Chip Card & Security ICs

SLE 5542

Intelligent 256-Byte EEPROM
with Write Protection function
and Programmable Security Code

Short Product Information

May 2006

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all	Editorial changes

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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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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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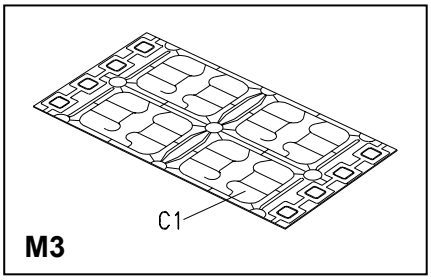
Intelligent 256-Byte EEPROM with Write Protection Function and Programmable Security Code (PSC)



M3

Features

- **100% functional compatibility to SLE 4442**
- **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
- **Data Memory (addresses 0…255) alterable only after verification of 3-Byte Programmable Security Code (PSC)**
- **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 ± 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

[1)] Values are temperature dependent.

1 Ordering and Packaging information

Table 1 Ordering Information

Type	Package[1)]	Remark	Ordering Code
SLE 5542 C	Die (on Wafer)	unsawn	on request
SLE 5542 D	Die (on Wafer)	sawn	on request
SLE 5542 M3	T-M3.2-6		on request
SLE 5542 MFC3	S-MFC3.1-6-1	FCoS™	on request

Pin Description

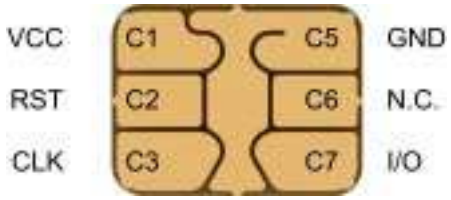


Figure 1 Pin Configuration Wire-bonded Module M3.2 (top view)

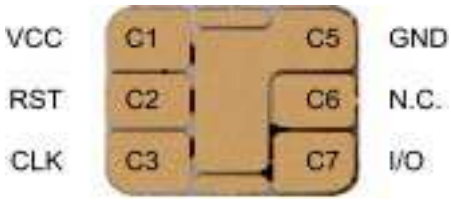


Figure 2 Pin Configuration Module Flip Chip MFC3.1 (top view)

[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

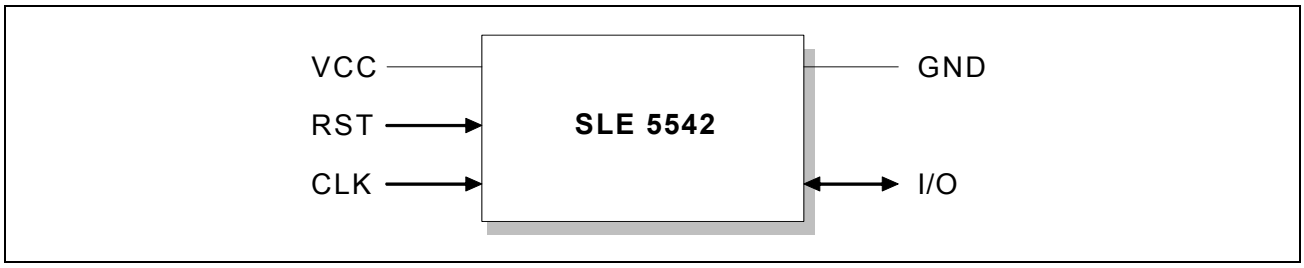


Figure 3 Pad Configuration Die

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.

Programmable Security Code
Change of data of the Data Memory and write a bit of the Protection Memory is only possible after verification of the 3-Byte **Programmable Security Code** (**PSC**).

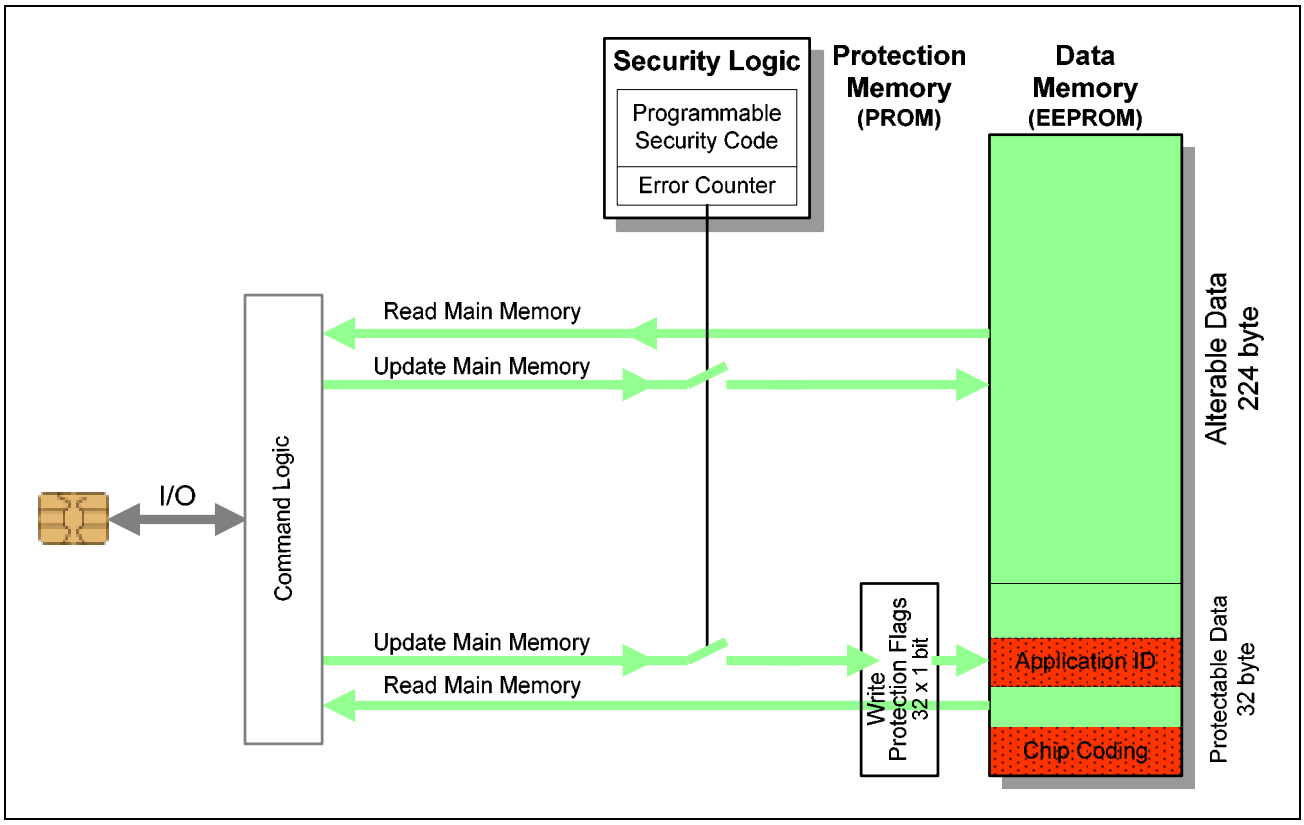


Figure 4 Memory Overview SLE 5542