



Security & Chip Card ICs

SLE 4406S

SLE 4406SE

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

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|---|--|-----------------------------|
| 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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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

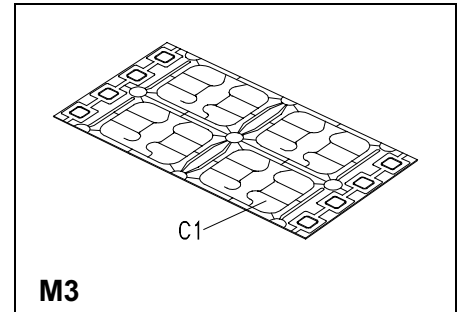
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Intelligent 112–Bit EEPROM Counter for > 20000 Units with Security Logic

Features

- **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 10⁵ write/erase cycles / bit¹⁾**
- **Data retention for minimum of 30 years¹⁾**
- **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

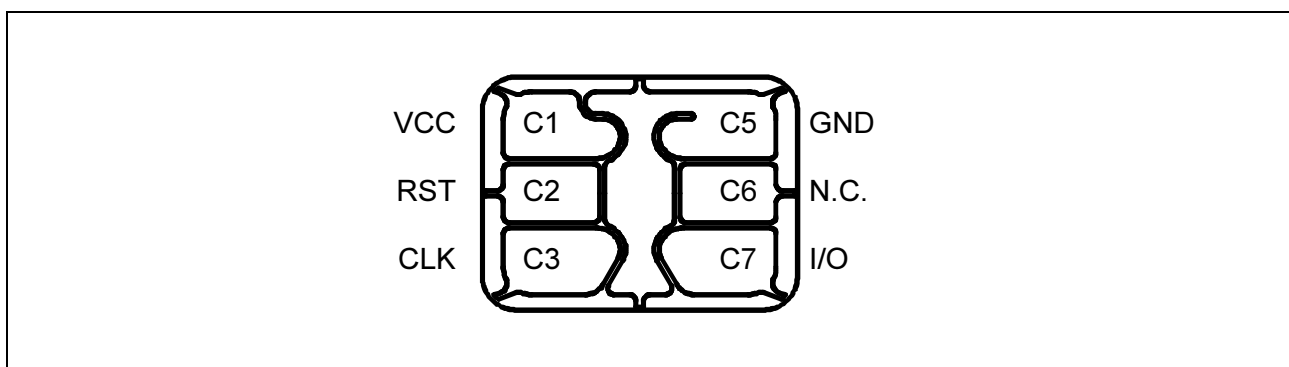


Figure 1 Pin Configuration Wire-bonded Module (top view)

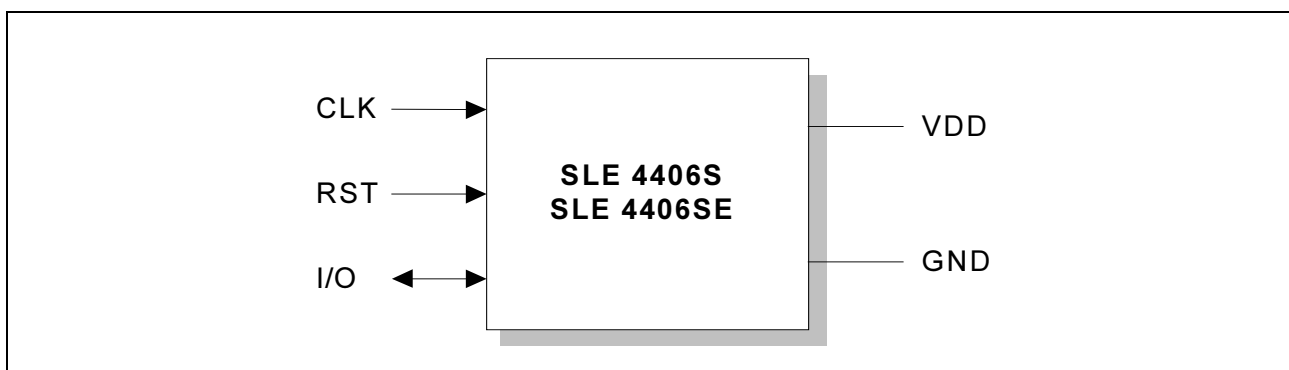


Figure 2 Pad Configuration Die

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.

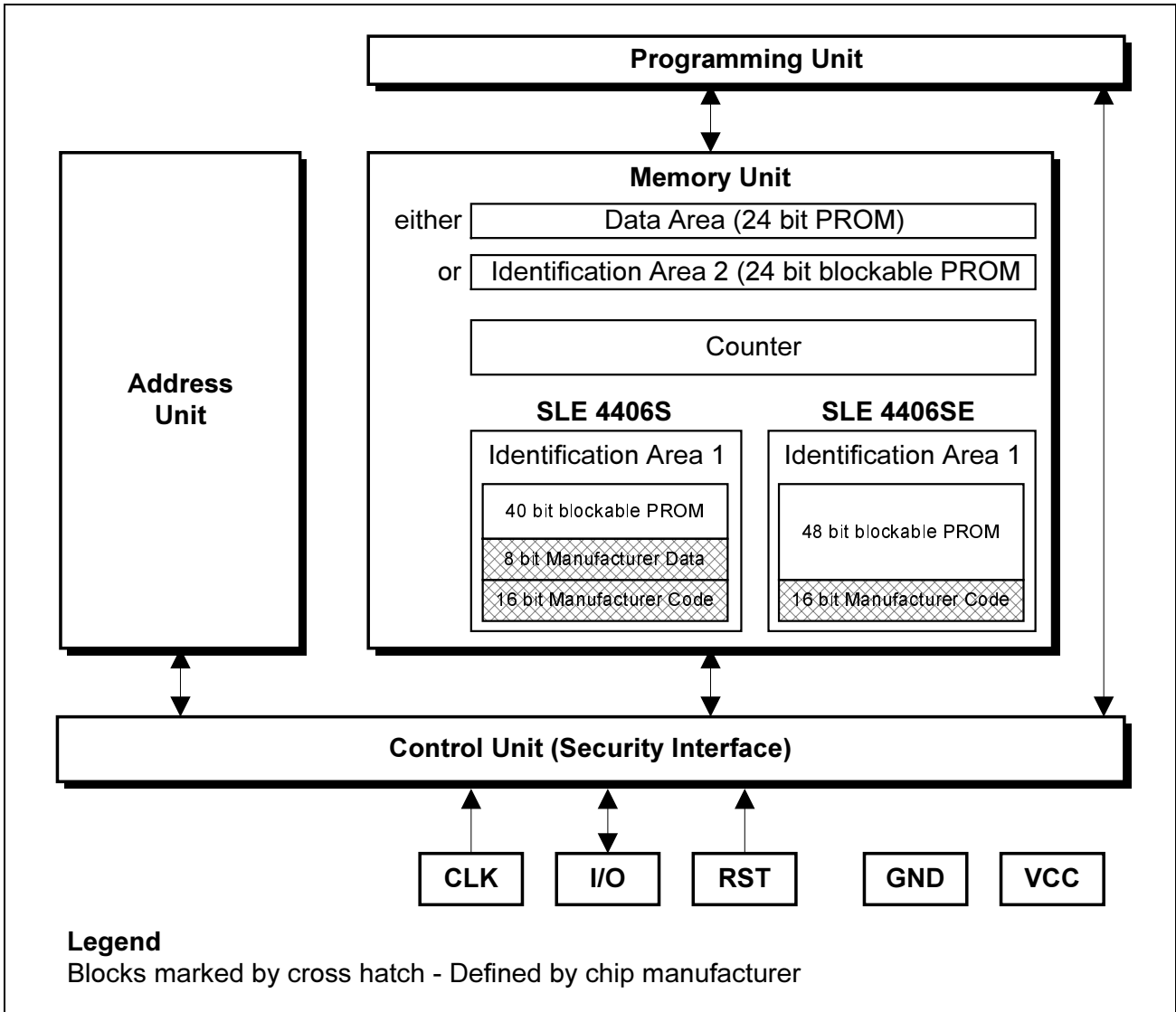


Figure 3 Block Diagram

- **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.