



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 EU868

for the Device

“sonico NANO”

for the Customer

“GWF AG”

Jens Lerner

Yavuz Turan

26th June, 2024

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 (EU868)

Company and Contact Information:

GWF AG

Mathieu Montevecchio

Obergrundstrasse 119

6005 Luzern

Switzerland

Tested Device: sonico NANO

Hardware version: 0.7

Firmware version: 1.0

End-device identifier: 70B3D5387C050002

LoRa Device Class: A

LoRaWAN Specification version: V1.0.4

Certification requirements:

LW1.0.4 End Device Certification V1.6.1

Frequency band(s) tested: 868MHz

Test Equipment: LCTT v3.12.0_R1

2x IMST LGW (iC880A + Raspberry Pi): Gateway software version 5.0.1

Packet forwarder software version 4.0.1

Test Result: PASS

Quality Engineer: Jens Lerner

Date: June 26th, 2024

The Test Report, No. 6240483 has the following conclusion:

The device has PASSED the tests hereunder.

Responsibility:


Yavuz Turan

Test Engineer

Approved:


Jens Lerner

Quality Engineer

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1 Description of the Device Under Test (DUT)

1.1 General

Item	Value
Product name	sonico NANO
Product Vertical(s)	Buildings, Cities, Home / Consumer, Industry
Series (if any)	N/A
Hardware Version	0.7
Software Version	1.0
Firmware Version	1.0
Type of DUT	☐ Module ☒ End Device/Sensor ☐ others
Geographical area of operation	☒ Europe ☐ USA ☐ Australia
Operating frequency	☐ 433 MHz ☒ 868 MHz ☐ 915 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	14 dBm
Number / Type of Antenna(s)	1x Helical PCB antenna
Antenna Gain	N/A

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 1.6.1” Chapter 2.

1.3 DUT Setup

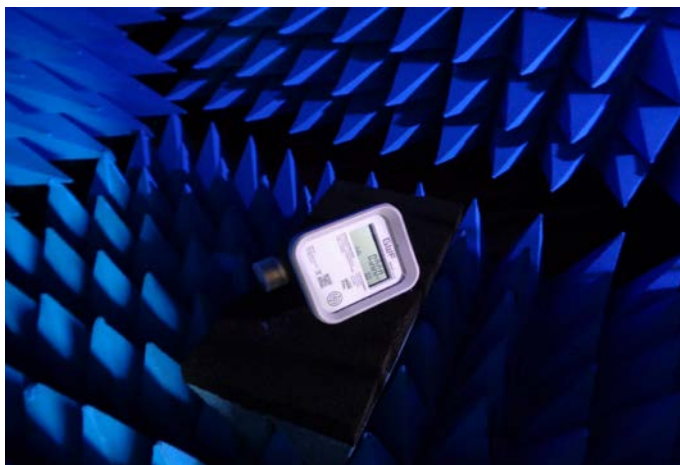


Figure 1 DUT Setup

Applied Methods of Measurement

1.4 Protocol Testing according to LoRaWAN® specification V1.0.4 (EU868)

Detailed Test Results Class A:

Test Case ID	Description	Verdict	Date
TP_A_EU868_ED_MAC_104_BV_000	Activation Pre-test	PASS	2024-06-26
TP_A_EU868_ED_MAC_104_BV_001_A	Over the Air Activation	PASS	2024-06-26
TP_A_EU868_ED_MAC_104_BV_002	Cryptography	PASS	2024-06-25
TP_A_EU868_ED_MAC_104_BV_003	Downlink Sequence Number	PASS	2024-06-25
TP_A_EU868_ED_MAC_104_BV_004	Confirmed Frames	PASS	2024-06-25
TP_A_EU868_ED_MAC_104_BV_005	DevStausReq MAC Command	PASS	2024-06-25
TP_A_EU868_ED_MAC_104_BV_006	NewChannelReq MAC Command for Dynamic Channel plan devices only	PASS	2024-06-25
TP_A_EU868_ED_MAC_104_BV_007	DIChannelReq for Dynamic Channel plan devices only	PASS	2024-06-25
TP_A_EU868_ED_MAC_104_BV_008	RXParameterSetupReq MAC Command	PASS	2024-06-25
TP_A_EU868_ED_MAC_104_BV_009	RXTimingSetupReq MAC Command	PASS	2024-06-25
TP_A_EU868_ED_MAC_104_BV_010	TXParamSetupReq MAC Command	PASS	2024-06-25
TP_A_EU868_ED_MAC_104_BV_011	LinkCheckReq MAC Command	PASS	2024-06-25
TP_A_EU868_ED_MAC_104_BV_012A	LinkADRReq MAC Command (Part 1)	PASS	2024-06-26
TP_A_EU868_ED_MAC_104_BV_012B	LinkADRReq MAC Command (Part 2)	PASS	2024-06-25
TP_A_EU868_ED_MAC_104_BV_013	DutyCycleReq MAC Command	PASS	2024-06-25
TP_A_EU868_ED_MAC_104_BV_014	DeviceTimeReq MAC Command	PASS	2024-06-25
TP_A_EU868_ED_MAC_104_BV_015A	RX1 Receive Window Test (Part 1)	PASS	2024-06-25
TP_A_EU868_ED_MAC_104_BV_015B	RX1 Receive Window Test (Part 2)	PASS	2024-06-25
TP_A_EU868_ED_MAC_104_BV_016	RX2 Receive Window Test	PASS	2024-06-25
TP_A_EU868_ED_MAC_104_BV_017	RX1 and RX2 simultaneous frames	PASS	2024-06-25
TP_A_EU868_ED_MAC_104_BV_018	RX Oversized Payload	PASS	2024-06-25
TP_A_EU868_ED_MAC_104_BV_019A	Maximum Allowed Payload (Part 1)	PASS	2024-06-25
TP_A_EU868_ED_MAC_104_BV_019B	Maximum Allowed Payload (Part 2)	PASS	2024-06-25
TP_A_EU868_ED_MAC_104_BV_020	MAC Command(s) in App-Payload and/or Frame Options	PASS	2024-06-25
TP_A_EU868_ED_MAC_104_BV_021	Multiple MAC Commands prioritization	PASS	2024-06-25
TP_A_EU868_ED_MAC_104_BV_022	FPort 224 Deactivation	PASS	2024-06-26

Supported Optional Features:

Adaptive Data Rate (ADR): Yes
SF7BW250 (DR6) Yes
FSK50 (DR7) Yes

Additional Tests By The Manufacturer:

Retransmission Back-Off for OTA devices only: **PASS**

Remarks: None

Result: The device passed the test without limitations.