Test Report on

WSL02-A0

Test Report Reference: MDE_FRIEND_1802_01

Date: 2018-07-11

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1 Administrative Data

1.1 Project Information

Project Name: MDE_FRIEND_1802

Responsible for Testing and Report: Abdellah Ahakki

Date of Report: 2018-07-11

Testing Time Frame: 2018-06-25 - 2018-07-10

1.2 Applicant Information

Company Name: Shenzhen Friendcom Technology Development Co., Ltd.

Address: 100-6/F, 17 Building, Guangqian Industrial Park, Longzhu Road, Xili Town, Nanshan Shenzhen, China Shenzhen

Contact Person: Chunzhi Yu
 Phone: N/A
 Fax: N/A
 Email: yucz@friendcom.com

1.3 Test Laboratory Information

The following list shows all Locations and Test Resources involved in the generation of test results:

1.4 Signature of the Testing Responsible

_____
(Responsible for Testing and Report)
Abdellah Ahakki

1.5 Signature of the Accreditation Responsible(s)

_____
(Responsible Accreditation Scope)
Constantine Nfor

2 Test Object Data

2.1 Object Under Test (OUT) Description(s)

The following section lists all Objects Under Test (OUTs) involved during testing.

Object Under Test: WSL02-A0

Description:	LoRaWAN Module
Type / Model:	WSL02-A0

Manufacturer:

Company Name:	Shenzhen Friendcom Technology Development Co., Ltd.
Address:	100-6/F, 17 Building, Guangqian Industrial Park, Longzhu Road, Xili Town, Nanshan Shenzhen, China Shenzhen
Contact Person:	Chunzhi Yu
Phone:	N/A
Fax:	N/A
Email:	yucz@friendcom.com

For further details see Annex.

2.2 Sample Description(s)

Sample Name: DE1333000aa01

Object Under Test:	WSL02-A0
Description:	LoRaWAN Module
Serial Number:	01335788
Hardware Version:	V1.0
Firmware Version:	V3.3.1
Code:	aa01

For further details see Annex.

3 Results

3.1 General

Documentation of tested devices: Available at the test laboratory.

Interpretation of the test results: The results of the inspection are described on the following pages, where 'Conformity' or 'Passed' means that the certification criteria were verified and that the tested device is conform to the applied standard.

In cases where 'Declaration' is stated, the required documents are available in the manufacturer's product documentation.

In cases where 'not applicable' is stated, the test case requirements are not relevant to the specific equipment implementation.

Notes: 1. This report contains the abbreviated information content pertaining to services rendered. Supporting documentation not included herein is maintained and available at the test laboratory.

2. All tests are performed under environmental conditions within the requirements of the specifications. Environmental condition records are available at the test laboratory.

3.2 Applicable Test Specification(s)

Test Specification:	LoRa End Device Certification EU v1.5
Date / Version:	Jun 21, 2017 / v1.5
Description:	LoRa alliance End Device Certification Requirements for EU 863-870 MHz ISM Band devices, v1.0.2 (LoRa WAN core spec 1.0.2)

3.3 Result Statistics

Test Specification	Total	Result Verdict			Pass Ratio
		Pass	Fail	Declaration	
LoRa End Device Certification EU v1.5	16	16	0	0	100.00 %

Note: Pass, Declaration, Fail and Inconclusive results are regarded for the Pass Ratio calculation.
Pass and Declaration are summarized as Pass results. Fail and Inconclusive are summarized as Fail results. All are summarized as Total count (Pass + Declaration + Fail + Inconclusive).
The Pass Ratio is calculated by the number of Pass results divided by the number of Total results.
All other results like Error or Not Tested are not regarded for the calculation.

3.4 Result Summary

Test Specification: LoRa End Device Certification EU v1.5

Test Case Name / Description Test Condition	Cat	Verdict	Date	Test Res. ID	Sample/Setup
TC_MAC_EU_001 / Test Mode activation					
Band = Band 868 MHz, Act_Mode = Activation-by-Personalization	-	Passed	2018-07-10		DE1333000aa01
TC_MAC_EU_002 / Test application functionality					
Band = Band 868 MHz	-	Passed	2018-06-25		DE1333000aa01
TC_MAC_EU_003 / Over The Air Activation					
Band = Band 868 MHz	-	Passed	2018-07-02		DE1333000aa01
TC_MAC_EU_004 / Packet Error Rate RX2 SF12					
Band = Band 868 MHz	-	Passed	2018-06-25		DE1333000aa01
TC_MAC_EU_005 / Cryptography					
Band = Band 868 MHz	-	Passed	2018-06-25		DE1333000aa01
TC_MAC_EU_006 / Downlink Window Timing					
Band = Band 868 MHz	-	Passed	2018-06-25		DE1333000aa01
TC_MAC_EU_007 / Frame Sequence Number					
Band = Band 868 MHz	-	Passed	2018-06-25		DE1333000aa01
TC_MAC_EU_008 / Device Status Request					
Band = Band 868 MHz	-	Passed	2018-06-25		DE1333000aa01
TC_MAC_EU_009 / MAC Commands					
Band = Band 868 MHz	-	Passed	2018-06-25		DE1333000aa01
TC_MAC_EU_010 / New Channel Request					
Band = Band 868 MHz	-	Passed	2018-06-25		DE1333000aa01
TC_MAC_EU_011 / DIChannelReq MAC command					
Band = Band 868 MHz	-	Passed	2018-07-10		DE1333000aa01
TC_MAC_EU_012 / Confirmed packets					
Band = Band 868 MHz	-	Passed	2018-05-24		DE1333000aa01
TC_MAC_EU_013 / RX Parameter Setup Request					
Band = Band 868 MHz	-	Passed	2018-05-24		DE1333000aa01
TC_MAC_EU_014 / RX timing setup request					
Band = Band 868 MHz	-	Passed	2018-05-24		DE1333000aa01
TC_MAC_EU_015 / Link ADR Request					
Band = Band 868 MHz	-	Passed	2018-07-02		DE1333000aa01
TC_MAC_EU_016 / Packet Error Rate Rx1 Window					
Band = Band 868 MHz	-	Passed	2018-07-02		DE1333000aa01
TC_MAC_EU_017 / Packet Error Rate Rx2 Window					
Band = Band 868 MHz	-	Passed	2018-06-25		DE1333000aa01

4 Test Equipment Details

4.1 List of Test Equipment

The information shown below is valid for the testing time frame of this test report.

Test Resource 1: 7layers LoRa Compliance Test Environment
Description: for LoRaWAN Specification and LoRa Compliance Testspec

Test System 7layers LoRa Compliance Test Environment (#7LDE01) of Test Resource 7layers LoRa Compliance Test Environment

Test System:	7layers LoRa Compliance Test Environment (#7LDE01)
Description:	Location: 7layers Conformance Lab
Manufacturer:	7layers GmbH
Serial Number:	#7LDE01

Software Version	Start Date	End Date
Release 2.0	2017-01-02	

7Layers LoRa Compliance Test Suite v2.0
7Layers LoRa Gateway Server v2.0

LoRa WAN core spec 1.0.2
End device Certification for EU 868MHz v1.5
End device Certification for US 915MHz v1.3

Single Devices of Test System 7layers LoRa Compliance Test Environment (#7LDE01)

Name	Serial Number	Manufacturer	
7Layers LoRa Control PC	DSCK001853	HP	
Semtech SX1301 LoRa Gateway for EU 868MHz	IOTSX1301	Semtech	
	Software Version	*Start Date*	*End Date*
	Lora Gateway SW (Driver HAL) v3.2.0; Packet forwarder v2.2.0	2017-01-01	

Name	Serial Number	Manufacturer	
senet LoRa Gateway for US 915MHz (64-Channels)	not available	senet	
	Software Version	*Start Date*	*End Date*
	Packet forwarder v1.0.RC3	2017-01-01	

5   Annex

5.1   Object Under Test (OUT) Features

Supported Features for Object Under Test: WSL02-A0

Name	Mnemonic
LoRa End Device Certification EU v1.5	
Band 868 MHz	Band 868 MHz
data rate SF7BW250	Support if data rate SF7BW250
data rate FSK	Support if data rate FSK
OTAA	Support of optional over-the-air feature
ADR	Support of optional adaptive data rate control feature
JOIN	allow to trigger join request on port 224

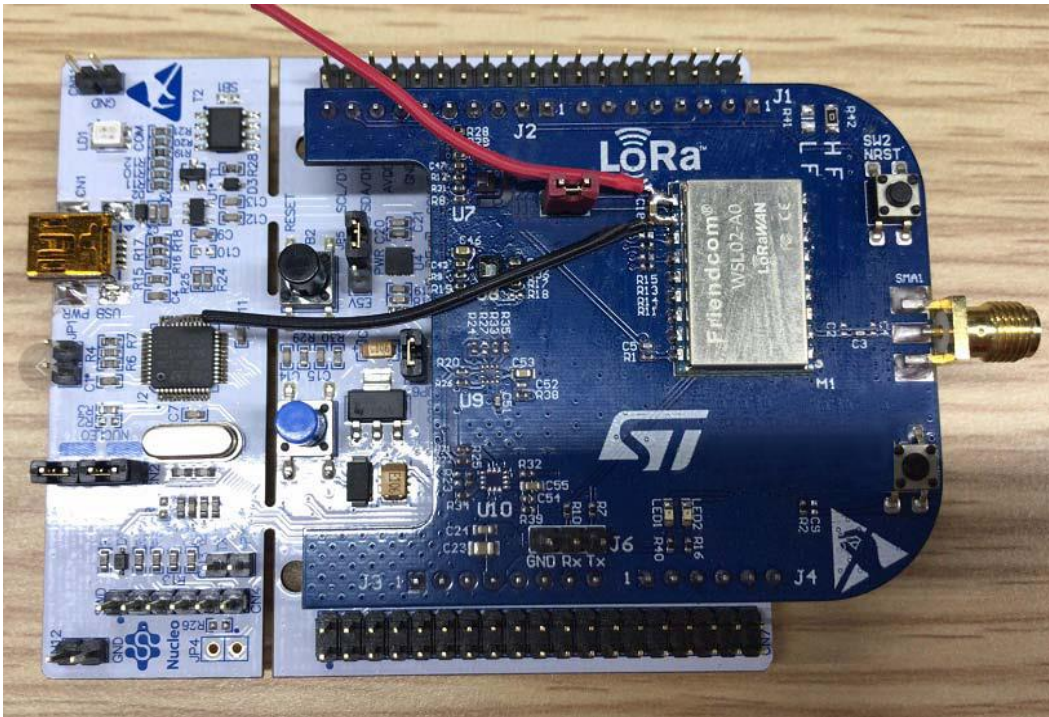## 5.2   Sample DE1333000aa01 Extra Information Parameters

Sample Name: DE133300aa01	
Object Under Test:	WSL02-A0
Identifier:	01335788
Description:	LoRaWAN Module
Serial Number:	01335788
Code:	aa01

Parameter Name	Value
a) End Device Identifier (DevEUI)	4786e6ed002f002d
b) Application Identifier (AppEUI)	4786e6ed002f002d
c) Application key (AppKey)	2B7E151628AED2A6ABF7158809CF4F3C
d) End-device address (DevAddr)	01335788
e) Application session key (AppSKey)	2B7E151628AED2A6ABF7158809CF4F3C
f) Network session key (NwkSKey)	2B7E151628AED2A6ABF7158809CF4F3C

5.3 Additional Documentation for Samples

The following documents have been attached to Sample definitions as supporting documentation.

Sample Name: DE1333000aa01

Object Under Test

End of Test Report