



# A71CL

## Plug & Trust Secure Element for Alibaba Cloud

Rev. 3.0 — 28 November 2018  
485030

Product short data sheet  
COMPANY PUBLIC

## 1. Introduction

The A71CL is a ready-to-use solution providing a root of trust at the IC level and proven, chip-to-cloud security right out of the box. The product configuration has the provisioned credential to support Alibaba Cloud. It is a platform capable of securely storing and provisioning credentials, securely connecting IoT devices to cloud services and performing cryptographic node authentication.

The A71CL solution provides security measures protecting the IC against physical and logical attacks. The solution is meant to be integrated with a host platform and running operating systems adding a chain of trust for a broad range of applications. The product is delivered with a manual and a set of documents to provide guidance on its integration within a complete system; offering easy design-in with plug & play host application code, development kits, reference designs.

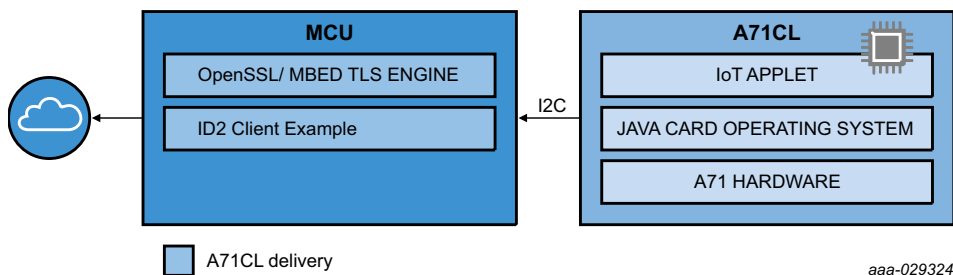


Fig 1. A71CL block diagram

## 2. General description

### 2.1 A71CL naming conventions

The following table explains the naming conventions of the commercial product name of the A71CL products. Every A71CL product gets assigned such a commercial name, which includes also customer and application specific data.

The A71CL basic type names have the following format.

#### A71CLxagpp(p)

The 'A71CL' is a constant, all other letters are variables, which are explained in [Table 1](#).

**Table 1. A71CL commercial name format**

Variable	Meaning	Values	Description
x	IC hardware specification code	1	standard operational ambient temperature: -25 °C to +85 °C I <sup>2</sup> C interface supported
		2	standard operational ambient temperature: -40 °C to +90 °C I <sup>2</sup> C interface supported
a	embedded operating system code	C	Java card operating system
g	embedded application firmware (applet) code	L	L is a fixed value = IoT security applet pre installed
pp(p)	package type code dd(d)= Delivery Type, TK2= HVSON8 (4x4)		

### 2.2 I<sup>2</sup>C interface

The A71CL has an I<sup>2</sup>C interface in slave mode, supporting data rates up to 400 kbit/s operating in Fast-Mode (FM). The I<sup>2</sup>C interface is using the Smartcard I<sup>2</sup>C protocol as defined in [Ref. 3](#) which is based on SMBus.

Depending on the interface pins state at boot, see [Section 7 "Pinning information"](#) for more details; the default I<sup>2</sup>C address after power-on-reset is 0x90 for Write, and 0x91 for Read.

### 2.3 Security licensing

NXP Semiconductors has obtained a patent license for SPA and DPA countermeasures from Cryptography Research Incorporated (CRI). This license covers both hardware and software countermeasures. It is important to customers that countermeasures within the operation system are covered under this license agreement with CRI. Further details can be obtained on request.

## 3. Features and benefits

### 3.1 Key benefits

- Secure, zero-touch connectivity
- End-to-end security, from chip to edge to cloud
- Secure credential injection for IC-level root of trust
- Fast design-in with complete product support package
- Easy to integrate with different MCU platforms

### 3.2 Security features

The A71CL security concepts includes many security measures to protect the chip.

The A71CL operates fully autonomously based on an integrated Javacard operating system and applet. Direct memory access is possible by the fixed functionalities of the applet only. With that, the content from the memory is fully isolated from the host system.

Attack protection by integrated design measures in the chip layout, the logic and the functional blocks.

### 3.3 Cryptography features

- Message digest with SHA1, SHA224, SHA256
- Random number generator
- Asymmetric key storage type: RSA Standard or RSA CRT
- Auto RSA key generator ranges from 512-bit key length to 2048-bit key length. Either RSA Standard or RSA CRT.
- Symmetric encryption/decryption with DES\_CBC\_NOPADDING, DES\_ECB\_NOPADDING, AES\_CBC\_NOPADDING, AES\_ECB\_NOPADDING.
- Symmetric signature/verification with DES\_CBC\_ISO9797\_M1, DES\_CBC\_ISO9797\_M2, AES\_CBC\_ISO9797\_M1, AES\_CBC\_ISO9797\_M2.
- Asymmetric encryption/decryption with RSA\_NOPADDING, RSA\_PKCS1.
- Asymmetric signature/verification with RSA\_SHA1(PKCS1), RSA\_SHA256.
- Service data storage: the storage data read and write is protected by SCP.
- SCP 02 service with option "i" = '55'.

### 3.4 Functional features

- 400 kbit/s I<sup>2</sup>C Fast-mode interface
- -40 °C to +90 °C operational ambient temperature (A7102)
- On-chip Javacard operating system
- 40 µA typical sleep mode current with I<sup>2</sup>C pads in tristate mode
- 10 µA max deep sleep mode current with I<sup>2</sup>C pads in tristate modeS
- High-performance Public Key Infrastructure (PKI)
- EEPROM with min 500,000 cycles endurance and min 25 years retention time
- HVSON8 package

## 4. Applications

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### 4.1 Use Cases and target applications

- A710xCL EXAMPLE USE CASES
  - ◆ Secure connection to public/private clouds, edge computing platforms, infrastructure
  - ◆ Secure commissioning
  - ◆ Device-to-device authentication
  - ◆ Proof of origin / anti-counterfeiting
  - ◆ Key storage and data protection
- A710xCL TARGET APPLICATIONS
  - ◆ Connected industrial devices
  - ◆ Sensor networks
  - ◆ IP cameras
  - ◆ Home gateways
  - ◆ Home appliances

## 5. Ordering information

### 5.1 Ordering options

Table 2. Ordering information

Type number <sup>[1]</sup>	Package		
	Name	Description	Version
A7101agTK2/...	HVSON-8	plastic thermal enhanced very thin small outline package; no leads; 8 terminals; body 4 × 4 × 0.85 mm	SOT909-1
A7102agTK2/...			

[1] a = A or C, g = G, C or A, according to the A71CL type classification see [Section 2.1 "A71CL naming conventions"](#)

[Table 3](#) gives an overview of available A71CL product types.

Table 3. A71CL feature table

Orderable type	Product type number <sup>[1]</sup>	12NC	Operational ambient temperature	Commercial name
A7101CLK2/T0BC2WJ	A7101CLK2/T0BC2WE	935368739118	-25 °C to +85 °C	A71CL, provisioned and ready to use for Alibaba Cloud
A7102CLK2/T0BC2XJ	A7102CLK2/T0BC2XR	935379152118	-40 °C to +90 °C	

[1] HN1, according to the A71CL type classification see [Section 2.1 "A71CL naming conventions"](#)

#### 5.1.1 Ordering A71CL samples

Samples can be ordered from the NXP Semiconductors e-commerce website.

Note that NXP Semiconductors can provide up to 5 pieces free of charge. Larger quantities have to be ordered separately.

## 6. Functional description

### 6.1 Functional diagram

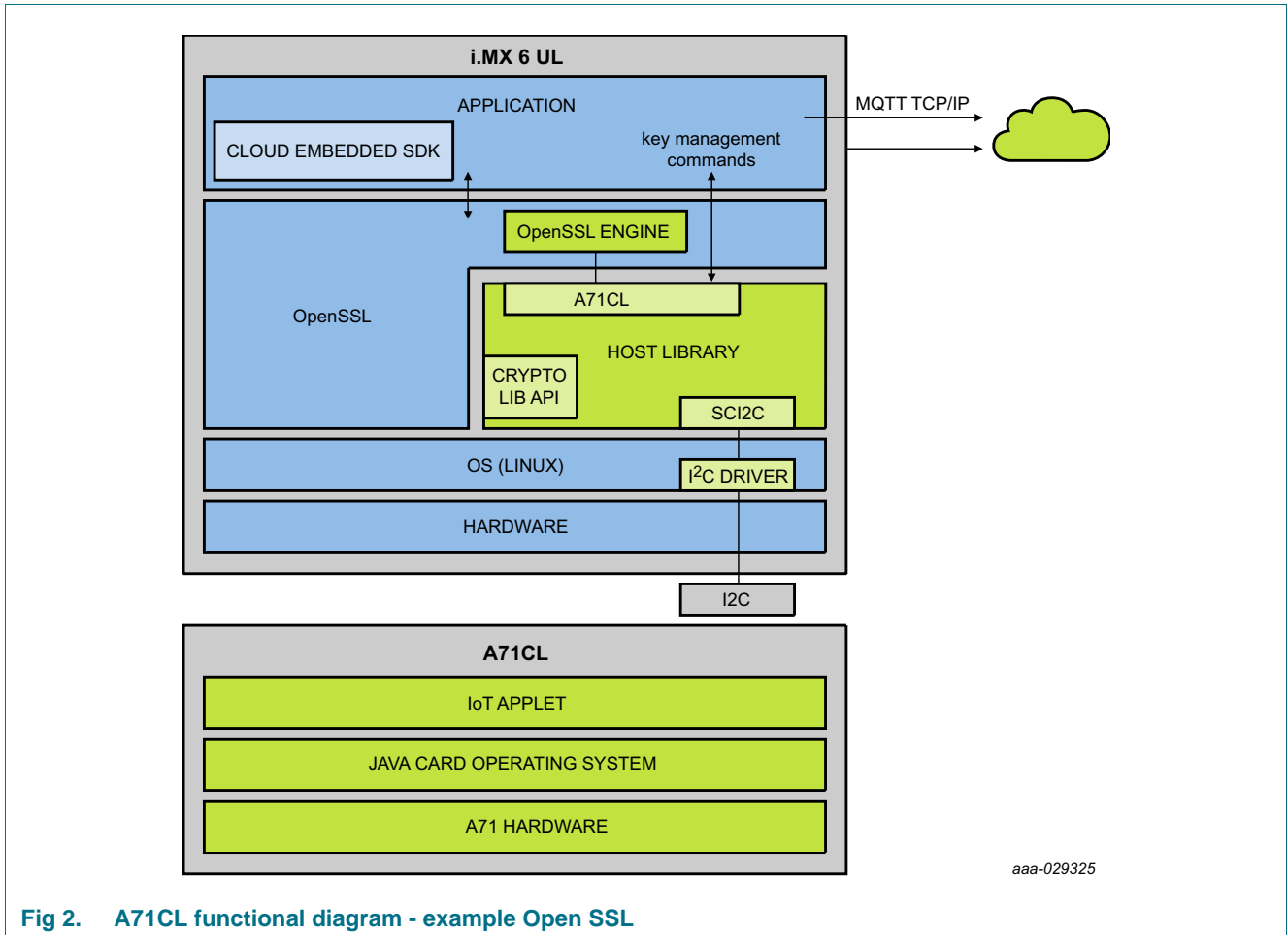


Fig 2. A71CL functional diagram - example Open SSL

The A71CL uses I<sup>2</sup>C as communication interface as described in the following section. The A71CL commands are wrapped using the Smartcard I<sup>2</sup>C protocol (SCI2C). The detailed documentation for the A71CL commands [ref to APDU Spec] and SCI2C encapsulation (Ref. 3) is available in NXP docstore.”

In order to simplify the product usage a host library was created which takes care for the A71CL commands and SCI2C protocol encapsulation. The host library is available on the A71CL website. The APDU specification is available for download with complete sources on the A71CL website.

### 6.2 I<sup>2</sup>C Interface

The A71CL has an I<sup>2</sup>C interface in slave mode, supporting data rates up to 400 kbit/s operating in Fast-Mode (FM). The I<sup>2</sup>C interface is using the Smartcard I<sup>2</sup>C protocol as defined in Ref. 3 which is based on SMBus. Depending on the interface pins state at boot, see Section 7 for more details. The default I<sup>2</sup>C address after power-on-reset depends on the bootup condition as shown in Table 4.

### 6.3 Automatic Communication Mode detection at Power on

The IC configures its interface according to the pin state as shown in the table below. The host system must keep the voltage levels stable at these pins for at least 500  $\mu$ s after power-on-reset.

Table 4. I<sup>2</sup>C address

IF0	Value at startup			I <sup>2</sup> C address	
	IF1	I2C_SCL	I2C_SDA	Write	Read
0	x	0	0	n.a.	n.a.
1	0	1	1	0x90	0x91
1	1	1	1	0x92	0x93

### 6.4 Power-saving modes

The device provides two power-saving operation modes, the SLEEP mode and the DEEP SLEEP mode. These modes are activated via pad RST\_N (DEEP SLEEP mode) or by the device.

#### 6.4.1 SLEEP mode

The SLEEP mode has the following properties:

- all internal clocks are frozen,
- CPU enters power saving mode with program execution being stopped,
- CPU registers keep their contents,
- RAM keeps its contents,

The A71CL enters automatically into SLEEP mode and also wakes up automatically from SLEEP mode. In SLEEP mode, all internal clocks are stopped. The IOs hold the logical states they had at the time IDLE was activated. During SLEEP mode security sensors HVS, LVS, LTS, HTS, Light Sensors, Glitch Sensors and Active Shielding are disabled.

There are two ways to exit from the SLEEP mode:

- A reset signal on RST\_N
- An External Interrupt edge triggered by a falling edge on I2C\_SDA

#### 6.4.2 DEEP SLEEP mode

The A71CLx provides a special sleep mode offering maximum power saving. It is reached by pulling RST\_N to a logic zero level for more than 500  $\mu$ s.

While in deep sleep mode the internal power is completely switched off and only the IO pads stay supplied. All digital pads will stay in high-Z mode.

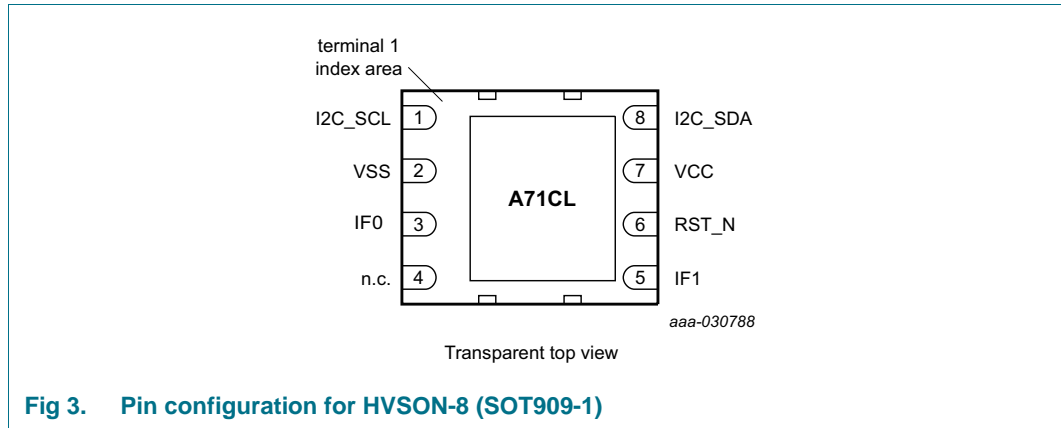
To leave the DEEP SLEEP mode RST\_N has to be released and set to a logic „1“ level.



## 7. Pinning information

### 7.1 Pinning

#### 7.1.1 Pinning HVSON8



**Fig 3. Pin configuration for HVSON-8 (SOT909-1)**

**Table 5. Pin description HVSON8**

Symbol	Pin	Description
I2C_SCL	1	I <sup>2</sup> C clock
VSS	2	ground
IF0	3	interface activation, apply high on startup
n.c.	4	not connected
IF1	5	I <sup>2</sup> C address selection
RST_N	6	reset input, active LOW
VCC	7	power supply voltage input
I2C_SDA	8	I <sup>2</sup> C data

## 8. Package outline

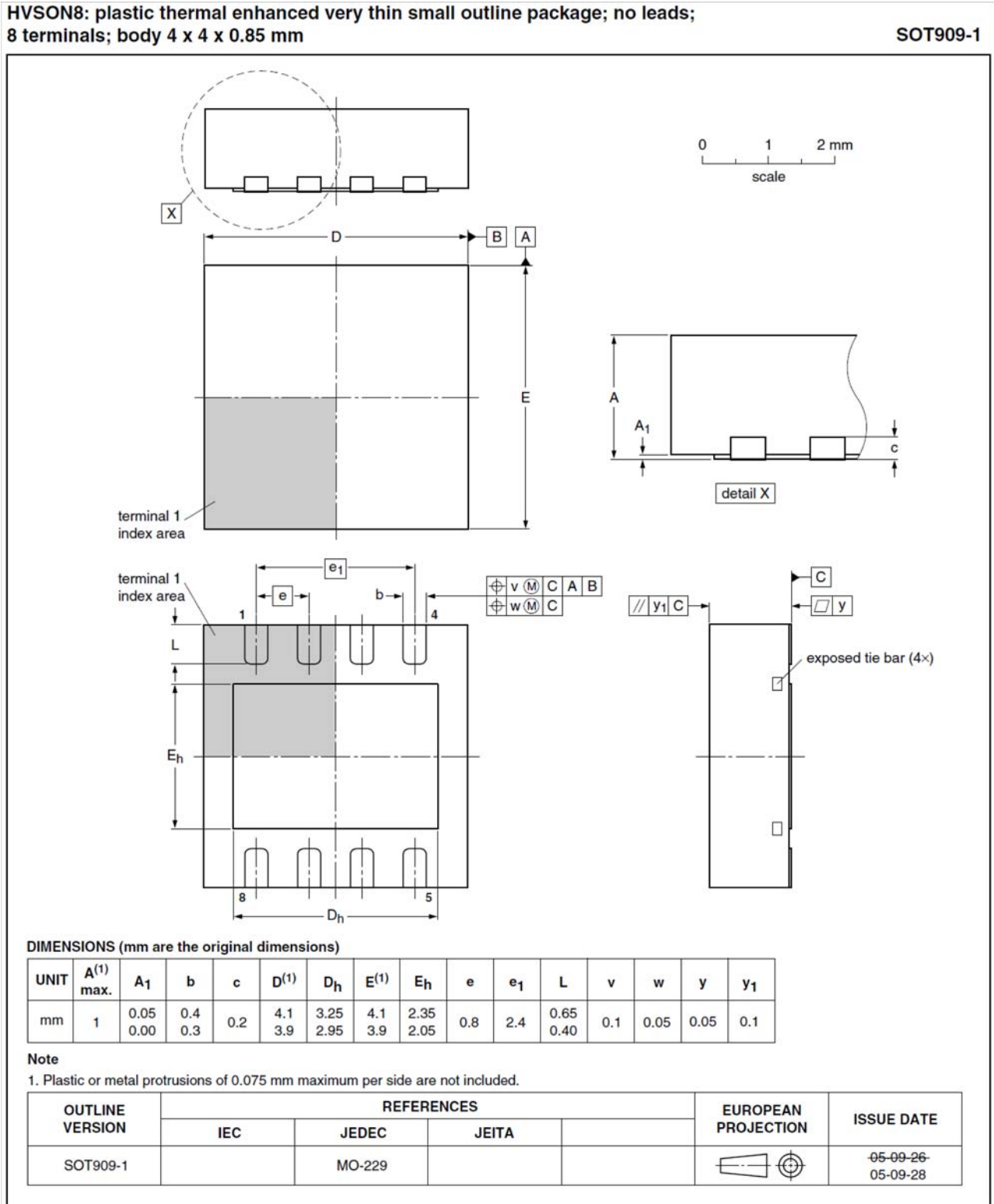


Fig 4. Package outline SOT909-1

## 9. Packing information

### 9.1 Reel packing

The A71CL product is available on 7" tape on reel and 13" tape on reel. Details are provided in [Table 6](#).

**Table 6. Reel packing options**

Package type	Reel type	Minimum packing quantity
HVSON8	7" tape on reel	1500
HVSON8	13" tape on reel <sup>[1]</sup>	6000

[1] For details about packing method, product orientation, tape dimensions and labeling for A71 parts in HVSON8 package having an ordering code (12NC) ending 118 refer to [Ref. 2](#).

## 10. Electrical and timing characteristics

The electrical interface characteristics of static (DC) and dynamic (AC) parameters for pads and functions used for I<sup>2</sup>C are in accordance with the NXP I<sup>2</sup>C specification (see [Ref. 1](#)).

## 11. Limiting values

**Table 7. Limiting values**

*In accordance with the Absolute Maximum Rating System (IEC 60134). Voltages are referenced to VSS (ground = 0 V).*

Symbol	Parameter	Conditions	Min	Max	Unit
V <sub>DD</sub>	supply voltage		-0.3	+4.6	V
V <sub>I</sub>	input voltage	any signal pad	-0.3	+4.6	V
I <sub>I</sub>	input current	pad I2C_SDA, I2C_SCL	-	10	mA
I <sub>O</sub>	output current	pad I2C_SDA, I2C_SCL	-	10	mA
I <sub>Iu</sub>	latch-up current	V <sub>I</sub> < 0 V or V <sub>I</sub> > V <sub>DD</sub>	-	100	mA
V <sub>esd_hbm</sub>	electrostatic discharge voltage (Human Body Model)	pads VCC, VSS, RST_N, I2C_SDA, I2C_SCL	[1]	± 2.0	kV
V <sub>esd_cdm</sub>	electrostatic discharge voltage (Charge Device Model)	pads VCC, VSS, RST_N, I2C_SDA, I2C_SCL	[3]	± 500	V
P <sub>tot</sub>	Total power dissipation		[2]	1	W
T <sub>stg</sub>	Storage temperature		-55	+125	°C

[1] MIL Standard 883-D method 3015; human body model; C = 100 pF, R = 1.5 kΩ; T<sub>amb</sub> = -25 °C to +85 °C.

[2] Depending on appropriate thermal resistance of the package.

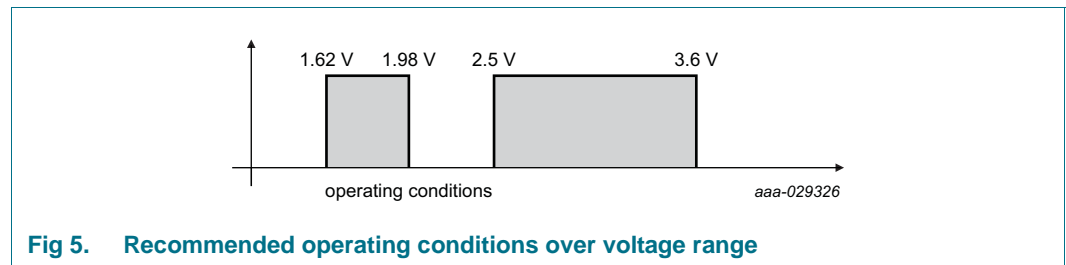
[3] JESD22-C101, JEDEC Standard Field induced charge device model test method.

## 12. Recommended operating conditions

The A71CL offers two operation modes, the so-called 1V8 mode and the 3V3 mode targeted for battery supplied applications.

**Table 8. Recommended operating conditions**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V <sub>DD</sub>	supply voltage range	3V3 mode range CPU in free runing mode	2.50	3.3	3.6	V
		1V8 mode	1.62	1.8	1.98	V
V <sub>I</sub>	DC input voltage on digital I/O pads I2C_SCL, I2C_SDA	3V3 mode	0		3.6	V
		1V8 mode	0		3.6	V
V <sub>I</sub>	DC input voltage on digital input pad RST_N	3V3 mode	0		3.6	V
		1V8 mode	0		3.6	V
T <sub>amb</sub>	Operating ambient temperature	A7101	-25		+85	°C
		A7102	-40		+90	°C



## 13. Characteristics

### 13.1 DC characteristics

#### Measurement conventions

Testing measurements are performed at the contact pads of the device under test. All voltages are defined with respect to the ground contact pad VSS. All currents flowing into the device are considered positive.

#### 13.1.1 General and I<sup>2</sup>C I/O interface

**Table 9. Electrical DC characteristics of I2C\_SCL, I2C\_SDA and RST\_N**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Input/Output: I2C_SCL, I2C_SDA in push-pull mode</b>						
V <sub>IH</sub>	HIGH level input voltage		0.7 V <sub>DD</sub>		V <sub>Imax</sub> <sup>[1]</sup>	V
V <sub>IL</sub>	LOW level input voltage		-0.5		0.3 V <sub>DD</sub>	V
I <sub>IH</sub>	HIGH level input current in input mode	V <sub>IHmin</sub> < V <sub>I</sub> < V <sub>IHmax</sub>			± 10	μA
I <sub>IL</sub>	LOW level input current	V <sub>ILmin</sub> < V <sub>I</sub> < V <sub>ILmax</sub>			± 10	μA
V <sub>OH</sub>	HIGH level output voltage	I <sub>OH</sub> = -3.0 mA; 3V3 mode	<sup>[2]</sup>	0.7 V <sub>DD</sub>		V
		I <sub>OH</sub> = -3.0 mA; 1V8 mode	<sup>[2]</sup>	0.7 V <sub>DD</sub>		V
V <sub>OL</sub>	LOW level output voltage	I <sub>OL</sub> = 3.0 mA 3V3 mode			0.4	V
		I <sub>OL</sub> = 2.0 mA 1V8 mode			0.2 V <sub>DD</sub>	V
<b>Input/Output: I2C_SCL, I2C_SDA in open-drain mode</b>						
V <sub>IH</sub>	HIGH level input voltage		0.7 V <sub>DD</sub>		V <sub>Imax</sub> <sup>[1]</sup>	V
V <sub>IL</sub>	LOW level input voltage		-0.5		0.3 V <sub>DD</sub>	V
I <sub>IH</sub>	HIGH level input current in input mode	V <sub>IHmin</sub> < V <sub>I</sub> < V <sub>IHmax</sub>			± 10	μA
I <sub>IL</sub>	LOW level input current	V <sub>ILmin</sub> < V <sub>I</sub> < V <sub>ILmax</sub>			± 10	μA
V <sub>OL</sub>	LOW level output voltage	I <sub>OL</sub> = 3.0 mA 3V3 mode			0.4	V
		I <sub>OL</sub> = 2.0 mA 1V8 mode			0.2 V <sub>DD</sub>	V
<b>Input: RST_N</b>						
V <sub>IH1</sub>	HIGH level input voltage		0.7 V <sub>DD</sub>		V <sub>Imax</sub> <sup>[1]</sup>	V
V <sub>IL1</sub>	LOW level input voltage		-0.3		0.3 V <sub>DD</sub>	V
I <sub>IH1</sub>	HIGH level RST_N input current	V <sub>IH1min</sub> ≤ V <sub>I</sub> ≤ V <sub>DD</sub>	<sup>[3]</sup>		± 20	μA
I <sub>IL1</sub>	LOW level RST_N input current	0 V ≤ V <sub>I</sub> ≤ V <sub>IL1max</sub>	<sup>[3]</sup>		± 20	μA

[1] Maximum value according to [Table 8 "Recommended operating conditions"](#)

- [2] : External pull-up resistor 20 kΩ to VDD. The worst case test condition for parameter  $V_{OH}$  is present at minimum  $V_{DD}$ . For class A supply voltage conditions  $V_{DD} = 4.5$  V is the worst case with respect to the fix specification limit  $V_{OHmin} = 3.8$  V ( $0.844 V_{DD}$ ). The supply voltage related limit “ $0.7 V_{DD}$ ” is a stricter requirement than the fix value 3.8 V at high  $V_{DD}$  ( $0.7 V_{DD} = 3.85$  V at  $V_{DD} = 5.5$  V). So, in the  $V_{DD}$  range 4.5 V to 5.5 V,  $V_{OHmin}$  is specified as “the larger value of  $0.7 V_{DD}$  and 3.8 V, respectively”.
- [3] The active low RST\_N input internally has a resistive pull-down device to VSS. Accordingly a current is flowing into the pad voltages above 0 V. [Figure 6](#) shows the RST\_N input characteristic.

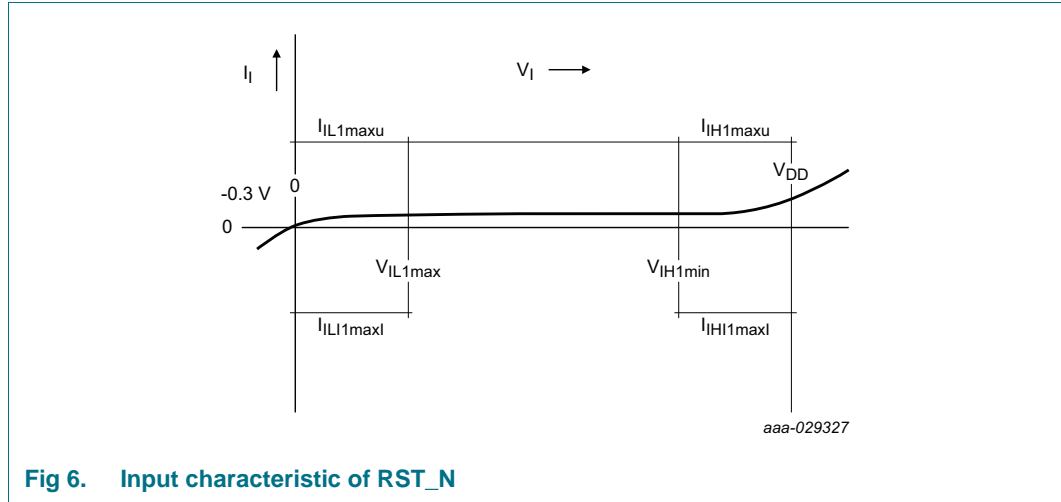


Fig 6. Input characteristic of RST\_N

13.1.2 I<sup>2</sup>C interface at 3V3 mode operation<sup>[1]</sup>Table 10. Electrical characteristics of IC supply voltage  $V_{DD}$ ;  $V_{SS} = 0\text{ V}$ ;  $T_{amb} = -40\text{ to }+90\text{ }^{\circ}\text{C}$ 

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Supply</b>						
$V_{DD}$	supply voltage range	3V3 mode range CPU in free running mode	2.50	3.3	3.6	V
$I_{DD}$	no coprocessor active	CPU in free running mode		6.3	7.0	mA
	EPROM programming in progress	CPU in free running mode		7.3	8.0	mA
	AES coprocessor active	CPU in free running mode		9.3	10.3	mA
	ECC coprocessor active	CPU in free running mode		13.7	15.1	mA
$I_{DD(SLP)}$	supply current SLEEP mode	$T_{amb} = 25\text{ }^{\circ}\text{C}$		45	150	$\mu\text{A}$
$I_{DD(DSLP)}$	supply current deep sleep mode	RST_N at 0V, $T_{amb} = 25\text{ }^{\circ}\text{C}$			10	$\mu\text{A}$
		RST_N at 0V, $T_{amb} = 90\text{ }^{\circ}\text{C}$			10	$\mu\text{A}$

[1] All appropriately marked values are typical values and only referenced for information. They are subject to change without notice.

### 13.1.3 I<sup>2</sup>C interface at 1V8 mode operation<sup>[1]</sup>

**Table 11. Electrical characteristics of IC supply voltage V<sub>DD</sub>; V<sub>SS</sub> = 0 V; T<sub>amb</sub> = -40 to +90 °C**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Supply</b>						
V <sub>DD</sub>	supply voltage range	1V8 mode range	1.62	1.8	1.98	V
I <sub>DD</sub>	no coprocessor active	CPU in free running mode		2.45		mA
	AES coprocessor active	CPU in free running mode		2.7		mA
	ECC coprocessor active	CPU in free running mode		7.5		mA
I <sub>DD(SLP)</sub>	supply current SLEEP mode	T <sub>amb</sub> = 25 °C		40	80	μA
I <sub>DD(DSLP)</sub>	supply current deep sleep mode	RST_N at 0V, T <sub>amb</sub> = 25 °C			10	μA
		RST_N at 0V, T <sub>amb</sub> = 90 °C			10	μA

[1] All appropriately marked values are typical values and only referenced for information. They are subject to change without notice.

## 13.2 AC characteristics

**Table 12. Non-volatile memory timing characteristics; V<sub>DD</sub> = 1.8 V ± 10% or 3 V ± 10% V; V<sub>SS</sub> = 0 V; T<sub>amb</sub> = -40 to 90 °C**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
t <sub>EEP</sub>	EEPROM erase + program time			2.7		ms
t <sub>EEE</sub>	EEPROM erase time			1.7		ms
t <sub>EEW</sub>	EEPROM program time			1.0		ms
t <sub>EEER</sub>	EEPROM data retention time	T <sub>amb</sub> = +55 °C	25			years
N <sub>EEC</sub>	EEPROM endurance (number of programming cycles)		5 × 10 <sup>5</sup>			cycles

**Table 13. Electrical AC characteristics of I2C\_SDA, I2C\_SCL, and RST\_N<sup>[1]</sup>; V<sub>DD</sub> = 1.8 V ± 10% or 3 V ± 10% V; V<sub>SS</sub> = 0 V; T<sub>amb</sub> = -40 to 90 °C**

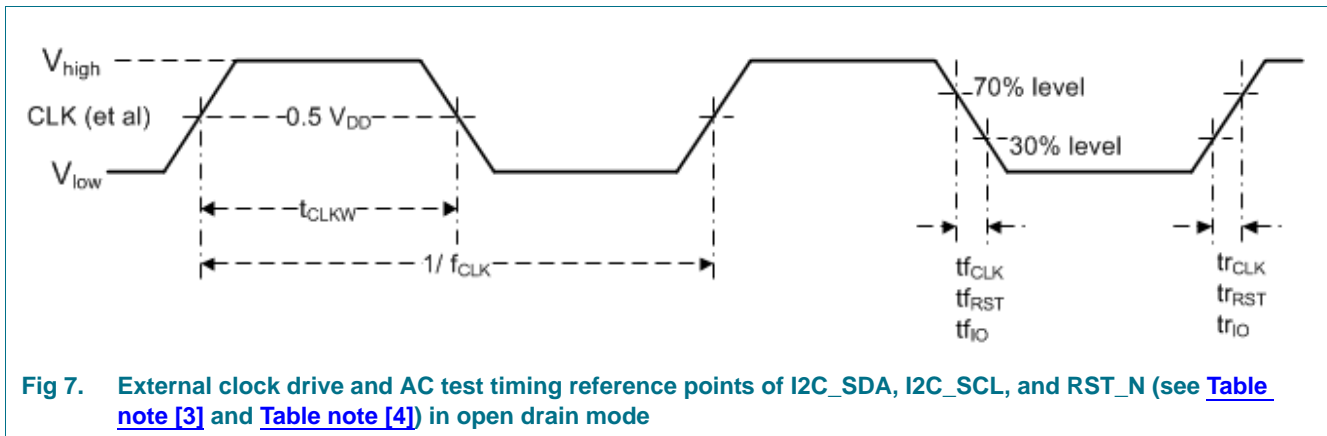
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Input/Output: I2C_SDA, I2C_SCL in open-drain mode</b>						
t <sub>rIO</sub>	I/O Input rise time	Input/reception mode <sup>[4]</sup>			1	μs
t <sub>fIO</sub>	I/O Input fall time	Input/reception mode <sup>[4]</sup>			1	μs
t <sub>fOIO</sub>	I/O Output fall time	Output/transmission mode; C <sub>L</sub> = 30 pF <sup>[4]</sup>			0.3	μs
f <sub>CLK</sub>	External clock frequency in I <sup>2</sup> C applications	t <sub>CLKW</sub> , T <sub>amb</sub> and V <sub>DD</sub> in their spec'd limits	-		400	kHz
t <sub>CLKW</sub>	Clock pulse width i.r.t. clock period (positive pulse duty cycle of CLK)	<sup>[3]</sup>	40		60	%
<b>Inputs: RST_N</b>						
t <sub>RW</sub>	Reset pulse width (RST_N low) without entering deep sleep mode		40		400	μs
t <sub>RDSLP</sub>	Reset pulse width (RST_N low) to enter deep sleep mode		500			μs
t <sub>WKP</sub>	Wake-up time from SLEEP mode	f <sub>CLKmin</sub> < f <sub>CLK</sub> < f <sub>CLKmax</sub>	-	8	10	μs



**Table 13. Electrical AC characteristics of I2C\_SDA, I2C\_SCL, and RST\_N<sup>[1]</sup>;**  
 $V_{DD} = 1.8\text{ V} \pm 10\%$  or  $3\text{ V} \pm 10\%$  V;  $V_{SS} = 0\text{ V}$ ;  $T_{amb} = -40\text{ to }90\text{ }^{\circ}\text{C}$

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$t_{WKPIO}$	Pad LOW time for wake-up from SLEEP mode	level triggered ext.int.	-	8	10	$\mu\text{s}$
		edge triggered ext.int.	-	8	10	$\mu\text{s}$
$t_{WKPRST}$	RST_N LOW time for wake-up from SLEEP mode		40		-	$\mu\text{s}$
$t_{WKWT}$	Time from SLEEP mode wake/up event to I2C_SDA valid			50	100	ns
$C_{PIN}$	Pin capacitances RST_N, I2C_SDA, /I2C_SCL	Test frequency = 1 MHz; $T_{amb} = 25\text{ }^{\circ}\text{C}$	-		10	pF

- [1] All appropriately marked values are typical values and only referenced for information. They are subject to change without notice.
- [2]  $t_r$  is defined as rise time between 20% and 80% of the signal amplitude.  
 $t_f$  is defined as fall time between 80% and 20% of the signal amplitude.
- [3] During AC testing the inputs RST\_N, I2C\_SDA, I2C\_SCL are driven at 0 V to +0.3 V for a LOW input level and at  $V_{DD} - 0.3\text{ V}$  to  $V_{DD}$  for a HIGH input level. Clock period and signal pulse (duty cycle) timing is measured at 50% of  $V_{DD}$ .
- [4]  $t_r$  is defined as rise time between 30% and 70% of the signal amplitude.  
 $t_f$  is defined as fall time between 70% and 30% of the signal amplitude.



### 13.3 EMC/EMI

EMC and EMI resistance according to IEC 61967-4.

## 14. Abbreviations

**Table 14. Abbreviations**

<b>Acronym</b>	<b>Description</b>
AES	Advanced Encryption Standard
CRC	Cyclic Redundancy Check
DES	Digital Encryption Standard
DPA	Differential Power Analysis
DSS	Digital Signature Standard
ECC	Elliptic Curve Cryptography
EEPROM	Electrically Erasable Programmable Read-Only Memory
I/O	Input/Output
MAC	Message Authentication Code
OS	Operating System
PKI	Public Key Infrastructure
SFI	Single Fault Injection
SHA	Secure Hash Algorithm

## 15. References

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- [1] I<sup>2</sup>C-bus specification and user manual, Rev. 3.0 — June-19-2007, NXP Semiconductors
- [2] SOT909-1; HVSON8; Reel pack; Ordering code (12NC) ending 118; Packing Information; Rev. 2 — 19 April 2013
- [3] Application note SCIIC Protocol Specification, Application note, Rev 1.5, an195015 — 31 January 2017
- [4] Application Note A71CL Secure Module Alibaba Cloud Ready APDU Application Note, Rev. 1.1, AN12297

## 16. Revision history

Table 15. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
485030	2018-11-27	Short data sheet		
Modifications:				
				<ul style="list-style-type: none"> <li>• <a href="#">Figure 1 "A71CL block diagram"</a> updated</li> <li>• <a href="#">Table 1 "A71CL commercial name format"</a> updated</li> <li>• <a href="#">Section 3.3 "Cryptography features"</a> updated</li> <li>• <a href="#">Table 3 "A71CL feature table"</a> updated</li> <li>• <a href="#">Section 5 "Ordering information"</a> updated</li> <li>• <a href="#">Figure 2 "A71CL functional diagram - example Open SSL"</a> updated</li> <li>• <a href="#">Section 6.1 "Functional diagram"</a> updated</li> <li>• <a href="#">Section 15 "References"</a> updated</li> <li>• <a href="#">Section 13.1.2 "I2C interface at 3V3 mode operation<sup>[1]</sup>"</a> updated</li> <li>• <a href="#">Section 13.1.3 "I2C interface at 1V8 mode operation<sup>[1]</sup>"</a> updated</li> <li>• <a href="#">Section 13.2 "AC characteristics"</a> updated</li> <li>• Changed status from Preliminary short data sheet to Product short data sheet</li> <li>• Title updated</li> <li>• <a href="#">Section 1 "Introduction"</a> updated</li> <li>• <a href="#">Table 3 "A71CL feature table"</a> updated</li> <li>• <a href="#">Figure 2 "A71CL functional diagram - example Open SSL"</a> updated</li> </ul>
485010	2018-07-10	Short data sheet		
Modifications:				<ul style="list-style-type: none"> <li>• Initial version</li> </ul>

## 17. Legal information

### 17.1 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".

[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>.

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