

# EMI TEST REPORT

## Test Report No. 15385574H-C-R2

|                     |                                |
|---------------------|--------------------------------|
| Customer            | ASAHI DENSO CO., LTD.          |
| Description of EUT  | Controller                     |
| Model Number of EUT | FZ134                          |
| FCC ID              | T8VFZ134                       |
| Test Regulation     | FCC Part 15 Subpart B, Class B |
| Test Result         | Complied                       |
| Issue Date          | January 27, 2025               |
| Remarks             | -                              |

**Representative test engineer**Ken Fujita  
Engineer**Approved by**Shinichi Miyazono  
Leader

CERTIFICATE 5107.02

- ☐ The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan, Inc.
- ☒ There is no testing item of "Non-accreditation".

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- The information provided by the customer for this report is identified in SECTION 1.
- The laboratory is not responsible for information provided by the customer which can impact the validity of the results.
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## **REVISION HISTORY**

### **Original Test Report No.: 15385574H-C**

This report is a revised version of 15385574H-C-R1. 15385574H-C-R1 is replaced with this report.

| Revision     | Test Report No. | Date             | Page Revised Contents                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------|-----------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| - (Original) | 15385574H-C     | October 21, 2024 | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 1            | 15385574H-C-R1  | January 23, 2025 | Addition and correction of the following information due to additional Conducted Emission (Mode 3, 4) and Radiated Emission (Mode 4) tests: <ul style="list-style-type: none"><li>- SECTION 2.1: Test Date</li><li>- SECTION 3.2: Worst Margin</li><li>- SECTION 3.4: Uncertainty</li><li>- SECTION 3.5: Test Location (note below the table)</li><li>- SECTION 4.1: Test Mode</li><li>- SECTION 4.2: Configuration and peripherals</li><li>- SECTION 5, 6: Procedure</li><li>- APPENDIX 1: Test Data</li><li>- APPENDIX 2: Test instruments</li><li>- APPENDIX 3: Photographs of test setup</li></ul> |
| 1            | 15385574H-C-R1  | January 23, 2025 | Deletion of the note *1) in SECTION 3.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 2            | 15385574H-C-R2  | January 27, 2025 | Addition of the note *1) in SECTION 4.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 2            | 15385574H-C-R2  | January 27, 2025 | Correction of the note *1), *2) in SECTION 4.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

## Reference: Abbreviations (Including words undescribed in this report)

|                  |                                                                 |                 |                                                                             |
|------------------|-----------------------------------------------------------------|-----------------|-----------------------------------------------------------------------------|
| A2LA             | The American Association for Laboratory Accreditation           | Hori.           | Horizontal                                                                  |
| AAN              | Asymmetric Artificial Network                                   | ICES            | Interference-Causing Equipment Standard                                     |
| AC               | Alternating Current                                             | I/O             | Input/Output                                                                |
| AE               | Auxiliary equipment                                             | IEC             | International Electrotechnical Commission                                   |
| AM               | Amplitude Modulation                                            | IEEE            | Institute of Electrical and Electronics Engineers                           |
| AMN              | Artificial Mains Network                                        | IF              | Intermediate Frequency                                                      |
| Amp, AMP         | Amplifier                                                       | ILAC            | International Laboratory Accreditation Conference                           |
| ANSI             | American National Standards Institute                           | ISED            | Innovation, Science and Economic Development Canada                         |
| Ant, ANT         | Antenna                                                         | ISN             | Impedance Stabilization Network                                             |
| AP               | Access Point                                                    | ISO             | International Organization for Standardization                              |
| ASK              | Amplitude Shift Keying                                          | JAB             | Japan Accreditation Board                                                   |
| Atten., ATT      | Attenuator                                                      | LAN             | Local Area Network                                                          |
| AV               | Average                                                         | LCL             | Longitudinal Conversion Loss                                                |
| BPSK             | Binary Phase-Shift Keying                                       | LIMS            | Laboratory Information Management System                                    |
| BR               | Bluetooth Basic Rate                                            | LISN            | Line Impedance Stabilization Network                                        |
| BT               | Bluetooth                                                       | MRA             | Mutual Recognition Arrangement                                              |
| BT LE            | Bluetooth Low Energy                                            | N/A             | Not Applicable                                                              |
| BW               | BandWidth                                                       | NIST            | National Institute of Standards and Technology                              |
| C.F              | Correction Factor                                               | NS              | No signal detect.                                                           |
| Cal Int          | Calibration Interval                                            | NSA             | Normalized Site Attenuation                                                 |
| CAV              | CISPR AV                                                        | OBW             | Occupied BandWidth                                                          |
| CCK              | Complementary Code Keying                                       | OFDM            | Orthogonal Frequency Division Multiplexing                                  |
| CDN              | Coupling Decoupling Network                                     | PER             | Packet Error Rate                                                           |
| Ch., CH          | Channel                                                         | PK              | Peak                                                                        |
| CISPR            | Comite International Special des Perturbations Radioelectriques | P <sub>LT</sub> | long-term flicker severity                                                  |
| Corr.            | Correction                                                      | POHC(A)         | Partial Odd Harmonic Current                                                |
| CPE              | Customer premise equipment                                      | Pol., Pola.     | Polarization                                                                |
| CW               | Continuous Wave                                                 | PR-ASK          | Phase Reversal ASK                                                          |
| DBPSK            | Differential BPSK                                               | P <sub>ST</sub> | short-term flicker severity                                                 |
| DC               | Direct Current                                                  | QAM             | Quadrature Amplitude Modulation                                             |
| DET              | Detector                                                        | QP              | Quasi-Peak                                                                  |
| D-factor, D.fac. | Distance factor                                                 | QPSK            | Quadrature Phase Shift Keying                                               |
| Dmax             | maximum absolute voltage change during an observation period    | r.m.s., RMS     | Root Mean Square                                                            |
| DQPSK            | Differential QPSK                                               | RBW             | Resolution BandWidth                                                        |
| DSSS             | Direct Sequence Spread Spectrum                                 | RE              | Radio Equipment                                                             |
| DUT              | Device Under Test                                               | REV             | Reverse                                                                     |
| EDR              | Enhanced Data Rate                                              | RF              | Radio Frequency                                                             |
| e.i.r.p., EIRP   | Equivalent Isotropically Radiated Power                         | RFID            | Radio Frequency Identifier                                                  |
| EM clamp         | Electromagnetic clamp                                           | RNSS            | Radio Navigation Satellite Service                                          |
| EMC              | ElectroMagnetic Compatibility                                   | RSS             | Radio Standards Specifications                                              |
| EMI              | ElectroMagnetic Interference                                    | Rx              | Receiving                                                                   |
| EMS              | ElectroMagnetic Susceptibility                                  | S.fac.          | Site factor                                                                 |
| EN               | European Norm                                                   | SINAD           | Ratio of (Signal + Noise + Distortion) to (Noise + Distortion)              |
| e.r.p., ERP      | Effective Radiated Power                                        | S/N             | Signal to Noise ratio                                                       |
| ETSI             | European Telecommunications Standards Institute                 | SA, S/A         | Spectrum Analyzer                                                           |
| EU               | European Union                                                  | SABS            | South African Bureau of Standards                                           |
| EUT              | Equipment Under Test                                            | SANS            | South African National Standards                                            |
| Fac.             | Factor                                                          | SG              | Signal Generator                                                            |
| FCC              | Federal Communications Commission                               | SVSWR           | Site-Voltage Standing Wave Ratio                                            |
| FHSS             | Frequency Hopping Spread Spectrum                               | THC(A)          | Total Harmonic Current                                                      |
| FM               | Frequency Modulation                                            | THD(%)          | Total Harmonic Distortion                                                   |
| Freq.            | Frequency                                                       | TR, T/R         | Test Receiver                                                               |
| FSK              | Frequency Shift Keying                                          | Tx              | Transmitting                                                                |
| Fund             | Fundamental                                                     | UFA             | Uniform field area                                                          |
| FWD              | Forward                                                         | VBW             | Video BandWidth                                                             |
| GFSK             | Gaussian Frequency-Shift Keying                                 | Vert.           | Vertical                                                                    |
| GNSS             | Global Navigation Satellite System                              | WLAN            | Wireless LAN                                                                |
| GPS              | Global Positioning System                                       | xDSL            | Generic term for all types of DSL technology (DSL: Digital Subscriber Line) |

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## **SECTION 1: Customer information**

|                  |                                                                      |
|------------------|----------------------------------------------------------------------|
| Company Name     | ASAHI DENSO CO., LTD.                                                |
| Address          | 6-2-1 Somejidai, Hamana-ku, Hamamatsu City, Shizuoka, 434-0046 Japan |
| Telephone Number | +81-53-586-7383                                                      |
| Contact Person   | Tomohiro Yaguchi                                                     |

The information provided by the customer is as follows;

- Customer, Description of EUT, Model Number of EUT on the cover and other relevant pages
- Operating/Test Mode(s) (Mode(s)) on all the relevant pages
- SECTION 1: Customer Information
- SECTION 2: Equipment Under Test (EUT) other than the Receipt Date and Test Date
- SECTION 4: Operation of EUT during testing

## **SECTION 2: Equipment under test (EUT)**

### **2.1 Identification of EUT**

|               |                                                                                           |
|---------------|-------------------------------------------------------------------------------------------|
| Description   | Controller                                                                                |
| Model Number  | FZ134                                                                                     |
| Serial Number | Refer to SECTION 4.2                                                                      |
| Condition     | Production prototype<br>(Not for Sale: This sample is equivalent to mass-produced items.) |
| Modification  | No Modification by the test lab                                                           |
| Receipt Date  | June 17, 25 and July 9, 2024                                                              |
| Test Date     | August 18, 2024 to January 9, 2025                                                        |

### **2.2 Product Description**

#### **General Specification**

|                                     |                                                                       |
|-------------------------------------|-----------------------------------------------------------------------|
| Rating                              | DC 3.7 V                                                              |
| Operating temperature               | Radio operating temperature range (BT LE):<br>-10 deg. C to 50 deg. C |
|                                     | Charging temperature range:<br>0 deg. C to 40 deg. C                  |
| Clock frequency (ies) in the system | 16 MHz (Main CPU)                                                     |

#### **Radio Specification**

|                        |                      |
|------------------------|----------------------|
| Equipment Type         | Transceiver          |
| Frequency of Operation | 2402 MHz to 2480 MHz |
| Type of Modulation     | GFSK                 |
| Antenna Gain           | 2.6 dBi              |

## SECTION 3: Test specification, procedures & results

### 3.1 Test Specification

|                    |                                                                                    |
|--------------------|------------------------------------------------------------------------------------|
| Test Specification | FCC Part 15 Subpart B<br>The latest version on the first day of the testing period |
| Title              | FCC 47CFR Part15 Radio Frequency Device<br>Subpart B Unintentional Radiators       |

### 3.2 Procedures and results

| Item               | Test Procedure                                                                                 | Limits  | Worst margin                                        | Result   | Remarks |
|--------------------|------------------------------------------------------------------------------------------------|---------|-----------------------------------------------------|----------|---------|
| Conducted emission | ANSI C63.4: 2014 +<br>C63.4a: 2017<br>7. AC power - line<br>conducted emission<br>measurements | Class B | 9.62 dB<br>0.50721 MHz,<br>QP, Phase N<br>(Mode 4)  | Complied | -       |
| Radiated emission  | ANSI C63.4: 2014 +<br>C63.4a: 2017<br>8. Radiated<br>emission measurements                     | Class B | 4.59 dB<br>206.953 MHz,<br>Vertical, QP<br>(Mode 2) | Complied | -       |

\* Note: UL Japan, Inc.'s EMI Work Procedure: Work Instructions-ULID-003591.

### 3.3 Addition to standard

No addition, exclusion nor deviation has been made from the standard.

### 3.4 Uncertainty

Measurement uncertainty is not taken into account when stating conformity with a specified requirement.  
Note: When margins obtained from test results are less than the measurement uncertainty, the test results may exceed the limit.

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor  $k = 2$ .

#### Conducted emission

| Item       | Frequency range    | Unit | Calculated<br>Uncertainty (+/-) |
|------------|--------------------|------|---------------------------------|
| AMN (LISN) | 0.15 MHz to 30 MHz | dB   | 3.3                             |

#### Radiated emission

| Radiated emission    |                     |            |      |                              |
|----------------------|---------------------|------------|------|------------------------------|
| Measurement distance | Frequency range     |            | Unit | Calculated Uncertainty (+/-) |
| 3 m                  | 9 kHz to 30 MHz     |            | dB   | 3.3                          |
| 10 m                 |                     |            | dB   | 3.1                          |
| 3 m                  | 30 MHz to 200 MHz   | Horizontal | dB   | 5.0                          |
|                      |                     | Vertical   | dB   | 5.0                          |
|                      | 200 MHz to 1000 MHz | Horizontal | dB   | 5.2                          |
|                      |                     | Vertical   | dB   | 6.2                          |
| 10 m                 | 30 MHz to 200 MHz   | Horizontal | dB   | 5.5                          |
|                      |                     | Vertical   | dB   | 5.4                          |
|                      | 200 MHz to 1000 MHz | Horizontal | dB   | 5.5                          |
|                      |                     | Vertical   | dB   | 5.5                          |
| 3 m                  | 1 GHz to 6 GHz      |            | dB   | 5.1                          |
|                      | 6 GHz to 18 GHz     |            | dB   | 5.4                          |
| 1 m                  | 10 GHz to 18 GHz    |            | dB   | 5.4                          |
|                      | 18 GHz to 26.5 GHz  |            | dB   | 5.3                          |
|                      | 26.5 GHz to 40 GHz  |            | dB   | 4.8                          |
| 0.5 m                | 26.5 GHz to 40 GHz  |            | dB   | 5.0                          |

### 3.5 Test Location

UL Japan, Inc. Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 Japan

Telephone: +81-596-24-8999

A2LA Certificate Number: 5107.02 / FCC Test Firm Registration Number: 884919

ISED Lab Company Number: 2973C / CAB identifier: JP0002

| Test site                  | Width x Depth x Height (m) | Size of reference ground plane (m) / horizontal conducting plane | Other rooms            | Maximum measurement distance |
|----------------------------|----------------------------|------------------------------------------------------------------|------------------------|------------------------------|
| No.1 semi-anechoic chamber | 19.2 x 11.2 x 7.7          | 7.0 x 6.0                                                        | No.1 Power source room | 10 m                         |
| No.2 semi-anechoic chamber | 7.5 x 5.8 x 5.2            | 4.0 x 4.0                                                        | -                      | 3 m                          |
| No.3 semi-anechoic chamber | 12.0 x 8.5 x 5.9           | 6.8 x 5.75                                                       | No.3 Preparation room  | 3 m                          |
| No.3 shielded room         | 4.0 x 6.0 x 2.7            | N/A                                                              | -                      | -                            |
| No.4 semi-anechoic chamber | 12.0 x 8.5 x 5.9           | 6.8 x 5.75                                                       | No.4 Preparation room  | 3 m                          |
| No.4 shielded room         | 4.0 x 6.0 x 2.7            | N/A                                                              | -                      | -                            |
| No.5 semi-anechoic chamber | 6.0 x 6.0 x 3.9            | 6.0 x 6.0                                                        | -                      | -                            |
| No.5 measurement room      | 6.4 x 6.4 x 3.0            | 6.4 x 6.4                                                        | -                      | -                            |
| No.6 shielded room         | 4.0 x 4.5 x 2.7            | 4.0 x 4.5                                                        | -                      | -                            |
| No.6 measurement room      | 4.75 x 5.4 x 3.0           | 4.75 x 4.15                                                      | -                      | -                            |
| No.7 shielded room         | 4.7 x 7.5 x 2.7            | 4.7 x 7.5                                                        | -                      | -                            |
| No.8 measurement room      | 3.1 x 5.0 x 2.7            | 3.1 x 5.0                                                        | -                      | -                            |
| No.9 measurement room      | 8.8 x 4.6 x 2.8            | 2.4 x 2.4                                                        | -                      | -                            |
| No.10 shielded room        | 3.8 x 2.8 x 2.8            | 3.8 x 2.8                                                        | -                      | -                            |
| No.11 measurement room     | 4.0 x 3.4 x 2.5            | N/A                                                              | -                      | -                            |
| No.12 measurement room     | 2.6 x 3.4 x 2.5            | N/A                                                              | -                      | -                            |
| Large Chamber              | 16.9 x 22.1 x 10.17        | 16.9 x 22.1                                                      | -                      | 10 m                         |
| Small Chamber              | 5.3 x 6.69 x 3.59          | 5.3 x 6.69                                                       | -                      | -                            |

\* Size of vertical conducting plane (for Conducted Emission test): 2.0 x 3.0 m for No.1, No.2, No.3, No.4, and No.5 semi-anechoic chambers and No.3 and No.4 shielded rooms.

### 3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

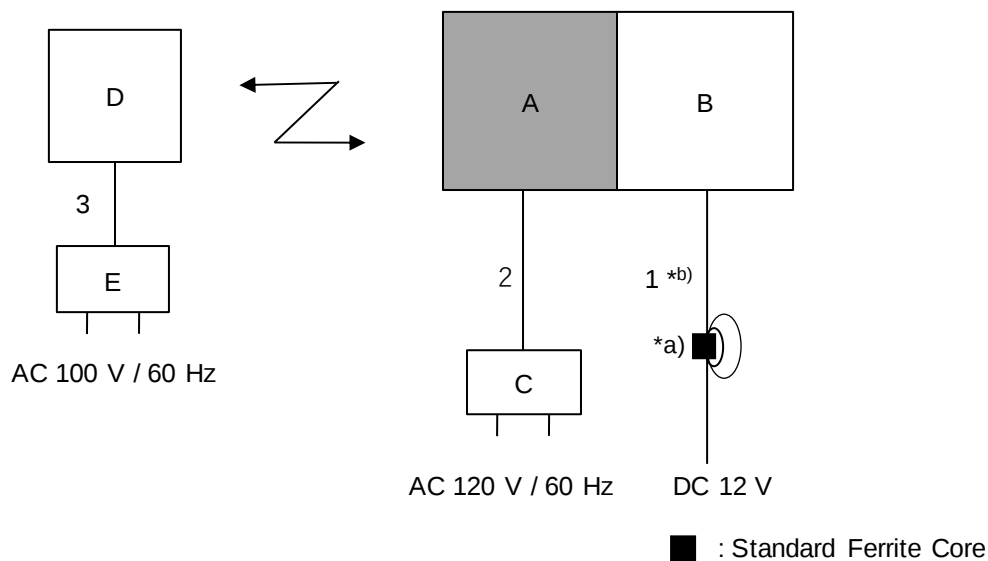
## SECTION 4: Operation of EUT during testing

### 4.1 Operating Mode(s)

|             |                                                               |
|-------------|---------------------------------------------------------------|
| Mode        | 1. BLE Communication (FZ134 only)                             |
|             | 2. BLE Communication (FZ134+FZ135)                            |
|             | 3. USB Charge (FZ134 only)                                    |
|             | 4. USB Charge + BLE Communication (FZ134 only) <sup>*1)</sup> |
| Software(s) | WPT_TX_ES2 Version: Ver1.3                                    |

<sup>\*1)</sup> The test was performed conservatively.

### 4.2 Configuration and peripherals



\* Cabling and setup(s) were taken into consideration and test data was taken under worse case conditions.

<sup>\*a)</sup> Ferrite Core Model No. E04sr2000935A (Manufacture seiwa) 10 cm from Item B, 3 turns

<sup>\*b)</sup> Conducted Emission test was excluded since the this device is installed on a ship.

### Description of EUT and Support equipment

| No. | Item       | Model number | Serial number | Manufacturer          | Remark         |
|-----|------------|--------------|---------------|-----------------------|----------------|
| A   | Controller | FZ134        | 2             | ASAHI DENSO CO., LTD. | EUT            |
| B   | Holder     | FZ135        | 1             | ASAHI DENSO CO., LTD. | -              |
| C   | AC Adapter | RP-UC11      | 0SCN19NY      | RAVPOWER              | <sup>*1)</sup> |
| D   | JIG        | -            | -             | ASAHI DENSO CO., LTD. | <sup>*2)</sup> |
| E   | AC Adapter | ACA-IP52BK   | J04-0256268   | SANWA supply          | <sup>*2)</sup> |

### List of cables used

| No. | Name      | Length (m) | Shield     |            | Remark         |
|-----|-----------|------------|------------|------------|----------------|
|     |           |            | Cable      | Connector  |                |
| 1   | DC Cable  | 2.3        | Unshielded | Unshielded | -              |
| 2   | USB Cable | 1.0        | Shielded   | Shielded   | <sup>*1)</sup> |
| 3   | USB Cable | 0.5        | Shielded   | Shielded   | <sup>*2)</sup> |

<sup>\*1)</sup> Used for Mode 3 and Mode 4 only.

<sup>\*2)</sup> Used for Mode 1 and Mode 2 and Mode 4 only.

## **SECTION 5: Conducted Emission**

### **5.1 Operating environment**

Date : See data  
Test place : See data  
Temperature : See data  
Humidity : See data  
Test engineer : See data

### **5.2 Test configuration**

EUT was placed on a urethane platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane.

The rear of tabletop was located 40 cm to the vertical conducting plane. The rear of EUT and its peripherals was aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80 cm from any other grounded conducting surface. EUT was located 80 cm from the LISN/AMN. They were folded back and forth forming a bundle 30 cm to 40 cm long and were hanged at a 40 cm height to the ground plane. Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN/AMN to the input power source. All unused 50 ohm connectors of the LISN/AMN were resistivity terminated in 50 ohm when not connected to the measuring equipment. Photographs of the set up are shown in APPENDIX 3.

Frequency range : 0.15 MHz to 30 MHz  
EUT position : Table top  
EUT operation mode : See Clause 4.1

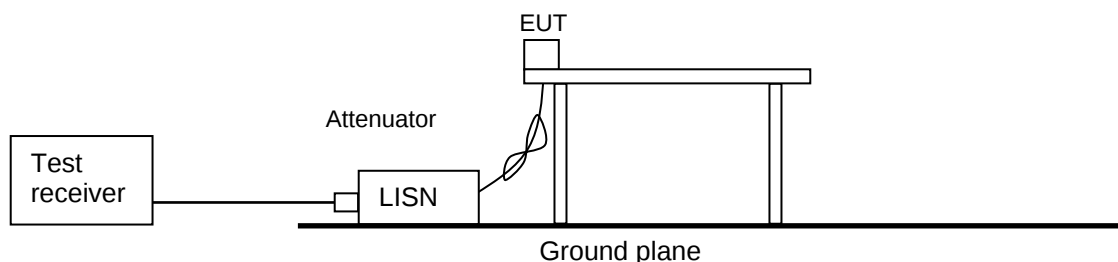
### **5.3 Test procedure**

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT within a semi anechoic chamber. The EUT was connected to a Line Impedance Stabilization Network (LISN)/ Artificial Mains network (AMN). An overview sweep with peak detection has been performed. The measurements have been performed with a quasi-peak detector and if required, with an average detector.

The conducted emission measurements were made with the following detector function of the test receiver.

Detector Type : QP and CAV  
IF Bandwidth : 9 kHz

**Figure 1: Test Setup**



### **5.4 Test result**

Summary of the test results: Pass

The test result is rounded off, so some differences might be observed.

## **SECTION 6: Radiated Emission**

### **6.1 Operating environment**

Date : See data  
Test place : See data  
Temperature : See data  
Humidity : See data  
Test engineer : See data

### **6.2 Test configuration**

EUT was placed on a urethane platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane.

The EUT was set on the edge of the tabletop.

Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

Photographs of the set up are shown in APPENDIX 3.

### **6.3 Test conditions**

Frequency range : 30 MHz to 200 MHz (Biconical antenna)  
200 MHz to 1000 MHz (Logperiodic antenna)  
1000 MHz to 13000 MHz (Horn antenna)  
Test distance : 3 m  
EUT position : Table top  
EUT operation mode : See Clause 4.1

### **6.4 Test procedure**

The height of the measuring antenna varied between 1 and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.

The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver.

The radiated emission measurements were made with the following detector function of the Test Receiver.

Test antenna was aimed at the emission source for receiving the maximum signal and always kept. (Above 1 GHz)

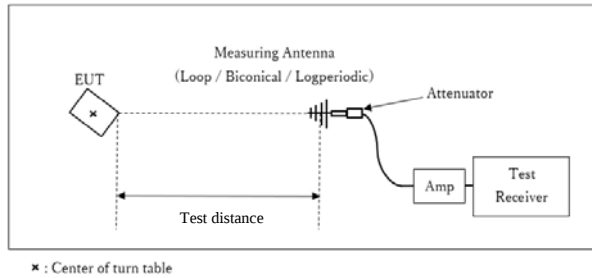
| Frequency       | Below 1 GHz    | Above 1 GHz *1)             |
|-----------------|----------------|-----------------------------|
| Instrument used | Test Receiver  | Test Receiver               |
| IF Bandwidth    | QP: BW 120 kHz | PK: BW 1 MHz, CAV: BW 1 MHz |

\*1) The measurement data was adjusted to a 3 m distance using the following Distance Factor.

Distance Factor: See Figure 1.

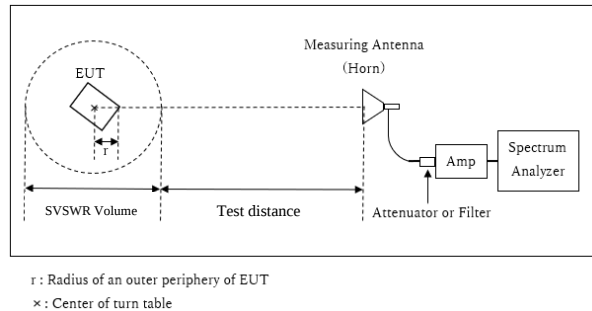
**Figure 1: Test Setup**

Below 1 GHz



Test Distance: 3 m

1 GHz to 10 GHz



**[1 GHz to 6 GHz]**

Distance Factor:  $20 \times \log (3.9 \text{ m}^* / 3.0 \text{ m}) = 2.28 \text{ dB}$

\* (Test Distance + SVSWR Volume / 2) - r = 3.9 m

Test Distance: 3 m

SVSWR Volume: 2 m

(SVSWR Volume has been calibrated based on CISPR 16-1-4.)

r: 0.1 m

**[6 GHz to 10 GHz] for No.1 Semi Anechoic Chamber**

Distance Factor:  $20 \times \log (5.9 \text{ m}^* / 3.0 \text{ m}) = 5.88 \text{ dB}$

\* (Test Distance + SVSWR Volume / 2) - r = 5.9 m

Test Distance: 5.16 m

SVSWR Volume: 1.68 m

(SVSWR Volume has been calibrated based on CISPR 16-1-4.)

r: 0.1 m

**[6 GHz to 10 GHz] for No.3 Semi Anechoic Chamber**

Distance Factor:  $20 \times \log (4.9 \text{ m}^* / 3.0 \text{ m}) = 4.27 \text{ dB}$

\* (Test Distance + SVSWR Volume / 2) - r = 4.9 m

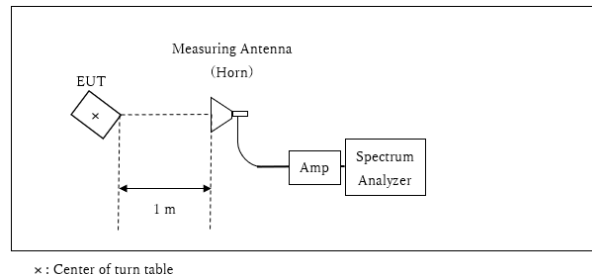
Test Distance: 4.30 m

SVSWR Volume: 1.40 m

(SVSWR Volume has been calibrated based on CISPR 16-1-4.)

r: 0.1 m

10 GHz to 13 GHz



Distance Factor:  $20 \times \log (1.0 \text{ m}^* / 3.0 \text{ m}) = -9.54 \text{ dB}$

\* Test Distance: 1 m

- The noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

## 6.5 Test result

Summary of the test results: Pass

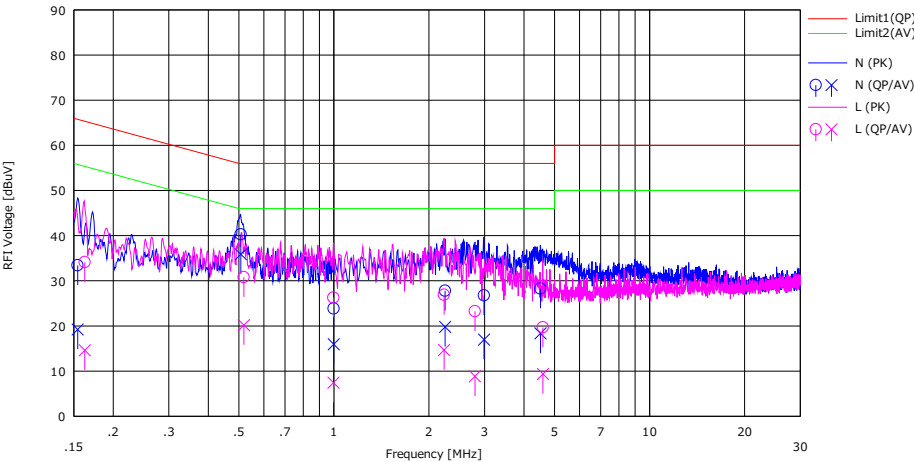
Test results are rounded off and limit are rounded down, so some differences might be observed.

APPENDIX 1: Test data

Conducted Emission

Test place                   Ise EMC Lab.  
Semi Anechoic Chamber   No.4  
Date                        December 23, 2024  
Temperature / Humidity    21 deg. C / 42 % RH  
Engineer                  Tetsuro Yoshida  
Mode                       Mode 3

Limit : FCC\_Part 15 Subpart B(15.107)\_Class B / ICES-003 Issue 7 October 2020\_Class B



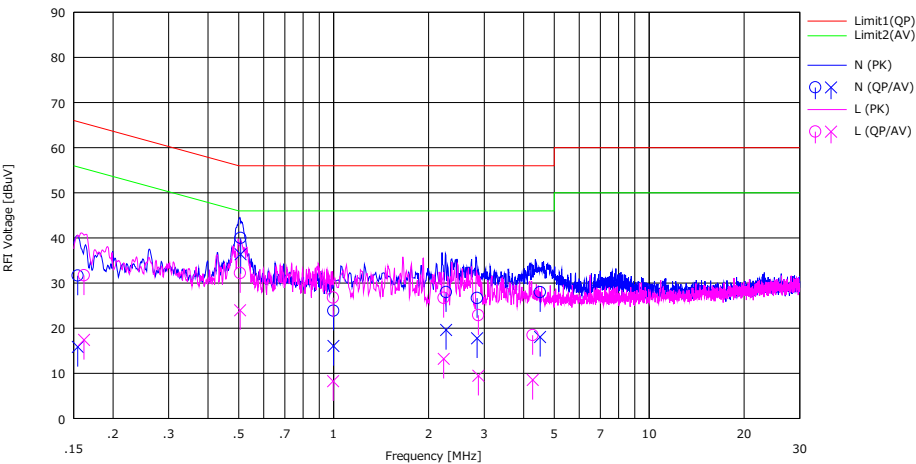
| No. | Freq.<br>[MHz] | Reading        |                | LISN | LOSS  | Results        |                | Limit          |                | Margin       |              | Phase | Comment |
|-----|----------------|----------------|----------------|------|-------|----------------|----------------|----------------|----------------|--------------|--------------|-------|---------|
|     |                | (QP)<br>[dBuV] | (AV)<br>[dBuV] |      |       | (QP)<br>[dBuV] | (AV)<br>[dBuV] | (QP)<br>[dBuV] | (AV)<br>[dBuV] | (QP)<br>[dB] | (AV)<br>[dB] |       |         |
| 1   | 0.15425        | 20.20          | 6.00           | 0.13 | 13.10 | 33.43          | 19.23          | 65.77          | 55.77          | 32.34        | 36.54        | N     |         |
| 2   | 0.50735        | 27.00          | 22.60          | 0.14 | 13.14 | 40.28          | 35.88          | 56.00          | 46.00          | 15.72        | 10.12        | N     |         |
| 3   | 0.99855        | 10.50          | 2.60           | 0.16 | 13.19 | 23.85          | 15.95          | 56.00          | 46.00          | 32.15        | 30.05        | N     |         |
| 4   | 2.25146        | 14.30          | 6.30           | 0.21 | 13.28 | 27.79          | 19.79          | 56.00          | 46.00          | 28.21        | 26.21        | N     |         |
| 5   | 2.98938        | 13.20          | 3.40           | 0.25 | 13.32 | 26.77          | 16.97          | 56.00          | 46.00          | 29.23        | 29.03        | N     |         |
| 6   | 4.51363        | 14.50          | 4.60           | 0.37 | 13.39 | 28.26          | 18.36          | 56.00          | 46.00          | 27.74        | 27.64        | N     |         |
| 7   | 0.16255        | 20.90          | 1.40           | 0.11 | 13.10 | 34.11          | 14.61          | 65.33          | 55.33          | 31.22        | 40.72        | L     |         |
| 8   | 0.51845        | 17.50          | 6.90           | 0.14 | 13.14 | 30.78          | 20.18          | 56.00          | 46.00          | 25.22        | 25.82        | L     |         |
| 9   | 0.99745        | 12.90          | -5.90          | 0.16 | 13.19 | 26.25          | 7.45           | 56.00          | 46.00          | 29.75        | 38.55        | L     |         |
| 10  | 2.23358        | 13.40          | 1.20           | 0.22 | 13.27 | 26.89          | 14.69          | 56.00          | 46.00          | 29.11        | 31.31        | L     |         |
| 11  | 2.79854        | 9.70           | -4.70          | 0.25 | 13.31 | 23.26          | 8.86           | 56.00          | 46.00          | 32.74        | 37.14        | L     |         |
| 12  | 4.59484        | 5.90           | -4.40          | 0.39 | 13.39 | 19.68          | 9.38           | 56.00          | 46.00          | 36.32        | 36.62        | L     |         |

CHART: WITH FACTOR Peak hold data. CALCULATION : RESULT = READING + LISN + LOSS (CABLE + ATT)  
Except for the above table: adequate margin data below the limits.

Conducted Emission

Test place Ise EMC Lab.  
Semi Anechoic Chamber No.4  
Date December 23, 2024  
Temperature / Humidity 21 deg. C / 42 % RH  
Engineer Tetsuro Yoshida  
Mode Mode 4

Limit : FCC\_Part 15 Subpart B(15.107)\_Class B / ICES-003 Issue 7 October 2020\_Class B



| No. | Freq.<br>[MHz] | Reading        |                | USN  | LOSS  | Results        |                | Limit          |                | Margin       |              | Phase | Comment |
|-----|----------------|----------------|----------------|------|-------|----------------|----------------|----------------|----------------|--------------|--------------|-------|---------|
|     |                | (QP)<br>[dBuV] | (AV)<br>[dBuV] |      |       | (QP)<br>[dBuV] | (AV)<br>[dBuV] | (QP)<br>[dBuV] | (AV)<br>[dBuV] | (QP)<br>[dB] | (AV)<br>[dB] |       |         |
| 1   | 0.15446        | 18.40          | 2.60           | 0.13 | 13.10 | 31.63          | 15.83          | 65.76          | 55.76          | 34.13        | 39.93        | N     |         |
| 2   | 0.50721        | 26.70          | 23.10          | 0.14 | 13.14 | 39.98          | 36.38          | 56.00          | 46.00          | 16.02        | 9.62         | N     |         |
| 3   | 0.99846        | 10.50          | 2.70           | 0.16 | 13.19 | 23.85          | 16.05          | 56.00          | 46.00          | 32.15        | 29.95        | N     |         |
| 4   | 2.27248        | 14.50          | 6.10           | 0.21 | 13.28 | 27.99          | 19.59          | 56.00          | 46.00          | 28.01        | 26.41        | N     |         |
| 5   | 2.84866        | 13.10          | 4.20           | 0.24 | 13.31 | 26.65          | 17.75          | 56.00          | 46.00          | 29.35        | 28.25        | N     |         |
| 6   | 4.51343        | 14.20          | 4.30           | 0.37 | 13.39 | 27.96          | 18.06          | 56.00          | 46.00          | 28.04        | 27.94        | N     |         |
| 7   | 0.16167        | 18.50          | 4.20           | 0.11 | 13.10 | 31.71          | 17.41          | 65.38          | 55.38          | 33.67        | 37.97        | L     |         |
| 8   | 0.50549        | 18.90          | 10.70          | 0.14 | 13.14 | 32.18          | 23.98          | 56.00          | 46.00          | 23.82        | 22.02        | L     |         |
| 9   | 0.99647        | 13.40          | -5.10          | 0.16 | 13.19 | 26.75          | 8.25           | 56.00          | 46.00          | 29.25        | 37.75        | L     |         |
| 10  | 2.23237        | 13.20          | -0.30          | 0.22 | 13.27 | 26.69          | 13.19          | 56.00          | 46.00          | 29.31        | 32.81        | L     |         |
| 11  | 2.87460        | 9.30           | -4.10          | 0.25 | 13.31 | 22.86          | 9.46           | 56.00          | 46.00          | 33.14        | 36.54        | L     |         |
| 12  | 4.27345        | 4.70           | -5.20          | 0.36 | 13.38 | 18.44          | 8.54           | 56.00          | 46.00          | 37.56        | 37.46        | L     |         |

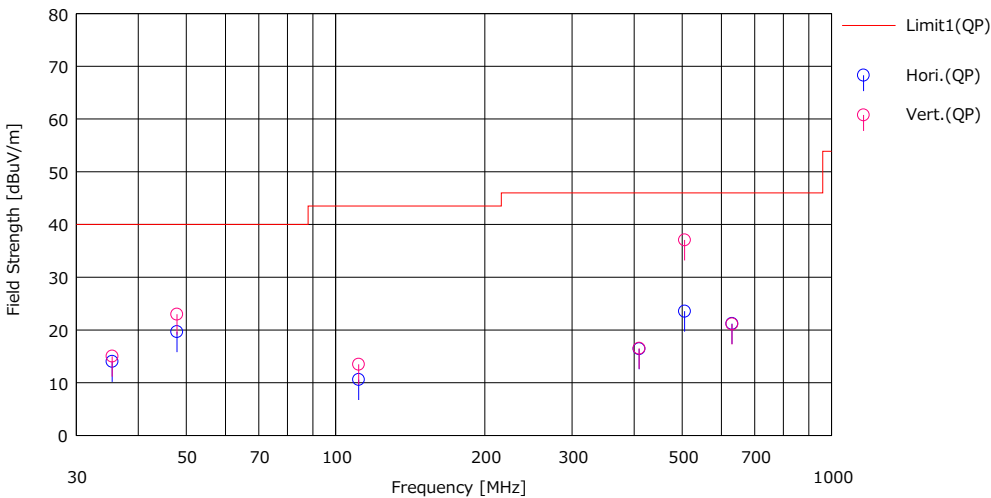
CHART: WITH FACTOR Peak hold data. CALCULATION : RESULT = READING + LISN + LOSS (CABLE + ATT)  
Except for the above table: adequate margin data below the limits.

Radiated Emission

Test place  
Semi Anechoic Chamber  
Date  
Temperature / Humidity  
Engineer  
  
Mode

Ise EMC Lab.  
No.1  
August 18, 2024  
23 deg. C / 43 % RH  
Ken Fujita  
(Below 1 GHz)  
Mode 1

Limit : FCC\_Part 15 Subpart B(15.109)\_Class B



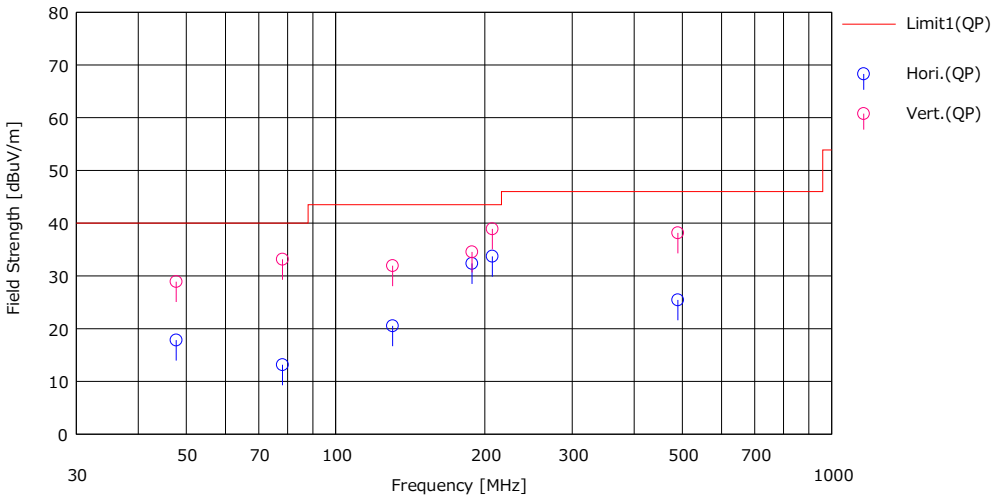
| No. | Freq.<br>[MHz] | Reading<br><QP> | Ant.Fac | Loss  | Gain  | Result<br><QP> | Limit<br><QP> | Margin<br><QP> | Pola. | Height | Angle | Ant.<br>Type | Comment |
|-----|----------------|-----------------|---------|-------|-------|----------------|---------------|----------------|-------|--------|-------|--------------|---------|
|     |                | [dBuV]          | [dB/m]  | [dB]  | [dB]  | [dBuV/m]       | [dBuV/m]      | [dB]           | [H/V] | [cm]   | [deg] |              |         |
| 1   | 35.450         | 29.10           | 16.44   | 7.36  | 38.87 | 14.03          | 40.00         | 25.97          | Hori. | 300    | 230   | BA           |         |
| 2   | 47.869         | 39.10           | 11.84   | 7.62  | 38.89 | 19.67          | 40.00         | 20.33          | Hori. | 300    | 1     | BA           |         |
| 3   | 111.312        | 29.30           | 11.67   | 8.58  | 38.95 | 10.60          | 43.50         | 32.90          | Hori. | 100    | 43    | BA           |         |
| 4   | 409.546        | 27.50           | 16.10   | 11.32 | 38.50 | 16.42          | 46.00         | 29.58          | Hori. | 100    | 260   | LA17         |         |
| 5   | 505.735        | 32.10           | 17.87   | 11.98 | 38.39 | 23.56          | 46.00         | 22.44          | Hori. | 150    | 111   | LA17         |         |
| 6   | 630.297        | 27.20           | 19.49   | 12.76 | 38.24 | 21.21          | 46.00         | 24.79          | Hori. | 100    | 124   | LA17         |         |
| 7   | 35.450         | 30.10           | 16.44   | 7.36  | 38.87 | 15.03          | 40.00         | 24.97          | Vert. | 100    | 36    | BA           |         |
| 8   | 47.869         | 42.40           | 11.84   | 7.62  | 38.89 | 22.97          | 40.00         | 17.03          | Vert. | 300    | 247   | BA           |         |
| 9   | 111.312        | 32.20           | 11.67   | 8.58  | 38.95 | 13.50          | 43.50         | 30.00          | Vert. | 100    | 6     | BA           |         |
| 10  | 409.546        | 27.60           | 16.10   | 11.32 | 38.50 | 16.52          | 46.00         | 29.48          | Vert. | 100    | 322   | LA17         |         |
| 11  | 505.735        | 45.60           | 17.87   | 11.98 | 38.39 | 37.06          | 46.00         | 8.94           | Vert. | 100    | 94    | LA17         |         |
| 12  | 630.297        | 27.10           | 19.49   | 12.76 | 38.24 | 21.11          | 46.00         | 24.89          | Vert. | 100    | 181   | LA17         |         |

CHART: WITH FACTOR  
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN  
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + ATT) - GAIN(AMP)  
Except for the above table: adequate margin data below the limits.

Radiated Emission

Test place                                   Ise EMC Lab.  
Semi Anechoic Chamber               No.1  
Date                                        August 18, 2024  
Temperature / Humidity               23 deg. C / 43 % RH  
Engineer                                 Ken Fujita  
                                              (Below 1 GHz)  
Mode                                       Mode 2

Limit : FCC\_Part 15 Subpart B(15.109)\_Class B



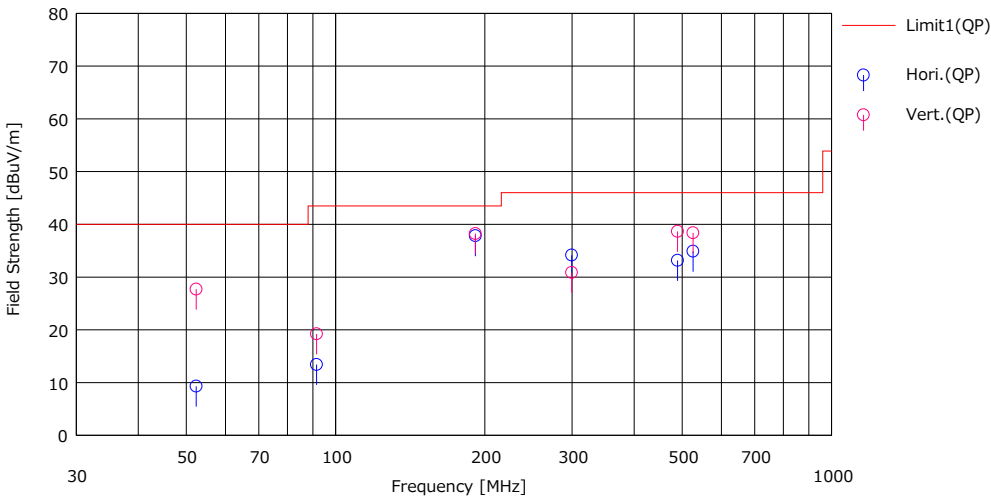
| No. | Freq.<br>[MHz] | Reading<br><QP> | Ant.Fac<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Result<br><QP> | Limit<br><QP> | Margin<br><QP> | Pola. | Height<br>[cm] | Angle<br>[deg] | Ant.<br>Type | Comment |
|-----|----------------|-----------------|-------------------|--------------|--------------|----------------|---------------|----------------|-------|----------------|----------------|--------------|---------|
|     |                | [dBuV]          |                   |              |              | [dBuV/m]       | [dBuV/m]      | [dB]           |       |                |                |              |         |
| 1   | 47.719         | 37.20           | 11.89             | 7.62         | 38.89        | 17.82          | 40.00         | 22.18          | Hori. | 100            | 359            | BA           |         |
| 2   | 78.154         | 37.20           | 6.76              | 8.12         | 38.93        | 13.15          | 40.00         | 26.85          | Hori. | 300            | 220            | BA           |         |
| 3   | 130.303        | 37.00           | 13.70             | 8.81         | 38.97        | 20.54          | 43.50         | 22.96          | Hori. | 300            | 85             | BA           |         |
| 4   | 188.360        | 45.50           | 16.36             | 9.46         | 38.97        | 32.35          | 43.50         | 11.15          | Hori. | 100            | 101            | BA           |         |
| 5   | 206.953        | 51.60           | 11.42             | 9.64         | 38.95        | 33.71          | 43.50         | 9.79           | Hori. | 100            | 110            | LA17         |         |
| 6   | 489.712        | 34.40           | 17.60             | 11.87        | 38.41        | 25.46          | 46.00         | 20.54          | Hori. | 100            | 288            | LA17         |         |
| 7   | 47.719         | 48.30           | 11.89             | 7.62         | 38.89        | 28.92          | 40.00         | 11.08          | Vert. | 100            | 357            | BA           |         |
| 8   | 78.154         | 57.20           | 6.76              | 8.12         | 38.93        | 33.15          | 40.00         | 6.85           | Vert. | 100            | 204            | BA           |         |
| 9   | 130.303        | 48.40           | 13.70             | 8.81         | 38.97        | 31.94          | 43.50         | 11.56          | Vert. | 100            | 358            | BA           |         |
| 10  | 188.360        | 47.70           | 16.36             | 9.46         | 38.97        | 34.55          | 43.50         | 8.95           | Vert. | 100            | 22             | BA           |         |
| 11  | 206.953        | 56.80           | 11.42             | 9.64         | 38.95        | 38.91          | 43.50         | 4.59           | Vert. | 100            | 71             | LA17         |         |
| 12  | 489.712        | 47.10           | 17.60             | 11.87        | 38.41        | 38.16          | 46.00         | 7.84           | Vert. | 100            | 312            | LA17         |         |

CHART: WITH FACTOR  
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN  
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + ATT) - GAIN(AMP)  
Except for the above table: adequate margin data below the limits.

Radiated Emission

Test place Ise EMC Lab.  
Semi Anechoic Chamber No.1  
Date August 18, 2024  
Temperature / Humidity 23 deg. C / 43 % RH  
Engineer Ken Fujita  
Mode (Below 1 GHz)  
Mode 3

Limit : FCC\_Part 15 Subpart B(15.109)\_Class B



| No. | Freq.<br>[MHz] | Reading<br>(QP) | Ant.Fac<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Result<br>(QP) | Limit<br>(QP) | Margin<br>(QP) | Pola.<br>[H/V] | Height<br>[cm] | Angle<br>[deg] | Ant.<br>Type | Comment |
|-----|----------------|-----------------|-------------------|--------------|--------------|----------------|---------------|----------------|----------------|----------------|----------------|--------------|---------|
|     |                | [dBuV]          |                   |              |              | [dBuV/m]       | [dBuV/m]      | [dB]           |                |                |                |              |         |
| 1   | 52.375         | 30.30           | 10.18             | 7.70         | 38.89        | 9.29           | 40.00         | 30.71          | Hori.          | 100            | 91             | BA           |         |
| 2   | 91.581         | 35.30           | 8.73              | 8.33         | 38.94        | 13.42          | 43.50         | 30.08          | Hori.          | 300            | 27             | BA           |         |
| 3   | 191.482        | 50.90           | 16.42             | 9.49         | 38.97        | 37.84          | 43.50         | 5.66           | Hori.          | 100            | 284            | BA           |         |
| 4   | 299.426        | 48.80           | 13.62             | 10.48        | 38.74        | 34.16          | 46.00         | 11.84          | Hori.          | 100            | 317            | LA17         |         |
| 5   | 489.502        | 42.10           | 17.60             | 11.87        | 38.41        | 33.16          | 46.00         | 12.84          | Hori.          | 100            | 350            | LA17         |         |
| 6   | 525.992        | 43.50           | 17.65             | 12.10        | 38.36        | 34.89          | 46.00         | 11.11          | Hori.          | 100            | 322            | LA17         |         |
| 7   | 52.375         | 48.70           | 10.18             | 7.70         | 38.89        | 27.69          | 40.00         | 12.31          | Vert.          | 100            | 161            | BA           |         |
| 8   | 91.581         | 41.10           | 8.73              | 8.33         | 38.94        | 19.22          | 43.50         | 24.28          | Vert.          | 100            | 172            | BA           |         |
| 9   | 191.482        | 51.30           | 16.42             | 9.49         | 38.97        | 38.24          | 43.50         | 5.26           | Vert.          | 100            | 215            | BA           |         |
| 10  | 299.426        | 45.50           | 13.62             | 10.48        | 38.74        | 30.86          | 46.00         | 15.14          | Vert.          | 150            | 3              | LA17         |         |
| 11  | 489.502        | 47.60           | 17.60             | 11.87        | 38.41        | 38.66          | 46.00         | 7.34           | Vert.          | 100            | 359            | LA17         |         |
| 12  | 525.992        | 47.00           | 17.65             | 12.10        | 38.36        | 38.39          | 46.00         | 7.61           | Vert.          | 100            | 205            | LA17         |         |

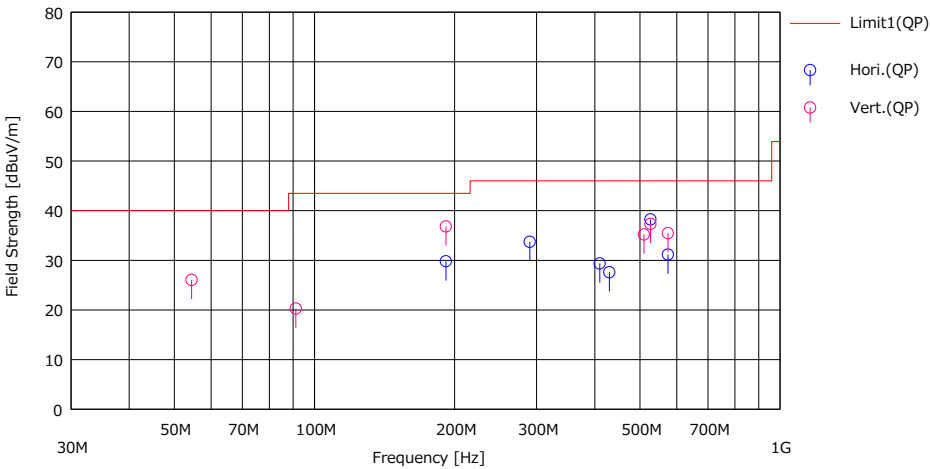
CHART: WITH FACTOR  
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN  
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + ATT) - GAIN(AMP)  
Except for the above table: adequate margin data below the limits.

Radiated Emission

Test place  
Semi Anechoic Chamber  
Date  
Temperature / Humidity  
Engineer  
  
Mode

Ise EMC Lab.  
No.3  
January 9, 2025  
19 deg. C / 38 % RH  
Junya Okuno  
(Below 1 GHz)  
Mode 4

Limit : FCC\_Part 15 Subpart B(15.109)\_Class B



| No. | Freq.<br>[MHz] | Reading | Ant.Fac<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Result   | Limit    | Margin | Polz.<br>[H/V] | Height<br>[cm] | Angle<br>[deg.] | Ant.<br>Type | Comment |
|-----|----------------|---------|-------------------|--------------|--------------|----------|----------|--------|----------------|----------------|-----------------|--------------|---------|
|     |                | [dBuV]  |                   |              |              | [dBuV/m] | [dBuV/m] | [dB]   |                |                |                 |              |         |
| 1   | 191.572        | 36.60   | 16.45             | 8.81         | 32.06        | 29.80    | 43.50    | 13.70  | Hori.          | 328            | 99              | BA           |         |
| 2   | 290.000        | 42.50   | 13.61             | 9.60         | 32.00        | 33.71    | 46.00    | 12.29  | Hori.          | 138            | 350             | LA22         |         |
| 3   | 410.002        | 35.00   | 15.92             | 10.46        | 32.02        | 29.36    | 46.00    | 16.64  | Hori.          | 100            | 238             | LA22         |         |
| 4   | 430.000        | 32.90   | 16.14             | 10.57        | 32.02        | 27.59    | 46.00    | 18.41  | Hori.          | 100            | 235             | LA22         |         |
| 5   | 526.874        | 41.50   | 17.67             | 11.11        | 32.05        | 38.23    | 46.00    | 7.77   | Hori.          | 100            | 195             | LA22         |         |
| 6   | 574.540        | 33.20   | 18.64             | 11.37        | 32.05        | 31.16    | 46.00    | 14.84  | Hori.          | 100            | 199             | LA22         |         |
| 7   | 54.459         | 41.20   | 9.70              | 7.34         | 32.19        | 26.05    | 40.00    | 13.95  | Vert.          | 100            | 260             | BA           |         |
| 8   | 91.190         | 36.00   | 8.62              | 7.82         | 32.16        | 20.28    | 43.50    | 23.22  | Vert.          | 100            | 108             | BA           |         |
| 9   | 191.572        | 43.60   | 16.45             | 8.81         | 32.06        | 36.80    | 43.50    | 6.70   | Vert.          | 100            | 211             | BA           |         |
| 10  | 510.007        | 38.50   | 17.73             | 11.02        | 32.04        | 35.21    | 46.00    | 10.79  | Vert.          | 100            | 350             | LA22         |         |
| 11  | 526.874        | 40.60   | 17.67             | 11.11        | 32.05        | 37.33    | 46.00    | 8.67   | Vert.          | 100            | 225             | LA22         |         |
| 12  | 574.540        | 37.50   | 18.64             | 11.37        | 32.05        | 35.46    | 46.00    | 10.54  | Vert.          | 100            | 282             | LA22         |         |

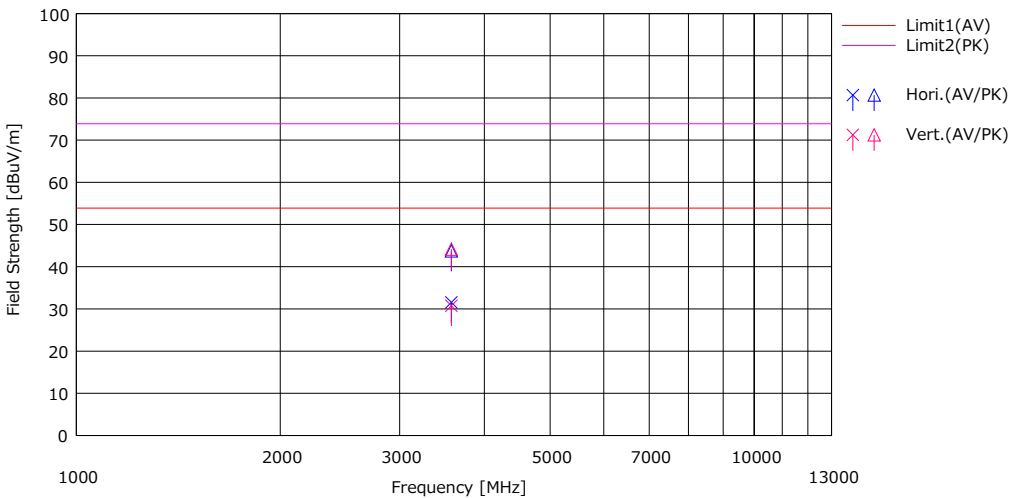
CHART: WITH FACTOR  
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN  
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + ATT) - GAIN(AMP)  
Except for the above table: adequate margin data below the limits.

Radiated Emission

Test place  
Semi Anechoic Chamber  
Date  
Temperature / Humidity  
Engineer  
  
Mode

Ise EMC Lab.  
No.1  
August 18, 2024  
23 deg. C / 43 % RH  
Ken Fujita  
(Above 1 GHz)  
Mode 1

Limit : FCC\_Part 15 Subpart B(15.109)\_Class B



| No. | Freq.<br>[MHz] | Reading        |                | Ant.Fac<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Result           |                  | Limit            |                  | Margin       |              | Pola.<br>[H/V] | Height<br>[cm] | Angle<br>[deg] | Ant.<br>Type | Comment |
|-----|----------------|----------------|----------------|-------------------|--------------|--------------|------------------|------------------|------------------|------------------|--------------|--------------|----------------|----------------|----------------|--------------|---------|
|     |                | <AV><br>[dBuV] | <PK><br>[dBuV] |                   |              |              | <AV><br>[dBuV/m] | <PK><br>[dBuV/m] | <AV><br>[dBuV/m] | <PK><br>[dBuV/m] | <AV><br>[dB] | <PK><br>[dB] |                |                |                |              |         |
| 1   | 3575.245       | 32.50          | 44.70          | 29.21             | 5.69         | 35.86        | 31.54            | 43.74            | 53.90            | 73.90            | 22.36        | 30.16        | Hori.          | 100            | 0              | HA5          |         |
| 2   | 3575.245       | 31.70          | 45.10          | 29.21             | 5.69         | 35.86        | 30.74            | 44.14            | 53.90            | 73.90            | 23.16        | 29.76        | Vert.          | 100            | 0              | HA5          |         |

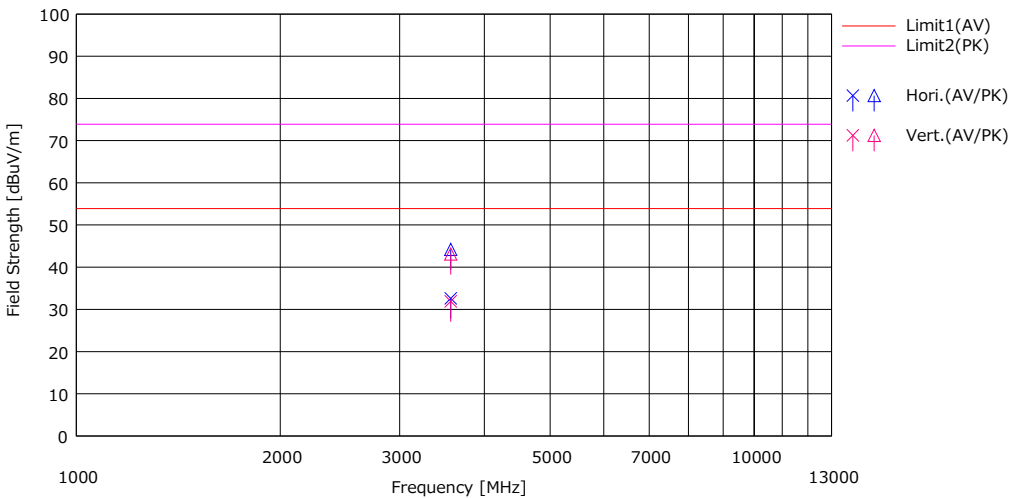
CHART: WITH FACTOR  
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN  
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + D-factor) - GAIN(AMP)  
Except for the above table: adequate margin data below the limits.

Radiated Emission

Test place  
Semi Anechoic Chamber  
Date  
Temperature / Humidity  
Engineer  
  
Mode

Ise EMC Lab.  
No.1  
August 18, 2024  
23 deg. C / 43 % RH  
Ken Fujita  
(Above 1 GHz)  
Mode 2

Limit : FCC\_Part 15 Subpart B(15.109)\_Class B



| No. | Freq.<br>[MHz] | Reading        |                | Ant.Fac<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Result           |                  | Limit            |                  | Margin       |              | Pola.<br>[H/V] | Haght<br>[cm] | Angle<br>[deg] | Ant.<br>Type | Comment |
|-----|----------------|----------------|----------------|-------------------|--------------|--------------|------------------|------------------|------------------|------------------|--------------|--------------|----------------|---------------|----------------|--------------|---------|
|     |                | (AV)<br>[dBuV] | (PK)<br>[dBuV] |                   |              |              | (AV)<br>[dBuV/m] | (PK)<br>[dBuV/m] | (AV)<br>[dBuV/m] | (PK)<br>[dBuV/m] | (AV)<br>[dB] | (PK)<br>[dB] |                |               |                |              |         |
| 1   | 3567.560       | 33.60          | 45.20          | 29.18             | 5.69         | 35.86        | 32.61            | 44.21            | 53.90            | 73.90            | 21.29        | 29.69        | Hori.          | 100           | 0              | HA5          |         |
| 2   | 3567.560       | 32.90          | 44.10          | 29.18             | 5.69         | 35.86        | 31.91            | 43.11            | 53.90            | 73.90            | 21.99        | 30.79        | Vert.          | 100           | 0              | HA5          |         |

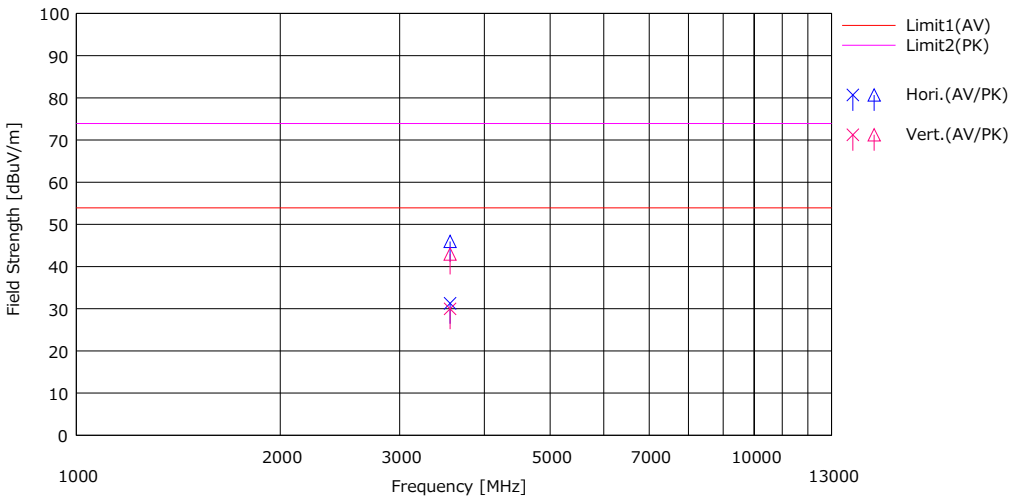
CHART: WITH FACTOR  
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN  
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + D-factor) - GAIN(AMP)  
Except for the above table: adequate margin data below the limits.

Radiated Emission

Test place  
Semi Anechoic Chamber  
Date  
Temperature / Humidity  
Engineer  
  
Mode

Ise EMC Lab.  
No.1  
August 18, 2024  
23 deg. C / 43 % RH  
Ken Fujita  
(Above 1 GHz)  
Mode 3

Limit : FCC\_Part 15 Subpart B(15.109)\_Class B



| No. | Freq.<br>[MHz] | Reading        |                | Ant.Fac<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Result           |                  | Limit            |                  | Margin       |              | Pola.<br>[H/V] | Height<br>[cm] | Angle<br>[deg] | Ant.<br>Type | Comment |
|-----|----------------|----------------|----------------|-------------------|--------------|--------------|------------------|------------------|------------------|------------------|--------------|--------------|----------------|----------------|----------------|--------------|---------|
|     |                | <AV><br>[dBuV] | <PK><br>[dBuV] |                   |              |              | <AV><br>[dBuV/m] | <PK><br>[dBuV/m] | <AV><br>[dBuV/m] | <PK><br>[dBuV/m] | <AV><br>[dB] | <PK><br>[dB] |                |                |                |              |         |
| 1   | 3558.855       | 32.30          | 47.00          | 29.15             | 5.69         | 35.87        | 31.27            | 45.97            | 53.90            | 73.90            | 22.63        | 27.93        | Hori.          | 100            | 0              | HA5          |         |
| 2   | 3558.855       | 31.00          | 44.00          | 29.15             | 5.69         | 35.87        | 29.97            | 42.97            | 53.90            | 73.90            | 23.93        | 30.93        | Vert.          | 100            | 0              | HA5          |         |

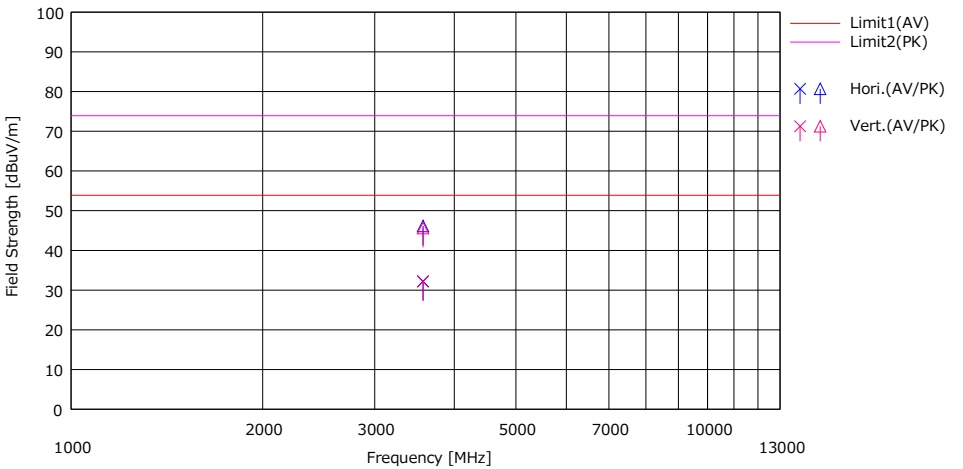
CHART: WITH FACTOR  
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN  
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + D-factor) - GAIN(AMP)  
Except for the above table: adequate margin data below the limits.

Radiated Emission

Test place  
Semi Anechoic Chamber  
Date  
Temperature / Humidity  
Engineer  
  
Mode

Ise EMC Lab.  
No.3  
January 9, 2025  
19 deg. C / 38 % RH  
Junya Okuno  
(Above 1 GHz)  
Mode 4

Limit : FCC\_Part 15 Subpart B(15.109)\_Class B



| No. | Freq.<br>[MHz] | Reading        |                | Ant.Fac<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Result           |                  | Limit            |                  | Margin       |              | Pols<br>[H/V] | Height<br>[cm] | Angle<br>[deg] | Ant.<br>Type | Comment |
|-----|----------------|----------------|----------------|-------------------|--------------|--------------|------------------|------------------|------------------|------------------|--------------|--------------|---------------|----------------|----------------|--------------|---------|
|     |                | (AV)<br>[dBuV] | (PK)<br>[dBuV] |                   |              |              | (AV)<br>[dBuV/m] | (PK)<br>[dBuV/m] | (AV)<br>[dBuV/m] | (PK)<br>[dBuV/m] | (AV)<br>[dB] | (PK)<br>[dB] |               |                |                |              |         |
| 1   | 3572.881       | 29.50          | 43.40          | 29.20             | 5.21         | 31.68        | 32.23            | 46.13            | 53.90            | 73.90            | 21.67        | 27.77        | Hori.         | 100            | 0              | H2O          |         |
| 2   | 3572.881       | 29.40          | 42.90          | 29.20             | 5.21         | 31.68        | 32.13            | 45.63            | 53.90            | 73.90            | 21.77        | 28.27        | Vert.         | 100            | 0              | H2O          |         |

CHART: WITH FACTOR  
ANT TYPE: - 30 MHz: LOOP, 30 MHz - 200 MHz: BICONICAL, 200 MHz - 1000 MHz: LOGPERIODIC, 1000 MHz -: HORN  
CALCULATION: RESULT = READING + ANT FACTOR + LOSS(CABLE + D-factor) - GAIN(AMP)  
Except for the above table: adequate margin data below the limits.

## APPENDIX 2: Test instruments

### Test equipment for RE (for Mode 1 to 3)

| Test Item | LIMS ID | Description                      | Manufacturer                    | Model                     | Serial                        | Last Calibration Date | Cal Int |
|-----------|---------|----------------------------------|---------------------------------|---------------------------|-------------------------------|-----------------------|---------|
| RE        | 141198  | Biconical Antenna                | Schwarzbeck Mess-Elektronik OHG | VHA9103+BBA9106           | 2513                          | 07/10/2024            | 12      |
| RE        | 141213  | Attenuator(6dB)                  | Weinschel Corp                  | 2                         | BK7971                        | 11/16/2023            | 12      |
| RE        | 141350  | Coaxial Cable                    | Suhner/storm/Agilent/TSJ        | -                         | -                             | 03/05/2024            | 12      |
| RE        | 141393  | Microwave Cable                  | Junkosha                        | MWX221                    | 1604S254(1 m) / 1608S088(5 m) | 07/06/2024            | 12      |
| RE        | 141511  | Horn Antenna 1-18GHz             | Schwarzbeck Mess-Elektronik OHG | BBHA9120D                 | 253                           | 09/25/2023            | 12      |
| RE        | 141530  | Digital Tester                   | Fluke Corporation               | FLUKE 26-3                | 78030621                      | 02/01/2024            | 12      |
| RE        | 141568  | Thermo-Hygrometer                | CUSTOM. Inc                     | CTH-201                   | 2901                          | 01/10/2024            | 12      |
| RE        | 141576  | Pre Amplifier                    | Keysight Technologies Inc       | 8449B                     | 3008A01671                    | 02/17/2024            | 12      |
| RE        | 141585  | Pre Amplifier                    | L3 Narda-MITEQ                  | MLA-10K01-B01-35          | 1237616                       | 02/17/2024            | 12      |
| RE        | 141950  | EMI Test Receiver                | Rohde & Schwarz                 | ESU26                     | 100412                        | 11/20/2023            | 12      |
| RE        | 141994  | AC1_Semi Anechoic Chamber(SVSWR) | TDK                             | Semi Anechoic Chamber 10m | DA-06881                      | 04/20/2023            | 24      |
| RE        | 141998  | AC1_Semi Anechoic Chamber(NSA)   | TDK                             | Semi Anechoic Chamber 10m | DA-06881                      | 12/06/2023            | 24      |
| RE        | 142226  | Measure, Tape, Steel             | KOMELON                         | KMC-36                    | -                             | -                     | -       |
| RE        | 160924  | Logperiodic Antenna              | Schwarzbeck Mess-Elektronik OHG | VUSLP9111B                | 225                           | 11/29/2023            | 12      |
| RE        | 178648  | EMI measurement program          | TSJ (Techno Science Japan)      | TEPTO-DV                  | -                             | -                     | -       |
| RE        | 238712  | Double Ridge Horn Antenna        | Schwarzbeck Mess-Elektronik OHG | BBHA 9120 C               | 687                           | 08/10/2023            | 12      |

### Test equipment for RE (for Mode 4)

| Test Item | LIMS ID | Description                       | Manufacturer                    | Model                                       | Serial                  | Last Calibration Date | Cal Int |
|-----------|---------|-----------------------------------|---------------------------------|---------------------------------------------|-------------------------|-----------------------|---------|
| RE        | 141266  | Logperiodic Antenna (200-1000MHz) | Schwarzbeck Mess-Elektronik OHG | VUSLP9111B                                  | 9111B-191               | 08/23/2024            | 12      |
| RE        | 141323  | Coaxial cable                     | UL-ISE                          | -                                           | -                       | 09/13/2024            | 12      |
| RE        | 141424  | Biconical Antenna                 | Schwarzbeck Mess-Elektronik OHG | VHA9103+BBA9106                             | 1915                    | 03/15/2024            | 12      |
| RE        | 141507  | Horn Antenna 1-18GHz              | Schwarzbeck Mess-Elektronik OHG | BBHA9120D                                   | 258                     | 11/11/2024            | 12      |
| RE        | 141532  | DIGITAL HiTESTER                  | HIOKI E.E. CORPORATION          | 3805                                        | 051201197               | 01/16/2025            | 12      |
| RE        | 141580  | MicroWave System Amplifier        | Keysight Technologies Inc       | 83017A                                      | MY39500779              | 03/08/2024            | 12      |
| RE        | 141582  | Pre Amplifier                     | SONOMA INSTRUMENT               | 310                                         | 260834                  | 02/17/2024            | 12      |
| RE        | 141951  | EMI Test Receiver                 | Rohde & Schwarz                 | ESR26                                       | 101408                  | 05/17/2024            | 12      |
| RE        | 142008  | AC3_Semi Anechoic Chamber(NSA)    | TDK                             | Semi Anechoic Chamber 3m                    | DA-10005                | 12/11/2023            | 24      |
| RE        | 142013  | AC3_Semi Anechoic Chamber(SVSWR)  | TDK                             | Semi Anechoic Chamber 3m                    | DA-10005                | 04/12/2023            | 24      |
| RE        | 142183  | Measure                           | KOMELON                         | KMC-36                                      | -                       | 10/21/2024            | 12      |
| RE        | 142314  | Attenuator                        | Pasternack Enterprises          | PE7390-6                                    | D/C 1504                | 06/06/2024            | 12      |
| RE        | 178648  | EMI measurement program           | TSJ (Techno Science Japan)      | TEPTO-DV                                    | -                       | -                     | -       |
| RE        | 244709  | Thermo-Hygrometer                 | HIOKI E.E. CORPORATION          | LR5001                                      | 231202103               | 01/19/2025            | 12      |
| RE        | 245787  | Double Ridge Horn Antenna         | Schwarzbeck Mess-Elektronik OHG | BBHA 9120 C                                 | 689                     | 03/06/2024            | 12      |
| RE        | 246001  | Microwave Cable                   | Huber+Suhner                    | SF103/11PC35/ 11PC35/1000mm / SF126E/5000mm | 800673(1m) / 610204(5m) | 03/06/2024            | 12      |

#### Test equipment for CE

| Test Item | LIMS ID | Description                    | Manufacturer                    | Model                                            | Serial    | Last Calibration Date | Cal Int |
|-----------|---------|--------------------------------|---------------------------------|--------------------------------------------------|-----------|-----------------------|---------|
| CE        | 141217  | Coaxial cable                  | Fujikura/Suhner/TSJ             | 5D-2W/SFM141/421-010/sucoform141-PE/RFM-E121(SW) | -/04178   | 06/14/2024            | 12      |
| CE        | 141290  | Attenuator(13dB)               | JFW Industries, Inc.            | 50FP-013H2 N                                     | -         | 12/10/2024            | 12      |
| CE        | 141357  | LISN(AMN)                      | Schwarzbeck Mess-Elektronik OHG | NSLK8127                                         | 8127-729  | 07/09/2024            | 12      |
| CE        | 141545  | DIGITAL HiTESTER               | HIOKI E.E. CORPORATION          | 3805                                             | 51201148  | 02/01/2024            | 12      |
| CE        | 141949  | Test Receiver                  | Rohde & Schwarz                 | ESCI                                             | 100767    | 06/05/2024            | 12      |
| CE        | 142011  | AC4_Semi Anechoic Chamber(NSA) | TDK                             | Semi Anechoic Chamber 3m                         | DA-10005  | 12/13/2023            | 24      |
| CE        | 142230  | Measure, Tape, Steel           | KOMELON                         | KMC-36                                           | -         | -                     | -       |
| CE        | 178648  | EMI measurement program        | TSJ<br>(Techno Science Japan)   | TEPTO-DV                                         | -         | -                     | -       |
| CE        | 244710  | Thermo-Hygrometer              | HIOKI E.E. CORPORATION          | LR5001                                           | 231202104 | 01/25/2024            | 12      |

\*Hyphens for Last Calibration Date and Cal Int (month) are instruments that Calibration is not required (e.g. software), or instruments checked in advance before use.

The expiration date of the calibration is the end of the expired month.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

Test item:

CE: Conducted emission  
RE: Radiated emission