

**Short
Introduction**

MM23SC221
221-Bit EEPROM Intelligent
Counter with Security Logic

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221-Bit EEPROM Intelligent Counter with Security Logic

MEMORY

- 221 bit EEPROM and 16 bit mask-programmable ROM
 - 104 bit user memory
 - 64 bit identification area consists of
 - 16 bit Mask ROM
 - 48 bit PROM for personalization data
 - 40 bit PROM / EEPROM counter includes 1 bit for personalization
 - 133 bit advanced feature memory
 - 4 bit backup counter for anti tearing purpose
 - 1 bit for authentication control
 - 16 bit Data Area 1
 - 48 bit Authentication Key 1
 - 48 bit Authentication Key2 with 16 bit unused address or 64 bit Data Area 2
- Counter of 21064

SECURITY

- Authentication Unit
 - Secret Authentication Key 1
 - Optional secret Authentication Key 2
 - Random Number Challenge
 - Up to 16 bit response calculation
- Anti tearing feature for counter
- Transport code protection
- Anti-hacking of signal and physical attacks
- Voltage sensor detection
- Frequency sensor detection

GENERAL

- Single power supply voltage 4.5V to 5.5V
- Low power operation
 - 3 mA typical active current
- 5 ms EEPROM programming time
- 3-wire serial interface
- Contact configuration and serial interface, ISO standard 7816 (Synchronous Transmission) compatible
- High ESD protection: > 4 KV
- High reliability:
 - 500,000 erase/write cycles guaranteed (typical 1 million)
 - 10 years data retention
- Wide operating temperature range -20°C to +80°C Commercial

DESCRIPTION

MM23SC221 consists of 221 bits of an EEPROM, 16 bit ROM and security features suitable for prepaid telephone cards. The EEPROM and ROM areas are used to store identification data, user data and counter. MM23SC221 is also equipped with security features, which include anti tearing protection, voltage and frequency sensor detection and anti-hacking preventing signal or physical analysis. The block diagram is illustrated in Figure 1 below.

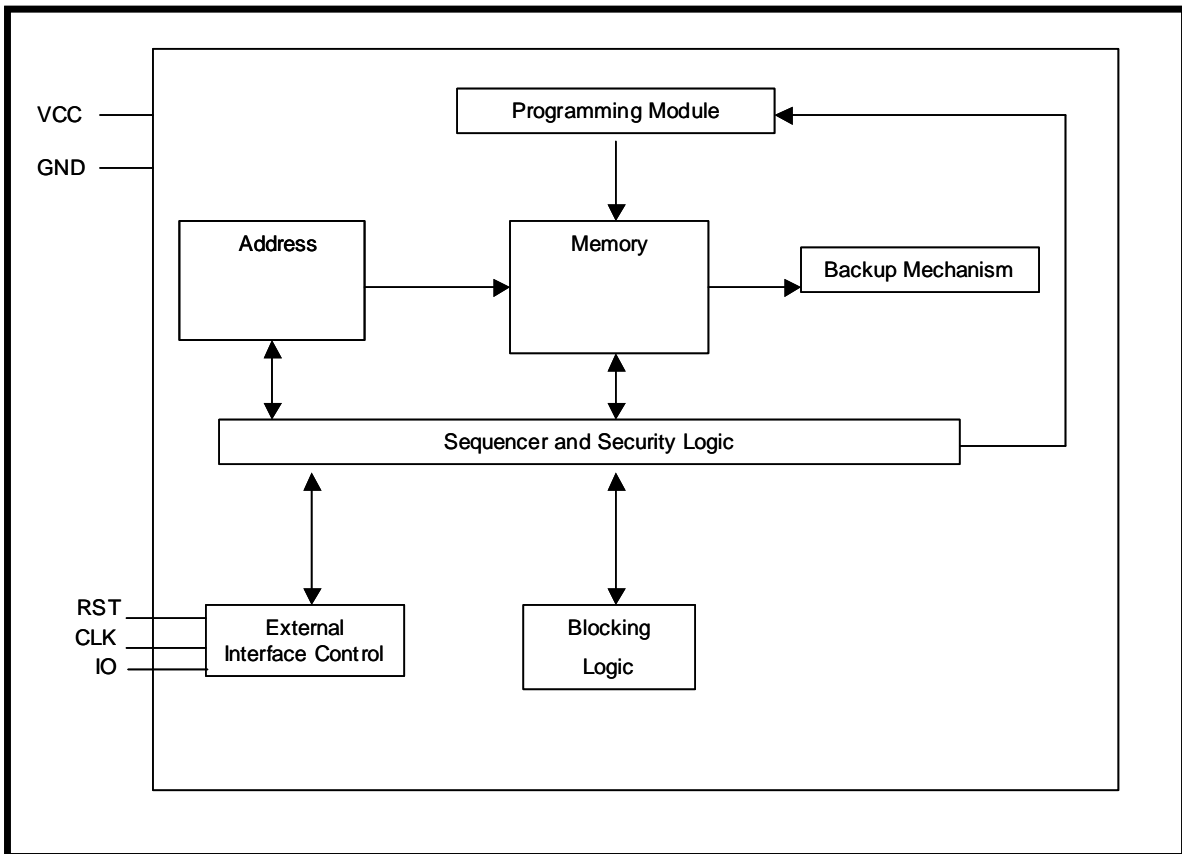


Figure 1: Block Diagram

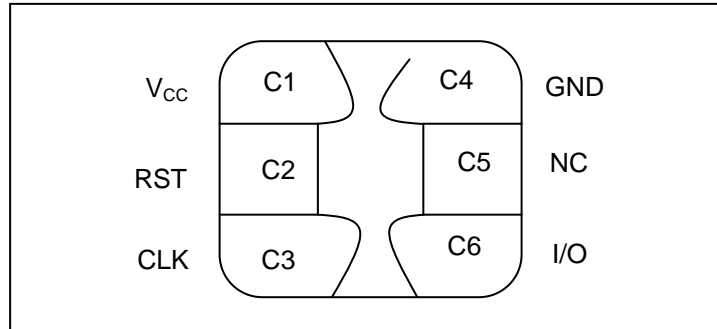


Figure 2: Pin Configuration – Smartcard M3 contact

PIN NAMES AND DESCRIPTIONS

Pin	Card Contact	Symbol	
1	C1	Vcc	Supply Voltage
2	C2	RST	Reset
3	C3	CLK	Serial Clock
4	C4	GND	Ground
5	C5	NC	No Connection
6	C6	I/O	Serial Data I/O (open drain)

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