

# **my-d™ move / my-d™ move lean**

## **my-d™ move NFC / my-d™ move lean NFC**

**SLE 66R01P(N) / SLE 66R01L(N)**

- **SLE 66R01P** - **my-d™ move**
- **SLE 66R01PN** - **my-d™ move NFC**
- **SLE 66R01L** - **my-d™ move lean**
- **SLE 66R01LN** - **my-d™ move lean NFC**

### **Short Product Information**

#### **Features**

##### **Contactless Interface**

- Physical interface and anti-collision complying to ISO/IEC 14443 Type A
  - Operation frequency: 13.56 MHz
  - Data rate 106 kbit/s in both direction
  - Contactless transmission of data and supply energy
  - Anti-collision logic: Several cards may be operated in the field simultaneously
- Read and Write Distance up to 10 cm and more (influenced by external circuitry i.e. reader and inlay design)

##### **152 byte EEPROM: SLE 66R01P(N)**

- Organized in 38 blocks of 4 bytes each
- 128 bytes freely programmable User Memory
- 24 bytes of Service Area reserved for UID, Configuration, LOCK Bytes, OTP Block and Manufacturer Data
- Read and Write of 128 bytes of User Memory in less than 100 ms

##### **64 byte EEPROM: SLE 66R01L(N)**

- Organized in 16 blocks of 4 bytes
- 48 bytes freely programmable User Memory
- 16 bytes of Service Area reserved for UID, Configuration, LOCK Bytes, OTP Block and Manufacturer Data

##### **EEPROM Features**

- Programming time per block < 4 ms
- Endurance minimum 10,000 erase/write cycles<sup>1</sup>
- Data Retention minimum 5 years<sup>1</sup>

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<sup>1</sup> Values are temperature dependent.

### **Privacy Features**

- One Time Programmable (OTP) memory area
- Locking mechanism for each block<sup>1</sup>
- Block Lock mechanism<sup>2</sup>
- Optional 32 bit Password for Read/Write or Write access
- Optional Password Retry Counter
- Optional 16 bit Value Counter

### **Data Protection**

- Data Integrity supported by 16 bit CRC, parity bit, and command length check
- Anti-tearing mechanism for OTP, Password Retry Counter and Value Counter

### **NFC Forum Operation**

- NFC certified Type 2 Tag Operation
- Support of Static and Dynamic Memory Structure according to NFC Forum Type 2 Tag Operation
- SLE 66R01PN / SLE 66R01LN: pre-configured NFC memory with empty NDEF message (INITIALIZED state, non-reversible)
- SLE 66R01P / SLE 66R01L: UNINITIALIZED state, may be configured to INITIALIZED state

### **Electrical Characteristics**

- On-Chip capacitance 17 pF + 5%
- ESD protection minimum 2 kV
- Ambient Temperature -25°C ... +70°C (for the chip)



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<sup>1</sup> NFC certified Type 2 Tag Operation

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## **1 my-d™ move Product Family**

my-d™ move products are available in plain mode with open memory access and in secure mode with memory access controlled by authentication procedures. The my-d™ move product family provides users with different memory sizes, features NFC Forum Type 2 Tag functionality and incorporates security features to enable considerable flexibility in the application design.

Flexible controls within the my-d™ devices start with plain mode operation featuring individual page locking; for more complex applications various settings in secure mode can be set for multi user / multi-application configurations.

In plain mode access to the memory is supported by both 4-byte block as well as 8-byte page structure.

In secure mode a cryptographic algorithm based on a 64-bit key is available. Mutual authentication, message authentication codes (MAC) and customized access conditions protect the memory against unauthorized access.

Configurable Value Counters featuring anti-tearing functionality are suitable for value token applications, such as limited use transportation tickets.

Architectural interoperability of my-d™ move products enables an easy migration from simple to more demanding applications.

The my-d™ move family is designed for cost optimized applications and its implemented command set eases the usage in existing applications and infrastructures.

### **1.1 Applications**

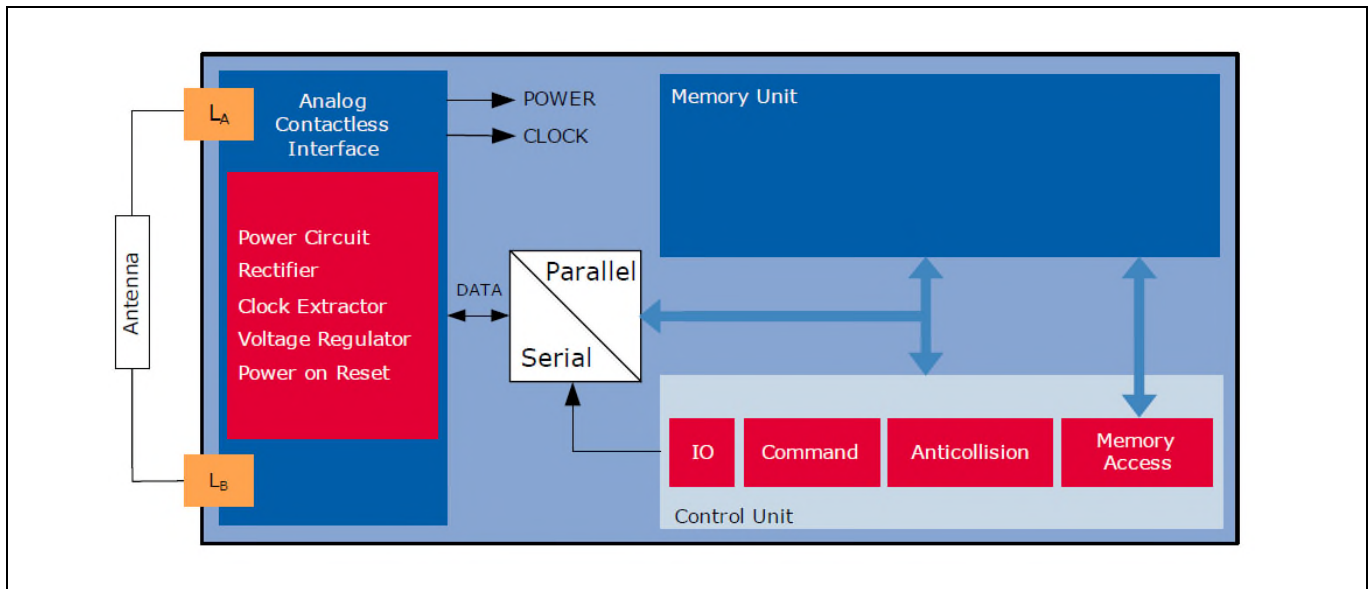
The my-d™ move products are targeting applications with basic security requirements.

- Public Transport
- Access Control
- Entertainment
- NFC Device Pairing

## 2 Product Overview

### 2.1 Circuit Description

my-d™ move products are made up of an EEPROM memory unit, an analog interface for contactless operation, a data transmission path and a control unit. The following diagram shows the main blocks of the SLE 66R01P and SLE 66R01PN



**Figure 1** Block diagram of the my-d™ move (NFC) / my-d™ move lean (NFC)

The **Analog Contactless Interface** comprises the voltage rectifier, voltage regulator and system clock to supply the IC with appropriate power. Additionally the data stream is modulated and demodulated.

The **Memory Unit** of SLE66R01P(N) consists of 38 blocks of 4 bytes each, whereas SLE66R01L(N) comes with 16 blocks of 4 bytes each.

**The Control Unit** decodes and executes all commands. Additionally the control unit is responsible for the correct anti-collision flow.

### 2.2 Memory Principle for SLE 66R01P(N)

The total amount of addressable memory for is 152 bytes organized in blocks of 4 bytes each.

The general structure comprises Service Areas as well as User Areas:

- 24 bytes of service and administration data (located in Service Area 1 and 2) reserved for
  - 7-byte double-size UID
  - configuration data
  - LOCKx bytes
  - OTP memory
  - Manufacturing Data
- 128 bytes of User memory (located in User Area 1 and User Area 2) reserved for
  - Value Counter
  - User Data

Additionally the Password and Password Retry Counter are available and accessible via dedicated commands.

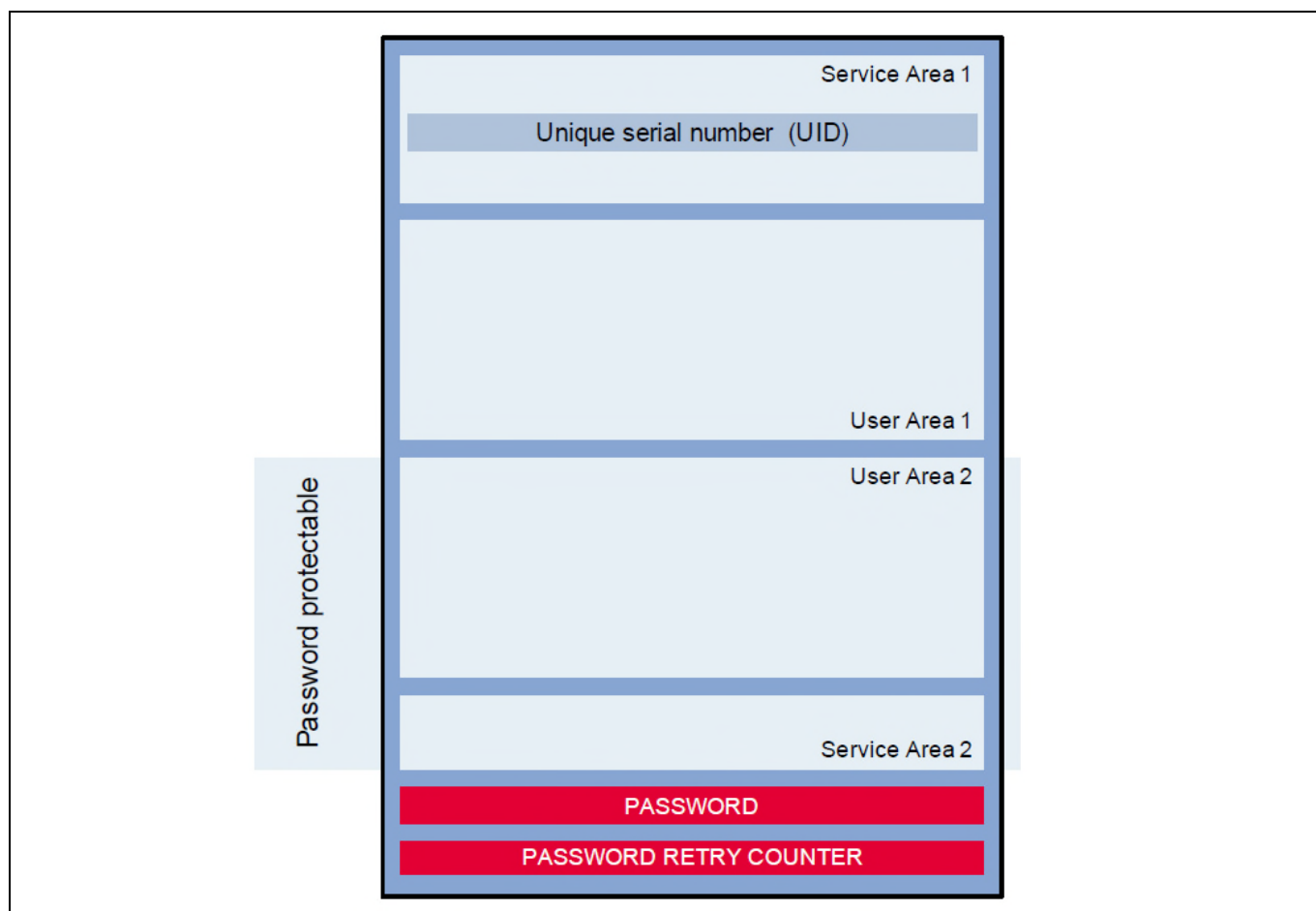


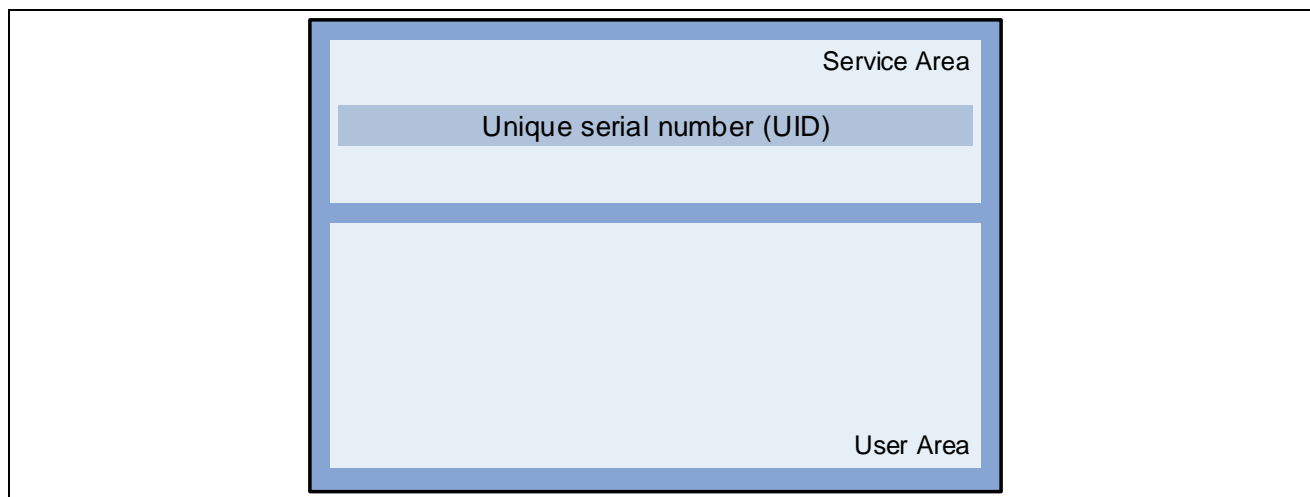
Figure 2 my-d™ move SLE 66R01P(N) memory principle

## 2.3 Memory Principle for SLE 66R01L(N)

The total amount of addressable memory is 64 bytes.

It comprises

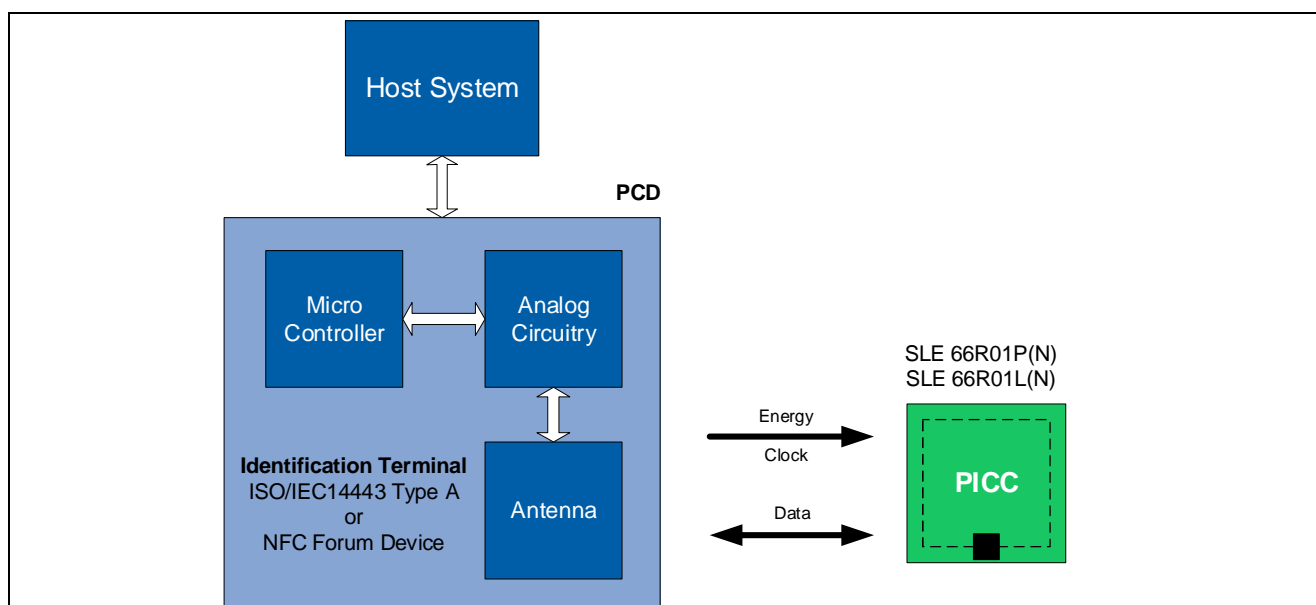
- 16 bytes of Service Area reserved for ...
  - 7-byte double-size UID
  - configuration data
  - LOCKx bytes
  - OTP memory
- 48 bytes of User Area reserved for User Data



**Figure 3** my-d™ move SLE 66R01L(N) memory principle

## 2.4 System Overview

The system consists of a host system, one or more my-d™move tags or other ISO/IEC 14443 Type A compliant cards and an ISO/IEC 14443 Type A compatible contactless reader. Alternatively, since the my-d™move products can be configured to hold a NFC Forum Type 2 Tag memory structure, a NFC Forum device in card reader/writer mode can be used to operate the chip.



**Figure 4** my-d™ move (NFC) / my-d™ move lean (NFC) Contactless System Overview

## 2.5 UID Coding

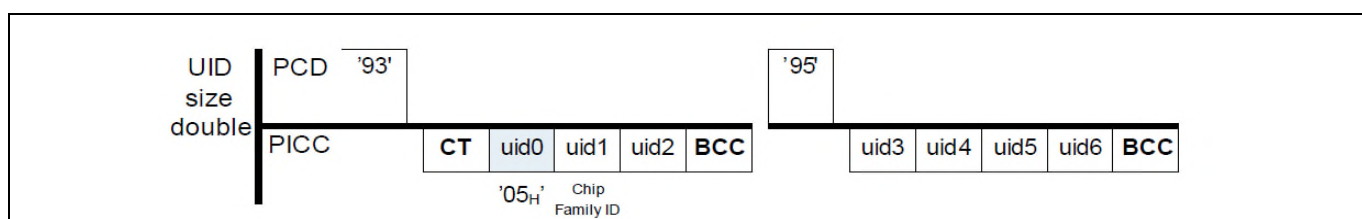
To identify my-d™move / my-d™ move lean chips the manufacturer code and a chip family identifier are coded into the UID as described in the Table 1 and Table 2. The chip family identifier can be used to determine the basic command set for the chip.

**Table 1 UID Coding: SLE66R01P(N)**

UID Field	Value	Description
uid0	05 <sub>H</sub>	IC Manufacturer Code according to ISO/IEC 7816-6
uid1	3x <sub>H</sub>	Chip Family Identifier Higher Nibble: 0011 <sub>B</sub> : my-d™ move and my-d™ move NFC Lower Nibble: part of the UID number

**Table 2 UID Coding: SLE 66R01L(N)**

UID Field	Value	Description
uid0	05 <sub>H</sub>	IC Manufacturer Code according to ISO/IEC 7816-6
uid1	7x <sub>H</sub>	Chip Family Identifier Higher Nibble: 0111 <sub>B</sub> : my-d™ move lean and my-d™ move lean NFC Lower Nibble: part of the UID number



**Figure 5 SLE 66R01P(N) and SLE 66R01L(N) double-size UID**

## 2.6 Supported Standards

The SLE 66R01P(N) and SLE 66R01L(N) support the following standards:

- ISO/IEC 14443 Type A (Parts 1, 2 and 3) tested according to ISO/IEC 10373-6 (PICC Test & Validation)
- NFC Forum Type 2 Tag Operation

## 2.7 Command Set

The IC is compliant to the ISO/IEC 14443 Type A standard.

A set of standard ISO/IEC 14443 Type a Part 3 commands is implemented to operate the chip.

Additionally NFC Forum Type 2 Tag commands and a my-d™ move (lean) specific command set is implemented.



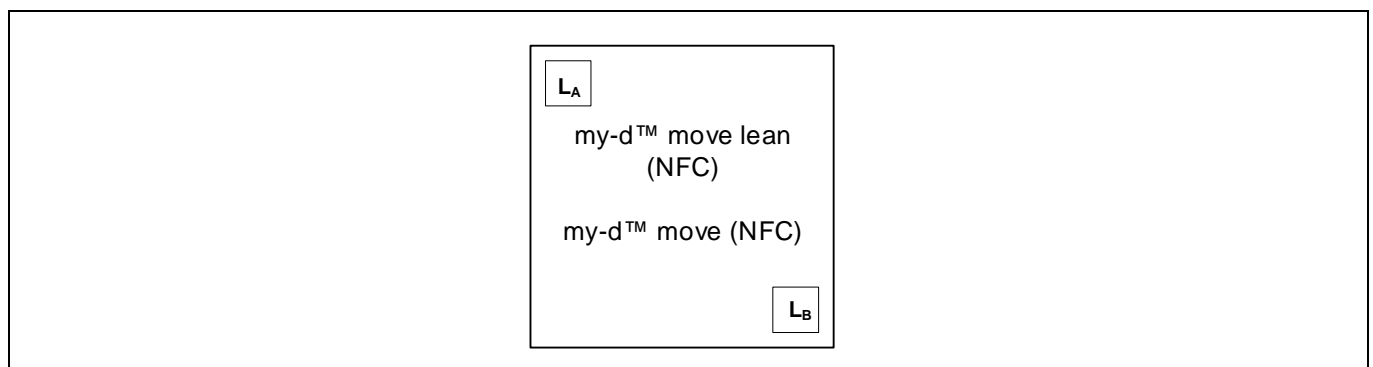
### 3 Ordering and packaging information

**Table 3** Ordering information

Type	Delivery form	Wafer thickness	Total/User Memory (Bytes)	Ordering Code
SLE 66 R01L_C	wafer unsawn	120 µm	64 / 48 bytes	on request
SLE 66 R01L_NB	NiAu Bumped (sawn wafer)	120 µm		SP00899734
SLE 66 R01LN_C	wafer unsawn	120 µm		on request
SLE 66 R01LN_NB	NiAu Bumped (sawn wafer)	120 µm		SP001139540
SLE 66 R01P_C	wafer unsawn	120 µm	152 / 128 bytes	SP001468124
SLE 66 R01P_NB	NiAu Bumped (sawn wafer)	120 µm		SP000911428
SLE 66 R01P_NB	NiAu Bumped (sawn wafer)	150 µm		SP001056194
SLE 66 R01PN_C	wafer unsawn	120 µm		on request
SLE 66 R01PN_NB	NiAu Bumped (sawn wafer)	120 µm		SP001049596
SLE 66 R01PN_NB	NiAu Bumped (sawn wafer)	150 µm		SP001052952

*Note:* For more ordering information about the form of delivery please contact your local Infineon sales office.

#### 3.1 Pin description



**Figure 6** Pin configuration die

**Table 4** Pin description and function

Symbol	Function
L <sub>A</sub>	Antenna connection
L <sub>B</sub>	Antenna Connection

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**Do you have a question about this document?**

**Email:**  
[dsscustomerservice@infineon.com](mailto:dsscustomerservice@infineon.com)

**Document reference**

[erratum@infineon.com](mailto:erratum@infineon.com)

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