Security & Chip Card ICs

SLE 11C001U

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

Short Product Information 08.00

SLE 11C001U Short Product Information	
This document contains information on a new product. Details are subject to change without notice.	
Revision History: Current Version 08.00	
Previous Releases: 03.99, 06.99	
Page	Subjects (changes since last revision)
3	Int. Frequency: 1 to 5 MHz
4	Ordering Information: F7 no longer available, packaging M5

Important:Further information is confidential and on request. Please contact:

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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 32-Kbyte ROM, 1280 Bytes RAM and 16-Kbyte 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
- **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
- **CRC Module**
- 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
- Software compatible with SLE 66C160S, SLE 44C160S

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, Random Number Generator, DES, etc.)

Ordering Information

Type	Package[1]	Voltage Range	Temperature Range	Frequency Range
SLE 11C001U-M5	M5	2.7 V - 5.5 V	– 25°C to + 70°C	1 MHz - 5 MHz
SLE 11C001U-C	C			
SLE 11C001U -T85-M5	M5	2.7 V - 5.5 V	– 25°C to + 85°C	1 MHz - 5 MHz
SLE 11C001U -T85-C	C			
SLE 11C001U -V5-M5	M5	4.5 V - 5.5 V	– 25°C to + 70°C	1 MHz - 5 MHz
SLE 11C001U -V5-C	C			
SLE 11C001U -V5-T85-M5	M5	4.5 V - 5.5 V	– 25°C to + 85°C	1 MHz - 5 MHz
SLE 11C001U -V5-T85-C	C			

Pin Description

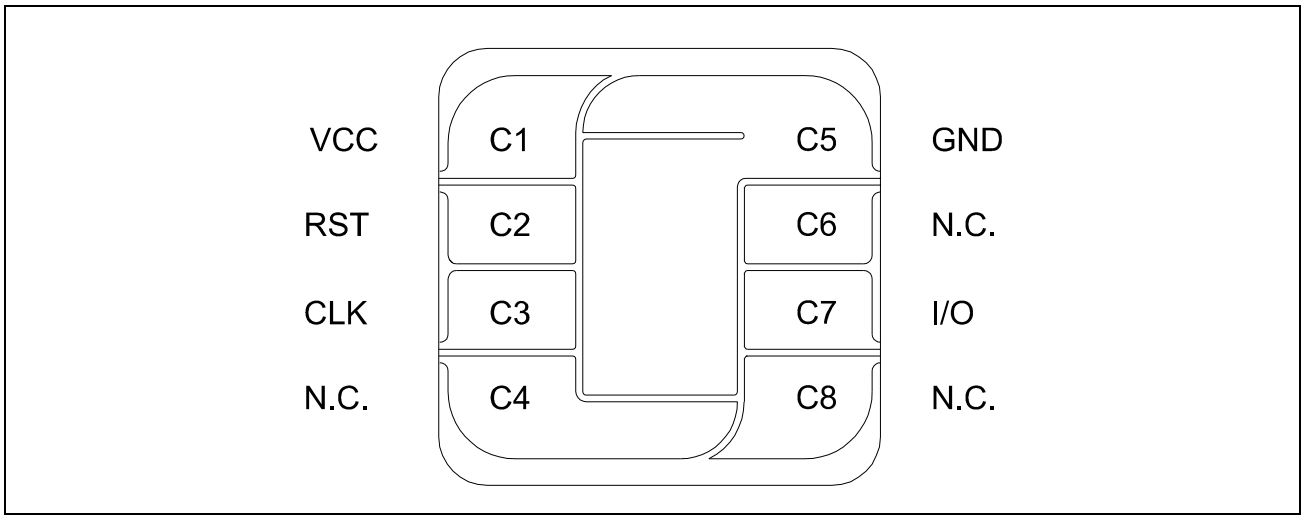

Figure 1 Pin Configuration (top view)

[1] available as wire-bonded module (M5) 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 11C001U is a member of the Infineon Technologies high end 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 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 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 11C001U fulfills the requirements of many chip card applications, and is especially well suited for use in SIM cards for GSM phones and also in health care applications. The SLE 11C001U is a powerful chip card controller IC integrating outstanding memory sizes, additional peripherals in combination with enhanced performance and optimized power consumption on a minimized die size. Therefore, the SLE 11C001U offers the basis for new chip card applications.