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 or e-mail [info\\_bli@nxp.com](mailto:info_bli@nxp.com)

**NXP Contactless Reader Systems**

Product Features	Reader ICs				Evaluation kits			
	MF RC500	MF RC530	MF RC531	CL RC632	SL RC400	MF RC522	MF RC523	CL RC643
Operating distance up to [mm] <sup>1)</sup>	100	100	100	100 / 150 <sup>1)</sup>	150	70	70	120
RFID depth [byte]	64	64	64	64	64	64	64	64
Host interface	8-bit parallel	8-bit parallel	8-bit parallel	8-bit parallel	8-bit parallel	SPI	SPI	SPI
RF Interface	fully integrated	fully integrated	fully integrated	fully integrated	fully integrated	fully integrated	fully integrated	fully integrated
Carrier frequency [MHz]	13.56	13.56	13.56	13.56	13.56	13.56	13.56	13.56
Modulation	100% ASK	10% & 100% ASK	10% & 100% ASK	10% & 100% ASK	10% & 100% ASK	100% ASK	100% ASK	10% & 100% ASK
Baudrate ISO 14443 [kb/s]	108	106/212/424	106/212/424	106/212/424	106/212/424/848	106/212/424/848	106/212/424/848	106/212/424/848
Baudrate ISO 15693 [kb/s]	-	-	-	1.66/26.5/3	1.66/26.5/3	-	-	1.66/26.5/3
Standards & Protocols								
NFC Tag Type Reader	yes	yes	yes	yes	yes	yes	yes	yes
ISO 14443 A	yes	yes	yes	yes	yes	yes	yes	yes
ISO 14443 B	-	-	-	-	-	-	-	-
ISO 15693	-	-	-	-	-	-	-	-
MIFARE Classic support	yes	yes	yes	yes	yes	yes	yes	yes
ICODE 1 protocol	-	-	-	-	-	-	-	-
HF NFC protocol	-	-	-	-	-	-	-	-
ISO 15692 (NFC)	-	-	-	-	-	-	-	-
Security Features								
MIFARE Classic	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	5
Supply voltage analog [V]	5	5	5	5	5	3.3	3.3	5
Power down mode current, typ. [µA]	2	2	2	2	2	1	1	n.a.
Temperature range [°C]	-25/+85	-25/+85	-25/+85	-25/+85	-25/+85	-25/+85	-25/+85	0/+70
Package	SO32	SO32	SO32	SO32	HVQFN32	HVQFN32	HVQFN32	HVQFN32
Approvals	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
EMC	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

<sup>1)</sup> Depending on antenna, coil size, tuning, and environment. <sup>2)</sup> Only passive mode initiator support. MIFARE and FelCa are registered trademarks of NXP Semiconductors and Sony Corporation. <sup>3)</sup> For ISO15693. <sup>4)</sup> With external booster.

**NXP Contact Smart Card Reader ICs**

Product Features	Analog Interface				Analog & UART				Analog & UART & CPU				
	TDA8020	TDA8023	TDA8024	TDA8025	TDA8026	TDA8034	TDA8035	TDA8007B	TDA8029	TDA8020	TDA8023	TDA8024	TDA8025
Analog interfaces	2	1	1	1	5	1	1	2	1	2	1	2	1
ISO 7816 UART	64	64	64	64	64	64	64	64	64	64	64	64	64
ISO 7816 dedicated timers	no	no	no	no	no	no	no	yes	yes	yes	yes	yes	yes
µC-core	-	-	-	-	-	-	-	no	no	no	no	no	no
ROM (bytes) / RAM (bytes)	-	-	-	-	-	-	-	80CS19B+16/168	80CS19B+16/168	80CS19B+16/168	80CS19B+16/168	80CS19B+16/168	80CS19B+16/168
Flexible sequencer programming	no	yes	no	no	yes	no	no	no	no	no	no	no	no
Host interface	IC	IC	IC	IC	I/O lines	I/O lines	I/O lines	serial or IC	serial or IC	serial or IC	serial or IC	serial or IC	serial or IC
ESD protection on ISO pads [kV]	6	6	6	6	7	6	6	8	8	8	8	8	8
Auxiliary protected lines for C4 and C8 contacts	2	2	2	2	2	2	2	2	2	2	2	2	2
Vcc card power supply [V]	3 & 5	1.8 & 3 & 5	3 & 5	1.8 & 3 & 5	3 & 5	1.8 & 3 & 5	1.8 & 3 & 5	1.8 & 3 & 5	1.8 & 3 & 5	1.8 & 3 & 5	1.8 & 3 & 5	1.8 & 3 & 5	1.8 & 3 & 5
Card supply current @ 3.3 V Vcc [mA]	2x5	55	55	55	65	65	65	65	65	65	65	65	65
Card supply current @ 1.8 V Vcc [mA]	-	35	-	35	35	35	35	35	35	35	35	35	35
Card supply voltage @ 1.8 V Vcc [mA]	-	20	20	26	26	26	26	26	26	26	26	26	26
Card clock frequency max. [MHz]	135	135	225	240	135	3500	3400	135	225	225	225	225	225
Card activation time max. [µs]	110	110	100	100	100	250	90	100	100	100	100	100	100
Card deactivation time max. [µs]	-	-	-	-	-	-	-	-	-	-	-	-	-
Protocol Support													
Synchronous card management	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Asynchronous protocol T=0 and T=1	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Voltage supervisor and over current detection	yes	yes	yes	yes	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	yes	yes	yes	yes
Additional Product Information													
Power supply interface VDDI [M]	1.5...6.5	-	1.6...3.3	-	1.6...3.3	-	1.6...3.3	-	1.6...3.3	-	1.6...3.3	-	1.6...3.3
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	2.7...6.0	2.7...6.0	2.7...6.0	2.7...6.0
Power down current max (µA)	150	2	-	100	25	12	1	350	20	20	20	20	20
Temperature range (°C)	-40/85	-40/85	-40/85	-40/85	-40/85	-40/85	-40/85	-40/85	-40/85	-40/85	-40/85	-40/85	-40/85
Package	LQFP32	TSSOP28	SO28 & TSSOP28	HVQFN32	TBGA44	HVQFN24 & SO16	HVQFN32	LQFP48	LQFP32	LQFP32	LQFP32	LQFP32	LQFP32
Software libraries (EMV 4.2)	-	-	-	-	-	-	-	-	-	-	-	-	-
NDS compliance	-	-	yes	yes	-	yes	-	yes	-	yes	-	yes	-

**NXP MIFARE™ SAMs for Reader Systems**

Product Features	MIFARE SAM AV1 MF3 IC D81 SAM		MIFARE SAM AV2		MF RX352	
	MF3 IC D81 SAM	MF3 IC D81 SAM	MIFARE SAM AV2	MIFARE SAM AV2	MF RX352	MF RX352
Memory	72 K	81 K	81 K	81 K	72 K	72 K
EEPROM size [byte]	-	-	-	-	-	-
OTP area [bit]	-	-	-	-	-	-
Write Endurance [cycles]	100 000	100 000	100 000	100 000	100 000	100 000
Data Retention [yrs]	10	10	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	up to 128 key entries	up to 128 key entries
SAM Interface	ISO 7816, T=1	ISO 7816, T=1	ISO 7816, T=1	ISO 7816, T=1	ISO 7816, T=1	ISO 7816, T=1
UART	1...10	1...10	1...10	1...10	1...10	1...10
Baudrate [kb/s]	9.6...1500	9.6...1500	9.6...1500	9.6...1500	9.6...1500	9.6...1500
Security						
Unique Serial Number [byte]	7	7	7	7	7	7
Random Number Generator	yes	yes	yes	yes	yes	yes
Access Keys	128 key entries	128 key entries	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	per key entry	per key entry
MIFARE Classic Security	supported	supported	supported	supported	supported	supported
DES & DES3 Security	MACing / Encipherment	MACing / Encipherment	MACing / Encipherment	MACing / Encipherment	MACing / Encipherment	MACing / Encipherment
AES 128 Security	MACing / Encipherment	MACing / Encipherment	MACing / Encipherment	MACing / Encipherment	MACing / Encipherment	MACing / Encipherment
PKI	Signature/Encipherment	Signature/Encipherment	Signature/Encipherment	Signature/Encipherment	Signature/Encipherment	Signature/Encipherment
FSI	-	-	-	-	-	-
Package	-	-	-	-	-	-
PCMT1 Module	PCF072E2V/TPD4090	PCF0810V/1AD2505	-	-	-	-
HVQFN package	HVQFN32: PSDF072EHV/TPD4090	HVQFN32: PSDF081HV/TPD4090	-	-	-	-

**NXP HITAG™ Reader ICs**

Product Features	HTRC10 HITAG™ Reader ICs	
	HTRC10 HITAG™	HTRC10 HITAG™
Modulation Type	100% ASK	100% ASK
Dimensions [mm]	6.2 x 8.75 x 1.45	6.2 x 8.75 x 1.45
Interface	CMOS	CMOS
Supply Voltage [V]	5 ± 10%	5 ± 10%
Antenna Driver Current [mA]	200 continuous	200 continuous
Clock Clk. Frequency [MHz]	4...16	4...16
Operating Temperature [°C]	-40...+85	-40...+85
Power Down Current [µA typ.]	7	7
Supported Products		
HITAG™ 1	yes	yes
HITAG™ 2	yes	yes
HITAG™ 5	yes	yes
HITAG™ µ	yes	yes
Security		
HITAG™ 1 data encryption	-	-
HITAG™ 2 data encryption	-	-
HITAG™ 5 data encryption	-	-
Package		
SO14, Tube	-	-
SO14, Beel	-	-
	HTRC10 01T02EE	HTRC10 01T02EE

**ISO 15693 ISO 18000 ISO 11784/85 EPCglobal**

Product Features	NXP Smart Label and Tag ICs																			
	HITAG™ 1	HITAG™ 2	HITAG™ S	HITAG™ µ	HITAG™ µ Advanced HITAG™ µ Advanced	HITAG™ µ R064	ICODE SLI-5 ICODE SLI-5T	ICODE SLI	ICODE SLI-L	ICODE SLIX	ICODE SLIX-S	ICODE SLIX-L	ICODE UID-OTP	ICODE UID	ICODE EPC	ICODE HSL	ICODE GX2L	ICODE GX2M	ICODE G2L / G2L+	
Total Memory	2048	256	256, 2048	128	512, 1760	1760	64	2048	1024	512	1024	2048	512	192	192	136	2048	368	880	256
Size [bit]	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000
Write Endurance [cycles]	up to 4	up to 4	up to 4	up to 4	up to 4	up to 4	up to 4	up to 4	up to 4	up to 4	up to 4	up to 4	up to 4	up to 4	up to 4	up to 4	up to 4	up to 4	up to 4	up to 4
Data Retention [yrs]	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Organization	64 blocks 4 4 bytes	8 blocks 4 4 bytes	8 blocks 4 4 bytes	4 blocks 4 4 bytes	16 blocks 4 4 bytes	55 blocks 4 4 bytes	2 blocks 4 4 bytes	16 pages each 4 blocks 4 4 bytes	32 blocks 4 4 bytes	4 pages each 4 blocks 4 4 bytes	32 blocks 4 4 bytes	16 pages each 4 blocks 4 4 bytes	24 blocks 1 1 byte	24 blocks 1 1 byte	17 blocks 1 1 byte	64 blocks 4 4 bytes	24 blocks 2 2 bytes	55 blocks 4 2 bytes	16 blocks 4 2 bytes	
RF-Interface																				
According to	HITAG 1	HITAG 2, ISO 11784/85	HITAG 1, ISO 11784/85	ISO 11784/85	ISO 11784/85 acc. ISO14223	ISO18000	-	ISO 15693, ISO 18000, EPC™	ISO 15693, ISO 18000	ISO 15693, ISO 18000	ISO 15693, ISO 18000	ISO 15693, ISO 18000	EPC™	EPC™	EPC™	ISO18000-4B	EPC Class 1 Gen2	EPC Class 1 Gen2	EPC Class 1 Gen2	EPC Class 1 Gen2
Frequency	100...150 kHz	100...150 kHz	100...150 kHz	100...150 kHz	100...150 kHz	100...150 kHz	100...150 kHz	13.56 MHz	13.56 MHz	13.56 MHz	13.56 MHz	13.56 MHz	13.56 MHz	13.56 MHz	13.56 MHz	UHF/2.4 GHz	840...960 MHz	840...960 MHz	840...960 MHz	840...960 MHz
Baudrate [kb/s]	up to 4	up to 4	up to 4	up to 4	up to 4	up to 4	up to 4	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 640	up to 640	up to 640	up to 640	up to 640
Anticollision	yes, collision detection	-	yes, collision detection	-	yes, collision detection	-	-	acc. ISO 15693, ISO 18000, EPC™	acc. ISO 15693, ISO 18000	acc. ISO 15693, ISO 18000	acc. ISO 15693, ISO 18000	acc. EPC™	acc. EPC™	acc. EPC™	acc. EPC™	binary tree	slotted ALCHA	slotted ALCHA	slotted ALCHA	slotted ALCHA
Operating Distance [m]	up to 1.5	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 <sup>1)</sup>	up to 1.5	up to 1.5	up to 2.0 <sup>1)</sup>									

