

0,18µm

**NXP SmartMX**  
**Contact and Dual Interface PKI Controllers**

Product Features	P5CC009	P5CD009	P5CC018	P5CC036	P5CD036	P5CN036	P5CU036	P5CC072	P5CD072	P5CN072	P5CT072
CPU	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 Contactless Interface	-	ISO 14443	-	-	ISO 14443	-	-	-	ISO 14443	-	ISO 14443
USB Interface	-	-	-	-	-	-	USB 2.0 (low speed)	-	-	-	USB 2.0 (low speed)
S <sup>2</sup> C (NFC) Interface	-	-	-	-	-	yes	-	-	-	yes	-
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
- Standard RAM [byte]	3.25 K	3.25 K	3.25 K	3.25 K	3.25 K	3.25 K	3.25 K	3.25 K	3.25 K	3.25 K	3.25 K
- RAM accessible by FameXE [byte]	1.25 K	1.25 K	1.25 K	1.25 K	1.25 K	1.25 K	1.25 K	1.25 K	1.25 K	1.25 K	1.25 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
<b>Security Features</b>											
PKI Crypto-Engine (RSA key length up to 4096-bit)	FameXE	FameXE	FameXE	FameXE	FameXE	FameXE	FameXE	FameXE	FameXE	FameXE	FameXE
RSA (1024 bit) signature generation (CRT)/verification, Exponent: 2 <sup>n</sup> +1	135 / 3 ms	135 / 3 ms	135 / 3 ms	135 / 3 ms	135 / 3 ms	135 / 3 ms	135 / 3 ms	135 / 3 ms	135 / 3 ms	135 / 3 ms	135 / 3 ms
ECC (192-bit signature) generation/verification	25 / 35 ms	25 / 35 ms	25 / 35 ms	25 / 35 ms	25 / 35 ms	25 / 35 ms	25 / 35 ms	25 / 35 ms	25 / 35 ms	25 / 35 ms	25 / 35 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 < 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
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
<b>Additional Product Information</b>											
UART for implemented interfaces	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
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 ... 6	1 ... 6	1 ... 6	1 ... 10 (13.56)	1 ... 6	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, 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)
Philips Handshake Technology	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Mifare® functionality (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	yes, 1K or 4K
Delivery Type Wafer	sawn/unsawn	sawn/unsawn	sawn/unsawn	sawn/unsawn	sawn/unsawn	sawn/unsawn	sawn/unsawn	sawn/unsawn	sawn/unsawn	sawn/unsawn	sawn/unsawn
Delivery Type Module	Contact	Contact, Dual Interface, Contactless	Contact	Contact	Contact	Contact, Dual Interface, Contactless	Contact	Contact	Contact, Dual Interface, Contactless	Contact	Contact, Dual Interface, Contactless
Delivery Type SMD package	SSOP20	SSOP20	-	SSOP20	-	SSOP20, HVQFN32	-	SSOP20	-	SSOP20, HVQFN32	-
<b>Evaluation and Certification</b>											
3rd Party Hardware Evaluation	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Security Certificates*	CC EAL5+ VISA, CAST	CC EAL5+ VISA, CAST	VISA, CAST	CC EAL5+ VISA, CAST	CC EAL5+ VISA, CAST	CC EAL5+ VISA, CAST	-	CC EAL5+ VISA, CAST	CC EAL5+ VISA, CAST	CC EAL5+ CAST	CC EAL5+ VISA, CAST

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