KOMINFO SDPPI IDTH Indonesia Digital Test House

KAN Komite Akreditasi Nasional LP-112-IDN

LEMBAR PENGESAHAN
LAPORAN HASIL UJI
Test Report

No. Aplikasi : 0912-25
Application Number

Nomor LHU : R-41/0979/2025
Test Report Number

DATA APLIKASI
Applicant's Data

Aplikan *Applicant's*	:	FARRA EKATAMA SOLUSI
Alamat Aplikan *Address of Applicant's*	:	*SATRIO TOWER, LANTAI 6, UNIT 1* *JL. PROF. DR. SATRIO BLOK C4, JAKARTA SELATAN*

DATA PERANGKAT
Test Item's Data

Nama Perangkat *Equipment*	:	AquaLink LoRaWAN
Merek/Tipe *Brand Name/ Type*	:	LAISON / AQ-01
Nomor Seri/IMEI *Serial Number/ IMEI*	:	6412170003
Buatan *Made In*	:	China

Tanggal Terima / Bayar *Date of Paid*	:	21 Juli 2025	**Jenis Pengujian** *Type of Testing*	:	UJI LABORATORIUM
Tanggal Mulai Uji *Date of Test*	:	23 Juli 2025	**Lokasi Pengujian** *Test Location*	:	Tapos - Depok
Tanggal Selesai Uji *Date of End*	:	24 Juli 2025			

Ketentuan Umum
General Statement

A. Laporan pengujian ini hanya berlaku untuk sampel uji sebagaimana diatas
This the report is only valid the test item which is stated on the data above

B. Persyaratan Teknis
Technical Specification

CISPR 32 / ITU-T K.116,

Kesimpulan
Conclusion

BERDASARKAN PERSYARATAN TEKNIS PERANGKAT TERSEBUT DINYATAKAN
Base on technical specification the equipment is

Sesuai (Comply)

Depok, 24 Juli 2025

Disahkan Oleh
An. Kepala Balai Besar Pengujian Perangkat Telekomunikasi
Ketua Tim Kerja Laboratorium Pengujian Radio Frequency dan Kalibrasi

Dokumen ini ditandatangani secara elektronik oleh
KETUA TIM KERJA LABORATORIUM PENGUJIAN
RADIO FREQUENCY DAN KALIBRASI

KARIJADI

BBPPT, Jl. Raya Tapos No. 46, Kec. Tapos, Depok
(+6221) 77817999, +62812-5000-0586
pelayanan.bbppt@kominfo.go.id
www.kominfo.go.id, www.sdppi.kominfo.go.id, bbppt.postel.go.id

TEST REPORT

Application Number: 0912-25

LAISON/AQ-01

AquaLink LoRaWAN

Tapos Street 46, Tapos, Depok, West Java, Indonesia 16467
www.idth.id; www.kominfo.go.id
pelayanan.bbppt@kominfo.go.id
(+62 21) 77817999, (+62) 812-5000-0586

TEST REPORT

Application Number	**0912-25**
Product Name	**AquaLink LoRaWAN**
Brand/Type	LAISON/AQ-01
S/N or IMEI	6412170003
Made in	China
Date of Paid	21/07/2025
Date of Test	23/07/2025 - 23/07/2025
Date of Issue	24/07/2025
Testing Type	Uji Laboratorium / Uji In-House / Uji Reguler
Test Location	Indonesian Digtal Test House
Standards	**CISPR 32 / ITU-T K.116**

In the configuration tested, the test item complied with the standards specified above.

Tested by:

Test Engineer

Halim Indrayanto

Supervisor

Rofi Yuliansyah

This document is confidential, which shall not be reproduced nor modified, except in full, without official written approval from Indonesia Digital Test House - BBPPT

Testing Laboratory information:		
Testing Laboratory Name	:	Indonesia Digital Test House (IDTH).
Address	:	Jl. Raya Tapos No, 46 Tapos, Depok
Testing location	:	Same as above
Tel.	:	(021) 77817999
Fax.	:	-
E-mail	:	pelayan.bbppt@kominfo.go.id

Possible test case verdicts:

- test case does not apply to the test object : N/A
- test object does meet the requirement : PASS
- test object does not meet the requirement : FAIL
- test object does not Tested : N/T

General remarks:

The test results provided in this report pertain solely to the tested object. The outcomes listed in this report reflect the results for this specific model and serial number. It is the manufacturer's responsibility to ensure that all production models comply with the requirements outlined in this report.

This report would be considered invalid without the signatures of both the testing technician and the approver. Reproduction of this report, either partially or in full, requires written consent from the issuing testing laboratory.

ISO 17025
IDTH
Indonesia Digital Test House

This document is confidential, which shall not be reproduced nor modified, except in full, without official written approval from Indonesia Digital Test House - BBPPT

Test Summary Update

Electromagnetic Interference (EMI)				
Test Item	**Test Standard**	**Test Method**	**Class/ Severity**	**Result**
Radiated Emission up to 1 GHz	CISPR 32	CISPR 32	Class B	PASS
Radiated Emission Above 1 GHz	CISPR 32	CISPR 32	Class B	PASS

Test Location

Indonesia Digital Test House (IDTH) Depok, West Java, Indonesia.

Notes

Test Mode

- LPWA (900 MHz) ON

ISO 17025
IDTH
Indonesia Digital
Test House

This document is confidential, which shall not be reproduced nor modified, except in full, without official written approval from Indonesia Digital Test House - BBPPT

Table of Contents

TEST REPORT 2
Test Summary Update 4
Test Location 4
Notes 4
Table of Contents 5
Section 1 General Information and Equipment Used 6
1.1. DUT General and Technician Description 6
1.2. DUT Operation 6
1.3. Equipment Used during Test 6
Section 2 Emission Test Results 7
2.1. Radiated Emission up to 1 GHz 7
2.1.1. D.U.T. Operation 7
2.1.2. Test Setup and Procedure 7
2.1.3. Measurement Data 8
2.2. Radiated Emission Above 1 GHz 10
2.2.1. D.U.T. Operation 10
2.2.2. Test Setup and Procedure 10
2.2.3. Measurement Data 11
Section 3 Photographs of Test Setup 13
3.1. Radiated Emission up to 1 GHz 13
3.2. Radiated Emission Above 1 GHz 13
Section 4 Photographs of DUT 14

This document is confidential, which shall not be reproduced nor modified, except in full, without official written approval from Indonesia Digital Test House - BBPPT

Section 1 General Information and Equipment Used

1.1. DUT General and Technician Description

DUT Name : AquaLink LoRaWAN

DUT Model : AQ-01

DUT Serial Number : 6412170003

DUT Made : China

1.2. DUT Operation

Temperature: 21.9°C Humidity: 56.7 %RH Pressure: 1005 mbar

1.3. Equipment Used during Test

Radiated Emission					
No.	**Test Equipment**	**Manufacturer**	**Model**	**Serial No.**	**Last Cal.**
1	Emi Receiver	Rohde & Schwarz	ESW44	103282	06/08/2024
2	Antenna	Rohde & Schwarz	HL562E	102208	-
1	Emi Receiver	Rohde & Schwarz	ESW44	103274	09/08/2024
2	Antenna	Rohde & Schwarz	HF907	103151	-

This document is confidential, which shall not be reproduced nor modified, except in full, without official written approval from Indonesia Digital Test House - BBPPT

Section 2 Emission Test Results

2.1. Radiated Emission up to 1 GHz

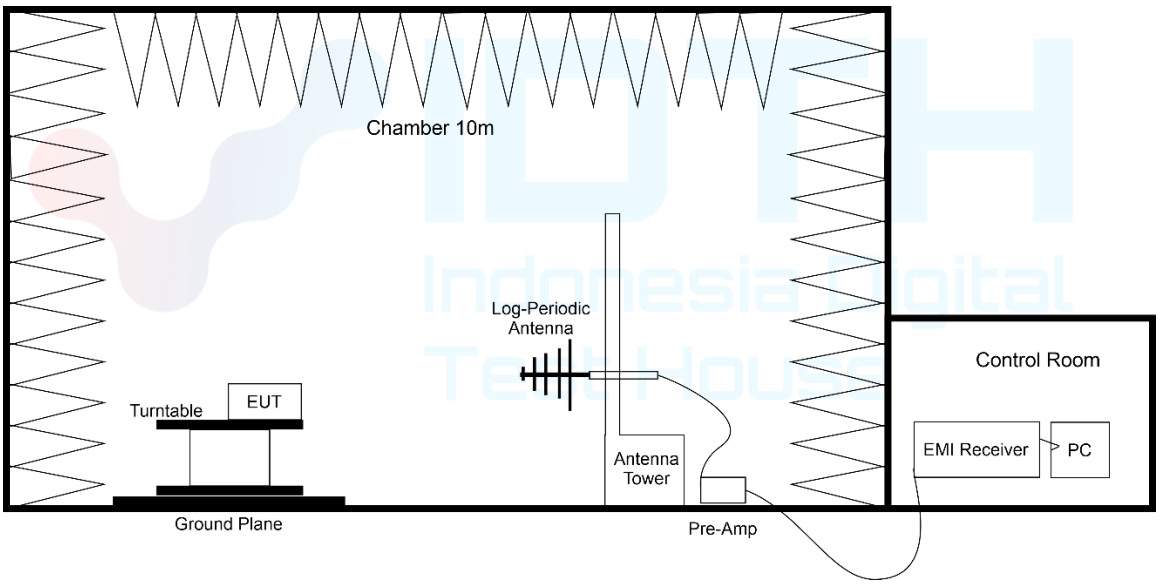
Test Requirement	:	CISPR 32
Test Method	:	CISPR 32
Test Voltage	:	220 VAC 50 Hz
Test Date	:	23/07/25
Frequency Range	:	30 MHz - 1GHz
Detector	:	- Peak for Pre-scan - Quasi Peak for Final Measurement
Uncertainty	:	3.6 dB
Class / Limit	:	Class B

Frequency range MHz	Class B Limits dB (µV)/m
	Quasi-peak
30 to 230	30
230 to 1000	37

2.1.1. D.U.T. Operation

Temperature: 21.9 °C Humidity: 56.7 %RH Atmospheric Pressure: 1005 mbar

2.1.2. Test Setup and Procedure



- The test was conducted in a semi – anechoic Chamber
- Log Periodic antenna was used for the test in frequency range from 30 MHz – 1 GHz
- The EUT was placed on a non – metallic table with 80 cm height above the horizontal reference ground plane. If the EUT need floor-standing arrangement, the EUT was placed on the horizontal ground plane but separated by 10 cm insulation from ground plane
- The distance between EUT and Antenna's reference should be 10 m

This document is confidential, which shall not be reproduced nor modified, except in full, without official written approval from Indonesia Digital Test House - BBPPT

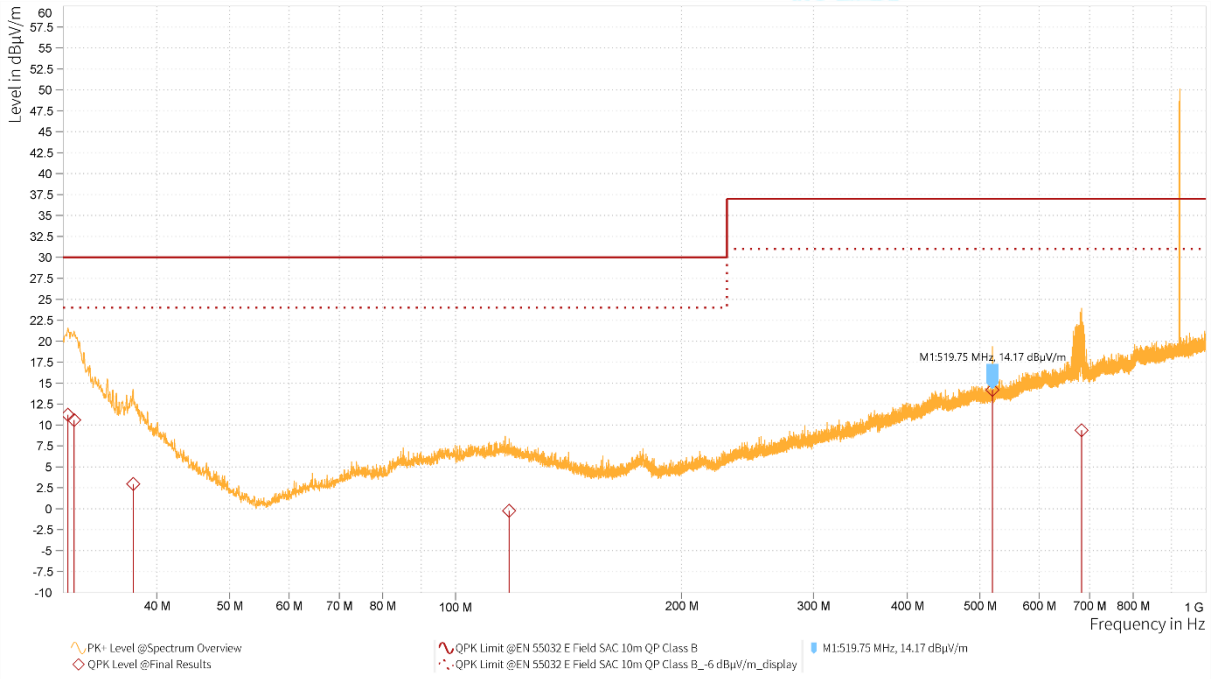
2.1.3. Measurement Data

- The EMI Receiver was connected to Antenna through Pre-Amp
- The EUT was rotated 360 with 15 stepped the antenna was raised and lowered from 1 to 4 meters, and measured for both horizontal and vertical antenna polarization
- Pre-scan was performed with peak detector
- Final measurement was performed with Quasi-peak detector at the frequencies which maximum peak level was detected

ISO 17025
IDTH
Indonesia Digital
Test House

This document is confidential, which shall not be reproduced nor modified, except in full, without official written approval from Indonesia Digital Test House - BBPPT

EMI Test Report



EMI Final Results (1/2)

Rg	Frequency [MHz]	QPK Level [dBµV/m]	QPK Limit [dBµV/m]	QPK Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]	Meas. Time [s]	Time of Meas.	Source
1	30.450	11.21	30.00	18.79	-12.73	V	-5.28817	2.00	120.000	1.000	11:14:20 am	Critical Points
1	31.020	10.58	30.00	19.42	-13.05	V	-138.0944	3.00	120.000	1.000	11:13:44 am	Critical Points
1	37.200	2.95	30.00	27.05	-16.76	H	-49.62268	1.00	120.000	1.000	11:12:45 am	Critical Points
1	117.930	-0.24	30.00	30.24	-20.20	H	77.33797	2.00	120.000	1.000	11:12:09 am	Critical Points
1	519.750	14.17	37.00	22.83	-12.30	H	173.2748	3.00	120.000	1.000	11:11:40 am	Critical Points
1	683.100	9.35	37.00	27.65	-9.62	H	-18.34226	1.00	120.000	1.000	11:12:56 am	Critical Points

EMI Final Results (2/2)

Rg	Frequency [MHz]	Attachments	Comment
1	30.450		
1	31.020		
1	37.200		
1	117.930		
1	519.750		
1	683.100		

This document is confidential, which shall not be reproduced nor modified, except in full, without official written approval from Indonesia Digital Test House - BBPPT

2.2. Radiated Emission Above 1 GHz

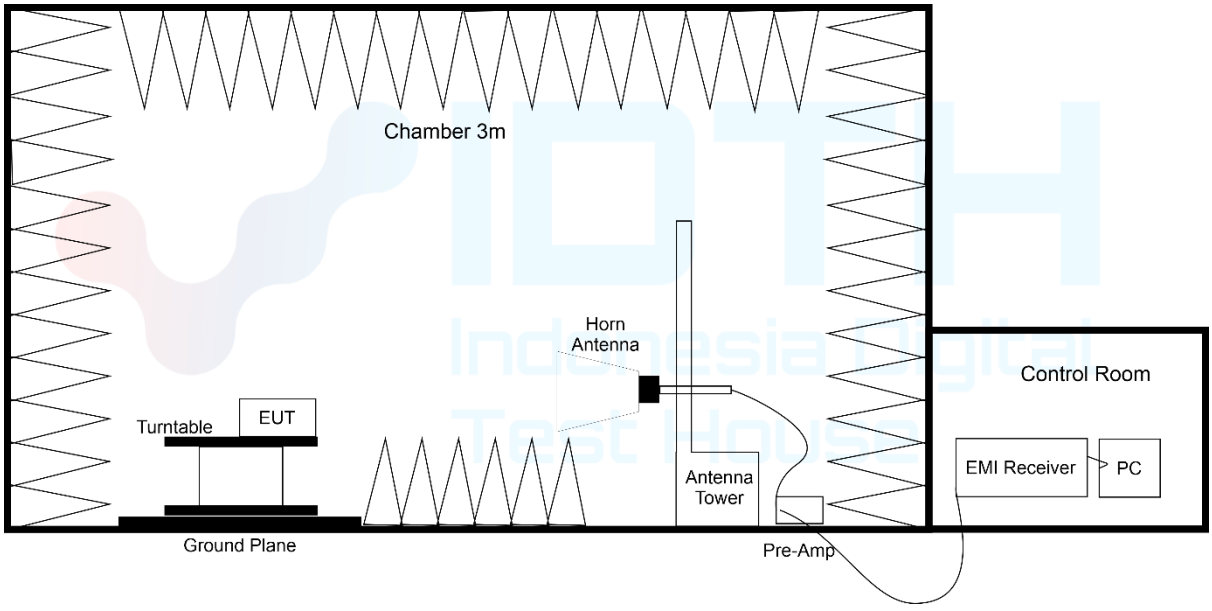
Test Requirement	:	CISPR 32
Test Method	:	CISPR 32
Test Voltage	:	220 VAC 50 Hz
Test Date	:	23/07/25
Frequency Range	:	1 GHz - 6GHz
Detector	:	- Peak for Pre-scan - Peak and Average for Final Measurement
Uncertainty	:	3.4 dB
Class / Limit	:	Class B

Frequency range MHz	**Class B Limits dB (µV)/m**	
	Peak	Average
1000 to 3000	70	50
3000 to 6000	74	54

2.2.1. D.U.T. Operation

Temperature: 21.8 °C Humidity: 61.3 %RH Atmospheric Pressure: 1005 mbar

2.2.2. Test Setup and Procedure



- The test was conducted in a full anechoic Chamber
- Horn antenna was used for the test in frequency range from 1 GHz – 6 GHz
- The EUT was placed on a non – metallic table with 80 cm height above the horizontal reference ground plane. If the EUT need floor-standing arrangement, the EUT was placed on the horizontal ground plane but separated by 10 cm insulation from ground plane
- The distance between EUT and Antenna's reference should be 3 m

This document is confidential, which shall not be reproduced nor modified, except in full, without official written approval from Indonesia Digital Test House - BBPPT

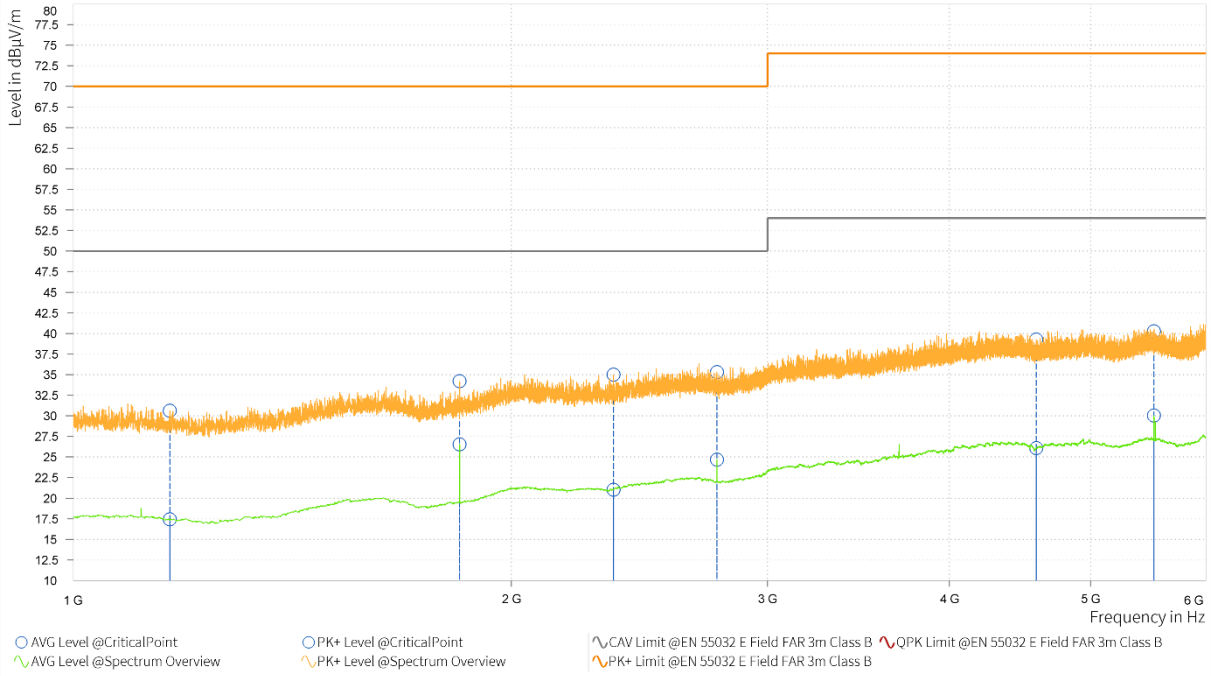
2.2.3. Measurement Data

- The EMI Receiver was connected to Antenna through Pre-Amp
- The EUT was rotated 360 with 15 stepped the antenna was raised and lowered from 1 to 4 meters, and measured for both horizontal and vertical antenna polarization
- Pre-scan was performed with peak detector
- Final measurement was performed with Peak & Average detector at the frequencies which maximum peak level was detected

ISO 17025
IDTH
Indonesia Digital
Test House

This document is confidential, which shall not be reproduced nor modified, except in full, without official written approval from Indonesia Digital Test House - BBPPT

EMI Test Report



EMI Critical Points (1/2)

Rg	Frequency [MHz]	Process State	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	AVG Level [dBµV/m]	AVG: CAV Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1.165,250	DataReduction	30,62	70,00	39,38	17,43	50,00	32,57	-12,14	V	-110,0188	3,00
1	1.843,000	DataReduction	34,21	70,00	35,79	26,54	50,00	23,46	-7,15	H	-121,5258	1,00
1	2.351,000	DataReduction	35,00	70,00	35,00	21,02	50,00	28,98	-4,29	V	-48,62217	1,00
1	2.768,750	DataReduction	35,29	70,00	34,71	24,67	50,00	25,33	-2,56	V	138,545	4,00
1	4.588,750	DataReduction	39,25	74,00	34,75	26,07	54,00	27,93	3,90	H	13,80967	4,00
1	5.528,500	DataReduction	40,28	74,00	33,72	30,03	54,00	23,97	6,64	V	145,3311	1,00

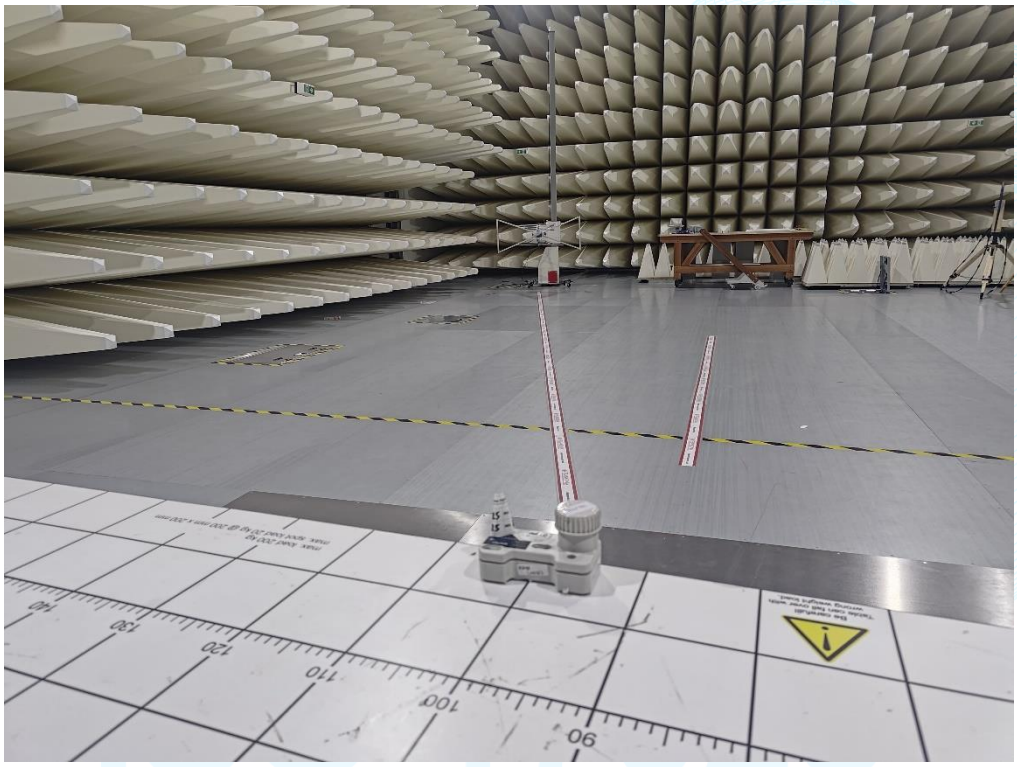
EMI Critical Points (2/2)

Rg	Frequency [MHz]	Meas. BW [kHz]	Meas. Time [s]	Source	Comment
1	1.165,250			User + Overview	
1	1.843,000			Trace + Overview	
1	2.351,000			Trace + Overview	
1	2.768,750			Trace + Overview	
1	4.588,750			Trace + Overview	
1	5.528,500			Trace + Overview	

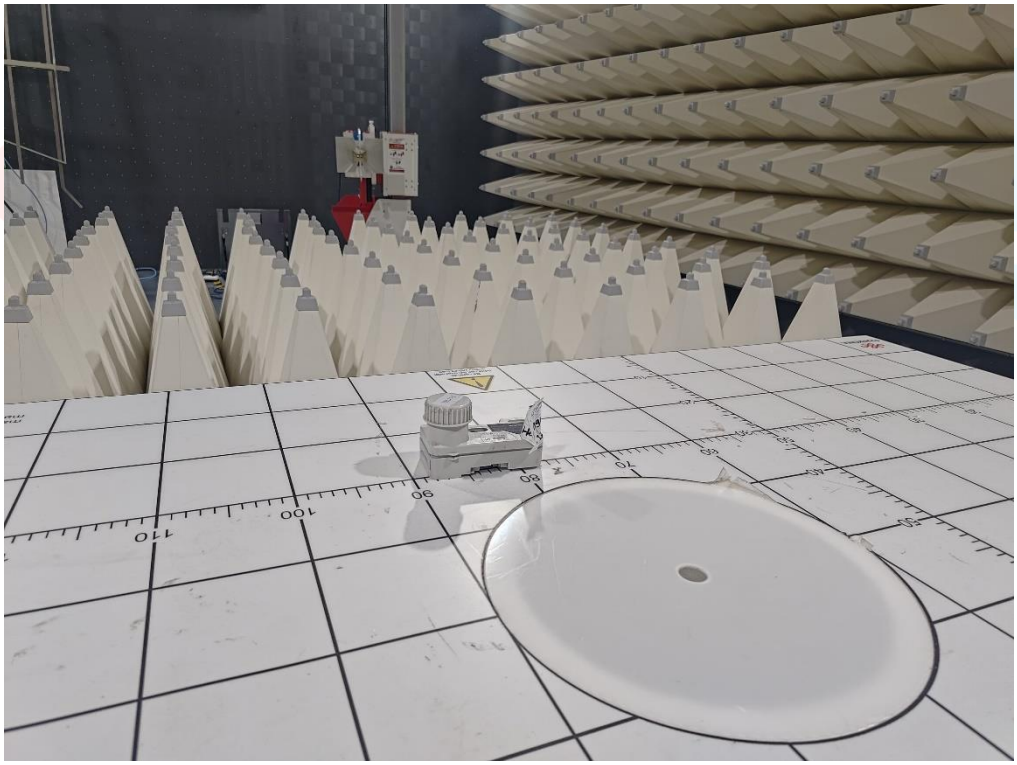
This document is confidential, which shall not be reproduced nor modified, except in full, without official written approval from Indonesia Digital Test House - BBPPT

Section 3 Photographs of Test Setup

3.1. Radiated Emission up to 1 GHz



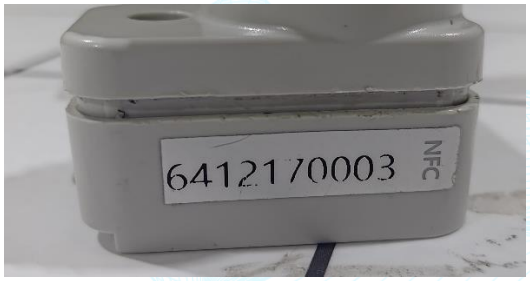
3.2. Radiated Emission Above 1 GHz



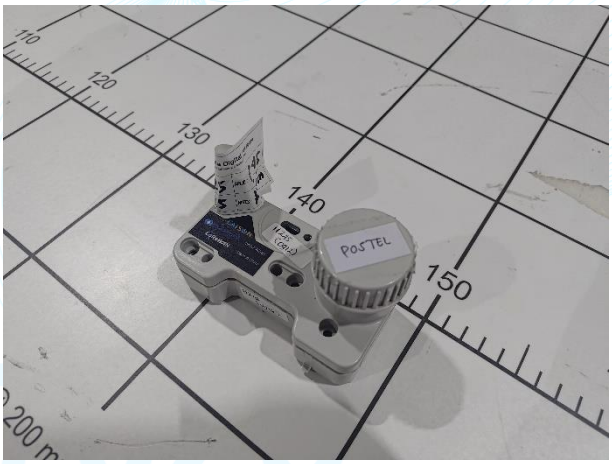
This document is confidential, which shall not be reproduced nor modified, except in full, without official written approval from Indonesia Digital Test House - BBPPT

Section 4 Photographs of DUT

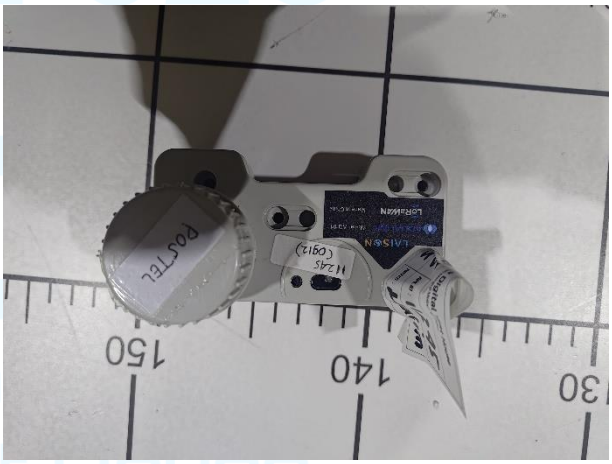






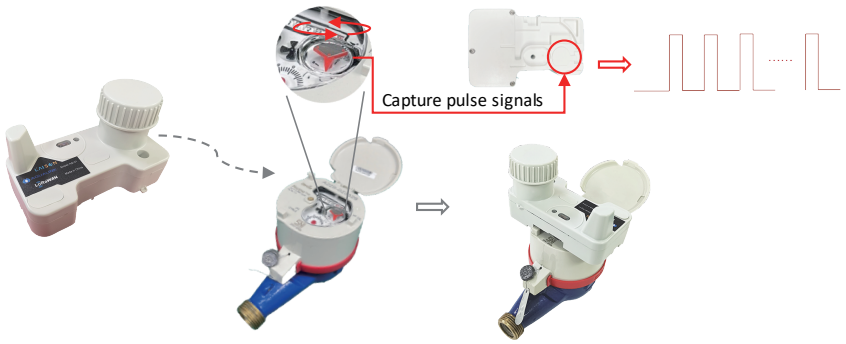




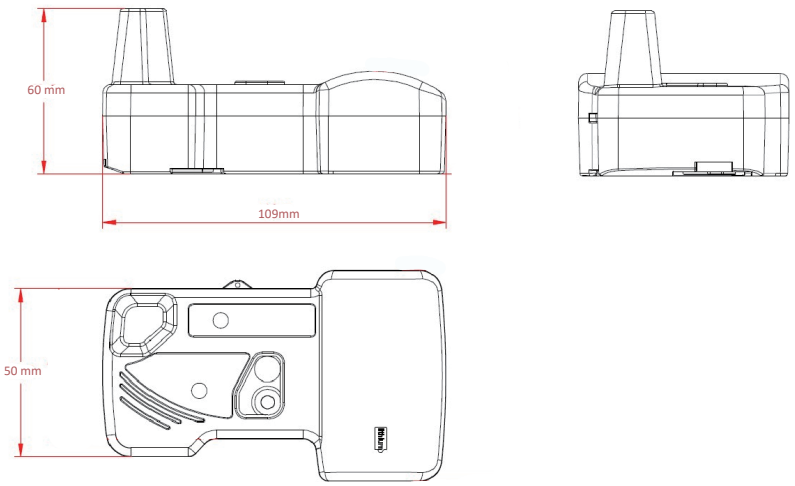


This document is confidential, which shall not be reproduced nor modified, except in full, without official written approval from Indonesia Digital Test House - BBPPT

Work Process



Shape and Installation Dimension



Technical Data

Power Supply & Consumption	
Operating Voltage	3～ 3.7V
Average Power Consumption	≤65 μA
Sleep Mode Power Consumption	22 μA
LoRa Operating Power Consumption	120mA, during continuous data transmission
Wireless Comm. Parameters	
Communication Mode	LoRaWAN
Power Supply	3.6V/8500mAH
Standby Current	≤80 μA
Operating Current	4mA
TX Current	126mA@22dBm
ISM Band	AS923, AU915, EU868
TX Power	Up to 22dBm*
RX Sensitivities	Down to -134dBm
Communication Distance	3km to 10km (Line of View）
Data Transmission Speed	980～ 12500bps
Transmission Method	LoRaWAN network and Point-to-Point network (in space or time)
Spreading Factor	SF7～ SF12 (adaptive)
LBT (Listen Before Talk)	Yes
LoRaWAN Class	Class A
Non-Magnetic Sampling Module	
Sensing Distance	7mm Diameter of steel plate 14mm, 3.6V working voltage
Supports Maximum	2.2 turns/second

DEKLARASI TEKNIS ALAT/PERANGKAT TELEKOMUNIKASI

A. Informasi Pemohon

PLG ID : 10441

B. Informasi Alat/Perangkat

APL ID : 11245

1.	Catu Daya	□ Vac 220 V ☑ VDC : 3.6V □ …..	□ DC Adaptor □ PoE
2.	Konstruksi	☑ Berdiri Sendiri □ Tergabung	□ Terpisah
3.	Area Penggunaan Produk	☑ Area Residensial □ Area Industri atau komersil	
4.	Frekuensi Kerja DUT (Bisa lebih dari satu)	920 – 923 MHz	

C. Fitur Telekomunikasi yang terdapat pada Alat/Perangkat

☑ Fitur LoRaWAN Class A (920–923 MHz)
□ Fitur ……
□ Fitur ……

D. Syarat Alat/Perangkat yang diujikan

- **Umum**

☑ Alat/perangkat yang diujikan adalah alat/perangkat yang merupakan produk akhir
☑ Alat/perangkat yang diujikan tidak pernah mengalami modifikasi sebelumnya (hardware dan software)
□ Menyertakan alat/perangkat lainnya yang tergabung dalam satu sistem dengan alat/perangkat yang diujikan sehingga dapat bekerja (khusus yang konstruksinya terpisah)

- **Catu Daya**

□ Vac	:	Tegangan maksimum 250 Vac, Arus maksimum 16 A, 1 fasa
☑ Vdc	:	Tegangan 3.6V menggunakan baterai lithium internal
□ DC Adaptor	:	Merupakan bagian dari perangkat dan merupakan produk OEM
□ PoE	:	Menyertakan adaptor yang merupakan produk OEM

E. Informasi Lainnya

- ……
- ……
- ……

PT. Farra Ekatama Solusi