

SL2MOS5401

Addendum contactless chip card module specification

Rev. 3.0 — 15 January 2009
168230

Product data sheet
PUBLIC

1. General description

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

Table 1. Ordering information

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

3. Specifications

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^[1]

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
T_{op} = -25 to 85 °C						
V _{LA-LB}	minimum supply voltage for READ/WRITE/EAS		± 2.5	± 2.6	± 2.9	V _{rms}
f _{op}	operating frequency		^[2] 13.553	13.560	13.567	MHz
C _{res}	input capacitance between LA – LB	V _{LA-LB} = 2 V _{rms}	^[3] 92	97	102	pF
P _{min}	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 _{psm}	modulation pulse length of RF voltage		^[5] -	-	-	μs
t _D	demodulator response time	m ≥ 10 %, 100 %	^[5] -	-	-	μs
R _{mod}	load modulation		^[5] -	-	-	Ω
EEPROM characteristics:						
t _{ret}	data retention time	T _{amb} ≤ 55 °C	10	-	-	year
n _{endu(W)}	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 ^{[1][2]}	Product status ^[3]	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".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL <http://www.nxp.com>.

8.2 Definitions

Draft — The document is a draft version only. The content is still under internal review and subject to formal approval, which may result in modifications or additions. NXP Semiconductors does not give any representations or warranties as to the accuracy or completeness of information included herein and shall have no liability for the consequences of use of such information.

Short data sheet — A short data sheet is an extract from a full data sheet with the same product type number(s) and title. A short data sheet is intended for quick reference only and should not be relied upon to contain detailed and full information. For detailed and full information see the relevant full data sheet, which is available on request via the local NXP Semiconductors sales office. In case of any inconsistency or conflict with the short data sheet, the full data sheet shall prevail.

8.3 Disclaimers

General — Information in this document is believed to be accurate and reliable. However, NXP Semiconductors does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information.

Right to make changes — NXP Semiconductors reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

Suitability for use — NXP Semiconductors products are not designed, authorized or warranted to be suitable for use in medical, military, aircraft, space or life support equipment, nor in applications where failure or malfunction of an NXP Semiconductors product can reasonably be expected to result in personal injury, death or severe property or environmental

damage. NXP Semiconductors accepts no liability for inclusion and/or use of NXP Semiconductors products in such equipment or applications and therefore such inclusion and/or use is at the customer's own risk.

Applications — Applications that are described herein for any of these products are for illustrative purposes only. NXP Semiconductors makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

Limiting values — Stress above one or more limiting values (as defined in the Absolute Maximum Ratings System of IEC 60134) may cause permanent damage to the device. Limiting values are stress ratings only and operation of the device at these or any other conditions above those given in the Characteristics sections of this document is not implied. Exposure to limiting values for extended periods may affect device reliability.

Terms and conditions of sale — NXP Semiconductors products are sold subject to the general terms and conditions of commercial sale, as published at <http://www.nxp.com/profile/terms>, including those pertaining to warranty, intellectual property rights infringement and limitation of liability, unless explicitly otherwise agreed to in writing by NXP Semiconductors. In case of any inconsistency or conflict between information in this document and such terms and conditions, the latter will prevail.

No offer to sell or license — Nothing in this document may be interpreted or construed as an offer to sell products that is open for acceptance or the grant, conveyance or implication of any license under any copyrights, patents or other industrial or intellectual property rights.

Quick reference data — The Quick reference data is an extract of the product data given in the Limiting values and Characteristics sections of this document, and as such is not complete, exhaustive or legally binding.

8.4 Trademarks

Notice: All referenced brands, product names, service names and trademarks are the property of their respective owners.

I-CODE — is a trademark of NXP B.V.

9. Contact information

For more information, please visit: <http://www.nxp.com>

For sales office addresses, please send an email to: salesaddresses@nxp.com

10. Tables

Table 1. Ordering information 1 Table 3. Characteristics^[1] 3
 Table 2. Limiting values ^{[1][2]} 2 Table 4. Revision history 4

11. Contents

1 **General description** 1
 2 **Ordering information** 1
 3 **Specifications** 1
 3.1 Chip 1
 4 **Limiting values** 2
 5 **Characteristics** 3
 5.1 Electrical characteristics 3
 6 **References** 3
 7 **Revision history** 4
 8 **Legal information** 5
 8.1 Data sheet status 5
 8.2 Definitions 5
 8.3 Disclaimers 5
 8.4 Trademarks 5
 9 **Contact information** 5
 10 **Tables** 6
 11 **Contents** 6

Please be aware that important notices concerning this document and the product(s) described herein, have been included in section 'Legal information'.



© NXP B.V. 2009.

All rights reserved.

For more information, please visit: <http://www.nxp.com>

For sales office addresses, please send an email to: salesaddresses@nxp.com

Date of release: 15 January 2009

Document identifier: 168230

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[NXP:](#)

[SL2MOS5401EV,118](#)