

LoRa accredited Test Lab



Test report No:

NIE: 70260CRLR.003

## Test report

### LoRa Alliance End Device Certification Requirements

(*) Identification of item tested	STM32WLE5
(*) Trademark	STMicroelectronics
(*) Model and /or type reference tested	STM32WL
(*) Other identification of the product	Final HW version: NUCLEO-WL55JC1 Final FW Version: STM32CubeWL v1.2.0
(*) Features	LoRaWAN Spec v1.0.4, Class A, Long-Range Wireless Microcontroller (Sub-GHz System-onChip)
Manufacturer	STMicroelectronics Address: Zone industrielle, 190 Avenue Coq Postal code, City: 13106, Rousset. Country: France
Test method requested, standard	Lora Alliance Certification Program
Standard.....:	LoRaWAN v1.0.4
Test Specification.....:	LoRa Alliance End-Device Certification Requirements for All Regions, LW1.0.4
LoRa_Certification_Questionnaire.....:	LoRaWAN_Certification_Questionnaire_V2.2
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	2022-01-04
Report template No	FLR001_05 (* "Data provided by the client")

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## Competences and guarantees

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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 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

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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 item tested ", "Trademark", "Model and /or type reference tested", "Derived model not tested", "Other identification of the product", "Features" and "Test Sample Description").
2. The ICS provided by the customer via the LoRa\_Certification\_Questionnaire\_V2.2 and used for testing are indicated in Annex B.

DEKRA Testing and Certification S.A.U. 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

Sample M/01 is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
70260C/001	LoRa Module	STM32WL	N/A	2021-13-12
70260C/002	Antenna	N/A	N/A	2021-13-12
Firmware version:	STM32CubeWL v1.2.0			2021-13-12

1. Sample M/01 has undergone the test(s) specified in subclause "Test method requested".

## Test sample description

Long-Range Wireless Microcontroller (Sub-GHz System-onChip)

## Identification of the client

STMicroelectronics

Address: Zone industrielle, 190 Avenue Coq  
Postal code, City: 13106, Rousset  
Country: France

## Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2021-12-21
Date (finish)	2021-12-22

## Document history

Report number	Date	Description
70260CRLR.001	2022-01-10	First release (test report without logs to be uploaded to the public area of LoRa Alliance website) <b>EU Band</b>
70260CRLR.002	2022-01-10	Identical test report as '70260CRLR.001' with the addition of the test logs. <b>EU Band</b>
70260CRLR.003	2022-01-10	First release (test report without logs to be uploaded to the public area of LoRa Alliance website) <b>IN Band</b>
70260CRLR.004	2022-01-10	Identical test report as '70260CRLR.003' with the addition of the test logs. <b>IN Band</b>
70260CRLR.005	2022-01-10	First release (test report without logs to be uploaded to the public area of LoRa Alliance website) <b>KR Band</b>
70260CRLR.006	2022-01-10	Identical test report as '70260CRLR.005' with the addition of the test logs. <b>KR Band</b>
70260CRLR.007	2022-01-10	First release (test report without logs to be uploaded to the public area of LoRa Alliance website) <b>AS Band</b>
70260CRLR.008	2022-01-10	Identical test report as '70260CRLR.007' with the addition of the test logs. <b>AS Band</b>
70260CRLR.009	2022-01-10	First release (test report without logs to be uploaded to the public area of LoRa Alliance website) <b>US Band</b>
70260CRLR.0010	2022-01-10	Identical test report as '70260CRLR.009' with the addition of the test logs. <b>US Band</b>

## Remarks and comments

Testing was performed by: Martín Sánchez Revuelta

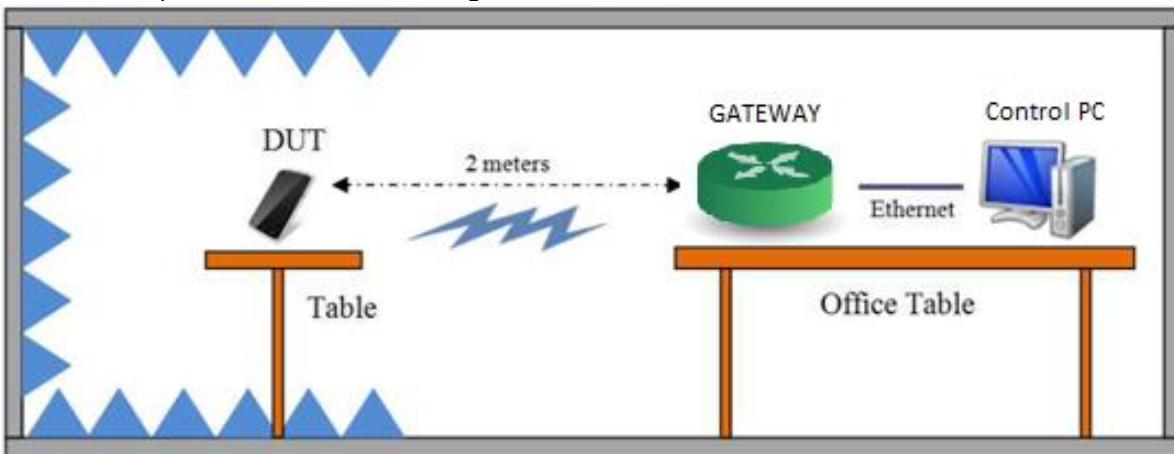
## Means of testing identification

TEST SYSTEM	BANCO LORA V1.0.4 (EU / AS / IN / KR)		
Control Number	8863		
Control PC	Control No.	Equipment	Serial No.
	7218	Control PC with LCTT Technology Packet Version v3.3.0_R1	-
LoRa Gateway	8864	Kerlink GW	-
LoRa Gateway	7342	Semtech GW(*)	-
RF Shielded box	5387	RF Shielded Test Enclosure	0001114
Test Setup:	See "Test Setup" section.		

(\*) Gateway used for some tests. See pages 8 and 9; Appendix A - "Observations" column.

## Test setup

This Test Setup has been used for testing:



## Testing verdicts

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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 70260CRLR.004

Test Case ID	Description	Date	Verdict	Observations
TP_A_IN865_ED_MAC_104_BV_000 (ABP)	Activation Pre-test	21/12/2021	P	Gateway: 8864
TP_A_IN865_ED_MAC_104_BV_000 (OTA)	Activation Pre-test	21/12/2021	p	Gateway: 8864
TP_A_IN865_ED_MAC_104_BV_001_A	Over The Air Activation	22/12/2021	P	Gateway: 7342
TP_A_IN865_ED_MAC_104_BV_001_B	Activation by Personalization	21/12/2021	P	Gateway: 8864
TP_A_IN865_ED_MAC_104_BV_002	Cryptography	21/12/2021	P	Gateway: 8864
TP_A_IN865_ED_MAC_104_BV_003	Downlink Sequence Number	21/12/2021	P	Gateway: 8864
TP_A_IN865_ED_MAC_104_BV_004	Confirmed Frames	21/12/2021	P	Gateway: 8864
TP_A_IN865_ED_MAC_104_BV_005	DevStatusReq MAC command	21/12/2021	P	Gateway: 8864
TP_A_IN865_ED_MAC_104_BV_006	NewChannelReq MAC command for Dynamic Channel plan devices only	22/12/2021	P	Gateway: 8864
TP_A_IN865_ED_MAC_104_BV_007	DIChannelReq for Dynamic Channel plan devices only	21/12/2021	P	Gateway: 8864
TP_A_IN865_ED_MAC_104_BV_008	RXParameterSetupReq MAC command	21/12/2021	P	Gateway: 8864
TP_A_IN865_ED_MAC_104_BV_009	RXTimingSetupReq MAC command	21/12/2021	P	Gateway: 8864
TP_A_IN865_ED_MAC_104_BV_010	TxParamSetupReq MAC Command	21/12/2021	P	Gateway: 8864
TP_A_IN865_ED_MAC_104_BV_011	LinkCheckReq MAC Command	21/12/2021	P	Gateway: 8864
TP_A_IN865_ED_MAC_104_BV_012_A	LinkADDRReq MAC command (Part 1)	22/12/2021	P	Gateway: 7342
TP_A_IN865_ED_MAC_104_BV_012_B	LinkADDRReq MAC command (Part 2)	22/12/2021	P	Gateway: 7342
TP_A_IN865_ED_MAC_104_BV_013	DutyCycleReq MAC Command	21/12/2021	P	Gateway: 8864
TP_A_IN865_ED_MAC_104_BV_014	DeviceTimeReq MAC Command	21/12/2021	P	Gateway: 8864
TP_A_IN865_ED_MAC_104_BV_015_A	RX1 Receive Window Test (Part 1)	22/12/2021	P	Gateway: 7342
TP_A_IN865_ED_MAC_104_BV_015_B	RX1 Receive Window Test (Part 2)	22/12/2021	P	Gateway: 7342
TP_A_IN865_ED_MAC_104_BV_016	RX2 Receive Window Test	22/12/2021	P	Gateway: 7342



TP_A_IN865_ED_MAC_104_BV_017	RX1 and RX2 simultaneous frames	21/12/2021	P	Gateway: 8864
TP_A_IN865_ED_MAC_104_BV_018	RX Oversized Payload	21/12/2021	P	Gateway: 8864
TP_A_IN865_ED_MAC_104_BV_019_A	Maximum Allowed Payload (Part 1)	22/12/2021	P	Gateway: 7342
TP_A_IN865_ED_MAC_104_BV_019_B	Maximum Allowed Payload (Part 2)	22/12/2021	P	Gateway: 7342
TP_A_IN865_ED_MAC_104_BV_020	MAC Command(s) in App-Payload and/or Frame Options	22/12/2021	P	Gateway: 8864
TP_A_IN865_ED_MAC_104_BV_021	Multiple MAC commands prioritization	22/12/2021	P	Gateway: 8864
TP_A_IN865_ED_MAC_104_BV_022	FPort 224 Deactivation	22/12/2021	P	Gateway: 7342

# 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_AU915	DUT works in Australia 915MHz 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	TRUE
C_ISM_KR920	DUT works in South Korea 920MHz ISM Band	BAND	C	FALSE
C_ISM_RU864	DUT works in Rusia 864MHz ISM Band	BAND	C	FALSE
C_ISM_US915	DUT works in USA 915MHz ISM Band	BAND	C	FALSE
C_CERT_102rB	DUT implements LoRaWAN v1.0.2rB certification requirements	CERT	C	FALSE
C_CERT_104	DUT implements LoRaWAN v1.0.4 certification requirements	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_AS923_GROUP1	DUT works in Asia 923MHz ISM Band Group 1	ED	C	FALSE
C_ED_AS923_GROUP2	DUT works in Asia 923MHz ISM Band Group 2	ED	C	FALSE
C_ED_AS923_GROUP3	DUT works in Asia 923MHz ISM Band Group 3	ED	C	FALSE
C_ED_DL_CHAN	DUT supports DChannelReq MAC command	ED	C	TRUE
C_ED_DR_DECAY	DUT implements Data Rate Decay	ED	C	False
C_ED_OTAA	DUT supports Over-The-Air Activation (OTAA) mechanism	ED	C	True
C_ED_PERMANENT_CLASS_C	DUT permanently enabled Class C	ED	C	False
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 Mode	ED	C	False

# Appendix C: Photographs

## Front view



## Rear view

