

LoRa accredited Test Lab



Test report No:
 NIE: 62931RLR.009

Test report LoRa Alliance End Device Certification Requirements

(*) Identification of item tested	STM32WLE5
(*) Trademark	STMICROELECTRONICS
(*) Model and /or type reference tested	STM32WL
(*) Derived model not tested	Final HW version: NUCLEO-WL55JC1
Other identification of the product	Long-Range Wireless Microcontroller (Sub-GHz System-on-Chip)
(*) Features	STM32WLE5
Manufacturer	STMICROELECTRONICS (ROUSSET) SAS Route Des Lucioles 635 Dyapason VALBONNE, ALPES-MARITIMES 06560, FRANCE
Test method requested, standard	Lora Alliance Certification Program
Standard.....:	LoRaWAN V1.0.2
Test Specification	LoRa Alliance End Devices Certification Requirements for US and Canada 915MHz ISM Band Version 1.2
LoRa_Certification_Questionnaire	LoRaCertificationQuestionnaireV2.0
Test procedure(s).....:	PELR000_00 LoRa Alliance Testing Procedure
Supported Optional Features	
Adaptive Data Rate (ADR)	Yes
SF7BW250.....:	Yes
FSK50	Yes
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Noemí Pérez Dans IoT Lab Manager
Date of issue	2019-11-26
Report template No	FLR001_03 (*) "Data provided by the client"

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Competences and guarantees

DEKRA Testing and Certification S.A.U is a LoRa Alliance 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 S.A.U has a calibration and maintenance program for its measurement equipment.

DEKRA Testing and Certification S.A.U 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 S.A.U at the time of performance of the test.

DEKRA Testing and Certification S.A.U 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.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA Testing and Certification S.A.U.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Testing and Certification S.A.U and the Accreditation Bodies.

Uncertainty

N/A

Data provided by the client

The following data has been provided by the client:

1. Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested").
3. 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: STMICROELECTRONICS (ROUSSET) SAS

Sample M/01 is composed of the following elements:

Control N° 62931/004	Model and/or type reference:	STM32WLE5
	Serial number:	STM32WL
	HW version:	NUCLEO-WL55JC1
	SW version:	STM32CubeWLv0.4.0
	Features supported:	ADR, SF7BW250, FSK50
	Description of test sample	Long-Range Wireless Microcontroller
	Date of reception	18/11/2019

Test sample description

Long-Range Wireless Microcontroller (Sub-GHz System-on-Chip)

Identification of the client

STMICROELECTRONICS (ROUSSET) SAS

Route Des Lucioles 635 Dyapason

VALBONNE, ALPES-MARITIMES

06560, FRANCE

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2019-11-22
Date (finish)	2019-11-22

Document history

Report number	Date	Description
62931RLR.009	2019-11-26	First release (test report without logs to be uploaded to the public area of LoRa Alliance website)

Environmental conditions

The following limits were not exceed during the test:

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

Remarks and comments

Testing was performed by: Jose Francisco González Castellary

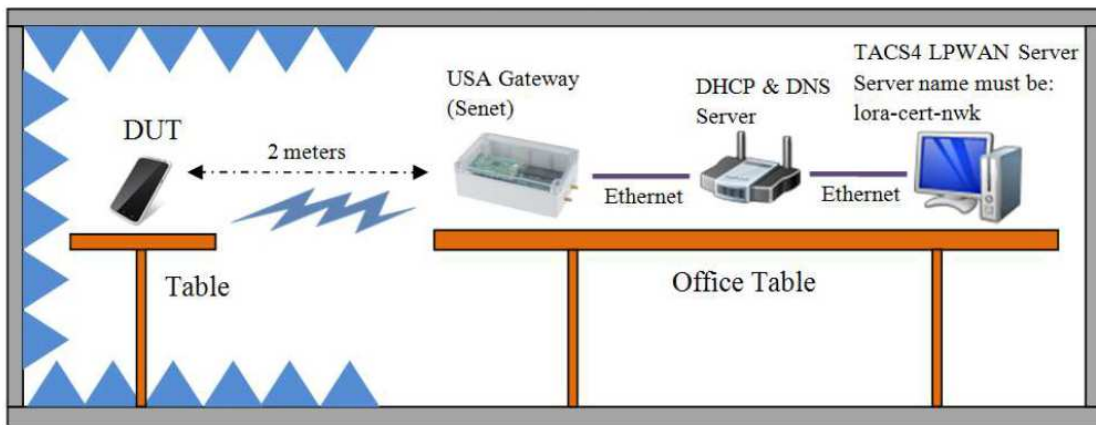
Means of testing identification

TEST SYSTEM	BANCO LORA USA		
Control Number	7210		
Control PC	Control No.	Equipment	Serial No.
	7218	Control PC with TACS4 version 2.0.0 and Technology Packet Version v5.14.0_R1	-
LoRa Gateway	5845	Senet LoRa Basestation	FCC ID: X94-0005845
RF Shielded box	5387	RF Shielded Test Enclosure	0001114
Test Setup:	See "Test Setup" section.		

Test setup

TS2: This Test Setup has been used for USA / Canada testing:

SENET USA & CANADA GATEWAY AND TACS4 LPWAN CONFIGURATION:



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.
Logs:	See 62931RLR.010

Test Case ID	Description	Date	Verdict	Observations
TP_A_US915_ED_MAC_BV_000_A	Test Mode Activation (ABP)	2019-11-22	P	ABP
TP_A_US915_ED_MAC_BV_000_B	Test Mode Activation (OTA)	2019-11-22	P	OTAA
TC_A_US915_ED_MAC_BV_001	Over The Air Activation	2019-11-22	P	
TC_A_US915_ED_MAC_BV_002	Test application functionality	2019-11-22	P	
TC_A_US915_ED_MAC_BV_003	AES encryption and message integrity	2019-11-22	P	
TC_A_US915_ED_MAC_BV_004	Downlink error rate	2019-11-22	P	
TC_A_US915_ED_MAC_BV_005	Downlink window timing	2019-11-22	P	
TC_A_US915_ED_MAC_BV_006_A	Frame sequence number	2019-11-22	P	
TC_A_US915_ED_MAC_BV_006_B	Downlink sequence number rollover	2019-11-22	P	
TC_A_US915_ED_MAC_BV_007	DevStatusReq MAC command	2019-11-22	P	
TC_A_US915_ED_MAC_BV_008_A	MAC commands	2019-11-22	P	
TC_A_US915_ED_MAC_BV_008_B	MAC Commands in App-Payload & Fopts	2019-11-22	P	
TC_A_US915_ED_MAC_BV_009	NewChannelReq MAC command	2019-11-22	P	
TC_A_US915_ED_MAC_BV_010	Confirmed packets	2019-11-22	P	
TC_A_US915_ED_MAC_BV_011	RXParamSetupReq MAC command	2019-11-22	P	
TC_A_US915_ED_MAC_BV_012	RX1 Receive window test	2019-11-22	P	
TC_A_US915_ED_MAC_BV_013	RX2 Receive window test	2019-11-22	P	
TC_A_US915_ED_MAC_BV_014	RXTimingSetupReq MAC command	2019-11-22	P	
TC_A_US915_ED_MAC_BV_015_A	LinkADDRReq MAC command	2019-11-22	P	
TC_A_US915_ED_MAC_BV_015_B	LinkADDRReq MAC command	2019-11-22	P	
TC_A_US915_ED_MAC_BV_016	RX Oversized payload	2019-11-22	P	
TC_A_US915_ED_MAC_BV_017	Maximum allowed payload	2019-11-22	P	

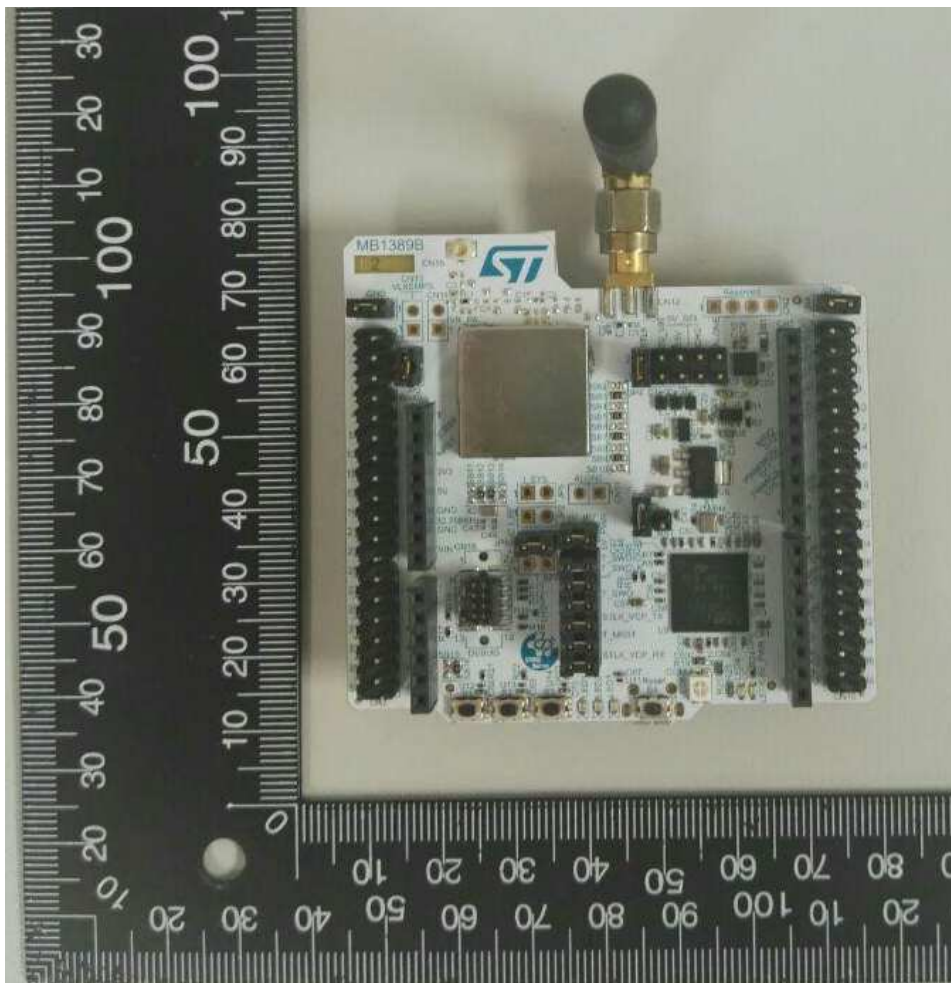
Appendix B: ICS

Implementation Conformance Statement (ICS)

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

Appendix C: Photographs

Front view



Rear view

