



# Final Test Report on

## WSL02-A0

**Test Report Reference:** MDE\_FRIEND\_1802\_02

**Date:** 2018-07-11

## Table of Contents

<b>1</b>	<b>Administrative Data</b>	<b>3</b>
1.1	Project Information	3
1.2	Applicant Information	3
1.3	Test Laboratory Information	3
1.4	Signature of the Testing Responsible	4
1.5	Signature of the Accreditation Responsible(s)	4
<b>2</b>	<b>Test Object Data</b>	<b>5</b>
2.1	Object Under Test (OUT) Description(s)	5
2.2	Object Under Test (OUT) Features	5
<b>3</b>	<b>Results</b>	<b>6</b>
3.1	General	6
3.2	Applicable Test Specification(s)	6
3.3	Result Details	7
<b>4</b>	<b>Test Equipment Details</b>	<b>9</b>
4.1	List of Used Test Equipment	9
<b>5</b>	<b>Annex</b>	<b>10</b>
5.1	Picture of the OUT Setup	10

## 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: 2018-06-22 - 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

### 1.3 Test Laboratory Information

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

#### **7layers DE, Ratingen, Germany**

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Company Name: 7layers GmbH  
 Address: Borsigstr. 11  
 40880 Ratingen  
 NRW  
 Germany  
 Contact: Michael Albert  
 Phone: +49 (0)2102 749 201  
 Email: Michael.Albert@7Layers.com  
 Laboratory accreditation no: DAkkS D-PL-12140-01-01

#### **Test Resource Details**

ID	Name	Responsible	Accreditation Info
1	InterLab LoRa-Compliance US915 Test Solution	Constantine Nfor	

**1.4 Signature of the Testing Responsible**



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(Responsible for Testing and Report)  
Abdellah Ahakki

**1.5 Signature of the Accreditation Responsible(s)**



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(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: Module LoRaWAN 915 (WSL02-A0)

Description:	LoRaWAN Module
Manufacturer:	WSL02-A0
Type / Model:	Module LoRaWAN 915 (WSL02-A0)
Serial Number:	01335788
LoRa Device Class:	A
Firmware version:	V3.3.1
Hardware version:	V1.0

### 2.2 Object Under Test (OUT) Features

Supported Features for Object under Test: DE1333000ac01

#### Supported Features

Name	Description
<b>LoRa End Device Certification US915 v1.3</b>	
ADR	Support of optional adaptive data rate control feature
Band 915 MHz	Support of Band 915 MHz
Geographical area of operation	Support of Band 915 MHz
Over the activation (OTA)	Support of over-the-air activation
Activation by personalization	Support of activation-by-personalization
Trigger Join Request	Support of "Trigger Join Request"
Output Power	Support 30dBm
Number / Type of Antenna(s)	Support 1xPCB Antenna
Antenna Gain	-
DevAddr	01335788
DevEui	4786e6ed002f002d
AppEui	4786e6ed002f002d
AppKey	2B7E151628AED2A6ABF7158809CF4F3C
NwkSKey	2B7E151628AED2A6ABF7158809CF4F3C
AppSKey	2B7E151628AED2A6ABF7158809CF4F3C

### 3 Results

#### 3.1 General

**Documentation of tested devices:** Available at the test laboratory.

**OUT Mode of Operation:** Test mode enabled as referenced in LoRa End Device Certification for US and Canada v1.3.

**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 Alliance End-Device Certification Requirements for US and Canada

**Date / Version:** v1.3

**Description:** LoRa Alliance End-Device Certification Requirements for US and Canada v1.3 is released for testing LoRaWAN Version 1.0.2 and LoRaWAN Regional Parameters Version 1.0.2rB

### 3.3 Result Details

Test Case Name	Test Specification Reference	Setup	Verdict	Date
TC_MAC_US_001: Cert-ApplicationActivation (TestModeActivation) (Activation-by-Personalization)	LoRa Alliance End-Device Certification Requirements for US and Canada 915MHz ISM Band Devices v1.3 (Clauses 2.1.1 & 3.1)	Setup_AC01	Passed	2018-07-10
TC_MAC_US_001: Cert-ApplicationActivation (TestModeActivation) (Over- the-Air activation)	LoRa Alliance End-Device Certification Requirements for US and Canada 915MHz ISM Band Devices v1.3 (Clauses 2.1.1 & 3.1)	Setup_AC01	Passed	2018-07-10
TC_MAC_US_002: Over- the-Air activation	LoRa Alliance End-Device Certification Requirements for US and Canada 915MHz ISM Band Devices v1.3 (Clauses 2.1.2 & 3.2)	Setup_AC01	Passed	2018-07-02
TC_MAC_US_003_P1: Certification Application Functionality Test a: Channel Plan and Usage	LoRa Alliance End-Device Certification Requirements for US and Canada 915MHz ISM Band Devices v1.3 (Clauses 2.2.1a & 3.3.1)	Setup_AC01	Passed	2018-06-22
TC_MAC_US_003_P2&P3: Certification Application Functionality Test b: Cryptography	LoRa Alliance End-Device Certification Requirements for US and Canada 915MHz ISM Band Devices v1.3 (Clauses 2.2.1bI, 2.21bII, 3.3.2 & 3.3.3)	Setup_AC01	Passed	2018-06-22
TC_MAC_US_003_P4: Certification Application Functionality Test c: 'Downlink Error Rate	LoRa Alliance End-Device Certification Requirements for US and Canada 915MHz ISM Band Devices v1.3 (Clauses 2.2.1c & 3.3.4)	Setup_AC01	Passed	2018-06-22
TC_MAC_US_003_P5: Certification Application Functionality Test d: Downlink Window Timing Test	LoRa Alliance End-Device Certification Requirements for US and Canada 915MHz ISM Band Devices v1.3 (Clauses 2.2.1d & 3.3.5)	Setup_AC01	Passed	2018-06-22
TC_MAC_US_003_P6&P7&P8: Certification Application Functionality Test e: Frame Sequence Number	LoRa Alliance End-Device Certification Requirements for US and Canada 915MHz ISM Band Devices v1.3 (Clauses 2.2.1eI, 2.2.1eII, 2.2.1eIII, 3.3.6, 3.3.7 & 3.3.8)	Setup_AC01	Passed	2018-06-22
TC_MAC_US_004: Confirmed Frames	LoRa Alliance End-Device Certification Requirements for US and Canada 915MHz ISM Band Devices v1.3 (Clauses 2.2.2 & 3.4)	Setup_AC01	Passed	2018-07-10
TC_MAC_US_005: Device Status Request	LoRa Alliance End-Device Certification Requirements for US and Canada 915MHz ISM Band Devices v1.3 (Clauses 2.3.1 & 3.5)	Setup_AC01	Passed	2018-06-22
TC_MAC_US_006: New Channel Request	LoRa Alliance End-Device Certification Requirements for US and Canada 915MHz ISM Band Devices v1.3 (Clauses 2.3.2 & 3.6)	Setup_AC01	Passed	2018-06-22
TC_MAC_US_007: RX Parameter Setup Request	LoRa Alliance End-Device Certification Requirements for US and Canada 915MHz ISM Band Devices v1.3 (Clauses 2.3.3 & 3.7)	Setup_AC01	Passed	2018-06-22
TC_MAC_US_008: RX Timing Setup Request	LoRa Alliance End-Device Certification Requirements for US and Canada 915MHz ISM Band Devices v1.3 (Clauses 2.3.4 & 3.8)	Setup_AC01	Passed	2018-06-22

Test Case Name	Test Specification Reference	Setup	Verdict	Date
TC_MAC_US_009: Link ADR Request	LoRa Alliance End-Device Certification Requirements for US and Canada 915MHz ISM Band Devices v1.3 (Clauses 2.3.5 & 3.9)	Setup_AC01	Passed	2018-07-10
TC_MAC_US_010: RX1 Receive Window Test (Packet Error Rate Rx1)	LoRa Alliance End-Device Certification Requirements for US and Canada 915MHz ISM Band Devices v1.3 (Clauses 2.3.6 & 3.10)	Setup_AC01	Passed	2018-07-02
TC_MAC_US_011: RX2 Receive Window Test (Packet Error Rate Rx2)	LoRa Alliance End-Device Certification Requirements for US and Canada 915MHz ISM Band Devices v1.3 (Clauses 2.3.7 & 3.11)	Setup_AC01	Passed	2018-06-22
TC_MAC_US_012_P1&P2&P3: Maximum Allowed Payload-Test a	LoRa Alliance End-Device Certification Requirements for US and Canada 915MHz ISM Band Devices v1.3 (Clauses 2.3.9aI, 2.3.9aII, 2.3.9aIII 3.12.1 3.12.2 & 3.12.3)	Setup_AC01	Passed	2018-06-22
TC_MAC_US_012_P4: Maximum Allowed Payload-Downlink-RX1/RX2 Window Test Scenarios	LoRa Alliance End-Device Certification Requirements for US and Canada 915MHz ISM Band Devices v1.3 (Clauses 2.3.8 & 3.12.4)	Setup_AC01	Passed	2018-07-02
TC_MAC_US_013: MAC Commands in App-Payload(FRMPayload) & FOpts	LoRa Alliance End-Device Certification Requirements for US and Canada 915MHz ISM Band Devices v1.3 (Clauses 2.3.10 & 3.13)	Setup_AC01	Passed	2018-06-22



## 4 Test Equipment Details

### 4.1 List of Used Test Equipment

The calibration, hardware and software states are shown for the testing time frame of this test report.

#### 1 7Layers LoRa Compliance Test Environment for LoRa Alliance End-Device Certification Requirements for US and Canada Version 1.3

Ref. No.	Device Name	Description
1.1	7Layers LoRa Control PC	<ul style="list-style-type: none"> <li>7Layers LoRa US 915MHz Compliance Test Suite SW v2.3</li> <li>7Layers LoRa GW SW v2.3</li> </ul>
1.2A	Senetco Lora US915MHz 64-Channels Gateway	<ul style="list-style-type: none"> <li>Packet forwarder v1.0.RC3 (<i>provided by SENETCO</i>)</li> </ul>
	<b>Or</b>	<b>Or</b>
1.2B	KONA Macro IoT Gateway US915MHz 64-Channels Gateway	<ul style="list-style-type: none"> <li>Packet forwarder v3.5.9 (<i>provided by TEKTELIC</i>)</li> </ul>

## 5 Annex

### 5.1 Picture of the OUT Setup

