

Test Report for FCC

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|--|---|---|-------------------|-------------|
| Report Number | | ESTEFC1908-002(1) | | |
| Applicant | Company name | Xperix Inc. | | |
| | Address | 1207, 37, Sagimakgol-ro 62beon-gil, Jungwon-gu, Seongnam-si, Gyeonggi-do, Republic of Korea | | |
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| | Contact Person | Byoung-Joon Jang | | |
| | Factory address | 1207, 37, Sagimakgol-ro 62beon-gil, Jungwon-gu, Seongnam-si, Gyeonggi-do, Republic of Korea | | |
| Product | Product name | Authentication Scanner | | |
| | Model No. | BioMini Slim 3 | Manufacturer | Xperix Inc. |
| | Serial No. | NONE | Country of origin | Korea |
| Test date | 30-Jul-19 | | Date of issued | 4-Sep-23 |
| Test location | EMC Test Lab 140-16, Eongmalli-ro, Majang-myeon, Icheon-si, Gyeonggi-do, R. O. Korea | | | |
| Standard | FCC PART 15 Subpart B , ANSI C 63.4(2014) | | | |
| Test item | <input checked="" type="checkbox"/> Conducted Emission | <input checked="" type="checkbox"/> Class A <input type="checkbox"/> Class B | Test result | OK |
| | <input checked="" type="checkbox"/> Radiated Emission | <input checked="" type="checkbox"/> Class A <input type="checkbox"/> Class B | Test result | OK |
| Measurement facility registration number | | 659627 | | |
| Tested by | Test Engineer Han-Byeol Jang (Signature) | | | |
| Reviewed by | Technical Manager Jin-Mo Yang (Signature) | | | |
| Abbreviation | OK, Pass = Complied, Fail = Failed, N/A = not applicable | | | |
| <p>* Note</p> <ul style="list-style-type: none"> - This report was reissued according to the change applicant, manufacturer, product name from original report. (Report No. : ESTEFC1908-002) Reissued without testing as the same product as the original one. - This test report is not permitted to copy partly without our permission. - This test report is not related to KOLAS accreditation. - This test result is dependent on only equipment to be used. - This test result based on a single evaluation of one sample of the above mentioned. | | | | |

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Appendix 1. Special diagram

1. Laboratory Information

1.1 General

This EUT (Equipment Under Test) has been shown to be capable of compliance with the applicable technical standards and is tested in accordance with the measurement procedures as indicated in this report. ESTECH Lab attests to accuracy of test data. All measurement reported herein were performed by ESTECH Co., Ltd.

ESTECH Lab assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

1.2 Test Lab.

Corporation Name : ESTECH Co., Ltd.

Head Office : Suite 1015 World Meridian II, 123 Gasan Digital 2-ro, Geumcheon-gu, Seoul 153-759, R. O. Korea

EMC Test Lab : 140-16, Eongmali-ro, Majang-myeon, Icheon-si, Gyeonggi-do, R.O.Korea

1.3 Official Qualification(s)

MSIT : Designated in accordance with the provisions of Radio Waves Act and
International Standard ISO/IEC 17025

FCC : Designated with registration number 659627 under APECTEL MRA
between the RRA and the FCC.

VCCI : Registered in the scope of conducted and radiated measurement,
(R-20023,T-20023,G-20033 and C-20021)

2. Description of EUT

2.1 Summary of Equipment Under Test

Product : Authentication Scanner
 Model Number : BioMini Slim 3
 Serial Number : NONE
 Manufacturer : Xperix Inc.
 Country of origin : Korea
 Sample Receipt Date : 21-Aug-23
 Rating : INPUT : DC 5 V, 250 mA (PC USB Power)
 Testing Voltage : AC 120 V, 60 Hz
 ** X-tallist(s) or Frequencies generated : 488 MHz, CPU 1.0 GHz (max. frequency)

2.2 General descriptions of EUT

| Section | Specification |
|-----------------------|-----------------------------------|
| Sensor technology | Optical |
| Sensing area | 21.32mm x 25.4mm |
| Image size(pixels) | 400 x 500 |
| Image resolution | 500 dpi |
| Interface | USB 2.0 high speed and full speed |
| Dimension | 83mm(W) X 45.9mm(L) X 20mm(H) |
| Weight | Approximately 111g |
| USB Cable Length | Approximately 1600mm |
| Operating temperature | -10 °C ~ 50 °C |
| Max Current | 5VDC / 250mA |

3. Test Standards

Test Standard : FCC PART 15 Subpart B

This Standard sets out the regulations under which an intentional, unintentional, or incidental radiator may be operated without an individual license. It also contains the technical specifications, administrative requirements and other conditions relating to the marketing of Part 15 devices.

Test Method : ANSI C 63.4 (2014)

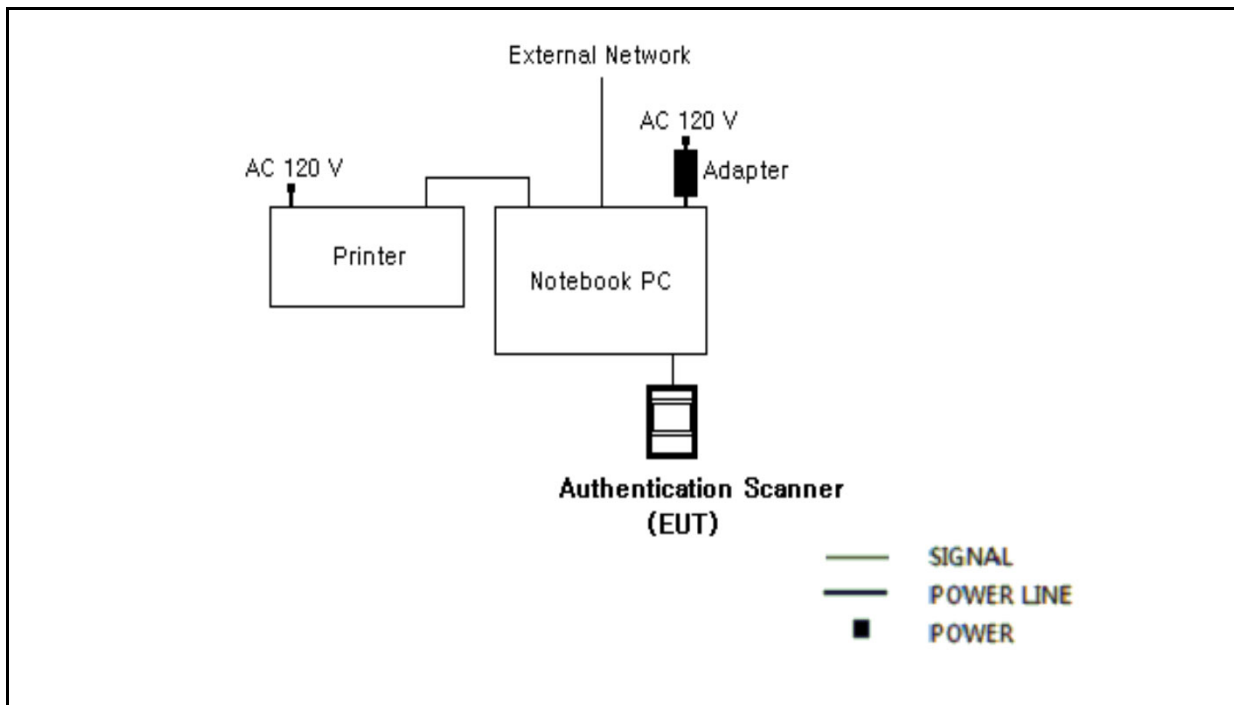
This standard sets forth uniform methods of measurement of radio-frequency (RF) signals and noise emitted from both unintentional and intentional emitters of RF energy in the frequency range 9 kHz to 40 GHz. Methods for the measurement of radiated and AC power-line conducted radio noise are covered and may be applied to any such equipment unless otherwise specified by individual equipment requirements. These methods cover measurement of certain devices that deliberately radiate energy, such as intentional emitters, but does not cover licensed transmitters. This standard is not intended for certification/approval of avionic equipment or for industrial, scientific, and medical (ISM) equipment. These methods apply to the measurement of individual units or systems comprised of multiple units.

4. Measurement Condition

4.1 EUT Operation.

- The EUT was in the following modes of operation during all tests.
 1. Monitor the operation status by connecting test equipment with Notebook PC
 2. Activate the fingerprint scan function of the test equipment by executing the provided program.

4.2 Configuration and Peripherals



4.3 EUT and Support equipment

| Equipment Name | Model Name | S/N | Manufacturer | Remark (FCC ID) |
|------------------------|----------------|---------------|------------------------------------|-----------------|
| Authentication Scanner | BioMini Slim 3 | NONE | Xperix Inc. | EUT |
| Notebook PC | 15U480 | 902QCBD573053 | LG Electronics. | |
| Adapter | A13-040N3A | NONE | Chicony Power Technology Co., Ltd. | |
| Printer | K10229 | NONE | CANON VIETNAM CO., LTD. | |

4.4 Cable Connecting

| Start Equipment | | End Equipment | | Cable Standard | | Remark |
|------------------------|----------|------------------|----------|----------------|------------|--------|
| Name | I/O port | Name | I/O port | Length | Shielded | |
| Authentication Scanner | USB | Notebook PC | USB | 1.6 | Shielded | |
| Notebook PC | Power | Adapter | – | 2.0 | Unshielded | |
| Notebook PC | USB | Printer | USB | 2.0 | Shielded | |
| Notebook PC | LAN | External Network | LAN | 20.0 | Unshielded | |

5. Measurement of radiated disturbance

Above 30 MHz Electric Field strength was measured in accordance with FCC PART 15 Subpart B. The test setup was made according to ANSI C 63.4 (2014) on an 10 m semi-anechoic chamber, which allows a 3 m distance measurement. The EUT was placed in the center of Plastic table. The height of this table was 0.8 m. The measurement was conducted with both horizontal and vertical antenna polarization. The turntable has fully rotated. For further description of the configuration refer to the picture of the test setup.

5.1 Measurement equipments

| Equipment Name | Type | Manufacturer | Serial No. | Next Calibration date |
|--|--------------|-------------------|-------------------------|-----------------------|
| TEST Receiver | ESCI7 | ROHDE & SCHWARZ | 100916 | 22-Oct-19 |
| Logbicon Antenna | VULB 9168 | SCHWARZBECK | 237 | 13-Apr-20 |
| Turn Table | DT3000-2t | Innco System GmbH | N/A | N/A |
| Antenna Mast | MA4000-EP | Innco System GmbH | N/A | N/A |
| Antenna Master & Turn table controller | CO3000-P | Innco System GmbH | CO3000/1138 /44661018/P | N/A |
| Antenna Mast | MA4640-XP-ET | Innco System GmbH | N/A | N/A |
| Antenna Master & Turn table controller | CO3000 | Innco System GmbH | CO3000/931 /38240516/L | N/A |
| Turn Table | DT1500-S | Innco System GmbH | N/A | N/A |
| Horn Antenna | BBHA9120D | SCHWARZBECK | 352 | 18-May-20 |
| PREAMPLIFIER | 8449B | AGILENT | 3008A00581 | 22-Oct-19 |
| Test Receiver | ESPI7 | Rohde & Schwarz | 100185 | 22-Oct-19 |
| EMI TEST RECEIVER | ESW | Rohde & Schwarz | 101554 | 31-Jul-20 |

5.2 Environmental Condition

Below 1 GHz –Test Place : 10 m Semi-anechoic chamber

Temperature (°C) : 22.9 °C
 Humidity (% R.H.) : 51.2 % R.H.

Above 1 GHz–Test Place : 3 m Semi-anechoic chamber

Temperature (°C) : 23.3 °C
 Humidity (% R.H.) : 51.4 % R.H.

5.3 Test data (Below 1 GHz)

Test Date : 30-Jul-19

Measurement Distance : 10 m

| Frequency (MHz) | Reading (dB μ V) | Position (V/H) | Height (m) | Correction Factor | | Result Value(Quasi-peak) | | |
|--------------------|--|-------------------|---------------|--------------------|---------------|--------------------------|--------------------------|----------------|
| | | | | Ant Factor (dB) | Cable (dB) | Limit (dB μ V/m) | Result (dB μ V/m) | Margin (dB) |
| 168.00 | 7.90 | V | 1.0 | 12.65 | 1.98 | 43.50 | 22.53 | 20.97 |
| 186.90 | 14.93 | V | 1.0 | 11.37 | 2.10 | 43.50 | 28.40 | 15.10 |
| 210.00 | 11.64 | V | 1.0 | 10.77 | 2.23 | 43.50 | 24.64 | 18.86 |
| 240.10 | 21.29 | V | 1.0 | 11.97 | 2.36 | 46.50 | 35.61 | 10.89 |
| 400.00 | 13.29 | H | 3.1 | 16.65 | 3.18 | 46.50 | 33.12 | 13.38 |
| 420.10 | 12.56 | H | 3.0 | 17.06 | 3.27 | 46.50 | 32.89 | 13.61 |
| 480.00 | 6.24 | H | 2.8 | 18.29 | 3.52 | 46.50 | 28.05 | 18.45 |
| 773.20 | 6.84 | H | 1.8 | 22.75 | 4.59 | 46.50 | 34.18 | 12.32 |
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| | | | | | | | | |
| Remark | H : Horizontal, V : Vertical *Result Value = Reading + Ant Factor + Cable loss *Margin= Limit - Result *The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection | | | | | | | |

5.4 Test data (Above 1 GHz)

Test Date : 30-Jul-19

Measurement Distance :

3 m

| Frequency (MHz) | Reading (dB μ V) | Position (V/H) | Height (m) | Correction Factor | | Result Value | | |
|-------------------------------|--|-------------------|---------------|--------------------|---------------|-------------------------|--------------------------|----------------|
| | | | | Ant Factor (dB) | Cable (dB) | Limit (dB μ V/m) | Result (dB μ V/m) | Margin (dB) |
| Peak(RBW:1 MHz VBW:1 MHz) | | | | | | | | |
| 1726.00 | 53.29 | H | 1.0 | 25.82 | -31.09 | 80.00 | 48.02 | 31.98 |
| 1726.00 | 56.41 | V | 1.0 | 25.82 | -31.09 | 80.00 | 51.14 | 28.86 |
| 1770.00 | 55.01 | H | 1.0 | 25.86 | -31.01 | 80.00 | 49.86 | 30.14 |
| 1770.00 | 54.11 | V | 1.0 | 25.86 | -31.01 | 80.00 | 48.96 | 31.04 |
| 2462.00 | 52.36 | H | 1.0 | 27.19 | -29.53 | 80.00 | 50.02 | 29.98 |
| 2462.00 | 54.04 | V | 1.0 | 27.19 | -29.53 | 80.00 | 51.70 | 28.30 |
| 2656.00 | 51.95 | H | 1.0 | 27.67 | -29.37 | 80.00 | 50.25 | 29.75 |
| 2656.00 | 56.53 | V | 1.0 | 27.67 | -29.37 | 80.00 | 54.83 | 25.17 |
| | | | | | | | | |
| | | | | | | | | |
| Average(RBW:1 MHz VBW:10 Hz) | | | | | | | | |
| 1726.00 | 43.20 | H | 1.0 | 25.82 | -31.09 | 60.00 | 37.93 | 22.07 |
| 1726.00 | 43.96 | V | 1.0 | 25.82 | -31.09 | 60.00 | 38.69 | 21.31 |
| 1770.00 | 43.05 | H | 1.0 | 25.86 | -31.01 | 60.00 | 37.90 | 22.10 |
| 1770.00 | 43.00 | V | 1.0 | 25.86 | -31.01 | 60.00 | 37.85 | 22.15 |
| 2462.00 | 45.01 | H | 1.0 | 27.19 | -29.53 | 60.00 | 42.67 | 17.33 |
| 2462.00 | 45.40 | V | 1.0 | 27.19 | -29.53 | 60.00 | 43.06 | 16.94 |
| 2656.00 | 32.66 | H | 1.0 | 27.67 | -29.37 | 60.00 | 30.96 | 29.04 |
| 2656.00 | 38.11 | V | 1.0 | 27.67 | -29.37 | 60.00 | 36.41 | 23.59 |
| | | | | | | | | |
| | | | | | | | | |
| Remark | <div>H : Horizontal, V : Vertical</div> <div>* Result Value = Reading + Ant Factor + Cable loss - Amplifier Gain</div> <div>* Margin= Limit - Result</div> <div>* The highest operating frequency of the EUT is 1.0 GHz , so the radiated emission measurement was performed up to 6 GHz by requested applicant.</div> <div><div></div><div>*Application method of the highest frequency is in the following</div><div>*Highest frequency of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz.</div><div>*Highest frequency of the EUT is between 108 MHz and 500 MHz, the measurement shall only be made up to 2 GHz.</div><div>*Highest frequency of the EUT is between 500 MHz and 1 GHz, the measurement shall only be made up to 5 GHz.</div><div>*Highest frequency of the EUT is above 1 GHz, the measurement shall be made up to 5 times the highest frequency or 40 GHz,</div></div> | | | | | | | |

6. Measurement of conducted disturbance

The continuous disturbance voltage of AC Mains in the frequency from 0.15 MHz to 30 MHz was measured in accordance to FCC PART 15 Subpart B . The test setup was made according to ANSI C 63.4 (2014) in a shielded room. The EUT was placed on a non-conductive table at least 0.8 m above the ground plan. A grounded vertical reference plane was positioned in a distance of 0.4 m from the EUT. The distance from the EUT to other metal surfaces was at least 0.8 m. The EUT was only earthen by its power cord through the line impedance stabilizing network. The power cord has been bundled to a length of 1.0 m. The test receiver with Quasi Peak detector complies with CISPR 16.

6.1 Measurement equipments

| Equipment Name | Type | Manufacturer | Serial No. | Next Calibration date |
|------------------------|----------|-----------------|------------|-----------------------|
| TEST RECEIVER | ESPI | Rohde & Schwarz | 100005 | 22-Oct-19 |
| LISN | ESH3-Z5 | Rohde & Schwarz | 836679/025 | 22-Oct-19 |
| Pulse Limiter | ESH3Z2 | Rohde & Schwarz | NONE | 22-Oct-19 |
| Artificial Hand (foil) | FCC-AH-1 | FCC | 9910 | N/A |

6.2 Environmental Condition

Test Place : Shielded Room

Temperature (°C) : 23.2 °C

Humidity (% R.H.) : 51.0 % R.H.

6.3 Test data

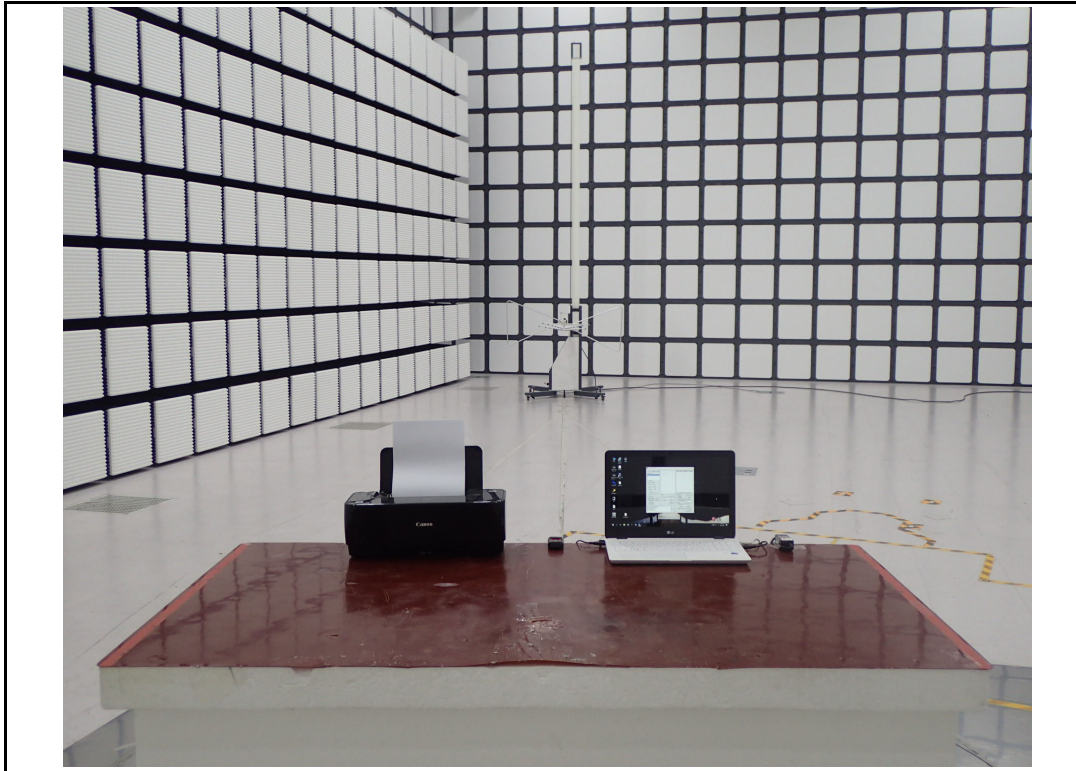
Test Date : 30-Jul-19

| Frequency (MHz) | Correction Factor | | Line (H/N) | Quasi-peak Value | | | Cispr Average Value | | |
|--------------------|--|---------------|---------------|-----------------------|-------------------------|------------------------|-----------------------|-------------------------|----------------|
| | Lisn (dB) | Cable (dB) | | Limit (dB μ V) | Reading (dB μ V) | Result (dB μ V) | Limit (dB μ V) | Reading (dB μ V) | Result (dB) |
| 0.51 | 0.10 | 0.28 | N | 73.00 | 40.08 | 40.46 | 60.00 | 26.22 | 26.60 |
| 0.62 | 0.10 | 0.29 | N | 73.00 | 38.78 | 39.17 | 60.00 | 24.57 | 24.96 |
| 0.68 | 0.11 | 0.29 | H | 73.00 | 34.12 | 34.52 | 60.00 | 21.99 | 22.39 |
| 1.23 | 0.11 | 0.30 | N | 73.00 | 34.94 | 35.35 | 60.00 | 22.53 | 22.94 |
| 17.28 | 0.62 | 0.48 | H | 73.00 | 35.99 | 37.09 | 60.00 | 30.17 | 31.27 |
| 17.65 | 0.55 | 0.48 | N | 73.00 | 36.68 | 37.71 | 60.00 | 30.26 | 31.29 |
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| | | | | | | | | | |
| Remark | H : Hot Line, N : Neutral Line *Correction Factor = Lisn + Cable *Result = Correction Factor + Reading | | | | | | | | |

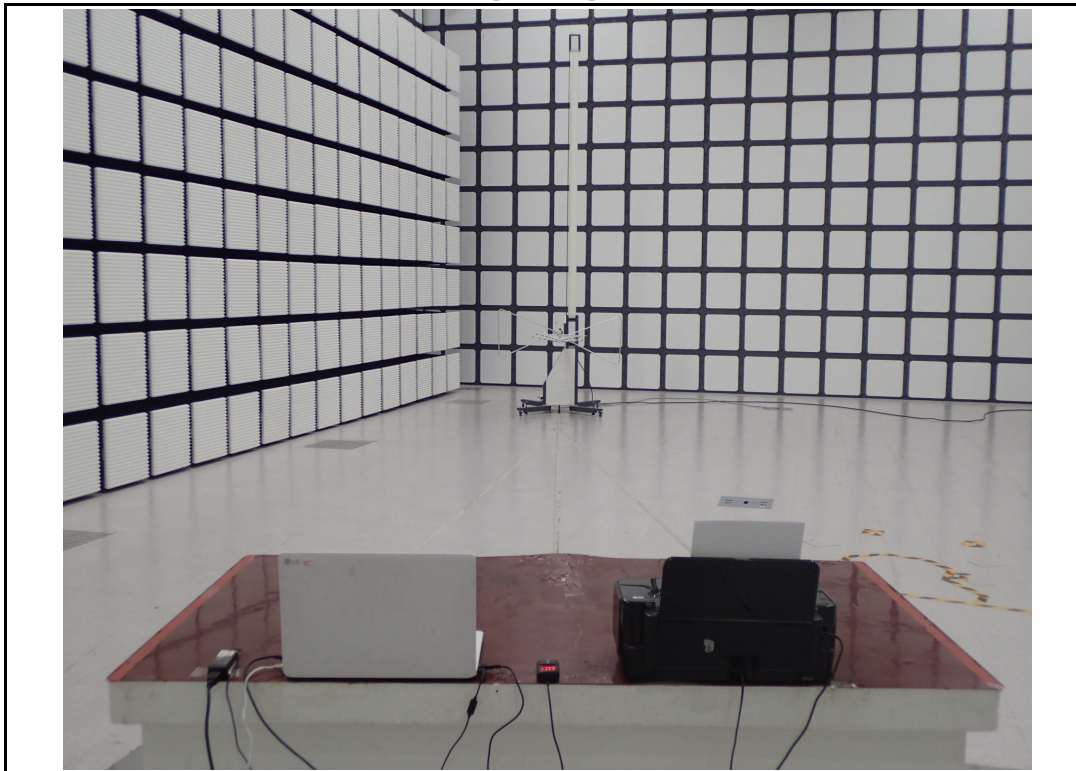
7. Photographs of test setup

7.1 Setup for Radiated Test : (30 ~ 1 000) MHz

[Front]

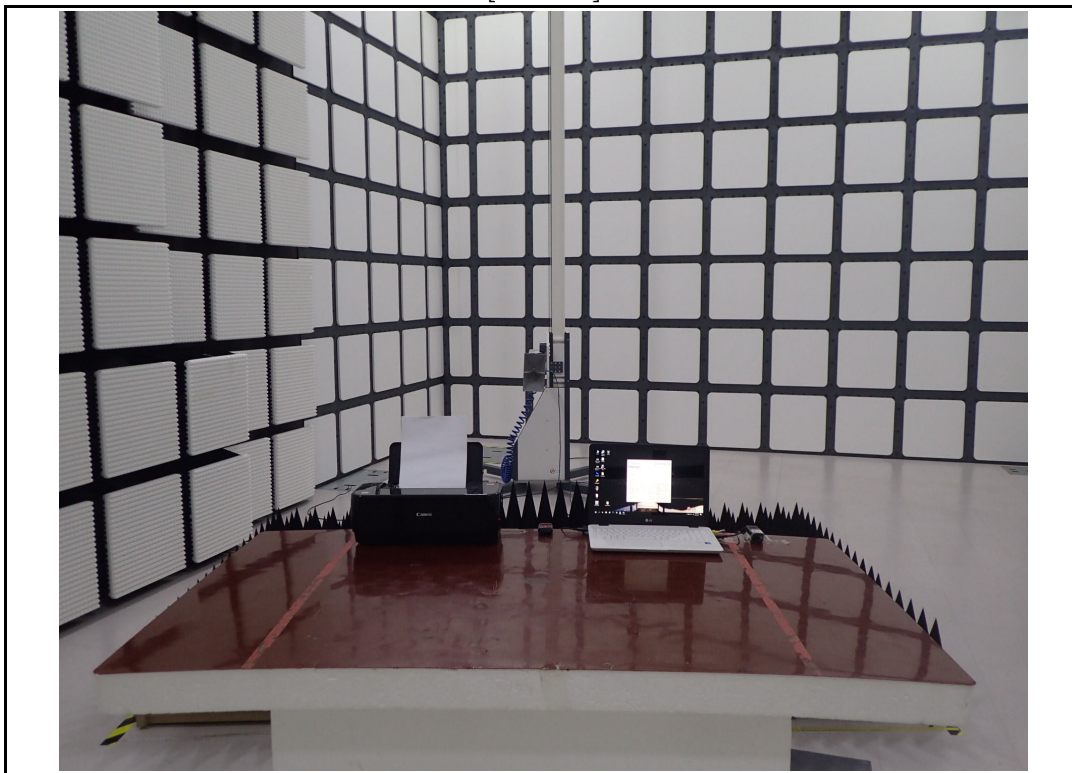


[Rear]

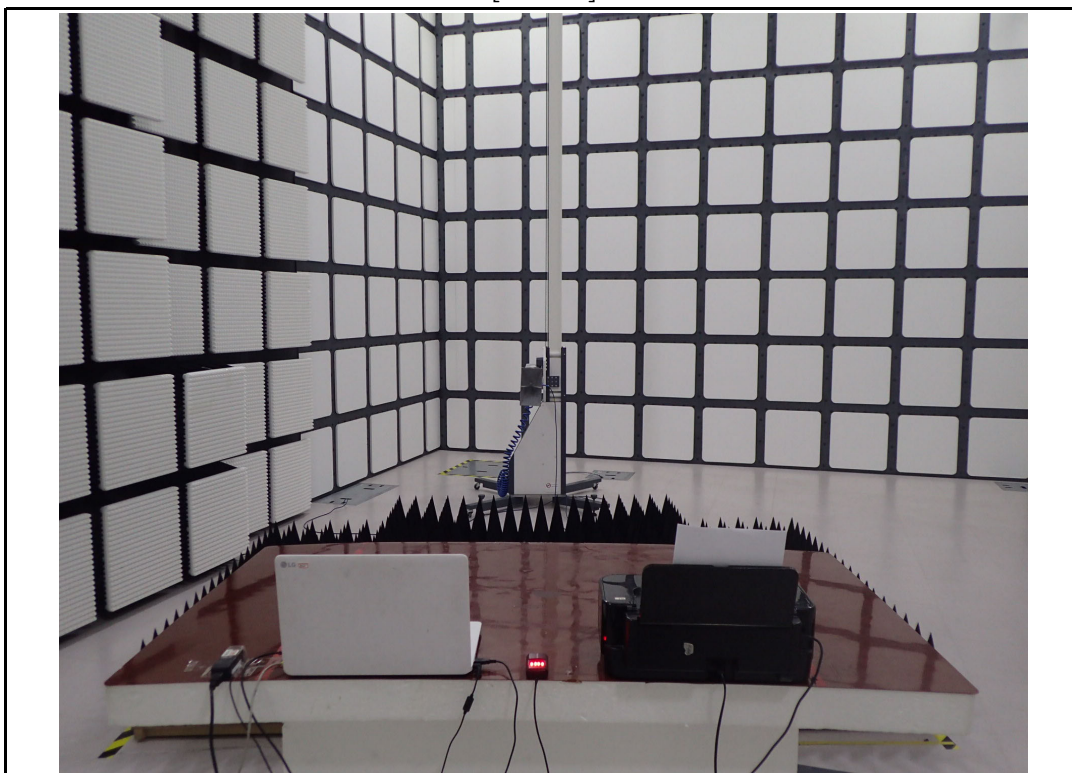


7.2 Setup for Radiated Test : above 1 GHz

[Front]

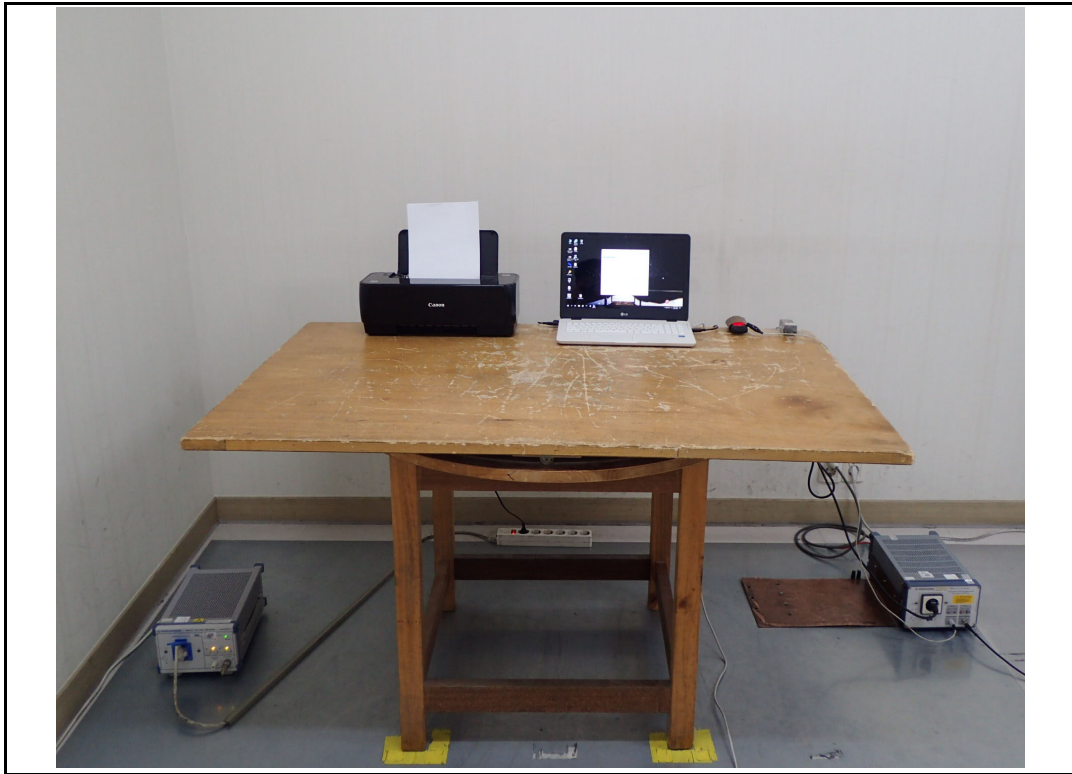


[Rear]



7.3 Setup for Conducted Test : (0.15 ~ 30) MHz

[Front]



[Rear]

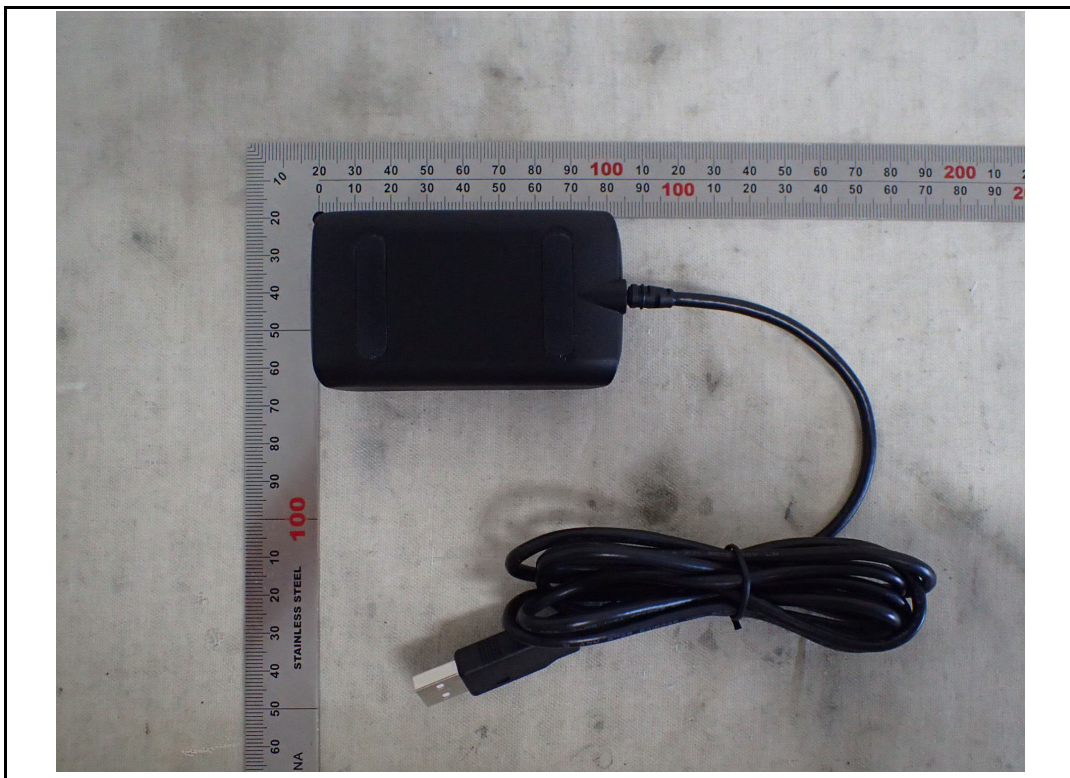


8. Photographs of EUT

[Front]

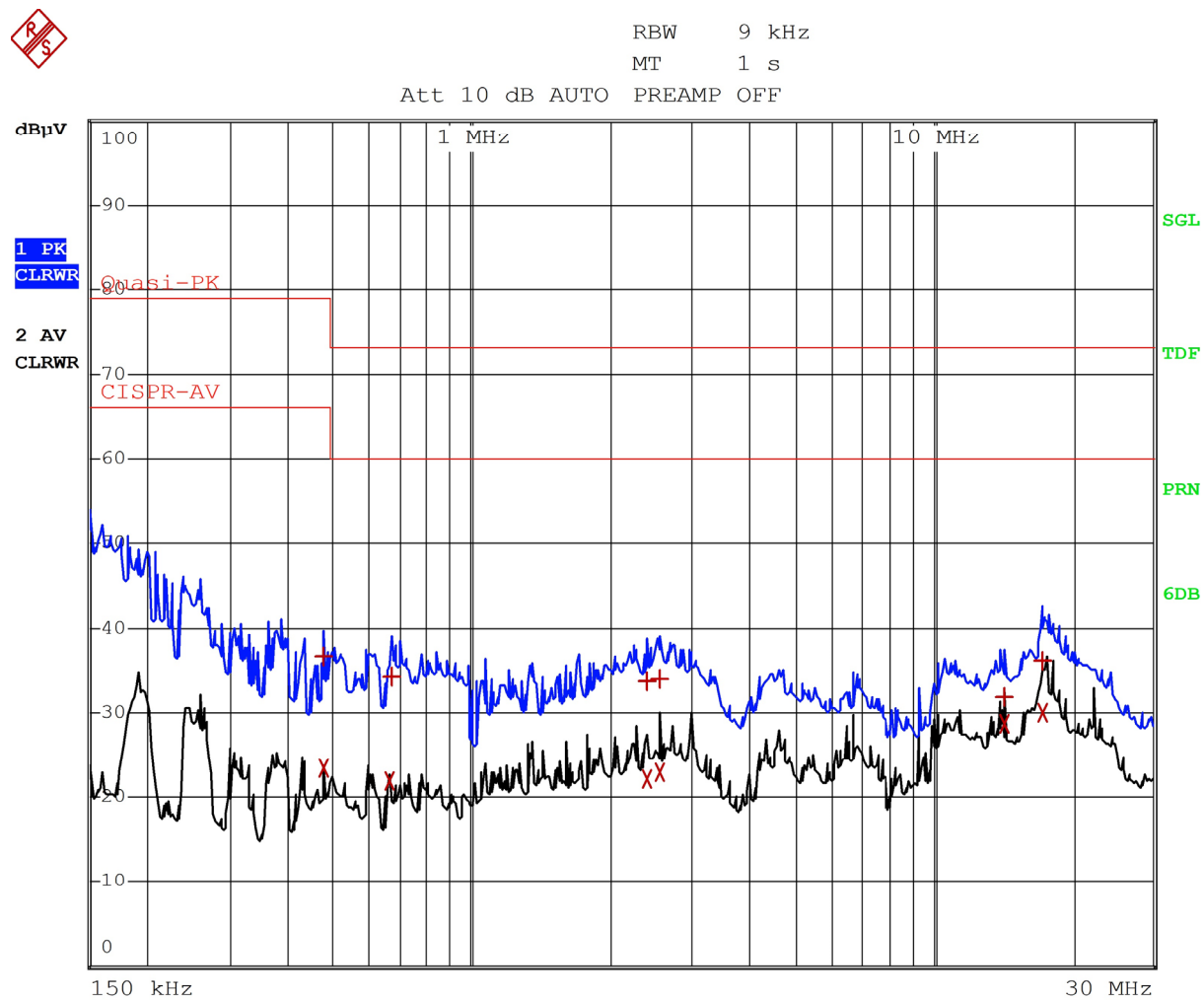


[Rear]



Appendix 1. Special diagram

*HOT



Comment: ESTE-19-01262-HOT
Date: 30.JUL.2019 11:23:35

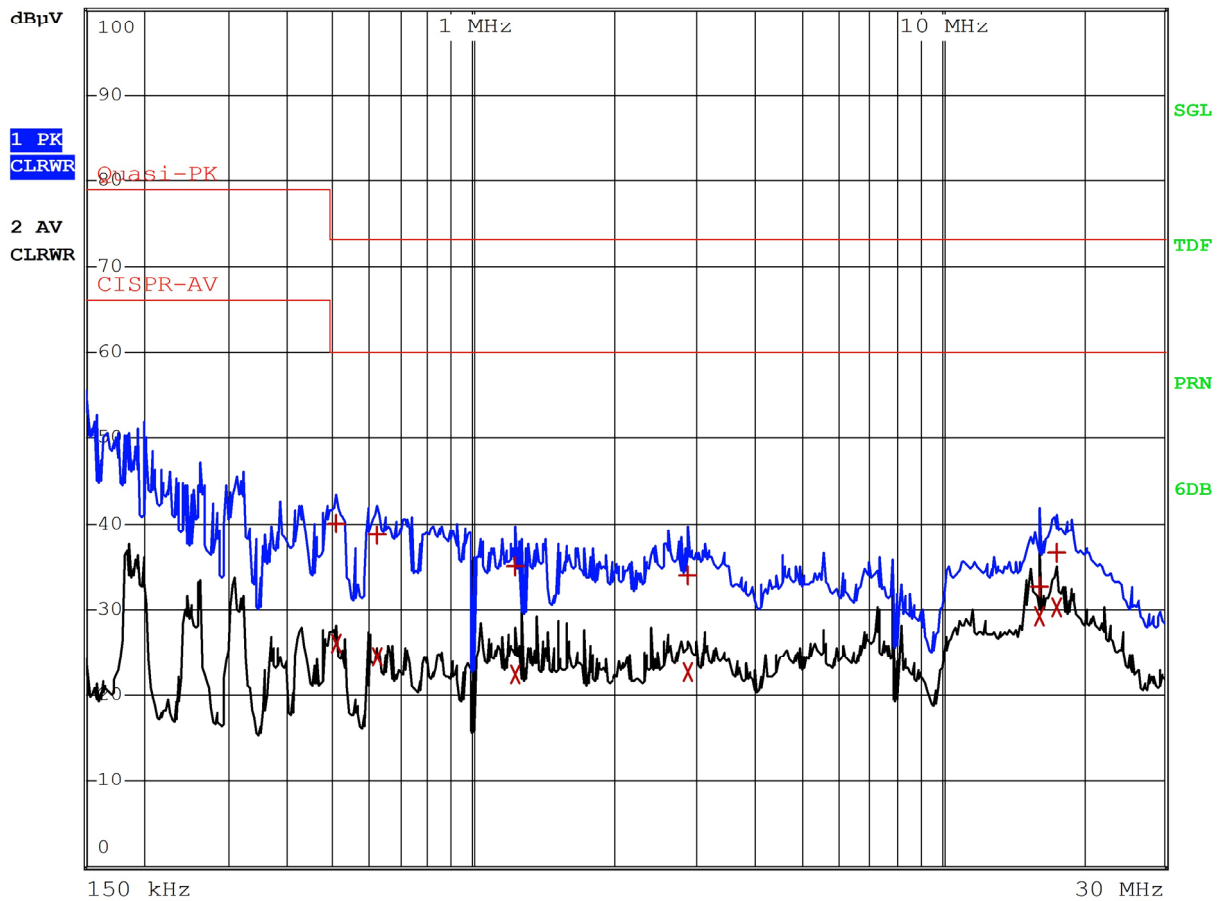
*NEUTRAL



RBW 9 kHz

MT 1 s

Att 10 dB AUTO PREAMP OFF



Comment: ESTE-19-01262-NEUTRAL
Date: 30.JUL.2019 11:29:24