Chip Card & Security ICs

SLE 5532

Intelligent 256-Byte EEPROM
with Write Protection function

SLE 5532 Short Product Information	Ref.: SPI_SLE5532_0506.doc
Revision History: **Current Version 2006-05-19**	
Previous Releases: 2005-06-16	
Page	Subjects (changes since last revision)
all	Editorial changes

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.

Attention please!

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

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Information

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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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Intelligent 256-Byte EEPROM with Write Protection Function

Features

M3

- **100% functional compatibility to SLE 4432**

- **256 x 8 bit EEPROM organization of Data Memory**

- **32 x 1 bit Protection Memory**
  - Byte-wise write protection of first 32 addresses (byte 0...31) of Data Memory
  - Manufacturer Code for unique identification of application

- **Two-wire link protocol**
  - Byte-wise addressing
  - End of processing indicated at data output

- **Contact configuration and Answer-to-Reset (synchronous transmission) in accordance to standard ISO/IEC 7816**

- **Sophisticated electrical characteristics**
  - Ambient temperature –40 … +80°C for chip, –25 … +80°C for module
  - Supply voltage 5 V $\pm$ 10 %
  - Supply current < 3 mA (typical 600 µA)
  - EEPROM erase / write time 5 ms
  - ESD protection typical 4,000 V
  - EEPROM Endurance minimum 100,000 erase / write cycles[1]
  - Data retention for minimum of 10 years[1]

- **Advanced 1.2 µm CMOS-technology optimised for security layout**
  - EEPROM-cells protected by shield
  - Shielding of deeper layers via metal
  - Sensory and logical security functions
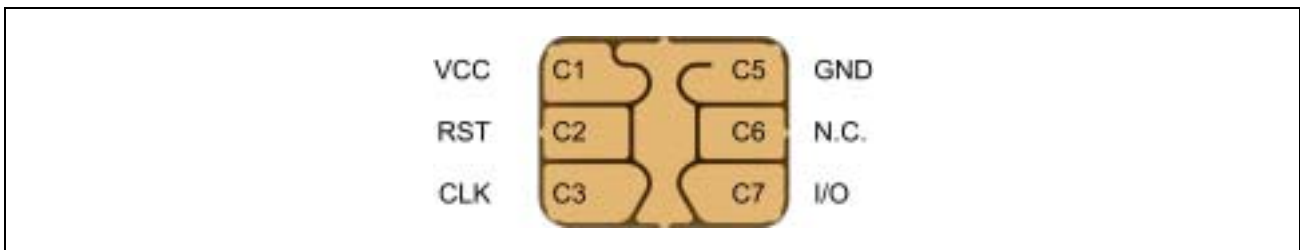 - No isolation on backside necessary

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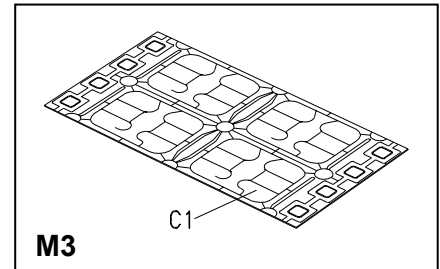
[1] Values are temperature dependent.
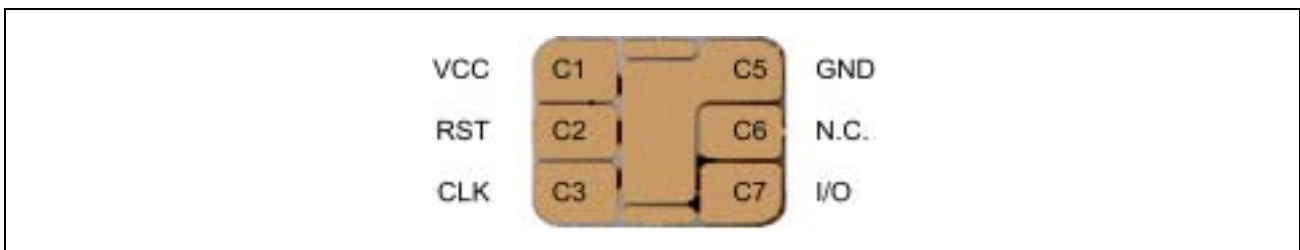
1   Ordering and Packaging information

Table 1   Ordering Information

Type	Package[1]	Remark	Ordering Code
SLE 5532 C	Die (on Wafer)	unsawn	on request
SLE 5532 D	Die (on Wafer)	sawn	on request
SLE 5532 M3	T-M3.2-6		on request
SLE 5532 MFC3	S-MFC3.1-6-1	FCoS™	on request

Pin Description

Figure 1   Pin Configuration Wire-bonded Module M3.2 (top view)

Figure 2   Pin Configuration Module Flip Chip MFC3.1 (top view)

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[1] Available as a Module Flip Chip (MFC3), wire-bonded module (M3) for embedding in plastic cards or as a die on unsawn (C) / sawn wafer (D) for customer packaging
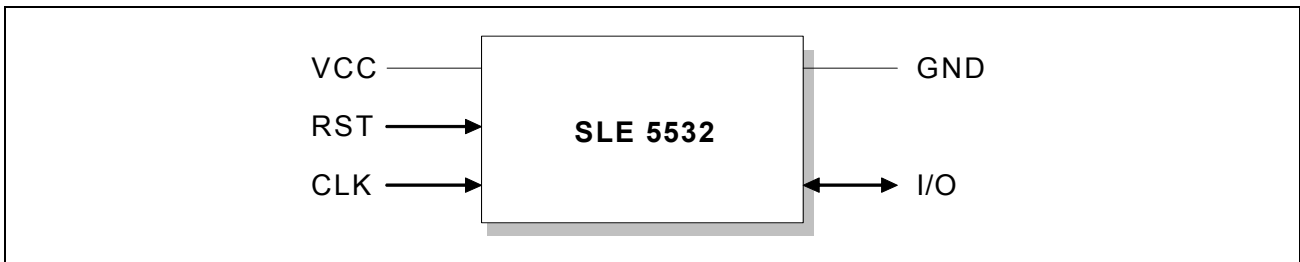
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Figure 3   Pad Configuration Die

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 Circuit Description

Memory Organization
The memory is organized in a **Data Memory** of 256 byte.

Write Protection of Data Memory
Each of the first 32 bytes of the Data Memory can be irreversibly protected against data change by writing the corresponding bit in the **Protection Memory** (32 bit). Dependent on the state of the protection bit the Data Memory is read only (ROM) or may be erased and written again (EEPROM). Change of the manufacturer code (Application ID and Chip Coding) is only possible by the chip manufacturer.
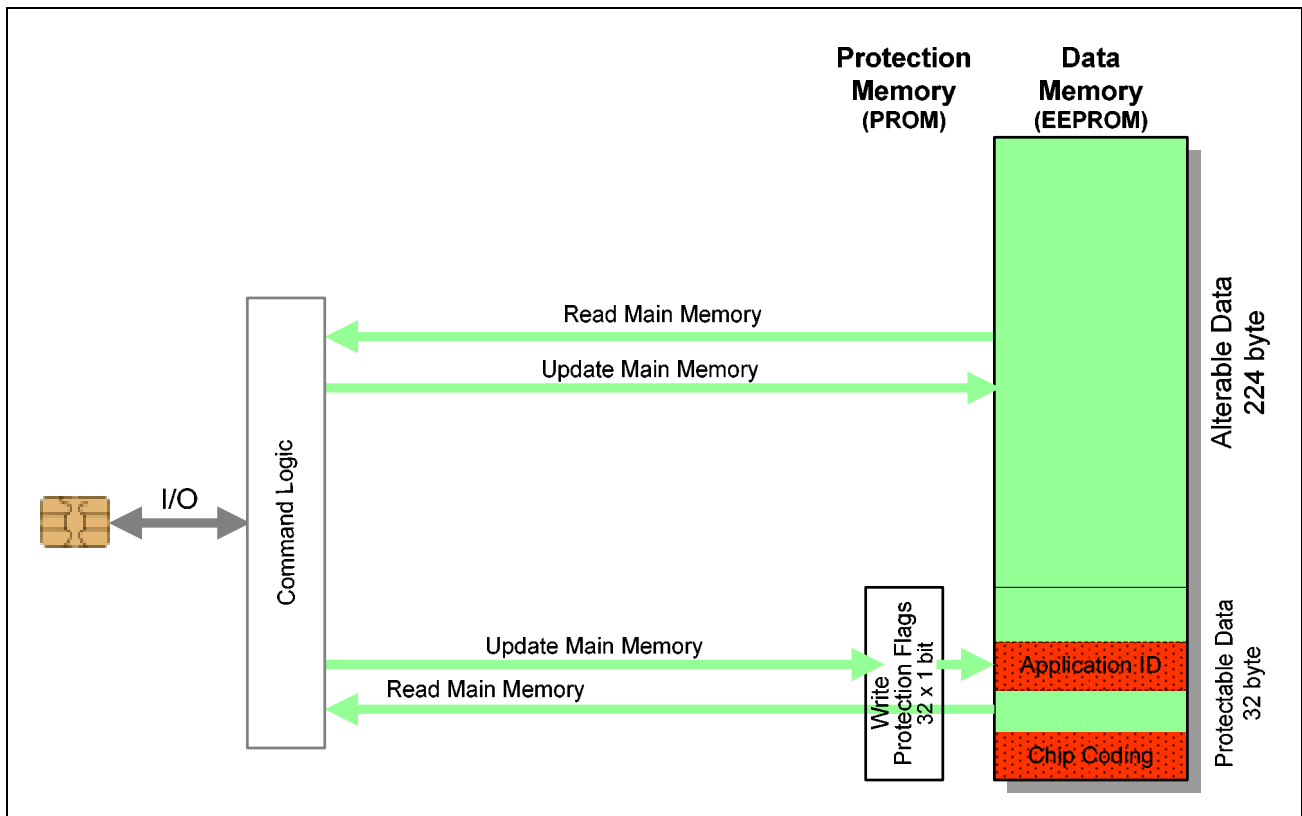

Figure 4   Memory Overview SLE 5532