



THE DATASHEET OF SLE5542M32XHSA2





Chip Card & Security ICs

SLE 5542

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

SLE 5542 Short Product Information		Ref.: SPI_SLE5542_0506.doc
Revision History: Current Version 2006-05-19		
Previous Releases: 2005-06-16		
Page	Subjects (changes since last revision)	
all	Editorial changes	

Important: Further information is confidential and on request. Please contact:
 Infineon Technologies AG in Munich, Germany,
 Chip Card & Security ICs,
 Tel +49 (0)89 / 234-80000
 Fax +49 (0)89 / 234-81000
 E-Mail: security.chipcard.ics@infineon.com

Published by Infineon Technologies AG, AIM CC Applications Group
D-81726 München
© Infineon Technologies AG 2006
All Rights Reserved.

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.

Terms of delivery and rights to technical change reserved.

We hereby disclaim any and all warranties, including but not limited to warranties of non-infringement, regarding circuits, descriptions and charts stated herein.

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).

Warnings

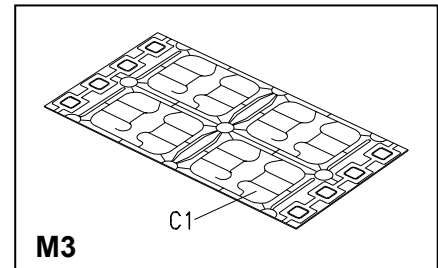
Due to technical requirements components may contain dangerous substances. For information on the types in question please contact your nearest Infineon Technologies Office.

Infineon Technologies components may only be used in life-support devices or systems with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life-support device or system, or to affect the safety or effectiveness of that device or system. Life support devices or systems are intended to be implanted in the human body, or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.

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

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 $-40 \dots +80^{\circ}\text{C}$ for chip, $-25 \dots +80^{\circ}\text{C}$ for module
 - Supply voltage $5\text{ V} \pm 10\%$
 - Supply current $< 3\text{ mA}$ (typical $600\ \mu\text{A}$)
 - EEPROM erase / write time 5 ms
 - ESD protection typical $4,000\text{ V}$
 - EEPROM Endurance minimum $100,000$ erase / write cycles¹⁾
 - Data retention for minimum of 10 years ¹⁾
- **Advanced $1.2\ \mu\text{m}$ 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

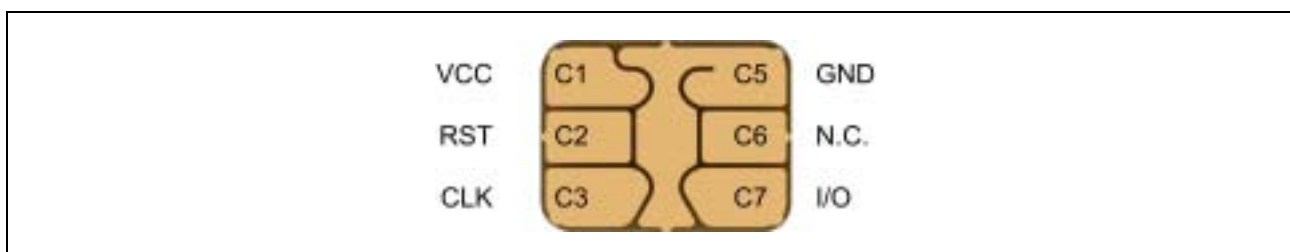


Figure 1 Pin Configuration Wire-bonded Module M3.2 (top view)

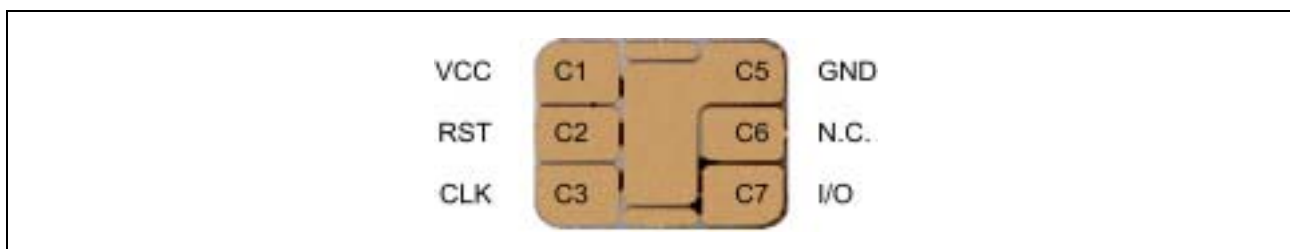


Figure 2 Pin Configuration Module Flip Chip MFC3.1 (top view)

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

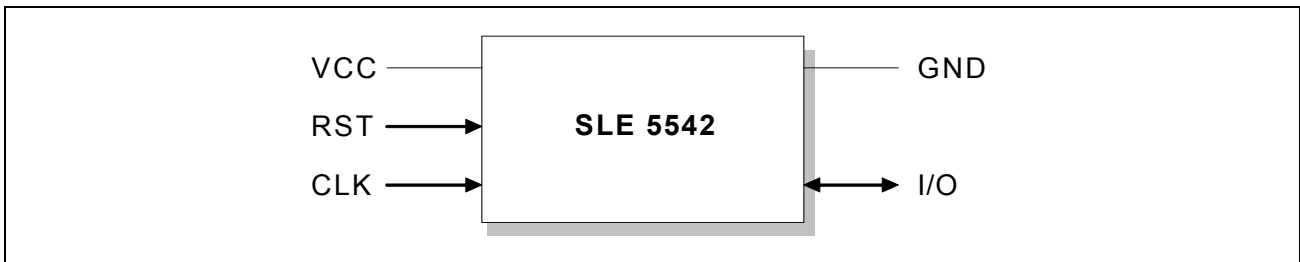


Figure 3 Pad Configuration Die

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)**.

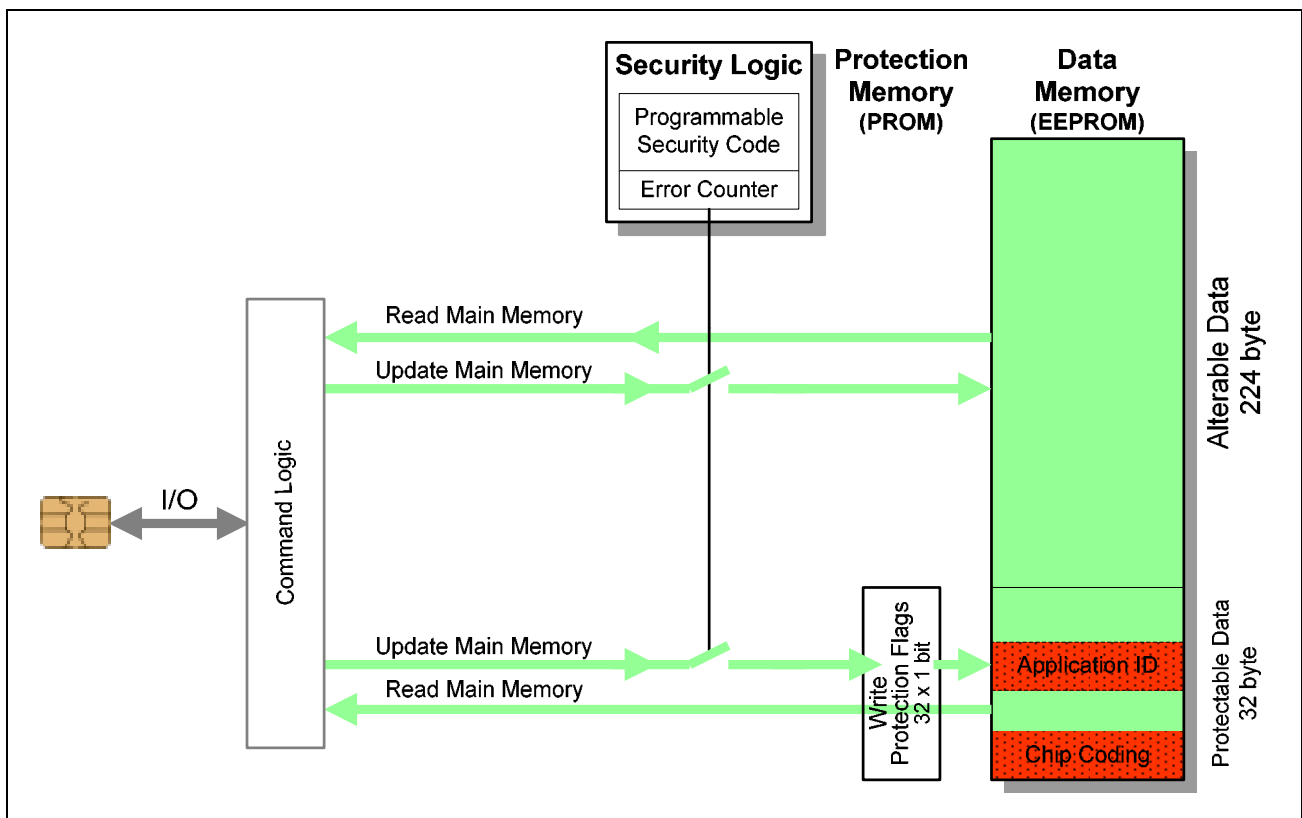


Figure 4 Memory Overview SLE 5542

Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

- ⊖ [View SLE5542M32XHSA2 on WIN SOURCE](#)
- ⊖ [Infineon Technologies Information](#)

Optimize Your Supply Chain with WIN SOURCE Solutions

- ✓ Global Sourcing Solution
- ✓ Obsolete Management
- ✓ Cost Control Management
- ✓ Shortage Management
- ✓ Alternative Solution
- ✓ Excess Inventory Management