

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, acc. FIPS 140-2
Access Keys	-	2 keys per sector	2 keys per sector	14 keys per application
Access Conditions	per page	per sector	per sector	per file
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	-	MF1MOA2550/D3F	MF1MOA2570/D	MF3MOD4001DV/2
MOA4 Module	-	MF1MOA4550/D	MF1MOA4570/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

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 FIPS 140-2	yes, according to FIPS 140-2	yes, according to FIPS 140-2	yes, according to FIPS 140-2
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 Certificates ***	yes	yes	yes	yes
	-	-	-	MULTOS
				Visa Level 3

* Chinese Remainder

** Straight Forward

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