



Security & Chip Card ICs

SLE 22C05S

16-bit Security Controller with
8-Kbytes ROM, 128 Bytes RAM and
512-Bytes EEPROM

SLE 22C05S Preliminary Short Product Information	
This document contains preliminary information on a new product under development. Details are subject to change without notice.	
Revision History: Current Version 06.99	
Previous Releases: 0.2 (10.98)	
Page	Subjects (changes since last revision)
	Layout change

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Infineon Technologies is an approved CECC manufacturer.

Information

For further information on technology, delivery terms and conditions and prices please contact your nearest Infineon Technologies Office in Germany or our Infineon Technologies Representatives world-wide (see address list).

Warnings

Due to technical requirements components may contain dangerous substances. For information on the types in question please contact your nearest Infineon Technologies Office.

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16-bit Security Controller with 8-Kbytes ROM, 128 Bytes RAM and 512-Bytes EEPROM

Features

- 16-bit microcomputer in 0.6 μm CMOS technology
- Instruction set opcode compatible with standard SAB 8051 processor
- Enhanced 16-bit arithmetic
- Additional powerful instructions optimized for chip card applications
- Dedicated, non-standard architecture with **execution time six times faster** than standard SAB 8051 processor
- **7.5-Kbytes User ROM** for application programs
- 512-bytes reserved ROM for Resource Management System (RMS) with intelligent write/erase routines
- **512-Bytes EEPROM** as program/data memory
- **128 bytes RAM**
- **CRC Module**
- Power saving sleep mode
- Clock freq. = int. freq.: 1 to 7.5 MHz
- Contact configuration and serial interface in accordance with ISO 7816
- Supply voltage range: 2.7 V to 5.5 V
- Current consumption < 8 mA at 5 MHz and 5.5 V
- Temperature range: -25 to +70°C
- ESD protection larger than 4 kV

EEPROM

- Reading, erasing and writing byte by byte
- Flexible page mode for 1 to 8 bytes write/erase operation
- 24 bytes security area
- Write time 3.62 ms, erase time 1.81 ms
- **Minimum of 500,000 write/erase cycles**
- Data retention for a minimum of ten years
- EEPROM programming voltage generated on chip

Security Features

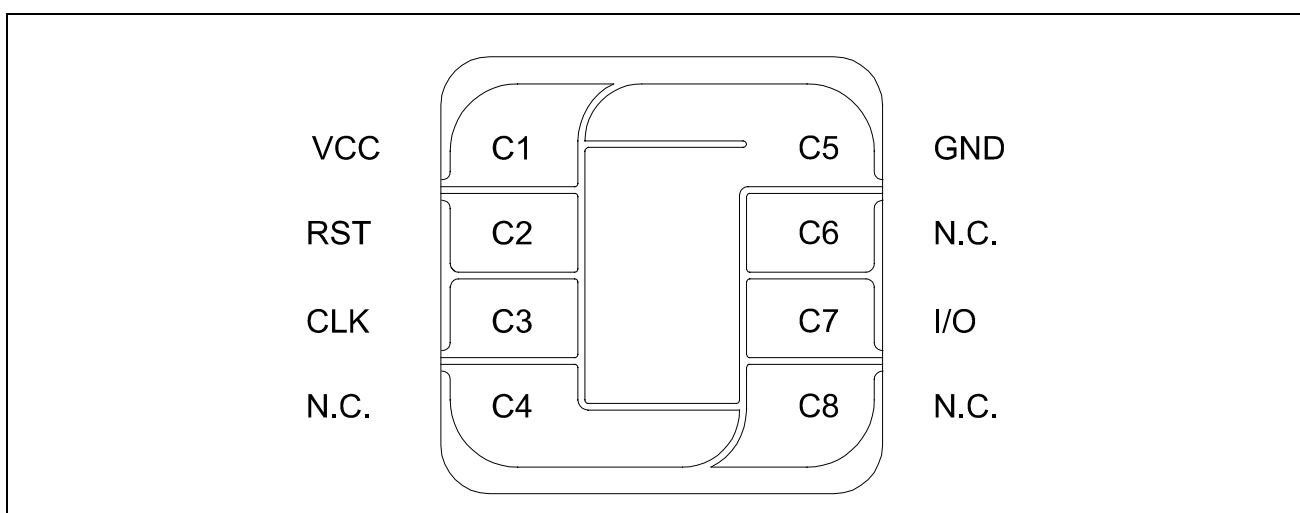
- ROM code not visible due to implantation
- Low and high voltage sensors
- Low-frequency sensor
- High-frequency filter
- Internal power-on-reset
- 16 bytes security PROM, hardware protected
- Unique chip identification number for each chip
- Security optimized layout
- Additional security features

Support

- Tools
- Application notes (e.g.: T=0, T=1)

Ordering Information

Type	Package ¹	Voltage Range	Temperature Range	Frequency Range
SLE 22C05S -M2	M2	2.7 V - 5.5 V	– 25°C to + 70°C	1 MHz - 5 MHz
SLE 22C05S -C	C			
SLE 22C05S -T85-M2	M2	2.7 V - 5.5 V	– 25°C to + 85°C	1 MHz - 5 MHz
SLE 22C05S -T85-C	C			
SLE 22C05S -V5-M2	M2	4.5 V - 5.5 V	– 25°C to + 70°C	1 MHz - 5 MHz
SLE 22C05S -V5-C	C			
SLE 22C05S -V5-T85-M2	M2	4.5 V - 5.5 V	– 25°C to + 85°C	1 MHz - 5 MHz
SLE 22C05S -V5-T85-C	C			
SLE 22C05S -V5-F7-M2	M2	4.5 V - 5.5 V	– 25°C to + 70°C	1 MHz - 7.5 MHz
SLE 22C05S -V5-F7-C	C			

Pin Description

Figure 1 Pin Configuration (top view)

¹ available as wire-bonded module (M2) for embedding in plastic cards or as die (C) for customer packaging

Pin Definitions and Functions

Card Contact	Symbol	Function
C1	VCC	Operating voltage
C2	RST	Reset input
C3	CLK	Processor clock input
C5	GND	Ground
C4; C6; C8	N.C.	Not connected
C7	I/O	Bi-directional data port

General Description

SLE 22C05S is a member of the Infineon Technologies low cost security controller family in 0.6 μm CMOS technology. The CPU provides the high efficiency of the SAB 8051 instruction set extended by additional powerful instructions together with enhanced performance, memory sizes and security features.

The controller IC offers 7.5 Kbytes of User-ROM, 128 bytes internal RAM and 512 Bytes EEPROM.

The CRC module allows the easy generation of checksums according to ISO 3309 (16-Bit-CRC). To minimize the overall power consumption, the chip card controller IC offers a sleep mode.

As an important measure, the chip provides a new and enhanced level of on-chip security features.

In conclusion, the SLE 22C05S fulfills the requirements for all chip card applications, like loyalty, Metering, Membership Cards etc. The SLE 22C05S is a powerful chip card controller IC with enhanced performance and optimized power consumption on a minimized die size. Therefore, the SLE 22C05S offers the basis for new chip card applications.