Security & Chip Card ICs
SLE 66C160S

16-bit Security Controller with 32-Kbyte ROM, 1280 Byte RAM and 16-Kbyte EEPROM

Short Product Information 09.00

SLE 66C160S Short Product Information	
This document contains information on a new product. Details are subject to change without notice. **Revision History: Current Version 09.00**	
Previous Releases: 01.00	
Page	Subjects (changes since last revision)
3	Int. Frequency 1 to 5 MHz
4	Ordering Information: F7 no longer available, packaging in M4 and M5

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To our valued customers
We constantly strive to improve the quality of all our products and documentation. We have spent an exceptional amount of time to ensure that this document is correct. However, we realise that we may have missed a few things. If you find any information that is missing or appears in error, please use the contact section above to inform us. We appreciate your assistance in making this a better document.

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Attention please!

The information herein is given to describe certain components and shall not be considered as warranted characteristics.

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We hereby disclaim any and all warranties, including but not limited to warranties of non-infringement, regarding circuits, descriptions and charts stated herein.

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.

Infineon Technologies Components may only be used in life-support devices or systems with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life-support device or system, or to affect the safety or effectiveness of that device or system. Life support devices or systems are intended to be implanted in the human body, or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.

16-bit Security Controller with 32-Kbyte ROM, 1280 Byte RAM and16-Kbyte EEPROM

Features

- 16-bit microcomputer in 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
- **31.5-Kbytes User ROM** for application programs
- 512-bytes reserved ROM for Resource Management System (RMS) with intelligent write/erase routines
- **16-Kbytes EEPROM** as program/data memory
- **1280 bytes RAM**
- **True random number generator** (RNG)
- **Interrupt module for I/O interface**
- **CRC Module**
- **16-bit timer with 8-bit prescaler**
- Power saving sleep mode
- Clock freq. = int. freq.: 1 to 5 MHz
- Contact configuration and serial interface in accordance with ISO 7816
- Supply voltage range: 2.7 V to 5.5 V
- Current consumption < 10 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 64 bytes write/erase operation
- 32 bytes security area
- Write time 3.62 ms, erase time 1.81 ms
- Programming time adaptable to clock frequency
- **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, DES, RSA etc.)

Ordering Information

Type	Package[1]	Voltage Range	Temperature Range	Frequency Range
SLE 66C160S –M4	M4	2.7 V - 5.5 V	– 25°C to + 70°C	1 MHz - 5 MHz
SLE 66C160S –C	C			1 MHz - 4 MHz @ 3V
SLE 66C160S -T85-M4	M4	2.7 V - 5.5 V	– 25°C to + 85°C	1 MHz - 5 MHz
SLE 66C160S -T85-C	C			1 MHz - 4 MHz @ 3V
SLE 66C160S -V5-M4	M4	4.5 V - 5.5 V	– 25°C to + 70°C	1 MHz - 5 MHz
SLE 66C160S -V5-C	C			
SLE 66C160S -V5-T85-M4	M4	4.5 V - 5.5 V	– 25°C to + 85°C	1 MHz - 5 MHz
SLE 66C160S -V5-T85-C	C			

SLE 66C160S –M5	M5	2.7 V - 5.5 V	– 25°C to + 70°C	1 MHz - 5 MHz
				1 MHz - 4 MHz @ 3V
SLE 66C160S -T85-M5	M5	2.7 V - 5.5 V	– 25°C to + 85°C	1 MHz - 5 MHz
				1 MHz - 4 MHz @ 3V
SLE 66C160S -V5-M5	M5	4.5 V - 5.5 V	– 25°C to + 70°C	1 MHz - 5 MHz
SLE 66C160S -V5-T85-M5	M5	4.5 V - 5.5 V	– 25°C to + 85°C	1 MHz - 5 MHz

[1] available as wire-bonded module (M4) for embedding in plastic cards of as die (C) for customer packaging

Pin Description

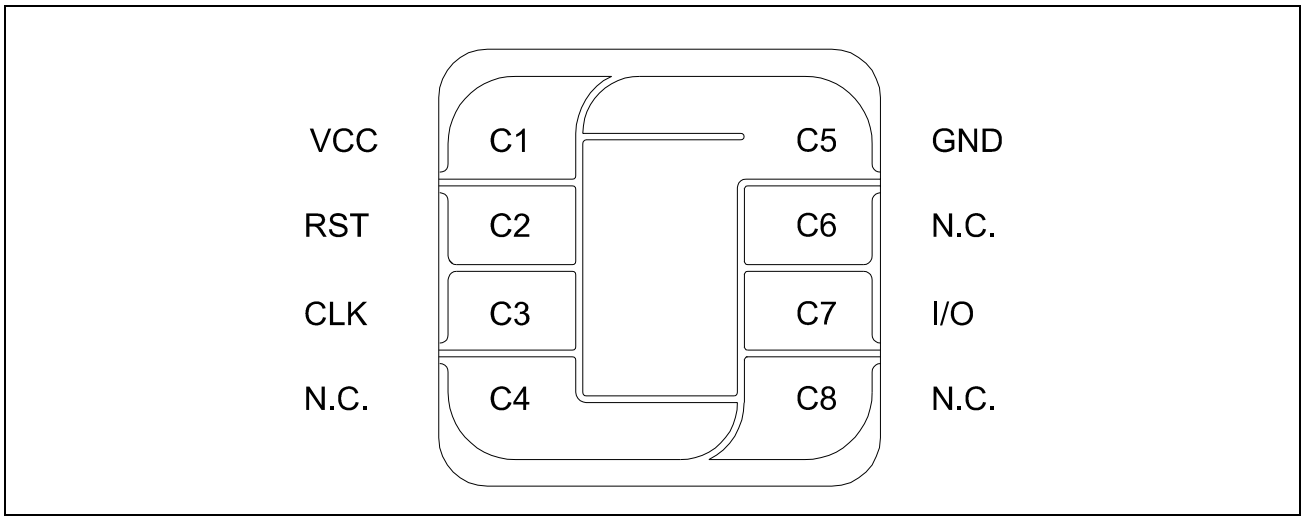

Figure 1 Pin Configuration (top view)

Pin Definitions and Functions

Card Contact	PAD	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 66C160S is a member of the Infineon Technologies high-end security controller family produced in 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 31.5 Kbytes of User-ROM, 256 bytes internal RAM, 1024 bytes XRAM and 16 Kbytes EEPROM. It meets the requirements of the new generation of operating systems.

The random number generator (RNG) is able to supply the CPU with true random Numbers under all conditions. 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 66C160S fulfills the requirements of all chip card applications, in particular the GSM and Access Control. The SLE 66C160S is a powerful chip card controller IC integrating outstanding security features on a minimized die size.