

# SL2MOS5401

## Addendum contactless chip card module specification

Rev. 3.0 — 15 January 2009  
168230

Product data sheet  
PUBLIC

## 1. General description

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This document gives specifications for the product SL2MOS5401.

- The SL2MOS5401 is the integrated circuit SL2ICS5401 in the package SOT500AA1.

Therefore this document encompasses all information not covered by the specification of the package and/or the functional specification of the integrated circuit.

- Detailed information on the package is given in the contactless chip card module specification.
- Functionality of the integrated circuit is described in the “Product data sheet SL2ICS53/SL2ICS54”.

## 2. Ordering information

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Table 1. Ordering information

| Type number  | Package |  | Version |
|--------------|---------|--|---------|
|              | Name    | Description  |         |
| SL2MOS5401EV | PLLMC   | Plastic leadless module carrier package; 35 mm wide tape | SOT500  |

## 3. Specifications

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### 3.1 Chip

Functionality of the integrated circuit is described in the “Product data sheet SL2ICS53/SL2ICS54”.

## 4. Limiting values

**Table 2. Limiting values** [1][2]

*In accordance with the Absolute Maximum Rating System (IEC 60134).*

*Processing temperature: refer to "Contactless chip card module specification"*

| Symbol           | Parameter                       | Conditions | Min | Max | Unit        |
|------------------|---------------------------------|------------|-----|-----|-------------|
| $T_{stg}$        | storage temperature             |            | -25 | +85 | °C          |
| $V_{ESD}$        | electrostatic discharge voltage | [3]        | -   | ±2  | $kV_{peak}$ |
| $I_{max\ LA-LB}$ | maximum input peak current      |            | -60 | +60 | $mA_{peak}$ |
| $T_{jop}$        | operating junction temperature  |            | -25 | +85 | °C          |
| $I_{LA-LB}$      | input current                   | [4]        | -   | 30  | $mA_{rms}$  |

- [1] Stresses above those listed under Absolute Maximum Ratings may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any conditions other than those described in the Operating Conditions and Electrical Characteristics section of this specification is not implied.
- [2] This product includes circuitry specifically designed for the protection of its internal devices from the damaging effects of excessive static charge. Nonetheless, it is suggested that conventional precautions be taken to avoid applying greater than the rated maxima.
- [3] MIL-STD-883D, Method 3015.7, Human Body Model.
- [4] The voltage between LA and LB is limited by the on-chip voltage limitation circuitry (corresponding to parameter  $I_{LA-LB}$ ).

## 5. Characteristics

### 5.1 Electrical characteristics

Table 3. Characteristics<sup>[1]</sup>

| Symbol                               | Parameter   | Conditions  | Min        | Typ    | Max    | Unit             |
|--------------------------------------|---|---|------------|--------|--------|------------------|
| <b>T<sub>op</sub> = -25 to 85 °C</b> |   |   |            |        |        |                  |
| V <sub>LA-LB</sub>                   | minimum supply voltage for READ/WRITE/EAS         |   | ± 2.5      | ± 2.6  | ± 2.9  | V <sub>rms</sub> |
| f <sub>op</sub>                      | operating frequency                               |   | [2] 13.553 | 13.560 | 13.567 | MHz              |
| C <sub>res</sub>                     | input capacitance between LA – LB                 | V <sub>LA-LB</sub> = 2 V <sub>rms</sub>               | [3] 92     | 97     | 102    | pF               |
| P <sub>min</sub>                     | minimum operating supply power                    |   | [4] -      | 280    | -      | μW               |
| m                                    | modulation of RF voltage for demodulator response | $m = \frac{V_{\max} - V_{\min}}{V_{\max} + V_{\min}}$ | [5] -      | -      | -      | %                |
| t <sub>Psm</sub>                     | modulation pulse length of RF voltage             |   | [5] -      | -      | -      | μs               |
| t <sub>D</sub>                       | demodulator response time                         | m ≥ 10 %, 100 %                                       | [5] -      | -      | -      | μs               |
| R <sub>mod</sub>                     | load modulation                                   |   | [5] -      | -      | -      | Ω                |
| <b>EEPROM characteristics:</b>       |   |   |            |        |        |                  |
| t <sub>ret</sub>                     | data retention time                               | T <sub>amb</sub> ≤ 55 °C                              | 10         | -      | -      | year             |
| n <sub>endu(W)</sub>                 | write endurance                                   |   | 100000     | -      | -      | cycle            |

[1] Typical ratings are not guaranteed. These values listed are at room temperature.

[2] Bandwidth limitation (± 7 kHz) according to ISM band regulations.

[3] Measured with an HP 4285A LCR meter at 13.56 MHz.

[4] Including losses in resonant capacitor and rectifier.

[5] Refer to ISO/IEC 15693-2 and ISO/IEC 15693-3 including pulse shapes and tolerances; proper coil design assumed

## 6. References

[1] **Data sheet** — Product data sheet SL2ICS53/SL2ICS54

## 7. Revision history

Table 4. Revision history

| Document ID | Release date | Data sheet status  | Change notice | Supersedes |
|-------------|--------------|--------------------|---------------|------------|
| 168230      | 20090115     | Product data sheet | -             | -          |

## 8. Legal information

### 8.1 Data sheet status

| Document status <sup>[1][2]</sup> | Product status <sup>[3]</sup> | Definition  |
|-----------------------------------|-------------------------------|---|
| Objective [short] data sheet      | Development                   | This document contains data from the objective specification for product development. |
| Preliminary [short] data sheet    | Qualification                 | This document contains data from the preliminary specification.                       |
| Product [short] data sheet        | Production                    | This document contains the product specification.                                     |

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

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