP Reader Library	NXP Reader Library	NXP Reader Library

[1] Depending on antenna, coil size, tuning, and environment [2] Only passive mode initiator support [3] For ISO 15693 [4] With external booster [5] ISO 14443A only [6] 5.0V supply for 125KHz module [7] Single chip package integrating CLRC663, LPC1227 [8] Single chip package integrating CLRC663, LPC1227, HTRC110 [9] External RF booster required

Samples and Evaluation Boards are available on request, please contact a local NXP distributor

NXP MIFARE SAMs for Reader Systems

Product Features	**MIFARE SAM AV1**	**MIFARE SAM AV2**	**MIFARE SAM AV2.6**	**MFRX852**
Memory				
Write Endurance [cycles]	100 000	100 000	100 000	100 000
Data Retention [yrs]	10	10	10	10
Secure key storage	up to 128 key entries	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	ISO 7816, T=1
Frequency [MHz]	1 … 10	1 … 10	1 … 10	1 … 10
Baudrate [kbit/s]	9.6 … 1500	9.6 … 1500	9.6 … 1500	9.6 … 1500
X-Interface	MFRC523, MFRC522, PN512	MFRC523, MFRC522, PN512	CLRC663, MFRC630, MFRC631, SLRC610	MIFARE SAM AV1 connected with interface to MFRC523
Security				
Unique Serial Number [byte]	7	7	7	7
Random Number Generator	yes	yes	yes	yes
Access Keys	128 key entries	128 key entries	128 key entries	128 key entries
Access Conditions	per key entry	per key entry	per key entry	per key entry
MIFARE Classic Security	supported	supported	supported	supported
DES & DES3 Security	MACing / Encipherment	MACing / Encipherment	MACing / Encipherment	MACing / Encipherment
AES 128 Security	MACing / Encipherment	MACing / Encipherment	MACing / Encipherment	MACing / Encipherment
PKI	-	Signature / Encipherment	Signature / Encipherment	-
RSA	-	Signature / Encipherment	Signature / Encipherment	-
Packaging				
PCM1.1 Module	P5DF072EV2/T0PD4090	P5DF081X0/T1AD2060S	P5DF081X0/T1AR1070S	-
HVQFN package	HVQFN32: P5DF072EHN/ TOPD4090	HVQFN32: P5DF081HN/T1AD2060	HVQFN32: P5DF081HN/T1AD2060	HVQFN48
Additional Product Information				
Evaluation Boards	MFEV710, CLRD710	MFEV710, CLRD710	-	MFEV852
Software Support	17173x NXP Reader Library, 18663x MIFARE discover	17173x NXP Reader Library, 18663x MIFARE discover	17173x NXP Reader Library, 18663x MIFARE discover	17173x NXP Reader Library, 18663x MIFARE discover

Samples and Evaluation Boards are available on request, please contact a local NXP distributor.

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.

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

NXP Contact Smart Card Reader ICs

	Analog Interface							Analog & UART	Analog & UART & CPU
Product Features	**TDA8020**	**TDA8023**	**TDA8024**	**TDA8025**	**TDA8026**	**TDA8034**	**TDA8035**	**TDA8007B**	**TDA8029**
Analog interfaces	2	1	1	1	5	1	1	2	1
ISO 7816 UART	-	-	-	-	-	-	-	yes	yes
ISO 7816 dedicated timers	-	-	-	-	-	-	-	yes	yes
µC-core	-	-	-	-	-	-	-	-	80C51RB+
ROM[kbyte] / RAM[byte]	-	-	-	-	-	-	-	-	16 / 768
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	10	6	6
Auxiliary protected lines for C4 and C8 contacts	0	2	2	2	2 (on slot 1)	2	2	2 x 2	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]	2 x 55	55	80	-	55	65	65	55	65
Card supply current @ 3 V VCC [mA]	2 x 50	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 TSSOP16	HVQFN32	LQFP48	LQFP32
EMVCo compliance	yes	yes	-	-	yes	yes	yes	yes	yes
NDS compliance	-	-	yes	yes	-	yes	yes	-	yes
Evaluation Boards	-	-	-	-	OM9800/MCT800 OM9800/DCT8026	OM9800/MCT800 OM9800/DCT8034	OM9800/MCT800 OM9800/DCT8035	-	-
Software Support	-	-	-	-	-	-	-	Cake8007MBA FW	ArmTDA8029i2c drives TDA8029 Demo

Samples and Evaluation Boards are available on request, please contact a local NXP distributor.

NXP NFC Infrastructure ICs

NFC family type	**NFC Transceiver**		**NFC Controller**			
Product features	**PN512**	**PN512A**	**PN532**	**PN533**	**PR533**	**PN544PC**
Operating distance typ [mm] [1]	70	70	70	70	70	70
Interfaces						
Serial Interfaces [Mbits/s]	up to 1.228	up to 1.228	up to 1.228	up to 1.228	up to 1.228	up to 460
I²C Interface [bits/s]	400k /3.4 M	400k /3.4 M	400k	-	-	up to 3.4 M
SPI Interface [Mbits/s]	up to 5	up to 5	up to 5	-	-	up to 8
8 bits parallel Interface	yes	yes	-	-	-	-
USB 2.0 (full speed) Interface	-	-	-	yes	yes	-
CL FIFO depth [bytes]	64	64	-	-	-	-
S²C Interface	yes	yes	yes	yes	yes	yes
SWP Interface	-	-	-	-	-	yes
CPU	-	-	80C51	80C51	80C51	80C51
RAM / ROM / EEPROM [bytes]	-	-	1 / 40 / 0	1.2 / 44 / 0	1.2 / 44 / 0	5 / 128 / 52
RF Interface						
Carrier Frequency [MHz]	13.56	13.56	13.56	13.56	13.56	13.56
Analog Interface	fully integrated	fully integrated	fully integrated	fully integrated	fully integrated	fully integrated
Standard and Protocols						
ISO18092 Peer to Peer (active / passive)	yes	yes	yes	yes	-	yes
Peer to peer passive initiator	yes	yes	yes	yes	yes	yes
ISO 14443-A Reader / Writer	yes	yes	yes	yes	yes	yes
ISO 14443-B Reader / Writer	yes	yes	yes	yes	yes	yes
FeliCa Reader / Writer	yes	yes	yes	yes	yes	yes
ISO 15693 Reader / Writer	-	-	-	-	-	yes
Baudrate [kbits/s]	106 / 212 / 424 / 848	106 / 212 / 424 / 848	106 / 212 / 424	106 / 212 / 424 / 848	106 / 212 / 424 / 848	106 / 212 / 424 / 848
EMVCo compliance	yes [3]	-	-	-	yes [3]	yes [3]
Security features						
MIFARE Classic security (Crypto 1)	yes	yes	yes	yes	yes	yes
Interface to secure element	S²C	S²C	S²C	S²C	-	S²C/SWP
Additionnal Product information						
Embedded firmware	no	no	yes	yes	yes	yes
Integrated LDO voltage regulator	-	-	yes	-	-	yes
Low battery mode	-	-	yes	-	-	yes
Battery Off mode	-	-	-	-	-	yes
Supply voltage [V]	2.5 - 3.6	2.5 - 3.6	2.7 - 5.5	2.5 - 3.6	2.5 - 3.6	2.3 - 5.5
Min. Host interface voltage [V]	1.6	1.6	1.6	1.6	1.6	1.6 or 3
USB bus power supply [V]	-	-	-	4.2 - 5.5	4.2 - 5.5	-
Supply voltage for secure device integrated	-	-	yes	yes	yes	yes
Power down mode typ. [uA]	5	5	12	12	12	3
Power down mode with RF level detector on [uA]	10	10	15	30	30	50
Transmitter supply current typ. [mA]	60	60	60	60	60	35[2]
Temperature range [C]	-25 / +85	-40 / +90	-25 / +85	-25 / +85	-25 / +85	-25 / +85
Automotive compliant (AEC Q100)	-	yes	-	-	-	-
Packages	HVQFN32/40	HVQFN32	HVQFN40	HVQFN40	HVQFN40	TFBGA64
Evaluation Boards	PNEV512, PNEV512B	-	OM5581	OM5588, PNEV533	OM5588, PREV533	
Software Support	PN51x BFL, HAL	PN51x BFL, HAL	HAL, NFC forum reference implementation	HAL, NFC forum reference implementation, USB PCSC driver	HAL, NFC forum reference implementation, USB CCID driver	HAL, NFC forum reference implementation, EMVCo L1

Samples and Evaluation Boards are available on request, please contact a local NXP distributor.
[1] Depending on antenna, coil size, tuning, and environment [2] Depends on antenna matching [3] External RF booster required