

## 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	Mifare® DESFire SAM MF3 IC D40 SAM
<b>Memory</b>					
EEPROM size [byte]	64	1024	4096	4096	72k
OTP area [bit]	32	-	-	-	-
Write Endurance [cycles]	10 000	100 000	100 000	100 000	100 000
Data Retention [yrs]	5	10	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	128 key entries
<b>RF-Interface</b>					
Acc. to ISO 14443A	yes - up to layer 3	yes - up to layer 3	yes - up to layer 3	yes - up to layer 4	ISO 7616,T=1
Frequency [MHz]	13.56	13.56	13.56	13.56	1 ... 10
Baudrate [kbit/s]	106	106	106	106 ... 424	9.6 ... 1000
Anticollision	bit-wise	bit-wise	bit-wise	bit-wise	-
Operating Distance [mm]	up to 100	up to 100	up to 100	up to 100	-
<b>Security</b>					
Unique Serial Number [byte]	7, cascaded	4	4	7, cascaded	7
Random Number Generator	-	yes	yes	yes, according to FIPS140-2	yes
Access Keys	-	2 keys per sector	2 keys per sector	14 keys per application per file	128 key entries per key entry
Access Conditions	per page	per sector	per sector	-	-
Mifare® Classic Security	-	supported	supported	-	-
DES & DES3 Security	-	-	-	MACing / Encipherment	MACing / Encipherment
Anti-tear supported by chip	-	for value blocks	for value blocks	yes	-
<b>Special Features</b>					
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	-
<b>Packaging</b>					
Sawn Wafer	-	MF1ICS5005W/V9D	MF1ICS7001W/V9D	MF3ICD4001DW/V506	-
Sawn Wafer (Au-Bumped)	MF0ICU1X01W/V1D	MF1ICS5005W/V1D	MF1ICS7001W/V1D	MF4ICD4001DW/V406	-
MOA2 Module	-	MF1MOA2S50/D3F	-	-	-
MOA4 Module	-	MF1MOA4S50/D	MF1MOA4S70/D	MF3MOD4001DV/406	-
FCP2 Module	MF0FCP2U1X/DH	MF1FCP2S50/DH	-	-	-
PDM1.1 Module	-	-	-	-	P5CT072EVO/TOM68220

\*MAD: Mifare® Application Directory

\*\*MAD2: MAD Extension for 4 kbyte EEPROM size

\*\*\*MAD3: MAD2 Extension for DESFire