

LoRa accredited Test Lab



Test report No:
 NIE: 56537RLR.007

Test report

LoRa Alliance End Device Certification Requirements

Identification of item tested	LoPy4
Trademark	Pycom Ltd
Model and /or type reference	LoPy4
Other identification of the product	Final HW version: 1.0 Final FW Version: 1.0.2
Features	The LoPy4 is a quadruple bearer MicroPython enabled development board (LoRa, Sigfox, WiFi, Bluetooth) – perfect enterprise grade IoT platform for your connected Things. With the latest Espressif chipset the LoPy4 offers a perfect combination of power, friendliness and flexibility. Create and connect your things everywhere. Fast.
Manufacturer	Pycom Ltd 57 Avenue Road Cranleigh, UK
Test method requested, standard	Lora Alliance Certification Program
Standard.....:	LoRaWAN v1.0.2
Test Specification	LoRa Alliance End-Device Certification Requirements for AS923 MHz ISM Band Devices Version 1.0
LoRa_Certification_Questionnaire	LoRa_Certification_Questionnaire_V2.0
Test procedure(s).....:	PELR000_00 LoRa Alliance Testing Procedure
Supported Optional Features	Yes
Adaptive Data Rate (ADR)	Yes
SF7BW250.....:	Yes
FSK50	No
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Noemí Pérez Dans IoT Lab Manager
Date of issue	2018-12-05
Report template No	FLR001_01

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Competences and guarantees

DEKRA Testing and Certification is a LoRa accredited Test Lab competent to carry out the tests described in this report.

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

DEKRA Testing and Certification 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 Testing and Certification at the time of performance of the test.

DEKRA Testing and Certification 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.
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Uncertainty

N/A

Data provided by the client

The ICS provided by the customer via the LoRa_Certification_Questionnaire_V2.0 and used for testing are indicated in Annex B.

DEKRA declines any responsibility with respect to the information provided by the client and that may affect the validity of results.

Usage of samples

Samples undergoing test have been selected by: Pycom Ltd

Sample 56537/002, is composed of the following elements:

Control N° 56537/002	Model and/or type reference:	LoPy4
	Serial number:	N/A
	HW version:	1.0
	SW version:	1.0.2
	Features supported:	LoRa, Sigfox, WiFi, Bluetooth
	Description of test sample	The LoPy4 is a quadruple bearer MicroPython enabled development board (LoRa, Sigfox, WiFi, Bluetooth) – perfect enterprise grade IoT platform for your connected Things. With the latest Espressif chipset the LoPy4 offers a perfect combination of power, friendliness and flexibility. Create and connect your things everywhere. Fast.
Date of reception	2018-03-15	

Control N° 56537/003	Model and/or type reference:	Antenna
	Serial number:	N/A
	HW version:	N/A
	SW version:	N/A
	Features supported:	N/A
	Description of test sample	N/A
	Date of reception	2018-03-15

Test sample description

The LoPy4 is a quadruple bearer MicroPython enabled development board (LoRa, Sigfox, WiFi, Bluetooth) – perfect enterprise grade IoT platform for your connected Things. With the latest Espressif chipset the LoPy4 offers a perfect combination of power, friendliness and flexibility. Create and connect your things everywhere. Fast.

Identification of the client

Daniel Campora
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+31(0)613274750

Pycom Ltd
57 Avenue Road
Cranleigh, UK

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2018-11-29
Date (finish)	2018-11-29

Document history

Report number	Date	Description
56537RLR.007	2018-12-05	First release

Environmental conditions

The following limits were not exceeded during the test:

Relative temperature	Min= 15 °C
	Max= 35 °C
Relative humidity	Min= 25 %
	Max= 75 %

Remarks and comments

Testing was performed by: Manuel Perales Ruiz

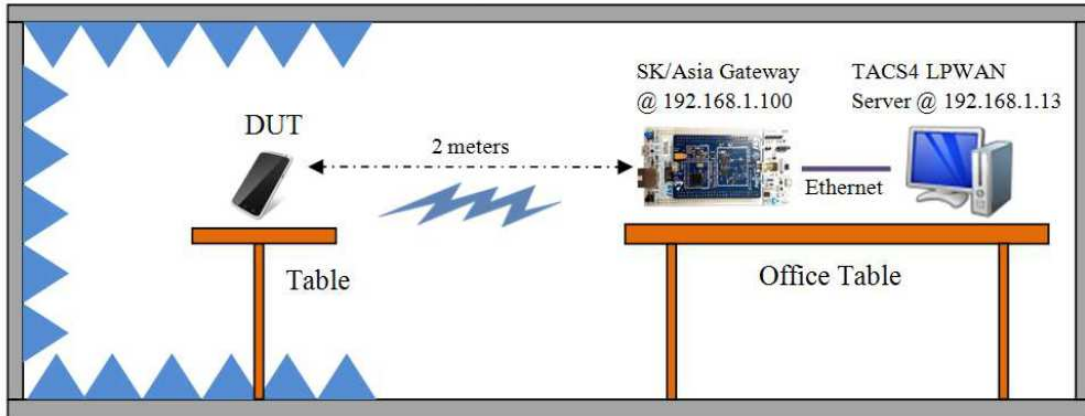
Means of testing identification

TEST SYSTEM	BANCO LORA ASIA		
Control Number	7212		
Control PC	Control No.	Equipment	Serial No.
	7218	Control PC with TACS4	-
LoRa Gateway	6762	Multiband ST Nucleo LoRa GW	-
RF Shielded box	5387	RF Shielded Test Enclosure	0001114
Test Setup:	See "Test Setup" section.		

Test setup

TS1: This Test Setup has been used for South Korea / Asia / India testing:

ST SOUTH KOREAN / ASIA / INDIA GATEWAY AND TACS4 LPWAN CONFIGURATION:



Measurement uncertainty

N/A

Testing verdicts

Not applicable :	N/A
Pass :	P
Fail :	F
Not measured :	N/M

Appendix A: Test results

Test campaign report

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

Test Case ID :	As it can be found on the standard
Verdict:	Records the verdict assigned to each Test Case run to completion (<u>Testing verdicts</u>)
Date:	Date of the beginning of the execution.
Observations:	Provides a reference to additional information relevant to the test presented in “Test Setup” section.

Test Case ID	Description	Date	Verdict	Observations
TC_A_AS923_ED_MAC_BV_000_a	Device Activation (ABP)	2018-11-29	P	
TC_A_AS923_ED_MAC_BV_000_b	Device Activation (OTAA)	2018-11-29	P	
TC_A_AS923_ED_MAC_BV_001	Test application functionality	2018-11-29	P	
TC_A_AS923_ED_MAC_BV_002	Over The Air Activation	2018-11-29	P	
TC_A_AS923_ED_MAC_BV_003	Packet Error Rate Part 1	2018-11-29	P	
TC_A_AS923_ED_MAC_BV_004	AES encryption and message integrity	2018-11-29	P	
TC_A_AS923_ED_MAC_BV_005	Downlink window timing	2018-11-29	P	
TC_A_AS923_ED_MAC_BV_006	Frame sequence number	2018-11-29	P	
TC_A_AS923_ED_MAC_BV_007	DevStatusReq MAC command	2018-11-29	P	
TC_A_AS923_ED_MAC_BV_008	MAC commands	2018-11-29	P	
TC_A_AS923_ED_MAC_BV_009	NewChannelReq MAC command	2018-11-29	P	
TC_A_AS923_ED_MAC_BV_010	DIChannelReq MAC command	2018-11-29	P	
TC_A_AS923_ED_MAC_BV_011	Confirmed packets	2018-11-29	P	
TC_A_AS923_ED_MAC_BV_012	RXParamSetupReq MAC command	2018-11-29	P	
TC_A_AS923_ED_MAC_BV_013	RXTimingSetupReq MAC command	2018-11-29	P	
TC_A_AS923_ED_MAC_BV_014_A	LinkADRRReq MAC command	2018-11-29	P	
TC_A_AS923_ED_MAC_BV_014_B	LinkADRRReq MAC command	2018-11-29	P	
TC_A_AS923_ED_MAC_BV_015	Packet Error Rate RX1	2018-11-29	P	
TC_A_AS923_ED_MAC_BV_016	Packet Error Rate RX2	2018-11-29	P	
TP_A_AS923_ED_MAC_BV_017	TXParamSetupReq MAC command	2018-11-29	P	

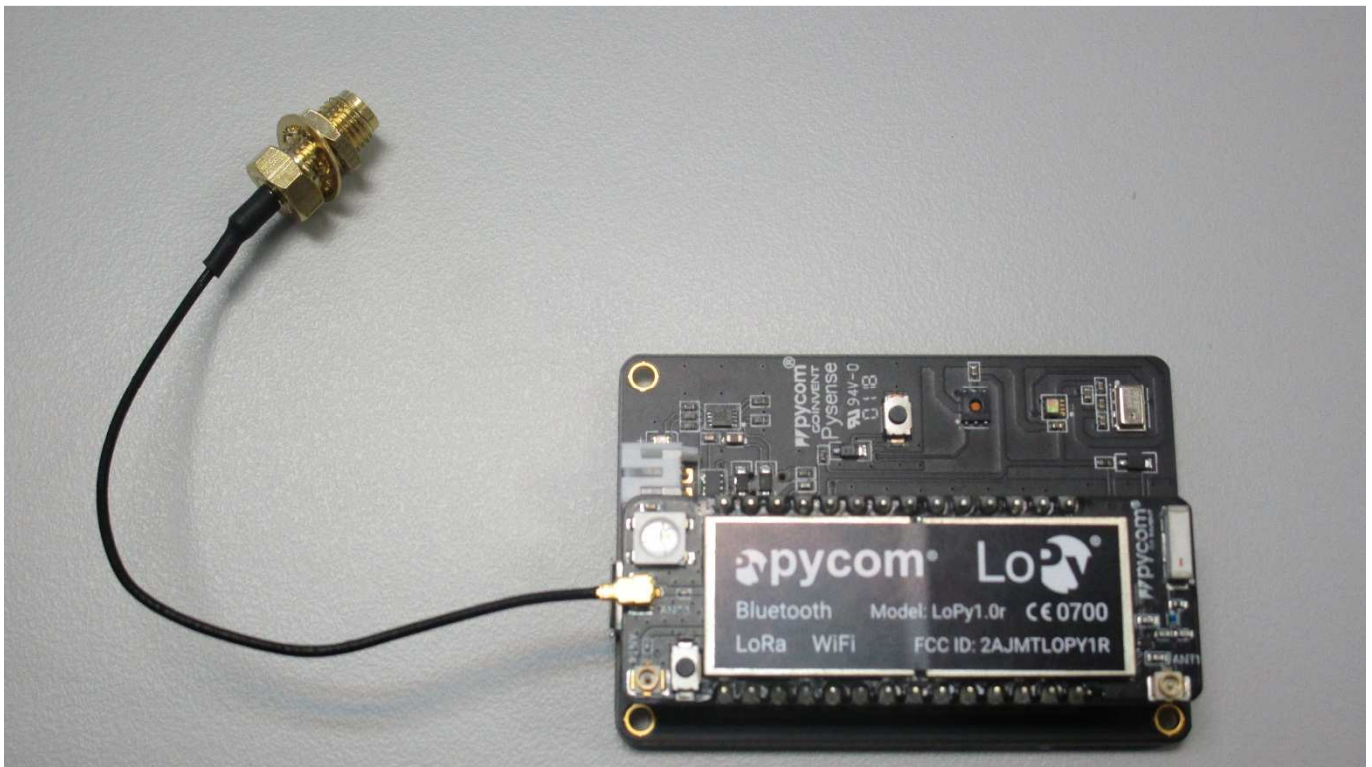
Appendix B: ICS

Implementation Conformance Statement (ICS)

Name	Title	Group	Value
C_ISM_AS923	DUT works in Asia 923MHz ISM Band	Band	TRUE
C_ISM_EU868	DUT works in EU 868MHz ISM Band	Band	FALSE
C_ISM_IN865	DUT works in India 865-867MHz ISM Band	Band	FALSE
C_ISM_KR920	DUT works in South Korea 920MHz ISM Band	Band	FALSE
C_ISM_US915	DUT works in USA 915MHz ISM Band	Band	FALSE
C_CERT_101	DUT implements LORAWAN v1.0.1 certification requirements	CERT	FALSE
C_CERT_102rB	DUT implements LORAWAN v1.0.2rB certification requirements	CERT	TRUE
C_CLASS_A	DUT is a Class A Device (All End Devices)	CLASS	TRUE
C_CLASS_B	DUT is a Class B Device (Beacon Mode)	CLASS	FALSE
C_CLASS_C	DUT is a Class C Device (Continuously Listening)	CLASS	FALSE
C_ED_ADR	DUT supports Adaptative Data Rate (ADR) feature	ED	TRUE
C_ED_ADR_BLOCK	DUT supports LinkADDRReq block	ED	TRUE
C_ED_CW	DUT supports Continuous Wave command	ED	FALSE
C_ED_DL_CHAN	DUT supports DChannelReq MAC command	ED	TRUE
C_ED_OTAA	DUT supports Over-The-Air Activation (OTAA) mechanism	ED	TRUE
C_ED_RESET	DUT supports a reset after deactivating Test Mode	ED	FALSE
C_ED_TM_TRI	DUT supports Trigger Join Request command in Test Mode	ED	TRUE

Appendix C: Photographs

Front view



Rear view

