The Testcenter facility 'LoRa® Test Lab' within IMST GmbH is recognized by the LoRa™ Alliance for testing in accordance to the LoRaWAN® Specification V1.0.4

Report for Test of Conformance to LoRaWAN® V1.0.4 Class C

for the Device

"CR138"

for the Customer

"Shenzhen Kaifa Technology(Chengdu) Co.,Ltd."

Jens Lerner
Yavuz Turan

23rd March, 2022

Administrative Summary

Location: IMST GmbH, Test Centre, Kamp-Lintfort, Germany
Responsible Test Engineer: Yavuz Turan, Jens Lerner

Subject: Test of Conformance to LoRaWAN® Specification V1.0.4 (Class C device for AU915)

Company and Contact Information:
Shenzhen Kaifa Technology(Chengdu) Co.,Ltd.
Alyssa Yang
No. 99 Tianquan Rd., Hi-Tech Development Zone
61731 Chengdu
China
Tested Device: CR138
Hardware version: V1.0
Firmware version: V4.5.2
End-device identifier: 0000003356D2FD01
LoRa Device Class: C
LoRaWAN Specification version: V1.0.4
Certification requirements: LoRaWAN 1.0.4 End Device Certification Requirement V1.4
Frequency band(s) tested: 915-928 MHz
Test Equipment: Test Software Version: 1.3 (Class A), 1.2 (Class C)
8x IMST LGW (iC980A + Raspberry Pi): Gateway software version 4.1.3
Packet forwarder software version 3.1.0

Test Result: PASS

Quality Engineer: Jens Lerner

Date: March 23rd, 2022

The Test Report, No. 6220150 has the following conclusion:

The device has PASSED the tests hereunder.

Responsibility: Yavuz Turan, Test Engineer Approved: Jens Lerner, Quality Engineer

1 Description of the Device Under Test (DUT)

1.1 General

Item	Value
Product name	CR138
Product Vertical(s)	Buildings
Series (if any)	N/A
Hardware Version	V1.0
Firmware Version	V4.5.2
LoRaWAN® Device Class	C
Type of DUT	☒ Module ☐ End Device/Sensor ☐ others
Geographical area of operation	☐ Europe ☐ USA ☒ Australia
Operating frequency	☐ 433 MHz ☐ 863-870 MHz ☒ 915-928 MHz
Adaptive Data Rate (ADR) supported?	☒ Yes ☐ No
Optional data rates supported?	☐ DR6 ☐ DR7
Activation possibilities	☒ Over the air ☐ by personalization ☐ both
Test According LoRaWAN® Spec	☐ V1.0.1 ☐ V1.0.2 ☒ V1.0.4
Output Power	ERP＜22dBm
Number / Type of Antenna(s)	1 / wire
Antenna Gain	2.07dBi (Peak Gain)

Table 1 Device Information

1.2 DUT Modes of Operation

During the tests the device operated in the following modes:

- Test mode according to document “LoRa Alliance End Device Certification Requirements for All Regions Version 1.4” Chapter 2.

1.3 DUT Setup

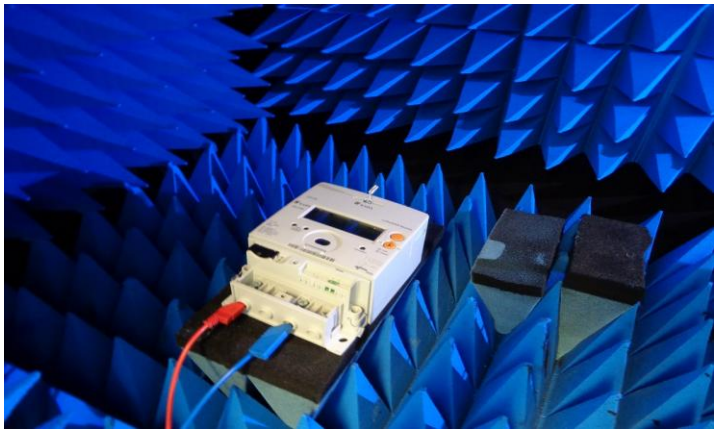

Figure 1 DUT Setup

Applied Methods of Measurement

1.4 Protocol Testing according to LoRaWAN® specification V1.0.4 (Class C device for AU915)

Detailed Test Results Class A:
Device Activation: **PASS**
Over the Air Activation: **PASS**
New Channel Request**: PASS**
Cryptography: **PASS**
Frame Sequence Number: **PASS**
Confirmed Packets: **PASS**
Device Status Request: **PASS**
New Channel Request**: PASS**
Di Channel Request Mac Command: **PASS**
RX Parameter Setup Request: **PASS**
RX Timing Setup Request: **PASS**
TX Parameter Setup Request: **PASS**
Link Check Request: **PASS**
Link ADR Request: **PASS**
Duty Cycle Request: **PASS**
Device Time Request: **PASS**
Uplink Datarate RX1 DR Offset Mapping: **PASS**
Packet Error Rate Rx1 MaxSize: **PASS**
Packet Error Rate Rx2 MaxSize: **PASS**
RX1 And RX2 Simultaneous Frames: **PASS**
RX Oversized Payload: **PASS**
Maximum Allowed Payload: **PASS**
Mac Commands: **PASS**
Mac Commands Buffer: **PASS**
Device Deactivation: **PASS**

Detailed Test Results Class C:

Test Mode Activation (Over the Air Activation): **PASS**
RXC Reception Part 1: **PASS**
RXC Reception Part 2: **PASS**
RXC Packet Error Rate: **PASS**
RXC Confirmed Uplinks: **PASS**
Over The Air Activation**: PASS**
Switch Class A: **PASS**

Supported Optional Features:

Adaptive Data Rate (ADR):	Yes
Min TX Power:	Yes
Permanent Class C	Yes

Remarks: None

Result: The device passed the test without limitations.