

LoRa Accredited Test Lab



Test report No:

NIE: 66332RLR.001

Test report LoRa Alliance End Device Certification Requirements

(*) Identification of item tested	LoRa Basics™ Modem-E EVK
(*) Trademark	Semtech
(*) Model and /or type reference tested	E516V02C
Other identification of the product	Final HW version: LR1110 Final FW Version: 1.0.7
(*) Features	Adaptive Data Rate, DICHannelReq, LinkADRRReq
Manufacturer	Semtech 14 chemin des clos, Meylan 38240 France
Test method requested, standard	Lora Alliance Certification Program
Standard	LoRaWAN v1.0.2
Test Specification	LoRa Alliance End-Device Certification Requirements for EU 868MHz ISM Band Devices Version 1.6
LoRa_Certification_Questionnaire.....	LoRa_Certification_Questionnaire_V2.1
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	2020-10-01
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.
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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 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_V2.1 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: Semtech

Sample M/01, is composed of the following elements:

Control N° 65268/003	Model and/or type reference:	E516V02C
	Serial number:	N/A
	HW version:	LR1110
	FW version:	V.1.0.7
	Features supported:	Adaptive Data Rate, DChannelReq, LinkADRReq
	Description of test sample	Based on the LR1110 semtech chip
	Date of reception	HW Board: 2020-06-05 FW v1.0.7: 2020-09-28

Control N° 65268/001	Model and/or type reference:	Nucleo Board
	Serial number:	N/A
	HW version:	N/A
	SW version:	N/A
	Features supported:	N/A
	Description of test sample	Connection with main board
Date of reception	2020-06-05	

The sample used for each test case is specified in the " Observations" field of the results annex

Test sample description

LoRa Basics™ Modem-E: Semtech Embedded modem based on the LR1110 semtech chip.

Identification of the client

Semtech
14 chemin des clos, Meylan
38240 France

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2020-09-29
Date (finish)	2020-09-30

Document history

Report number	Date	Description
66332RLR.001	2020-10-01	First release for EU863-870 MHz ISM Band Devices, including test logs
66332RLR.002	2020-10-01	First release for US and Canada 902-928 MHz ISM Band Devices, including test logs

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: Jose Francisco González Castellary and Daniel Ríos Toca

For test case TC_A_EU868_ED_MAC_BV_019 the TCL reports an Inconclusive result because it expects to receive a LinkCheckReq in the FOpts, but it is sent in the FRMPayload, which is also valid. Therefore, the test is considered as PASS. The issue has been referenced as *Mantis 0010124: TC_A_EU868_ED_MAC_BV_019 – LinkCheckReq* for a fix in a future release of the tool.

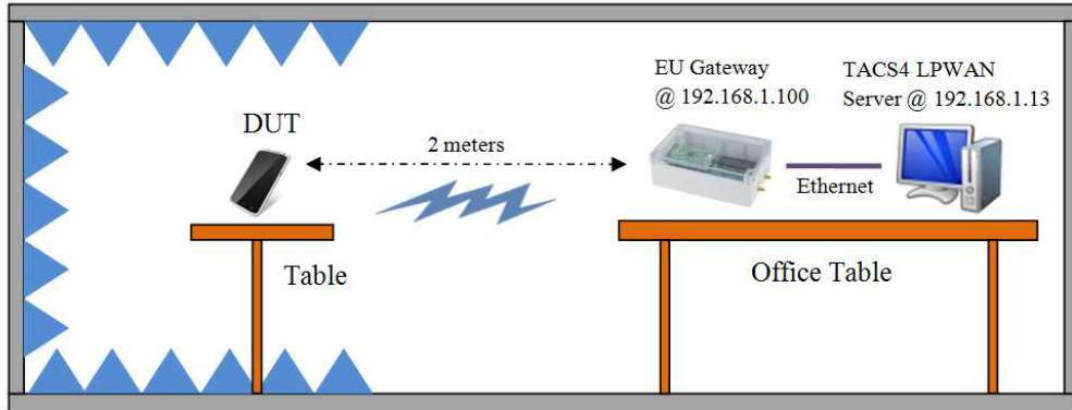
Means of testing identification

TEST SYSTEM	BANCO LORA EU		
Control Number	5866		
Control PC	Control No.	Equipment	Serial No.
	7218	Control PC with TACS4 version 2.0.0_R1 and Technology Packet Version LORA v.5.18.0_R1	-
LoRa Gateway	7342	Semtech 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 EU testing:

SEMTECH EUROPEAN 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:	

Test Case ID	Description	Date	Verdict	Observations
TC_A_EU868_ED_MAC_BV_000	Device Activation (ABP)	N/A	N/A	-
TC_A_EU868_ED_MAC_BV_000	Device Activation (OTAA)	2020-09-29	P	-
TC_A_EU868_ED_MAC_BV_001_A	Over the air activation	2020-09-29	P	-
TC_A_EU868_ED_MAC_BV_001_B	Activation by Personalization	N/A	N/A	-
TC_A_EU868_ED_MAC_BV_002	Test application functionality	2020-09-29	P	-
TC_A_EU868_ED_MAC_BV_003	AES encryption and message integrity	2020-09-29	P	-
TC_A_EU868_ED_MAC_BV_004	Downlink error rate	2020-09-29	P	-
TC_A_EU868_ED_MAC_BV_005	Downlink window timing	2020-09-29	P	-
TC_A_EU868_ED_MAC_BV_006	Frame sequence number	2020-09-29	P	-
TC_A_EU868_ED_MAC_BV_007	DevStatusReq MAC command	2020-09-29	P	-
TC_A_EU868_ED_MAC_BV_008	MAC commands	2020-09-29	P	-
TC_A_EU868_ED_MAC_BV_009	NewChannelReq MAC command	2020-09-29	P	-
TC_A_EU868_ED_MAC_BV_010	DIChannelReq MAC command	2020-09-29	P	-
TC_A_EU868_ED_MAC_BV_011	Confirmed packets	2020-09-29	P	-
TC_A_EU868_ED_MAC_BV_012	RXParamSetupReq MAC command	2020-09-29	P	-
TC_A_EU868_ED_MAC_BV_013	RXTimingSetupReq MAC command	2020-09-29	P	-
TC_A_EU868_ED_MAC_BV_014_A	LinkADRRReq MAC command (Part 1)	2020-09-30	P	-
TC_A_EU868_ED_MAC_BV_014_B	LinkADRRReq MAC command (Part 2)	2020-09-30	P	-
TC_A_EU868_ED_MAC_BV_015_A	RX1 Receive windows test (Part 1)	2020-09-30	P	-
TC_A_EU868_ED_MAC_BV_015_B	RX1 Receive windows test (Part 2)	2020-09-29	P	-
TC_A_EU868_ED_MAC_BV_016	RX2 Receive window test	2020-09-30	P	-
TC_A_EU868_ED_MAC_BV_017	RX1 and RX2 simultaneous frames	2020-09-29	P	-
TC_A_EU868_ED_MAC_BV_018	TXParamSetupReq MAC command	2020-09-29	P	-

TC_A_EU868_ED_MAC_BV_019	LinkCheckReq MAC command	2020-09-29	P*	See 'Remarks and comments'
TC_A_EU868_ED_MAC_BV_020	RX Oversized payload	2020-09-29	P	-
TC_A_EU868_ED_MAC_BV_021	Maximum Allowed payload	2020-09-30	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	TRUE
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	FALSE
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_CERT_102rA	DUT implements LoRaWAN v1.0.3rA (ClassB) certification requirements	CERT	C	FALSE
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_CONFIRMED_FRAME_RETRANSMIT	DUT supports uplink re-transmissions for Confirmed frames	ED	C	TRUE
C_ED_CW	DUT supports Continuous Wave command	ED	C	TRUE
C_ED_DL_CHAN	DUT supports DChannelReq MAC command	ED	C	TRUE
C_ED_JOIN_ISSUES_REMEDIES_100	DUT supports the Lorawan-1.0.x-join-synch-issues-remedies-v1.0.0	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

