Infineon technologies

Security & Chip Card ICs

SLE 4406S
SLE 4406SE

Intelligent 112–Bit EEPROM Counter
for > 20000 Units with Security Logic

Short Product Information 09.99

SLE 4406S/06SE Short Product Information	Ref.: SPI_SLE4406S_0999.doc
Revision History: Current Version 09.99	
Previous Releases:	
Page	Subjects (changes since last revision)

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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).

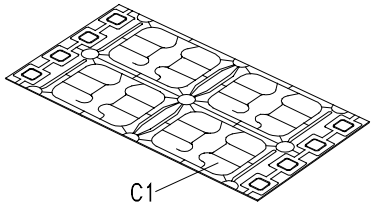
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Intelligent 112–Bit EEPROM Counter for > 20000 Units with Security Logic

Features



M3

- **100% functional compatibility to 4406/06E**
- **112 bit EEPROM and 16 bit ROM**

  104 bit user memory fully compatible with SLE 4406/06E
  - 64 bit Identification Area 1 consisting of
    - 16 bit Manufacturer code
    - SLE 4406S:
      8 bit Manufacturer data, card issuer dependent
      40 bit for personalization data of card issuer
    - SLE 4406SE:
      48 bit for personalization data of card issuer
  - 40 bit Counter Area including 1 bit for personalization (PROM/EEPROM)

  24 bit additional memory for advanced features configurable during personalization
  - either 24 bit Identification Area 2 for personalization data of card issuer
  - or 24 bit Data Area for free user access
- **Counter with up to 33352 count units**
  - Five stage abacus counter
  - Due to testing purposes a maximum of 21064 count units is guaranteed
- **Transport Code protection for delivery**
- **Ambient temperature –40 … +80°C**
- **Supply voltage 5 V ± 10 %**
- **Supply current < 1 mA**
- **EEPROM programming time 5 ms**
- **ESD protection typical 4000 V**
- **Endurance minimum 10^5 write/erase cycles / bit**[1)]
- **Data retention for minimum of 30 years**[1)]
- **Contact configuration and Answer-to-Reset (synchronous transmission) in accordance to standard ISO/IEC 7816**

- **Advanced 1.2 µm CMOS-technology**
- **Protecting of deeper layers via metal**
- **No isolation on backside necessary**

[1)] Values are temperature dependent

Table 1 Ordering Information

Type	Package[2)]	Access of 3rd byte
SLE 4406S M3	M3	Data of 3rd byte are programmed by Infineon exclusively
SLE 4406S C	C	
SLE 4406SE M3	M3	Data of 3rd byte are programmed by the card manufacturer at personalisation
SLE 4406SE C	C	

Pin Description

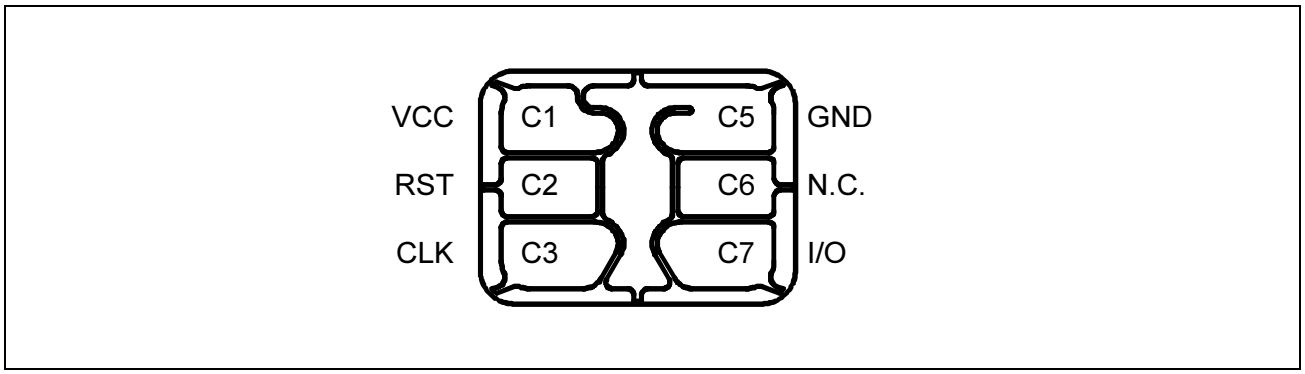


Figure 1 Pin Configuration Wire-bonded Module (top view)

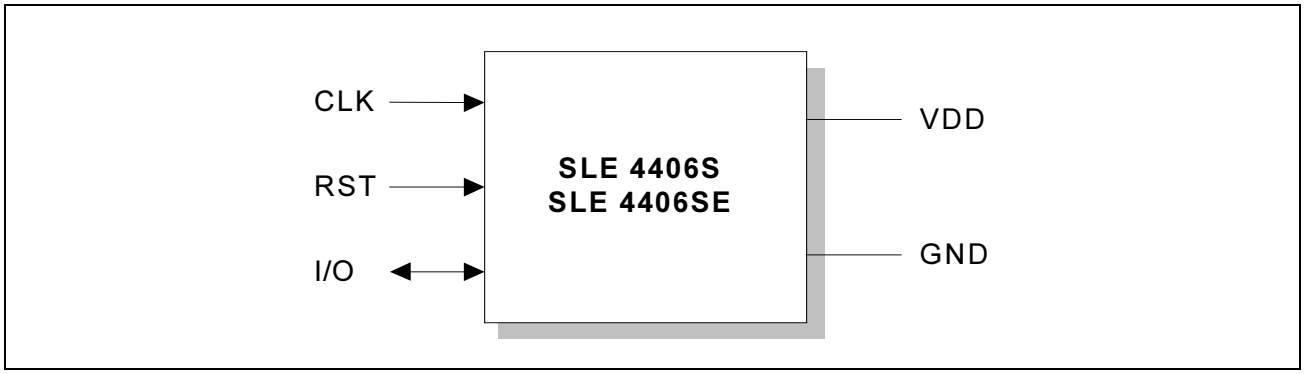


Figure 2 Pad Configuration Die

Table 2 Pin Definitions and Functions

Card Contact	Symbol	Function
C1	VCC	Supply voltage
C2	RST	Control input (Reset Signal)
C3	CLK	Clock input
C5	GND	Ground
C6	N.C.	Not connected
C7	I/O	Bi-directional data line (open drain)

2) Available as a wire-bonded module (M3) for embedding in plastic cards or as a die (C) for customer packaging

General Description

SLE 4406S/06SE is designed for applications in prepaid telephone cards. The chip consists of an EEPROM memory of 112 bit, a ROM of 16 bits and a control/security unit.

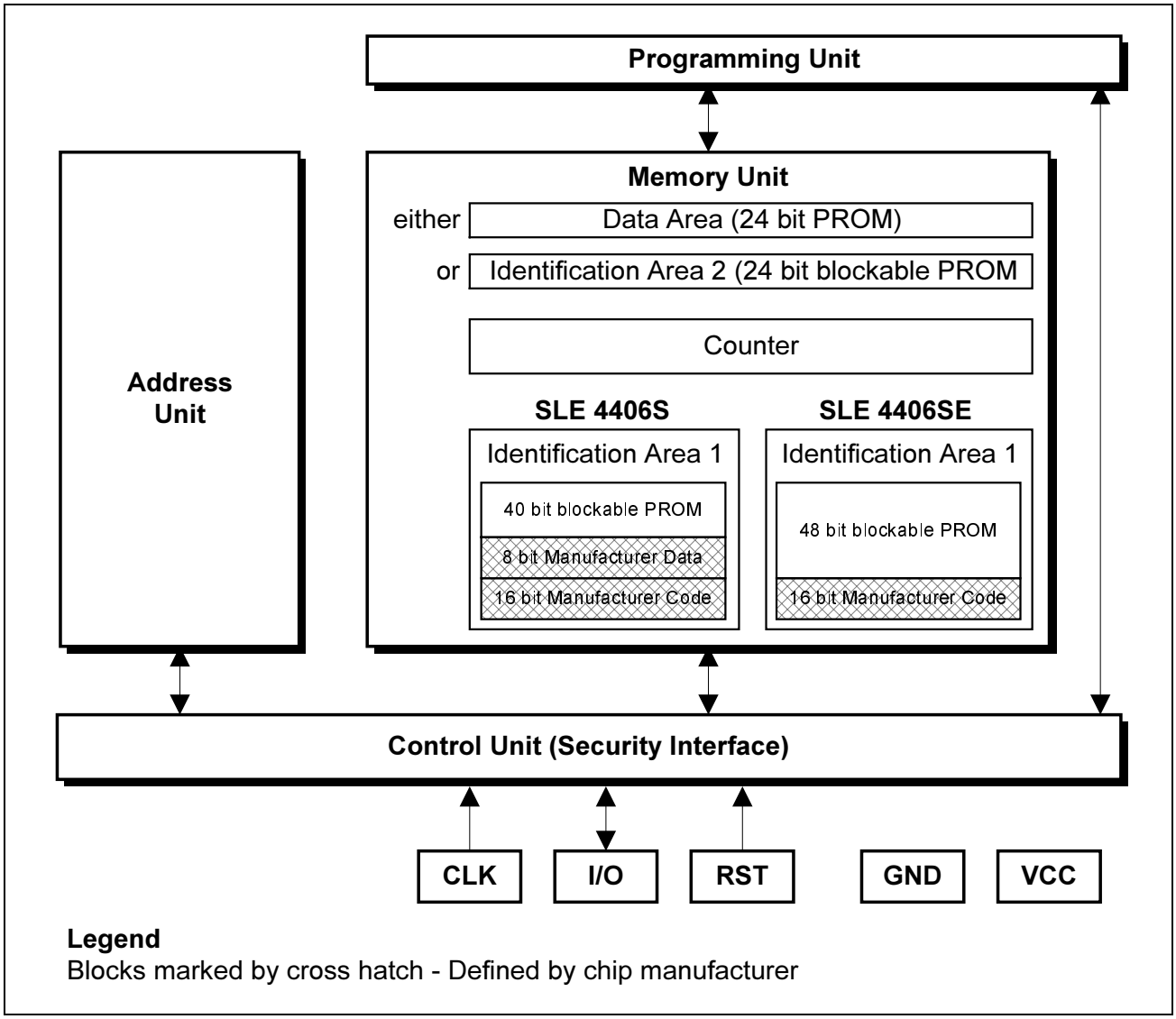


Figure 3 Block Diagram

- **Memory Unit**
  Counter, Identification Data (e.g. serial number, expiry date) and Data Area.
- **Address Unit**
  Setting of the address counter is synchronously with the CLK.
- **Programming Unit**
  The programming voltage for the EEPROM/PROM is generated internally.
- **Security Interface**
  Ensures a minimum and a maximum frequency and proper logical voltage levels.