DEKRA

LoRa Alliance	Test report No: **NIE: 420240300.001**

Test Report
LoRa Alliance End Device Certification Requirements

Identification of item tested ....:	Wireless Communication Module
Trademark ....:	Yokogawa Electric Corporation
DUT ....:	420240300_XS110
Model or type reference ....:	XS110A
Final HW version..:	S2.01
Final SW version ....:	N/A
Final FW version ....:	R1.03.01
Standard..:	LoRaWAN specification V1.0.2 for EU 868MHz ISM Band
Manufacturer...:	Yokogawa Electric Corporation
Test method requested ....:	LoRa Alliance End Device Certification Requirements for EU 868MHz ISM Band Devices Version 1.5
Test procedure(s) ....:	LoRaEndDeviceCertificationEU868v1.5
Supported optional features................................:	YES
Adaptive Data Rate (ADR) ....:	YES
➔ **SF7BW250**	YES
➔ **FSK**	NO
Summary..:	IN COMPLIANCE
Approved by (name / position & signature).......:	Miguel Delorme Manager
Date of issue ....:	2020-04-28
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.

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Usage of samples

Samples undergoing test have been selected and supplied by: Yokogawa Electric Corporation

Sample M/01 is composed of the following elements:

CONTROL Nº	DESCRIPTION	MODEL	HW VERSION	SW VERSION	FW VERSION	SERIAL Nº	DATE OF RECEPTION
420240300/01	Wireless Communication module	XS110A	S2.01	N/A	R1.03.01	91VC27520	2020-04-22

Test sample description

The test sample M/01 consists of 420240300/01 device programmed with FW version R1.03.01.

Yokogawa XS110A is an Industrial IoT wireless communication module that is used with various measurement modules provided from Yokogawa. These sensors have environmental resistance features to support heavy-duty use. This module contains a battery and it can be a power supply for a measurement module. Yokogawa is offering a temperature sensor and a pressure sensor as measurement modules.

Identification of the client

Yokogawa Electric Corporation

2-9-32 Nakacho, Musashino-shi, Tokyo

180-8750 Japan

Testing period

The performed test started and finished on 2020-04-22.

The tests have been performed at DEKRA Certification Japan.

Environmental conditions

The testing has been performed within the following limits:

TEMPERATURE	Min. = 15 ℃ Max. = 35 ℃
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	EU868 SETUP	
TEST SYSTEM	TACS4 LPWAN	
CONTROL NUMBER	DKJP-0003	
HARDWARE	Equipment	Serial N°
	Semtech GW IOT SX1301 Starter Kit	50811DC
SOFTWARE	Equipment	
	TACS4 LPWAN GUI v1.13.0 TACS4 LPWAN Reporting Module v1.5.0 TACS4 LPWAN Technology Package v5.14.0_R1 TACS4 LPWAN ED Certification EUv1.5	

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).

18 test cases selected of 18 executed
18 test cases executed of 18 applicable

Test Case ID	Sample		Date	Conf	Verdict	Observations
TP_A_EU868_ED_MAC_BV_000 **Device activation**	**Device ID**	M/01	2020-04-22	Yes	**PASS**	
	App ID	N/A				
	Fw ver	R1.03.01				
	Hw ver	S2.01				
TP_A_EU868_ED_MAC_BV_001 **Test application functionality**	**Device ID**	M/01	2020-04-22	Yes	**PASS**	
	App ID	N/A				
	Fw ver	R1.03.01				
	Hw ver	S2.01				
TP_A_EU868_ED_MAC_BV_002 **Over The Air activation**	**Device ID**	M/01	2020-04-22	Yes	**PASS**	
	App ID	N/A				
	Fw ver	R1.03.01				
	Hw ver	S2.01				
TP_A_EU868_ED_MAC_BV_003 **Packet Error Rate Part 1**	**Device ID**	M/01	2020-04-22	Yes	**PASS**	
	App ID	N/A				
	Fw ver	R1.03.01				
	Hw ver	S2.01				
TP_A_EU868_ED_MAC_BV_004 **AES encryption and message integrity**	**Device ID**	M/01	2020-04-22	Yes	**PASS**	
	App ID	N/A				
	Fw ver	R1.03.01				
	Hw ver	S2.01				
TP_A_EU868_ED_MAC_BV_005 **Downlink window timing**	**Device ID**	M/01	2020-04-22	Yes	**PASS**	
	App ID	N/A				
	Fw ver	R1.03.01				
	Hw ver	S2.01				
TP_A_EU868_ED_MAC_BV_006 **Frame sequence number**	**Device ID**	M/01	2020-04-22	Yes	**PASS**	
	App ID	N/A				
	Fw ver	R1.03.01				
	Hw ver	S2.01				

TP_A_EU868_ED_MAC_BV_007 **DevStatusReq MAC command**	**Device ID**	M/01	2020-04-22	Yes	**PASS**	
	App ID	N/A				
	Fw ver	R1.03.01				
	Hw ver	S2.01				
TP_A_EU868_ED_MAC_BV_008 **MAC Commands**	**Device ID**	M/01	2020-04-22	Yes	**PASS**	
	App ID	N/A				
	Fw ver	R1.03.01				
	Hw ver	S2.01				
TP_A_EU868_ED_MAC_BV_009 **NewChannelReq MAC command**	**Device ID**	M/01	2020-04-22	Yes	**PASS**	
	App ID	N/A				
	Fw ver	R1.03.01				
	Hw ver	S2.01				
TP_A_EU868_ED_MAC_BV_010 **DlChannelReq MAC command**	**Device ID**	M/01	2020-04-22	Yes	**PASS**	
	App ID	N/A				
	Fw ver	R1.03.01				
	Hw ver	S2.01				
TP_A_EU868_ED_MAC_BV_011 **Confirmed packets**	**Device ID**	M/01	2020-04-22	Yes	**PASS**	
	App ID	N/A				
	Fw ver	R1.03.01				
	Hw ver	S2.01				
TP_A_EU868_ED_MAC_BV_012 **RXParamSetupReq MAC command**	**Device ID**	M/01	2020-04-22	Yes	**PASS**	
	App ID	N/A				
	Fw ver	R1.03.01				
	Hw ver	S2.01				
TP_A_EU868_ED_MAC_BV_013 **RXTimingSetupReq MAC command**	**Device ID**	M/01	2020-04-22	Yes	**PASS**	
	App ID	N/A				
	Fw ver	R1.03.01				
	Hw ver	S2.01				
TP_A_EU868_ED_MAC_BV_014_A **LinkADRReq MAC command**	**Device ID**	M/01	2020-04-22	Yes	**PASS**	
	App ID	N/A				
	Fw ver	R1.03.01				
	Hw ver	S2.01				
TP_A_EU868_ED_MAC_BV_014_B **LinkADRReq MAC command**	**Device ID**	M/01	2020-04-22	Yes	**PASS**	
	App ID	N/A				
	Fw ver	R1.03.01				
	Hw ver	S2.01				
TP_A_EU868_ED_MAC_BV_015 **Packet Error Rate RX1**	**Device ID**	M/01	2020-04-22	Yes	**PASS**	
	App ID	N/A				
	Fw ver	R1.03.01				
	Hw ver	S2.01				
TP_A_EU868_ED_MAC_BV_016 **Packet Error Rate RX2**	**Device ID**	M/01	2020-04-22	Yes	**PASS**	
	App ID	N/A				
	Fw ver	R1.03.01				
	Hw ver	S2.01				

Appendix B – ICS

NAME	VALUE
DUT is a Class A Device (All End Devices)	TRUE
DUT works in EU 868MHz 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 DlChannelReq MAC command	TRUE
DUT supports LinkADRReq block	TRUE
DUT implements LoRaWAN v1.0.2rB certification requirements	TRUE

Appendix C – IXIT

NAME	VALUE
Minimum transmission power	7
Maximum transmission power	7
End-device identifier (DevEUI)	'000064FFFEA96836'O
Application key (AppKey)	'0000000000000000000000000000001'O
Application identifier (AppEUI)	'0000000000000001'O

Appendix D – General Parameters

NAME	VALUE
Gateway model	Semtech
General Timer	600
Gateway IP Address	192.168.1.100
Gateway socket port	1780
Default Tx Power (dBm)	14
Default Tx Antenna	0
EU868 RECEIVE_DELAY1 (s)	1.0
EU868 RECEIVE_DELAY2 (s)	2.0
EU868 JOIN_ACCEPT_DELAY1 (s)	5.0
EU868 JOIN_ACCEPT_DELAY2(s)	6.0
EU868 RX2 Receive window frequency	869.525
EU868 RX2 Receive window DR	SF12BW125