Security & Chip Card ICs

SLE 4406/06E

Intelligent 88–Bit EEPROM Counter
for > 20000 Units with Security Logic

Short Product Information 07.99

SLE 4406/06E Short Product Information		Ref.: SPI_SLE4406_0799.doc
Revision History:	**Current Version 07.99**	
Previous Releases:	09.96	
Page	Subjects (changes since last revision)	
	Layout change	

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Published by Infineon Technologies AG, CC Applications Group
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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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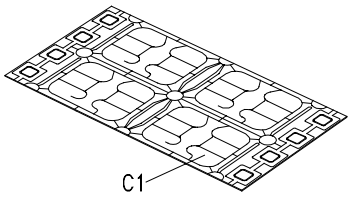
Intelligent 88–Bit EEPROM Counter for > 20000 Units with Security Logic

Features



M3

- **88 bit EEPROM and 16 bit mask-programmable ROM**
  64 bit Identification Area consisting of
  – 16 bit Manufacturer code (mask-programmable ROM)
  – SLE 4406: 8 bit Manufacturer data, card issuer dependent (ROM)
  40 bit for personalization data of card issuer (PROM)
  – SLE 4406E: 48 bit for personalization data of card issuer (PROM)
  40 bit Counter Area including 1 bit for personalization (PROM/EEPROM)
- **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 –35 … +80°C**
- **Supply voltage 5 V ± 10 %**
- **Supply current < 3 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 10 years**[1)]
- **Contact configuration and Answer-to-Reset (synchronous transmission) in accordance to standard ISO/IEC 7816**

Table 1 Ordering Information

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

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

Pin Description

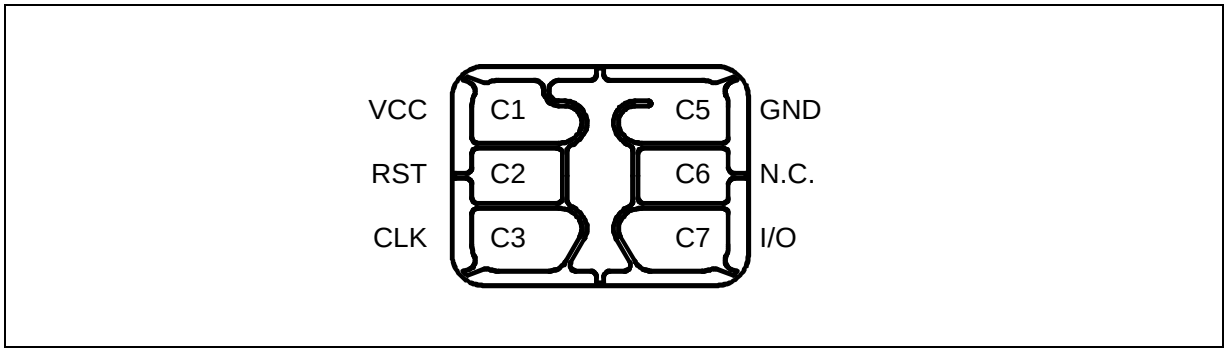


Figure 1 Pin Configuration Wire-bonded Module (top view)

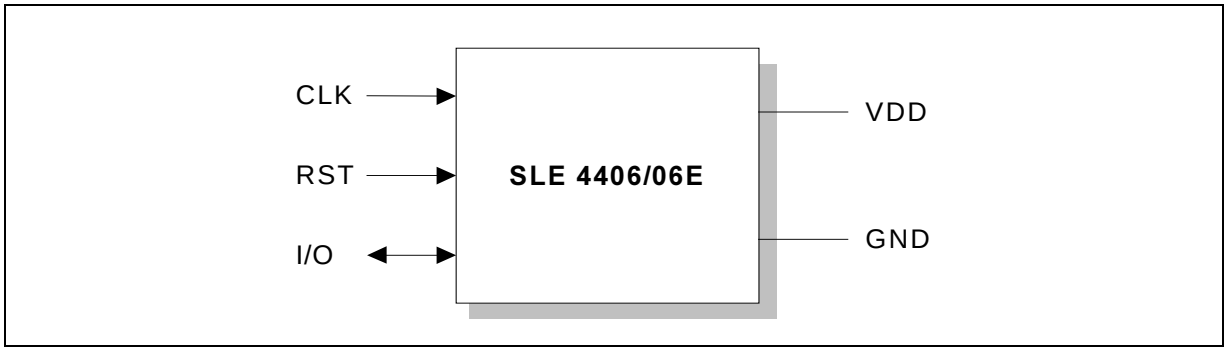


Figure 2 Pad Configuration Die

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)

General Description

SLE 4406/06E is designed for applications in prepaid telephone cards. The chip consists of an EEPROM memory of 88 bit, a ROM of 16 bits and a control/security unit.

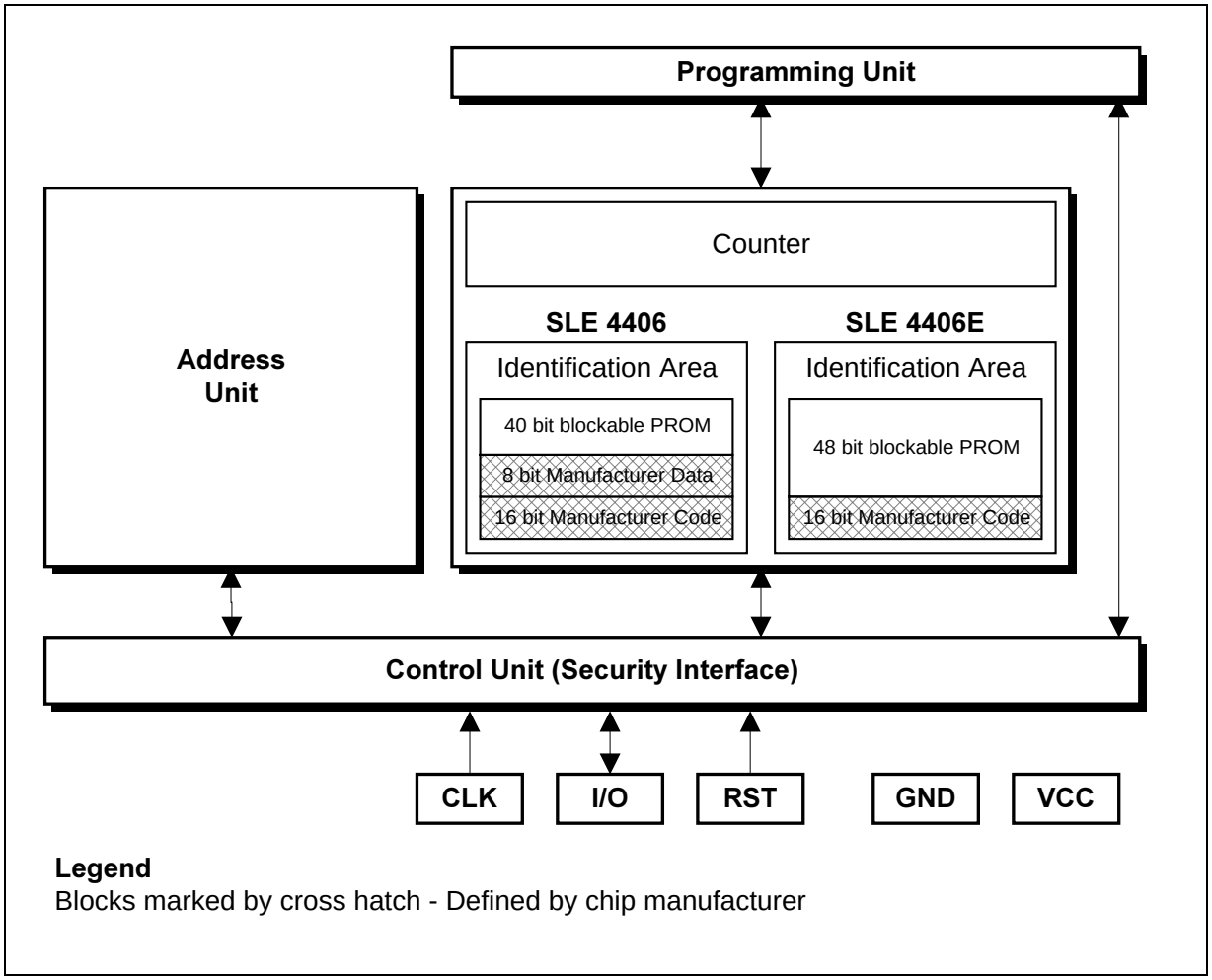


Figure 3 Block Diagram

- **Memory Unit**
  Counter, Identification Data (e.g. serial number, expiry date) and Data Areas.
- **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.