

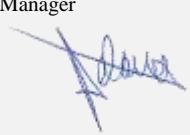


Test report No:

NIE: 420129700.002

Test Report

LoRa Alliance End Device Certification Requirements

Identification of item tested	LPWAN Module
Trademark.....	Kiwi Technology Inc.
DUT	420129700_Sample1_ABP / 420129700_Sample2_OTAA
Model or type reference	TLM922S
Final HW version	V1.2
Final SW version	N/A
Final FW version.....	V2.0.1
Features.....	LoRa Alliance End-Device Certification Requirements for AS923MHz ISM Band Devices
Manufacturer	Kiwi Technology Inc.
Test method requested	LoRaWAN specification V1.1 for AS 923MHz ISM Band
Standard.....	LoRa Alliance End-Device Certification Requirements for AS923MHz ISM Band Devices ver1.1
Test Spec Errata(s)	v1.1/2017-07-19
Test procedure(s).....	LoRaEndDeviceCertificationAS923v11
Summary.....	IN COMPLIANCE
Approved by (name / position & signature)	Miguel Delorme Manager 
Date of issue.....	2017-10-10
Report template No	FLO001_01

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Competences and guarantees

DEKRA is a testing laboratory competent to carry out the tests described in this report.

In order to assure the traceability to other national and international laboratories, DEKRA has a calibration and maintenance program for its measurement equipment.

DEKRA guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at DEKRA at the time of performance of the test.

DEKRA is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

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General conditions

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
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4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA and the Accreditation Bodies.

Usage of samples

Samples undergoing test have been selected and supplied by: Kiwi Technology Inc.

Sample M/01 is composed of the following elements:

CONTROL N°	DESCRIPTION	MODEL	HW VERSION	SW VERSION	FW VERSION	SERIAL N°	DATE OF RECEPTION
420129700/01	ADB922_ABP	TLM922S	V1.2	N/A	V2.0.1	117032700769	2017-04-28

Sample M/02 is composed of the following elements:

CONTROL N°	DESCRIPTION	MODEL	HW VERSION	SW VERSION	FW VERSION	SERIAL N°	DATE OF RECEPTION
420129700/02	ADB922_OTAA	TLM922S	V1.2	N/A	V2.0.1	117032700573	2017-04-28

Test sample description

The test sample M/01 consists on 420129700/01 device programmed with FW labeled as:

TLM922S_Certificate_AS923_ABP_20171005.hex

The test sample M/02 consists on 420129700/02 device programmed with FW labeled as:

TLM922S_Certificate_AS923_OTAA_20171005.hex

TLM922S is a tiny but powerful module and easy for users to integrate it into their system for different applications, especially IoT and M2M. TLM922S provides UART interface and in line command to simplify the development effort for developers.

Identification of the client

Kiwi Technology Inc.
 4F., No.158, Sec.1, Wenxing Rd.
 302, Zhubei City
 Hsinchu County, Taiwan

Testing period

The performed test started on 2017-10-03 and finished on 2017-10-10.

The tests have been performed by DEKRA Certification Japan.

Environmental conditions

The testing has been performed within the following limits:

TEMPERATURE	Min. = 15 °C
	Max. = 35 °C
RELATIVE HUMIDITY	Min. = 20 %
	Max. = 80 %

Remarks and comments

The tests have been performed by the technical personnel:

Jose Enrique Serrano Comes

Testing verdicts

As detailed in Appendix A.

Means of testing identification

Following equipment was used to perform the testing:

ITEM	AS923 SETUP	
TEST SYSTEM	TACS4 LPWAN	
CONTROL NUMBER	DKJP-0002	
HARDWARE	Equipment	Serial N°
	ST Nucleo-F746ZG LoRa GW	2163200506
SOFTWARE	Equipment	
	TACS4 LPWAN GUI v1.9.0	
	TACS4 LPWAN Reporting Module v1.5.0	
	TACS4 LPWAN Technology Package v4.3.0_R1	
	TACS4 LPWAN ED Certification AS v1.1	

Appendix A – Test result

Test campaign report

The abbreviations used in the header row of the test campaign report tables are:

- Test Case ID: Test case identifier, as it can be found on the referred standard.
- Sample: Sample details.
- Description: Test case description, as it can be found on the referred standard.
- Date: Date of the beginning of the execution.
- Conformance: YES/NO. If the test case has been executed in accordance to the standard.
- Verdict: Records the verdict assigned to each Test case run to completion. Following verdicts are possible:
 - PASS**: If the Test case passed.
 - FAIL**: If the Test case failed.
 - INCONC**: Inconclusive. The test case did not reach a PASS or FAIL verdict.
 - NA**: Not applicable.
 - NM**: Not measured.
- Observations: Provides a reference to additional information relevant to the test (when required).

0 test cases have been executed with SCR errors
 19 test cases selected of 19 executed
 19 test cases executed of 19 applicable

Test Case ID	Sample	Date	Conf	Verdict	Observations	
TP_A_AS923_ED_MAC_BV_000 Test mode activation	Device ID	M/01	2017-10-06	Yes	PASS	
	App ID	N/A				
	Fw ver	2.0.1				
	Hw ver	1.2				
TP_A_AS923_ED_MAC_BV_001 Test application functionality	Device ID	M/01	2017-10-06	Yes	PASS	
	App ID	N/A				
	Fw ver	2.0.1				
	Hw ver	1.2				
TP_A_AS923_ED_MAC_BV_002 Over the Air activation	Device ID	M/02	2017-10-06	Yes	PASS	
	App ID	N/A				
	Fw ver	2.0.1				
	Hw ver	1.2				
TP_A_AS923_ED_MAC_BV_003 Downlink error rate	Device ID	M/01	2017-10-06	Yes	PASS	
	App ID	N/A				
	Fw ver	2.0.1				
	Hw ver	1.2				
TP_A_AS923_ED_MAC_BV_004 AES encryption and message integrity	Device ID	M/01	2017-10-06	Yes	PASS	
	App ID	N/A				
	Fw ver	2.0.1				
	Hw ver	1.2				
TP_A_AS923_ED_MAC_BV_005 Downlink window timing	Device ID	M/01	2017-10-06	Yes	PASS	
	App ID	N/A				
	Fw ver	2.0.1				
	Hw ver	1.2				

TP_A_AS923_ED_MAC_BV_006 Frame sequence number	Device ID	M/01	2017-10-06	Yes	PASS	
	App ID	N/A				
	Fw ver	2.0.1				
	Hw ver	1.2				
TP_A_AS923_ED_MAC_BV_007 DevStatusReq MAC command	Device ID	M/01	2017-10-06	Yes	PASS	
	App ID	N/A				
	Fw ver	2.0.1				
	Hw ver	1.2				
TP_A_AS923_ED_MAC_BV_008 MAC Commands	Device ID	M/01	2017-10-06	Yes	PASS	
	App ID	N/A				
	Fw ver	2.0.1				
	Hw ver	1.2				
TP_A_AS923_ED_MAC_BV_009 NewChannelReq MAC command	Device ID	M/01	2017-10-06	Yes	PASS	
	App ID	N/A				
	Fw ver	2.0.1				
	Hw ver	1.2				
TP_A_AS923_ED_MAC_BV_010 DIChannelReq MAC command	Device ID	M/01	2017-10-06	Yes	PASS	
	App ID	N/A				
	Fw ver	2.0.1				
	Hw ver	1.2				
TP_A_AS923_ED_MAC_BV_011 Confirmed packets	Device ID	M/01	2017-10-06	Yes	PASS	
	App ID	N/A				
	Fw ver	2.0.1				
	Hw ver	1.2				
TP_A_AS923_ED_MAC_BV_012 RXParamSetupReq MAC command	Device ID	M/01	2017-10-06	Yes	PASS	
	App ID	N/A				
	Fw ver	2.0.1				
	Hw ver	1.2				
TP_A_AS923_ED_MAC_BV_013 RXTimingSetupReq MAC command	Device ID	M/01	2017-10-06	Yes	PASS	
	App ID	N/A				
	Fw ver	2.0.1				
	Hw ver	1.2				
TP_A_AS923_ED_MAC_BV_014_A LinkADDRReq MAC command	Device ID	M/01	2017-10-10	Yes	PASS	
	App ID	N/A				
	Fw ver	2.0.1				
	Hw ver	1.2				
TP_A_AS923_ED_MAC_BV_014_B LinkADDRReq MAC command	Device ID	M/01	2017-10-06	Yes	PASS	
	App ID	N/A				
	Fw ver	2.0.1				
	Hw ver	1.2				
TP_A_AS923_ED_MAC_BV_015 Packet Error Rate RX1	Device ID	M/01	2017-10-06	Yes	PASS	
	App ID	N/A				
	Fw ver	2.0.1				
	Hw ver	1.2				
TP_A_AS923_ED_MAC_BV_016 Packet Error Rate RX2	Device ID	M/01	2017-10-06	Yes	PASS	
	App ID	N/A				
	Fw ver	2.0.1				
	Hw ver	1.2				
TP_A_AS923_ED_MAC_BV_017 TXParamSetupReq MAC command	Device ID	M/01	2017-10-06	Yes	PASS	
	App ID	N/A				
	Fw ver	2.0.1				
	Hw ver	1.2				

Appendix B – ICS

NAME	VALUE
DUT is a Class A Device (All End Devices)	TRUE
DUT works in Asia 923MHz ISM Band	TRUE
DUT supports Over-The-Air Activation (OTAA) mechanism	TRUE
DUT supports Adaptive Data Rate (ADR) feature	TRUE
DUT supports Trigger Join Request command in Test Mode	TRUE
DUT supports DiChannelReq MAC command	TRUE
DUT supports LinkADRReq block	TRUE

Appendix C – IXIT

NAME	VALUE
Minimum transmission power	2 dBm
Maximum transmission power	20 dBm
Application session key (AppSKey)	'2B7E151628AED2A6ABF7158809CF4F3C'O
Network session key (NwkSKey)	'2B7E151628AED2A6ABF7158809CF4F3C'O
Application key (AppKey)	'2B7E151628AED2A6ABF7158809CF4F3C'O
Application identifier (AppEUI)	'0000000000000000'O
End-device Address (DevAddr)	'78563412'O

Appendix D – General Parameters

NAME	VALUE
General Timer	60
AS923 RECEIVE_DELAY1 (s)	1.0
AS923 RECEIVE_DELAY2 (s)	2.0
AS923 JOIN_ACCEPT_DELAY1 (s)	5.0
AS923 JOIN_ACCEPT_DELAY2 (s)	6.0
AS923 RX2 Receive window DR	SF10BW125
AS923 RX2 Receive window frequency	923.2
Gateway IP Address	192.168.1.100
Socket port communication between Test Tool and Gateway	1780
Default Tx Power (dBm)	14
Default Tx Antenna	0