



SMART SOLUTIONS FOR SMART SERVICES

ISSUE DATE 10/04

PHILIPS

Philips' Contactless Reader Systems

[illegible]

ISO 15693

ISO 14223

ISO 18000

Philips' Smart Label and Tag ICs

Philips' Smart Label and Tag ICs										
Product Features	ICODE 1 SL1 ICS30	ICODE 1 HC* SL1 ICS31	ICODE SLI SL2 ICS20	ICODE EPC SL2 ICS10	ICODE UID SL2 ICS11	UCODE HSL SL3 ICS30	UCODE EPC 1.19	HITAG™ 1	HITAG™ 2	HITAG™ S
Memory										
Size [bit]	512	512	1024	136	192	2048	96 + 256	2048	256	32, 256, 2048
Write Endurance [cycles]	100 000	100 000	100 000	-	10 000	100 000	100 000	100 000	100 000	100 000
Data Retention [yrs]	10	10	10	5	5	10	10	10	10	10
Organisation	16 blocks á 4 bytes	16 blocks á 4 bytes	32 blocks á 4 bytes	17 blocks á 1 byte	24 blocks á 1 byte	64 blocks á 4 bytes	11 blocks á 4 bytes	64 blocks á 4 bytes	8 blocks á 4 bytes	64 blocks á 4 bytes
RF-Interface										
According to	ICODE 1	ICODE 1	ISO 15693, ISO 18000	EPC	EPC	ISO 18000	ISO 18000	HITAG 1	HITAG 2, ISO 11784/85	HITAG 1+, ISO 11784/85
Frequency	13.56 MHz	13.56 MHz	13.56 MHz	13.56 MHz	13.56 MHz	UHF / 2.45 GHz	UHF / 2.45 GHz	100 ... 150 kHz	100 ... 150 kHz	100 ... 150 kHz
Baudrate [kbit/s]	up to 26.5	up to 26.5	up to 53	up to 53	up to 53	up to 40	up to 40	up to 4	up to 4	up to 8
Anticollision	time slot	time slot	acc. ISO 15693	acc. EPC	acc. EPC	adapted binary tree	adapted binary tree	yes, collision detection	-	yes, collision detection
Operating Distance [m]	up to 1.5	up to 1.5	up to 1.5	up to 1.5	up to 1.5	up to 7.0	up to 7.0	up to 1.5	up to 1.5	up to 2.0
Security										
Unique Serial Number [byte]	8	8	8	-	5	8	8	4	4	4
Write Protection	blockwise	blockwise	blockwise	-	-	bitwise	bitwise	blockwise	blockwise	blockwise, multi user mode
Access Keys	-	-	-	-	-	-	-	32-bit	48-bit	48-bit
Access Conditions	-	-	-	-	-	-	-	Encrypted Mutual Authentication or Plain	Encrypted Mutual Authentication or Plain	Encrypted Mutual Authentication or Plain
Encryption Algorithm	-	-	-	-	-	-	-	yes	yes	yes, for authentication only
Special Features										
EAS	yes	yes	yes	-	-	-	-	-	-	-
AFI	yes	yes	yes	-	-	yes	yes	-	-	-
EPC	-	-	yes	yes	yes	-	yes	-	-	-
TTF Modes	-	-	-	-	-	-	-	-	yes	yes
Destroy Command	-	-	-	yes	yes	-	-	-	-	-
Packaging										
Sawn Wafer	-	SL1 ICS3101W/N5D	-	-	-	-	-	HT1ICS3002W/N5A	HT2ICS2002W/N5A	-
Sawn Wafer (Au-Bumped)	SL1 ICS3001W/N4D	SL1 ICS3101W/N4D	SL2 ICS2001DW/V4D	SL2 ICS1001DW/V4	SL2 ICS1101DW/V4	SL3 ICS3001W/V4F	SL3 ICS3101W/V4F	-	-	HTSICHxx01EW/V4**
MOA2 Module	SL1 MOA2S30/D	-	SL2 MOS2001DV	-	-	-	-	HT1MOA2S30/E/3	HT2MOA2S20/E/3	HTSMOHxx01EV**
FCP2 Module	-	-	SL2 FCS2001DV/DX	SL2 FCS1001DV/DH	SL2 FCS1101DV/DH	-	-	-	-	HTSFCHxx01EV/DH**
Stick SOT 385-1	-	-	-	-	-	-	-	HT1DC20S30/F	HT2DC20S20/F	-
TSSOP8	-	-	-	-	-	SL3S3001/FT	-	-	-	-

* HC: high capacitance (97pF)

** xx is: "32" for 32bit, "56" for 256bit, and "48" for 2048 bit memory size

HITAG™ Reader ICs		
Product Features	HTRC110 HITAG™ Reader ICs	PCF7921, HITAG Reader Security Controller
Modulation Type	100 % ASK	not applicable
Dimensions [mm]	6.2 × 8.75 × 1.45	SSOP20
Interface	CMOS	programmable IO Pins
Supply Voltage [V]	5 ±10%	2.1V ... 3.6
Antenna Driver Current [mA]	200 continuous	not applicable
Clock Osc. Frequency [MHz]	4 ... 16	up to 2.2 (single clock instruction)
Operating Temperature [°C]	-40 ... +85	-40 ... +85
Power Down Current [µA typ.]	7	0.1 ; max: 0.5 (RUN: 300 ; IDLE:20 ; PD: 100nA)
Memory	-	4 Kbyte EROM (Flash) 512 Byte EEPROM 128 Byte RAM
Supported Products		
HITAG™ 1	yes	-
HITAG™ 2	yes	yes
HITAG™ S	yes	yes
Security		
HITAG™ 1 data encryption	-	-
HITAG™ 2 data encryption	-	yes
HITAG™ S data encryption	-	yes
Package		
SO14, Tube	HTRC110 01T/02EE	-
SO14, Reel	HTRC110 01T/03EE	-
SSOP20	-	PCF7921ATS/3391

Philips' Contact Smart Card Reader ICs

[illegible]

Philips' Contactless mifare® Smart Card ICs

Product Features	mifare® Ultralight MF0 IC U1X	mifare® Std 1k MF1 IC S50	mifare® Std 4k MF1 IC S70	mifare® DESFire MF3 IC D40
Memory				
EEPROM size [byte]	64	1024	4096	4096
OTP area [bit]	32	-	-	-
Write Endurance [cycles]	10 000	100 000	100 000	100 000
Data Retention [yrs]	5	10	10	10
Organization	16 pages á 4 byte	16 sectors á 64 byte	32 sectors á 64 byte 8 sectors á 256 byte	flexible file system
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 4
Frequency [MHz]	13.56	13.56	13.56	13.56
Baudrate [kbit/s]	106	106	106	106 ... 424
Anticollision	bit-wise	bit-wise	bit-wise	bit-wise
Operating Distance [mm]	up to 100	up to 100	up to 100	up to 100
Security				
Unique Serial Number [byte]	7, cascaded	4	4	7, cascaded
Random Number Generator	-	yes	yes	yes, according to FIPS140-2 / AIS31
Access Keys	-	2 keys per sector	2 keys per sector	14 keys per application per file
Access Conditions	per page	per sector	per sector	
mifare® Classic Security	-	supported	supported	-
DES & DES3 Security	-	-	-	MACing / Encipherment
Anti-tear supported by chip	-	for value blocks	for value blocks	yes
Special Features				
Multi-application	-	supports MAD*	supports MAD2**	28 applications, MAD3***
Purse Functionality	-	Value block format	Value block format	Value file
Secure Transport Transaction	48 byte read 16 byte write	512 byte read 16 byte write	512 byte read 128 byte write	512 byte read 128 byte write
Transaction Time [ms]	31.4	164	140	105
Packaging				
Sawn Wafer	-	MF1ICS5005W/V5D	MF1ICS7001W/V5D	MF3ICD4001DW/V5
Sawn Wafer (Au-Bumped)	MF0ICU1X01W/V4D	MF1ICS5005W/V4D	MF1ICS7001W/V4D	MF4ICD4001DW/V4
MOA2 Module	-	MF1MOA2S50/D3F	MF1MOA2S70/D	MF3MOD4001DV/2
MOA4 Module	-	MF1MOA4S50/D	MF1MOA4S70/D	MF3MOD4001DV/4
FCP2 Module	MF0FCP2U1X/DH	MF1FCP2S50/DH	-	-

*MAD: mifare® Application Directory

**MAD2: MAD Extension for 4 kbyte EEPROM size

***MAD3: MAD2 Extension for DESFire

ISO 18092**ISO 14443****Philips' NFC Devices**

Product Features	PN511	PN531
Operating distance typ. [mm]	50 (passive mode) 100 (active mode)	50 (passive mode) 100 (active mode)
Interfaces		
serial [Mbit/s]	up to 1.228	up to 1.228
I ² C [bit/s]	400k / 3.4M	400k
SPI [Mbit/s]	up to 5	up to 5
8 bits parallel	yes	-
USB 2.0 (full speed)	-	yes
CL FIFO depth [byte]	64	64
Serial/SPI FIFO [byte]	-	180
S ² C interface	yes	yes
CPU	-	80C51
RAM / ROM [byte]	-	1K / 32K
RF Interface		
analog interface	fully integrated	fully integrated
Carrier frequency [MHz]	13.56	13.56
Baudrates ISO18092 [kbits/s]	106 / 212 / 424	106 / 212 / 424
Baudrates ISO14443-A [kbits/s]	106 / 212 / 424	106 / 212 / 424
Standards & Protocols		
ISO18092 (active/passive)	yes	yes
ISO14443-A	yes	yes
Mifare Classic	yes	yes
FeliCa RF interface	yes	yes
Security Features		
Mifare classic	yes	yes
Additional Product Information		
Supply voltage [V]	2.5 ... 3.6	2.5 ... 4.0
Host interface voltage min. [V]	1.6	1.6
USB bus power supply [V]	-	4.2 ... 5.5
Power down mode typ. [μA]	5	10
Power down mode with RF level detector on [μA]	10	30
Transmitter supply current typ. [mA]	60	60
Temperature range [°C]	-25 ... +85	-25 ... +85
Packages	TSSOP38/HVQFN40 /HVQFN32	HVQFN40
Embedded firmware	-	yes

Development Tools Overview Philips' Smart Card Controller Families

Product Family	Tool Components					
	Software Tools			Hardware Tools		
	C-Compiler, Assembler, Linker/Locator	Simulator	Source-Level Debugger, Integrated Development Environment	In-Circuit Emulator	Prototyping Kit	Smart Card Probe
Extended 8051 Architecture						
WE Family P8WE6xxx P8WE5xxx	KEIL RAISONANCE	KEIL * RAISONANCE *	ASHLING KEIL RAISONANCE	ASHLING/PHILIPS RAISONANCE	ASHLING RAISONANCE	ASHLING RAISONANCE
Mifare ProX Family P8RF6xxx P8RF5xxx	KEIL RAISONANCE	KEIL * RAISONANCE *	ASHLING KEIL RAISONANCE	ASHLING/PHILIPS RAISONANCE	ASHLING RAISONANCE	ASHLING RAISONANCE
SmartMX Family P5Sx0xx P5Cx0xx	KEIL	KEIL *	KEIL ASHLING	ASHLING/PHILIPS	ASHLING KEIL	ASHLING KEIL
SmartXA Architecture						
SmartXA2 Family P16Wyxxx P7SCxxx P7CCxxx P7CUxxx	RAISONANCE	RAISONANCE *	ASHLING RAISONANCE	ASHLING/PHILIPS RAISONANCE	ASHLING RAISONANCE	ASHLING RAISONANCE
Smart MIPS Architecture						
HiPerSmart Family P9SCxxx P9CTxxx	MIPS, Distribution via ASHLING	MIPS, Distribution via ASHLING	ASHLING	ASHLING/PHILIPS	ASHLING	ASHLING

* Product specific simulator extensions are available from Philips free of charge

Development Tool Partner Contacts

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0.18µm

Philips' SmartMX

Contact and Dual Interface Security Controllers

Product Features	P5SD009	P5SC018	P5SC036	P5SN036	P5SC072	P5SN072
CPU (enhanced 80C51 performance)	Secure_MX51	Secure_MX51	Secure_MX51	Secure_MX51	Secure_MX51	Secure_MX51
Contact Interface	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816
Contactless Interface	ISO 14443	-	-	S ² C (NFC interface)	-	S ² C (NFC interface)
ROM [byte]	96 K	96 K	96 K	128 K	128 K	128 K
RAM (linear addressable) [byte]	2.25 K	2.25 K	2.25 K	2.25 K	2.25 K	2.25 K
EEPROM [byte]	12 K	18 K	36 K	36 K	72 K	72 K
Security Features						
PKI Crypto-Engine incl. ECC	-	-	-	-	-	-
DES-Engine	DES3 < 50 µs	DES3 < 50 µs	DES3 < 50 µs	DES3 < 50 µs	DES3 < 50 µs	DES3 < 50 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
Memory Management Unit (Firewall)	-	-	-	-	-	-
Additional Product Information						
UART for implemented interfaces	yes	yes	yes	yes	yes	yes
mifare® Emulation Mode (optional)	yes, 1K or 4K	-	-	-	-	-
CRC-Engine	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
External Clock [MHz]	1 ... 10 / 13.56	1 ... 10	1 ... 10	1 ... 10	1 ... 10	1 ... 10
Internal Clock [MHz]	1 ... 30	1 ... 30	1 ... 30	1 ... 30	1 ... 30	1 ... 30
Temperature range [°C]	-25 ... +85	-25 ... +85	-25 ... +85	-25 ... +85	-25 ... +85	-25 ... +85
EEPROM page mode granularity [byte]	1 ... 64	1 ... 64	1 ... 64	1 ... 64	1 ... 64	1 ... 64
16-bit Timer (also "etu" Counter use)	2	2	2	2	2	2
True Random Number Generator	yes, according to FIPS140-2 / AIS31	yes, according to FIPS140-2 / AIS31	yes, according to FIPS140-2 / AIS31	yes, according to FIPS140-2 / AIS31	yes, according to FIPS140-2 / AIS31	yes, according to FIPS140-2 / AIS31
Philips Handshake Technology	yes	yes	yes	yes	yes	yes
Delivery Types	sawn wafer, module	sawn wafer, module	sawn wafer, module	sawn wafer, module	sawn wafer, module	sawn wafer, module
Evaluation and Certification						
3 rd Party Hardware Evaluation	yes	yes	yes	yes	yes	yes
Certificates*	CC EAL5+ (planned)	-	-	-	-	-

* Common Criteria (CC), Mastercard, VISA, ZKA evaluations planned depending on application requirements

0.18µm

Philips' SmartMX Contact and Dual Interface PKI Controllers

Product Features	P5CC009	P5CD009	P5CC018	P5CC036	P5CD036	P5CN036	P5CU036	P5CC072	P5CD072	P5CN072	P5CT072
CPU (enhanced 80C51 performance)	Secure_MX51	Secure_MX51	Secure_MX51	Secure_MX51	Secure_MX51	Secure_MX51	Secure_MX51	Secure_MX51	Secure_MX51	Secure_MX51	Secure_MX51
Contact Interface	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816
Contactless Interface	-	ISO 14443	-	-	ISO 14443	-	-	-	ISO 14443	S ² C (NFC interface)	ISO 14443
ROM [byte]	96 K	96 K	128 K	128 K	160 K	160 K	160 K	160 K	160 K	160 K	160 K
RAM (linear addressable) [byte]	4.5 K	4.5 K	4.5 K	4.5 K	4.5 K	4.5 K	4.5 K	4.5 K	4.5 K	4.5 K	4.5 K
EEPROM [byte]	10 K	12 K	18 K	36 K	36 K	36 K	36 K	72 K	72 K	72 K	72 K
Security Features											
PKI Crypto-Engine incl. ECC	FameXE	FameXE	FameXE	FameXE	FameXE	FameXE	FameXE	FameXE	FameXE	FameXE	FameXE
RSA Modular Exponentiation M:2048 E:17bit (SF)* [ms]	< 35	< 35	< 35	< 35	< 35	< 35	< 35	< 35	< 35	< 35	< 35
ECC (192-bit signature) generation/verification [ms]	< 20 / 40	< 20 / 40	< 20 / 40	< 20 / 40	< 20 / 40	< 20 / 40	< 20 / 40	< 20 / 40	< 20 / 40	< 20 / 40	< 20 / 40
DES-Engine	DES3 < 50 µs	DES3 < 50 µs	DES3 < 50 µs	DES3 < 50 µs	DES3 < 50 µs	DES3 < 50 µs	DES3 < 50 µs	DES3 < 50 µs	DES3 < 50 µs	DES3 < 50 µs	DES3 < 50 µs
AES-Engine key length 128/192/256 bit [µs]	-	-	-	-	-	-	-	11 / 12 / 13	-	-	11 / 12 / 13
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
Memory Management Unit (Firewall)	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
mifare® Emulation Mode (optional)	-	yes, 1K or 4K	-	-	yes, 1K or 4K	yes, 1K or 4K	-	-	yes, 1K or 4K	yes, 1K or 4K	yes, 1K or 4K
CRC-Engine	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
External Clock [MHz]	1 ... 10	1 ... 10 / 13.56	1 ... 10	1 ... 10	1 ... 10 / 13.56	1 ... 10 / 13.56	1 ... 10	1 ... 10	1 ... 10 / 13.56	1 ... 10 / 13.56	1 ... 10 / 13.56
Internal Clock [MHz]	1 ... 30	1 ... 30	1 ... 30	1 ... 30	1 ... 30	1 ... 30	1 ... 30	1 ... 30	1 ... 30	1 ... 30	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
EEPROM page mode granularity [byte]	1 ... 64	1 ... 64	1 ... 64	1 ... 64	1 ... 64	1 ... 64	1 ... 64	1 ... 64	1 ... 64	1 ... 64	1 ... 64
16-bit Timer (also "etu" Counter use)	2	2	2	2	2	2	2	2	2	2	2
True Random Number Generator	yes, according to FIPS140-2 / AIS31	yes, according to FIPS140-2 / AIS31	yes, according to FIPS140-2 / AIS31	yes, according to FIPS140-2 / AIS31	yes, according to FIPS140-2 / AIS31	yes, according to FIPS140-2 / AIS31	yes, according to FIPS140-2 / AIS31	yes, according to FIPS140-2 / AIS31	yes, according to FIPS140-2 / AIS31	yes, according to FIPS140-2 / AIS31	yes, according to FIPS140-2 / AIS31
Philips Handshake Technology	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Delivery Types	sawn wafer, module	sawn wafer, module	sawn wafer, module	sawn wafer, module	sawn wafer, module	sawn wafer, module	sawn wafer, module	sawn wafer, module	sawn wafer, module	sawn wafer, module	sawn wafer, module
Evaluation and Certification											
3 rd Party Hardware Evaluation	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Certificates**	CC EAL5+	CC EAL5+ (planned)	-	CC EAL5+	CC EAL5+ (in progress)	CC EAL5+ (planned)	-	CC EAL5+	CC EAL5+ (in progress)	CC EAL5+ (planned)	CC EAL5+

* Straight Forward

** Common Criteria (CC), Mastercard, VISA, ZKA evaluations planned depending on application requirements

0.35µm

Philips' 8-bit mifare® proX Dual Interface Security and PKI Controllers

	Security Controllers			PKI Controllers
Product Features	P8RF6005	P8RF6010	P8RF6016	P8RF5016
CPU	Secure 8-bit 80C51	Secure 8-bit 80C51	Secure 8-bit 80C51	Secure 8-bit 80C51
Contact Interface	ISO 7816	ISO 7816	ISO 7816	ISO 7816
Contactless Interface	ISO 14443	ISO 14443	ISO 14443	ISO 14443
ROM [byte]	64 K	64 K	64 K	64 K
Standard RAM [byte]	256	256	256	256
Extension RAM [byte]	1024	1024	1024	2048
EEPROM [byte]	4 K	8 K	16 K	16 K
Security Features				
Crypto-Engine 32-bit	-	-	-	FameX
RSA 512 - bit (CR) *	-	-	-	40 ms
RSA 1024 - bit (SF) **	-	-	-	400 ms
DES-Engine	DES3 < 35µs	DES3 < 35µs	DES3 < 35µs	DES3 < 35µs
Exception Sensors	V, f, T	V, f, T	V, f, T	V, f, T
Memory Management Unit	yes	yes	yes	yes
Hardware Firewall	yes	yes	yes	yes
Additional Product Information				
UART for implemented Interfaces	yes	yes	yes	yes
mifare® Emulation Mode (optional)	yes, 1K	yes, 1K or 4K	yes, 1K or 4K	yes, 1K or 4K
CRC-Engine	yes	yes	yes	yes
High Speed Memory Access (XMA)	yes	yes	yes	yes
Supply voltage [V]	2.7 ... 5.5	2.7 ... 5.5	2.7 ... 5.5	2.7 ... 5.5
External Clock [MHz]	1 ... 8 / 13.56	1 ... 8 / 13.56	1 ... 8 / 13.56	1 ... 8 / 13.56
Internal Clock [MHz]	up to 16	up to 16	up to 16	up to 16
Temperature Range [°C]	-25 ... +85	-25 ... +85	-25 ... +85	-25 ... +85
16-bit Timer	2	2	2	2
True Random Number Generator	yes, according to FIPS140-2 / AIS31	yes, according to FIPS140-2 / AIS31	yes, according to FIPS140-2 / AIS31	yes, according to FIPS140-2 / AIS31
Philips Handshake Technology	yes	yes	yes	yes
Delivery Types	sawn wafer; module	sawn wafer; module	sawn wafer; module	sawn wafer; module
Evaluation and Certification				
3 rd Party Hardware Evaluation	yes	yes	yes	yes
Certificates ***	-	-	-	MULTOS Visa Level 3

a* Chinese Remainder

** Straight Forward

*** Common Criteria (CC), Mastercard, VISA, ZKA evaluations planned depending on application requirements

0.35µm

Philips' 8-bit WE Security and PKI Controllers

	Security Controllers				PKI Controllers				
Product Features	P8WE6004	P8WE6017	P8WE6032	P8WE6033	P8WE5008	P8WE5016	P8WE5017	P8WE5032	P8WE5033
CPU	Secure 8-bit 80C51	Secure 8-bit 80C51	Secure 8-bit 80C51	Secure 8-bit 80C51	Secure 8-bit 80C51	Secure 8-bit 80C51	Secure 8-bit 80C51	Secure 8-bit 80C51	Secure 8-bit 80C51
Contact Interface	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816
ROM [byte]	32 K	48 K	32 K	96 K	32 K	32 K	64 K	32 K	96 K
Standard RAM [byte]	256	256	256	256	256	256	256	256	256
Extension RAM [byte]	512	1024	1024	2048	2048	2048	2048	2048	2048
EEPROM [byte]	4 K	16 K	32 K	32 K	8 K	16 K	16 K	32 K	32 K
Security Features									
Crypto-Engine 32-Bit	-	-	-	-	FameX	FameX	FameX	FameX	FameX
RSA 1024 - bit (SF)*	-	-	-	-	400 ms	400 ms	400 ms	400 ms	400 ms
DES-Engine	DES3 < 110 µs	DES3 < 110 µs	DES3 < 110 µs	DES3 < 110 µs	DES3 < 110 µs	DES3 < 110 µs	DES3 < 110 µs	DES3 < 110 µs	DES3 < 110 µs
Exception Sensors	V, f, T	V, f, T	V, f, T	V, f, T	V, f, T	V, f, T	V, f, T	V, f, T	V, f, T
Memory Management System	no	yes	no	yes	no	no	yes	no	yes
Additional Product Information									
UART for implemented interfaces	yes	yes	yes	yes	yes	yes	yes	yes	yes
Supply voltage [V]	2.7 ... 5.5	2.7 ... 5.5	2.7 ... 5.5	2.7 ... 5.5	2.7 ... 5.5	2.7 ... 5.5	2.7 ... 5.5	2.7 ... 5.5	2.7 ... 5.5
Clock [MHz]	1 ... 8	1 ... 8	1 ... 8	1 ... 8	1 ... 8	1 ... 8	1 ... 8	1 ... 8	1 ... 8
Temperature Range [°C]	-25 ... +85	-25 ... +85	-25 ... +85	-25 ... +85	-25 ... +85	-25 ... +85	-25 ... +85	-25 ... +85	-25 ... +85
16-bit Timer	2	2	2	2	2	2	2	2	2
True Random Number Generator	yes, according to FIPS140-2 / AIS31	yes, according to FIPS140-2 / AIS31	yes, according to FIPS140-2 / AIS31	yes, according to FIPS140-2 / AIS31	yes, according to FIPS140-2 / AIS31	yes, according to FIPS140-2 / AIS31	yes, according to FIPS140-2 / AIS31	yes, according to FIPS140-2 / AIS31	yes, according to FIPS140-2 / AIS31
Delivery Types	sawn wafer, module	sawn wafer, module	sawn wafer, module	sawn wafer, module	sawn wafer, module	sawn wafer, module	sawn wafer, module	sawn wafer, module	sawn wafer, module
Evaluation and Certification									
3 rd Party Hardware Evaluation	yes	yes	yes	yes	yes	yes	yes	yes	yes
Certificates	CC EAL 5+ Visa Level 3 MasterCard Proton World	CC EAL 5+ Visa Level 3 MasterCard ZKA	Visa Level 3	-	-	-	Visa Level 3 MasterCard	ITSEC E4 High Visa Level 3 ZKA	CC EAL 5+ Visa Level 3 MasterCard ZKA

* Straight Forward

0.35µm

Philips' 16-bit SmartXA PKI Controllers

	PKI Controllers	USB
Product Features	P16WM064	P16WX064
CPU	16-bit SmartXA2	16-bit SmartXA2
Contact Interface	ISO 7816	ISO 7816 USB 2.0 (Low Speed)
ROM [byte]	128 K	128 K
RAM total [byte]	5 K	5 K
RAM accessible by FameX [byte]	1056	1056
EEPROM [byte]	64 K	64 K
Security Features		
Crypto-Engine 32-Bit	FameX	FameX
RSA 1024 - bit (SF)*	400 ms	400 ms
DES-Engine	DES3 < 110 µs	DES3 < 110 µs
Exception Sensors	V, f, T	V, f, T
Memory Management Unit	yes, enhanced	yes, enhanced
Hardware Firewall	yes	yes
Additional Product Information		
UART for implemented interfaces	yes	yes
UART DMA	yes	yes
CRC-Engine	yes	yes
JAVA VM Support	SmartXAccelerator	SmartXAccelerator
GSM Power Control Mode	yes	yes
Supply voltage [V]	2.7 ... 5.5	2.7 ... 5.5
External Clock [MHz]	1 ... 6	1 ... 6
Temperature Range [°C]	-25 ... +85	-25 ... +85
EEPROM page mode granularity [byte]	1 ... 128	1 ... 128
16-bit Timer	2	2
True Random Number Generator	yes, according to FIPS140-2 / AIS31	yes, according to FIPS140-2 / AIS31
Delivery Types	sawn wafer, module	sawn wafer, module
Evaluation and Certification		
3 rd Party Hardware Evaluation	yes	yes
Certificates	-	CC EAL 5+

* *Straight Forward*

0.18µm

Philips' 16-bit SmartXA Security and PKI Controllers

	Security Controllers		PKI Controllers		USB	
Product Features	P7SC073	P7SC145	P7CC073	P7CC145	P7CU073	P7CU145
CPU	16-bit SmartXA2	16-bit SmartXA2	16-bit SmartXA2	16-bit SmartXA2	16-bit SmartXA2	16-bit SmartXA2
Contact Interface	ISO 7816	ISO 7816	ISO 7816	ISO 7816	ISO 7816 USB 2.0 (Low Speed)	ISO 7816 USB 2.0 (Low Speed)
ROM [byte]	256 K	256 K	256 K	256 K	256 K	256 K
RAM total [byte]	6 K	6 K	7 K	7 K	7 K	7 K
RAM accessible by FameX [byte]	-	-	1056	1056	1056	1056
EEPROM [byte]	72 K	144 K	72 K	144 K	72 K	144 K
Security Features						
Crypto-Engine 32-Bit	-	-	FameX	FameX	FameX	FameX
RSA 1024 - bit (SF)*	-	-	tbF	tbF	tbF	tbF
DES-Engine	DES3 < 110 µs	DES3 < 110 µs	DES3 < 110 µs	DES3 < 110 µs	DES3 < 110 µs	DES3 < 110 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
Memory Management Unit	yes, enhanced	yes, enhanced	yes, enhanced	yes, enhanced	yes, enhanced	yes, enhanced
Hardware Firewall	yes	yes	yes	yes	yes	yes
Additional Product Information						
UART for implemented interfaces	yes	yes	yes	yes	yes	yes
UART DMA	yes	yes	yes	yes	yes	yes
CRC-Engine	yes	yes	yes	yes	yes	yes
JAVA VM Support	SmartXAccelerator	SmartXAccelerator	SmartXAccelerator	SmartXAccelerator	SmartXAccelerator	SmartXAccelerator
GSM Power Control Mode	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
External Clock [MHz]	1 ... 6	1 ... 6	1 ... 6	1 ... 6	1 ... 6	1 ... 6
Temperature Range [°C]	-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
16-bit Timer	2	2	2	2	2	2
True Random Number Generator	yes, according to FIPS140-2 / AIS31	yes, according to FIPS140-2 / AIS31	yes, according to FIPS140-2 / AIS31	yes, according to FIPS140-2 / AIS31	yes, according to FIPS140-2 / AIS31	yes, according to FIPS140-2 / AIS31
Delivery Types	sawn wafer; module	sawn wafer; module	sawn wafer; module	sawn wafer; module	sawn wafer; module	sawn wafer; module
Evaluation and Certification						
3 rd Party Hardware Evaluation	yes	yes	yes	yes	yes	yes
Certificates **	-	-	-	-	-	-

* Straight Forward

** Common Criteria (CC), Mastercard, VISA, ZKA evaluations planned depending on application requirements

0.18µm

Philips' 32-bit HiPerSmart Smart Computing Platform

Product Features	P9SC648	P9ST024**
CPU	32bit MIPS RISC CPU	32bit MIPS RISC CPU
Contact Interface	ISO 7816	ISO 7816, USB
Contactless Interface	-	ISO 14443
ROM [byte]	-	512 K
Flash [byte]	512 K	256 K
EEPROM [byte]	142 K	256 K
Data RAM [byte]	16K	16 K
Instruction Cache [byte]	2 K	2 K
Data Cache [byte]	1 K	1 K
Security Features		
Memory Management Unit	yes	yes
Crypto-Engine 32-Bit	supported by enhanced core	supported by enhanced core
DES / AES -Engine	no	no
Exception Sensors	V, f, T, Light	V, f, T, Light
Additional Product Information		
UART for implemented interfaces	yes	yes
CRC-Engine	no	yes
JAVA VM support	yes	yes
True Random Number Generator	yes, according to FIPS140-2 / AIS31	yes, according to FIPS140-2 / AIS31
32-bit Timer	two	two
Supply Voltage [V]	1.62 ... 5.5	1.62 ... 5.5
External Clock [MHz]	1 ... 6	1 ... 6
Temperature Range [°C]	-25 ... +85	-25 ... +85
Delivery Types	sawn wafer; module	sawn wafer; module
Evaluation and Certification		
3 rd Party Hardware Evaluation	yes	yes
Certificates *	-	-

* Common Criteria (CC), Mastercard, VISA, ZKA evaluations planned depending on application requirements

** Planned product (specification is subject to change)

A decorative graphic of a circuit board with a clip is positioned at the top of the page. The circuit board is light blue and features a series of parallel lines that form a rectangular loop. A silver-colored clip is attached to the top of the loop. The background of the entire page is a light blue gradient with a faint, stylized mountain range.

Identification product range

October 2004

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