

## Report on the EMC Testing of:

KYOCERA Corporation  
Mobile Phone, Model: EB1136

## In accordance with FCC Part 15 Subpart B Class B

Prepared for: KYOCERA Corporation  
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Japan

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## COMMERCIAL-IN-CONFIDENCE

Document Number: JPD-TR-22175-0

### SIGNATURE

| NAME           | JOB TITLE                  | RESPONSIBLE FOR    | ISSUE DATE |
|----------------|----------------------------|--------------------|------------|
| Hiroaki Suzuki | Deputy Manager of RF Group | Approved Signatory |            |

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD Japan Ltd. document control rules.

### EXECUTIVE SUMMARY – Result: Complied

A sample of this product was tested and the result above was confirmed in accordance with FCC Part 15 Subpart B (excluding the deviations mentioned in section 1.4 of this document).



Certificate #3686.03

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**Additional signatures required by FCC 47 CFR Part 2, § 2.938 (b) (10)****Signatures of the individuals responsible for testing the product****ENGINEERING STATEMENT**

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC Part 15 Subpart B. The sample tested was found Complied compliant with the requirements defined in the applied rules.

| NAME             | RESPONSIBLE FOR | SIGNATURE |
|------------------|-----------------|-----------|
| Tsuyoshi Okumura | Testing         |           |
| Nobuhiko Iwasawa | Testing         |           |

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## 1 Summary of Test

### 1.1 Modification history of the test report

| Document Number | Modification History | Issue Date              |
|-----------------|----------------------|-------------------------|
| JPD-TR-22175-0  | First Issue          | Refer to the cover page |

### 1.2 Standards

FCC Part 15 Subpart B

### 1.3 Measurement standards

ANSI C63.4 2014

### 1.4 Deviation from standards

None

### 1.5 List of applied test(s) of the EUT

Regarding judgment of conformance to Emission test, a value of measurement uncertainty was not taken in account.

| Test Name                        | Classification of EUT | Test    | Worst Point (Margin)                                                                  | Result | Remarks |
|----------------------------------|-----------------------|---------|---------------------------------------------------------------------------------------|--------|---------|
| Conducted emission at mains port | Class B               | Applied | S/N: 354649890001379, Case 2<br>MP4 + USB Read with PC mode<br>L2 0.150 MHz QP 8.9 dB | Pass   | -       |
| Radiated emission (below 1 GHz)  | Class B               | Applied | S/N: 354649890001379, Case2<br>Out Camera with ADP mode<br>V 63.320 MHz QP 7.6 dB     | Pass   | -       |
| Radiated emission (above 1 GHz)  | Class B               | Applied | S/N: 354649890001379, Case2<br>Out Camera with ADP mode<br>V 2880.001 MHz AV 11.0 dB  | Pass   | -       |

## 1.6 Test information

EB1136 is a model with the following changes to EB1134 (Test Report JPD-TR-22048-0).

- a. Change the shape of the LED display on the back of the LCD
- b. Addition of LED Driver, memory and LCD vendors

Case 1 has been pre-tested with EB1134.

|            | Case1<br>(Base pattern) | Case 2           | Case 3            | Case 4           |
|------------|-------------------------|------------------|-------------------|------------------|
| LCD        | Sitronix                | ILITEK           | Sitronix          | Sitronix         |
| LED Driver | On Semiconductor        | On Semiconductor | Texas Instruments | On Semiconductor |
| Memory     | Samsung                 | Samsung          | Samsung           | Nanya            |

The following EMC test conditions were applied based on the conditions specified by the applicant.

- Tested supply voltage and supply frequency
- Operation mode

## 1.7 Test set up

Table-top

## 1.8 Test period

29-September-2022 - 01-October-2022

## 2 Equipment Under Test

All information in this chapter was provided by the applicant.

### 2.1 EUT information

|                            |                                                                                                                                                             |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Applicant                  | KYOCERA Corporation<br>Yokohama Office 2-1-1 Kagahara, Tsuzuki-ku, Yokohama-shi,<br>Kanagawa, 224-8502 Japan<br>Phone: +81-45-943-6253 Fax: +81-45-943-6314 |
| Equipment Under Test (EUT) | Mobile Phone                                                                                                                                                |
| Model number               | EB1136                                                                                                                                                      |
| Serial number              | 354649890001379, 354649890001387, 354649890001395                                                                                                           |
| Trade name                 | KYOCERA                                                                                                                                                     |
| Authorization              | JOYEB1136                                                                                                                                                   |
| Number of sample(s)        | 3                                                                                                                                                           |
| EUT condition              | Pre-production                                                                                                                                              |
| Maximum frequency          | 2000 MHz                                                                                                                                                    |
| Power rating               | Battery: DC 3.8 V                                                                                                                                           |
| Size                       | (W) 112.9 × (D) 51.3 × (H) 18.1 mm                                                                                                                          |

### 2.2 Modification to the EUT

The table below details modifications made to the EUT during the test project.

| Modification State           | Description of Modification  | Modification fitted by | Date of Modification |
|------------------------------|------------------------------|------------------------|----------------------|
| EB1136, S/N: 354649890001379 |                              |                        |                      |
| 0                            | As supplied by the applicant | Not Applicable         | Not Applicable       |
| EB1136, S/N: 354649890001387 |                              |                        |                      |
| 0                            | As supplied by the applicant | Not Applicable         | Not Applicable       |
| EB1136, S/N: 354649890001395 |                              |                        |                      |
| 0                            | As supplied by the applicant | Not Applicable         | Not Applicable       |

### 2.3 Variation of family model(s)

#### 2.3.1 List of family model(s)

Not applicable

#### 2.3.2 Reason for selection of EUT

Not applicable



Japan

## **2.4 Operation mode**

1. Out Camera with ADP mode
  - i) Power ON
  - ii) Record
  
2. MP4 + USB Read with PC mode
  - i) Power ON
  - ii) EUT connects to PC via USB cable
  - iii) Read / write of MP4 moving picture data
  - iv) Execution of Color Bar moving picture data

### 3 Configuration of Equipment

Numbers assigned to equipment or cables in "3.1 Equipment(s) used" and "3.2 Cable(s) used" correspond to numbers in "3.3 System configuration".

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

#### 3.1 Equipment used

| No.  | Equipment         | Company | Model No.          | Serial No.              | FCC ID /DoC | Remarks |
|------|-------------------|---------|--------------------|-------------------------|-------------|---------|
| EUT1 | Mobile Phone      | KYOCERA | EB1136             | 354649890001379         | JOYEB1036   | EUT, *3 |
|      |                   |         |                    | 354649890001387         | JOYEB1036   | EUT, *4 |
|      |                   |         |                    | 354649890001395         | JOYEB1036   | EUT, *5 |
| AE1  | AC adapter        | KDDI    | 0602PQA            | NKA                     | N/A         | *1      |
| AE2  | Personal Computer | Lenovo  | Lenovo G570 (4334) | CB07410173              | DoC         | *2      |
| AE3  | AC adapter        | Lenovo  | CPA-A065           | 11S36001943ZZ2001 1I16S | N/A         | *2      |

\*1: AC adapter is connected to keep operating.

\*2: The property of TÜV SÜD Japan was used.

\*3: Case2: Vendor of LCD: ILITEK, Vendor of LED driver: On Semiconductor, Vendor of Memory: Samsung

\*4: Case3: Vendor of LCD: Sitronix, Vendor of LED driver: Texas Instruments, Vendor of Memory: Samsung

\*5: Case4: Vendor of LCD: Sitronix, Vendor of LED driver: On Semiconductor, Vendor of Memory: Nanya

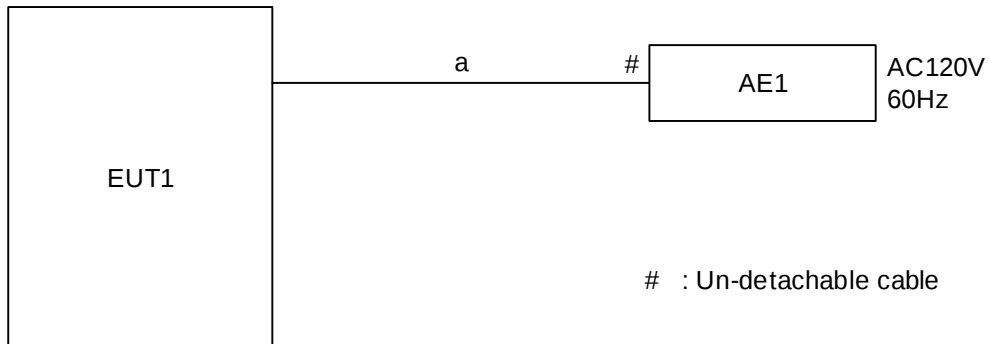
#### 3.2 Cable(s) used

| No. | Cable                           | Length (m) | Shield | EUT accessory Ferrite core | Remarks |
|-----|---------------------------------|------------|--------|----------------------------|---------|
| a   | DC cable                        | 1.5        | Yes    | -                          | -       |
| b   | DC cable for PC AC adapter      | 1.8        | No     | -                          | *1      |
| c   | AC power cord for PC AC adapter | 1.0        | No     | -                          | *1      |
| d   | USB cable                       | 1.0        | Yes    | -                          | -       |

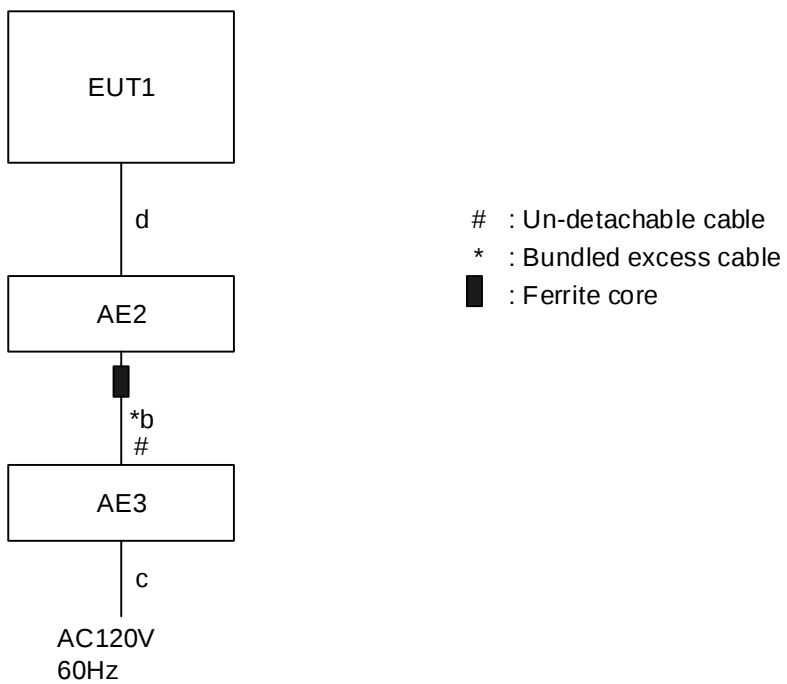
\*1: The property of TÜV SÜD Japan was used.

### 3.3 System configuration

#### 1. Out Camera with ADP mode



#### 2. MP4 + USB Read with PC mode



## 4 Test Result

### 4.1 Conducted emission at mains port

#### 4.1.1 Measurement condition

|                                             |                                                       |
|---------------------------------------------|-------------------------------------------------------|
| Frequency range                             | 0.15 MHz-30 MHz                                       |
| Test place                                  | 10 m Semi-Anechoic Chamber No. 1                      |
| EUT was placed on                           | Styrene foam table (W) 2.0 × (D) 1.0 × (H) 0.8 m      |
| Metal reference plane                       | Vertical                                              |
| Test receiver setting                       | Detector: Quasi-peak, Average<br>Bandwidth: 9 kHz     |
| Line Impedance Stabilization Network (LISN) | Specification: 50 Ω/50 μH<br>Distance from EUT: 0.8 m |

EUT is placed on a non-conducting table for table-top equipment or on insulation material for a floor-standing equipment. In addition, a table-top equipment is located 0.4 m to a metal reference plane.

Line Impedance Stabilization Network (LISN) is placed 0.8 m away from the EUT. The power code of the EUT is connected to LISN and its excess part is bundled in the center. The length of bundling is 0.3-0.4 m.

A power code of a peripheral is connected to LISN and terminated into 50 Ω.

Excess cables between equipment are bundled in the center. The length of bundling is 0.3-0.4 m.

Where LISN cannot be applied, the test is performed using a voltage probe.

After overall frequency range is investigated with spectrum analyzer using peak detector, measurements are performed with test receiver in setting to the defined values.

#### 4.1.2 Calculation method

Emission Level = Reading + Factor\*

Margin = Limit – Emission Level

\*Note: Factor = AMN factor + Cable system loss + ATT. loss

Example)

Limit @ 6.770 MHz: 60.0 dBμV (Quasi-peak)  
50.0 dBμV (Average)

Quasi-peak      Reading = 41.2 dBμV      Factor = 10.3 dB  
Emission level = 41.2 + 10.3 = 51.5 dBμV  
Margin = 60.0 - 51.5 = 8.5 dB

Average      Reading = 35.0 dBμV      Factor = 10.3 dB  
Emission level = 35.0 + 10.3 = 45.3 dBμV  
Margin = 50.0 - 45.3 = 4.7 dB

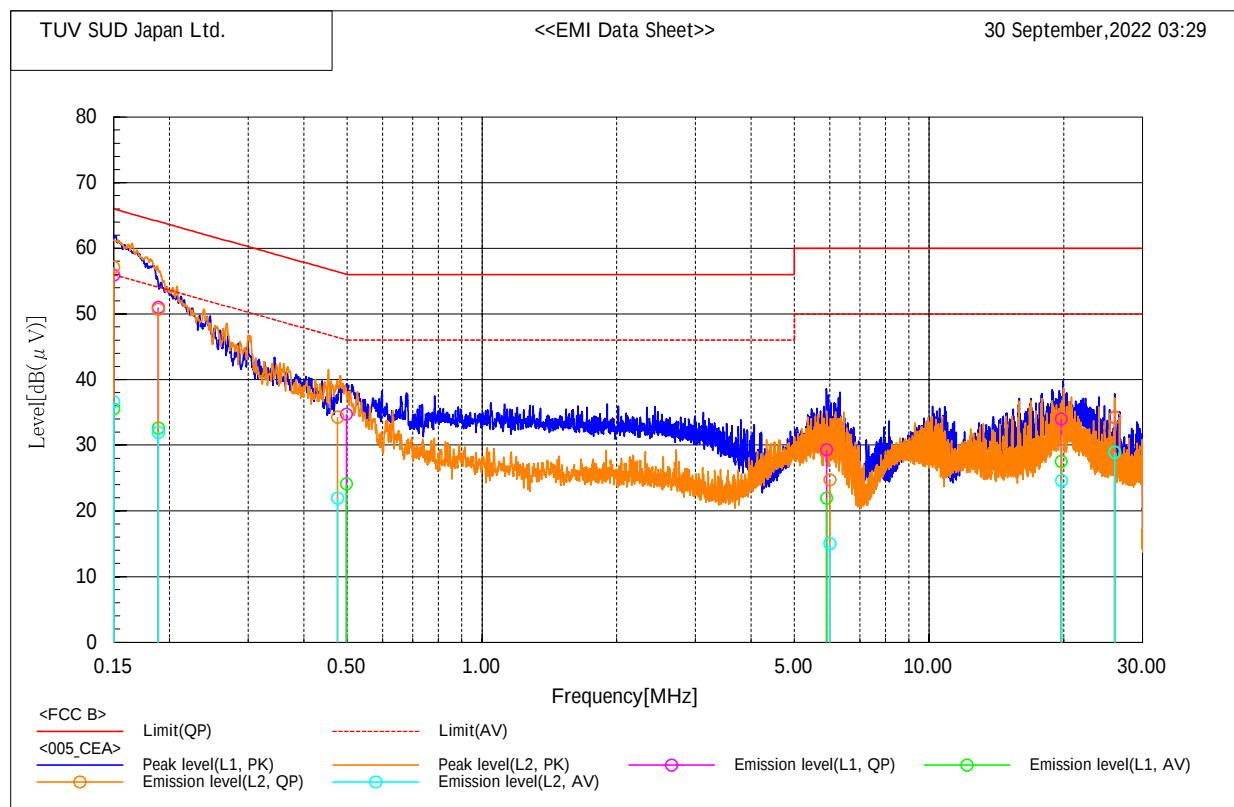
### 4.1.3 Test data and Configuration photographs

|                |                                                     |
|----------------|-----------------------------------------------------|
| Operation mode | MP4 + USB Read with PC mode                         |
| EUT            | EB1136, S/N: 354649890001379 - Modification State 0 |

S/N: 354649890001379, Case 2

Standard : FCC Part 15 Class B  
 Date of test : 30 September, 2022 03:29  
 Operator : Tsuyoshi Okumura  
 Temp, Hum, Atm : 21.6 [°C], 56.2 [%], 987 [hPa]  
 Supply power : AC 120 V, 60 Hz, 1 phase

\*\*\*\*\* CONDUCTED EMISSION \*\*\*\*\*  
 [ 10m Semi-anechoic chamber #1 ]



### Final Result

| Line | Frequency<br>MHz | Reading<br>dB(μV) |      | Factor<br>dB | Level<br>dB(μV) |      | Limit<br>dB(μV) |      | Margin<br>dB |      |
|------|------------------|-------------------|------|--------------|-----------------|------|-----------------|------|--------------|------|
|      |                  | QP                | CAV  |              | QP              | CAV  | QP              | AV   | QP           | AV   |
| L1   | 0.150            | 45.4              | 25.0 | 10.5         | 55.9            | 35.5 | 66.0            | 56.0 | 10.1         | 20.5 |
| L1   | 0.189            | 40.6              | 22.2 | 10.4         | 51.0            | 32.6 | 64.1            | 54.1 | 13.1         | 21.5 |
| L1   | 0.498            | 24.4              | 13.8 | 10.3         | 34.7            | 24.1 | 56.0            | 46.0 | 21.3         | 21.9 |
| L1   | 5.903            | 18.6              | 11.2 | 10.7         | 29.3            | 21.9 | 60.0            | 50.0 | 30.7         | 28.1 |
| L1   | 19.749           | 22.8              | 16.3 | 11.2         | 34.0            | 27.5 | 60.0            | 50.0 | 26.0         | 22.5 |
| L1   | 26.000           | 23.0              | 17.7 | 11.3         | 34.3            | 29.0 | 60.0            | 50.0 | 25.7         | 21.0 |
| L2   | 0.150            | 46.6              | 26.1 | 10.5         | 57.1            | 36.6 | 66.0            | 56.0 | 8.9          | 19.4 |
| L2   | 0.189            | 40.3              | 21.5 | 10.4         | 50.7            | 31.9 | 64.1            | 54.1 | 13.4         | 22.2 |
| L2   | 0.476            | 24.0              | 11.6 | 10.3         | 34.3            | 21.9 | 56.4            | 46.4 | 22.1         | 24.5 |
| L2   | 5.998            | 14.0              | 4.3  | 10.7         | 24.7            | 15.0 | 60.0            | 50.0 | 35.3         | 35.0 |
| L2   | 19.797           | 20.3              | 13.3 | 11.3         | 31.6            | 24.6 | 60.0            | 50.0 | 28.4         | 25.4 |
| L2   | 26.000           | 22.7              | 17.4 | 11.5         | 34.2            | 28.9 | 60.0            | 50.0 | 25.8         | 21.1 |

## 4.2 Radiated emission (below 1 GHz)

### 4.2.1 Measurement condition

|                       |                                                                          |
|-----------------------|--------------------------------------------------------------------------|
| Frequency range       | 30 MHz-1000 MHz                                                          |
| Test place            | 10 m Semi-Anechoic Chamber No. 1                                         |
| EUT was placed on     | Styrene foam table (W) 2.0 × (D) 1.0 × (H) 0.8 m                         |
| Axis                  | 0°-360°                                                                  |
| Antenna               | Distance from EUT: 3 m<br>Height: 1-4 m<br>Polarity: Horizontal/Vertical |
| Test receiver setting | Detector: Quasi-peak<br>Bandwidth: 120 kHz                               |

EUT is placed on a non-conducting table for table-top equipment or on insulation material for a floor-standing equipment. The non-conducting table or the insulation material is placed on a rotating turn table.

Excess cables between equipment are bundled in the center. The length of bundling is 0.3-0.4 m.

An antenna is adjusted between 1-4 m in height and varied its polarization (horizontal and vertical), and the EUT azimuth is varied by the rotating turntable 0 to 360 degrees.

After overall frequency range is investigated with spectrum analyzer using peak detector, measurements are performed with test receiver in setting to the defined values.

### 4.2.2 Calculation method

Emission level = Reading + Factor\*

Margin = Limit - Emission level

\*Note: Factor = Antenna factor + Cable system loss + ATT. loss - Amplifier Gain

Example)

Limit @ 350.0 MHz: 37.0 dB $\mu$ V/m (Quasi-peak)

Quasi-peak      Reading = 41.1 dB $\mu$ V      Factor = -11.8 dB/m  
Emission level = 41.1 - 11.8 = 29.3 dB $\mu$ V/m  
Margin = 37.0 - 29.3 = 7.7 dB

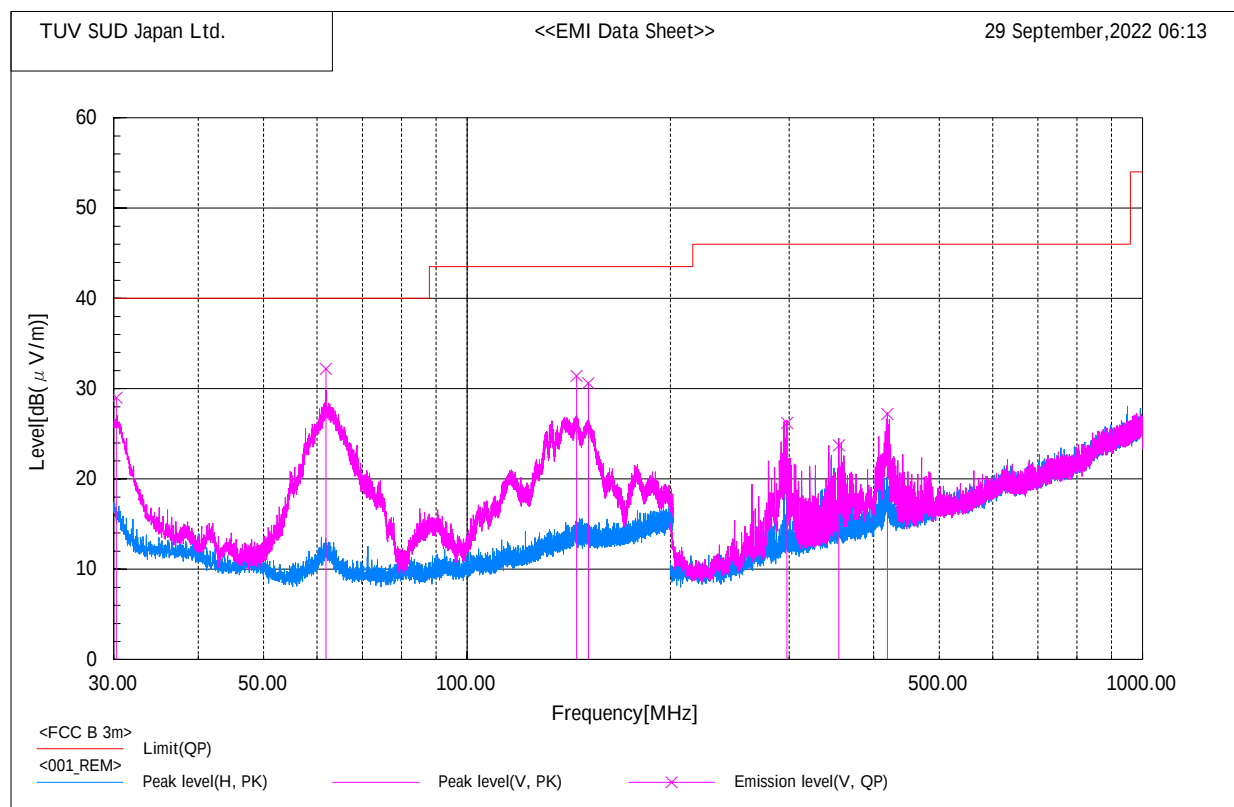
### 4.2.3 Test data and Configuration photographs

|                |                                                                                                                                                                   |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Operation mode | Out Camera with ADP mode                                                                                                                                          |
| EUT            | EB1136, S/N: 354649890001379 - Modification State 0<br>EB1136, S/N: 354649890001387 - Modification State 0<br>EB1136, S/N: 354649890001395 - Modification State 0 |

S/N: 354649890001387, Case 3

Standard : FCC Part 15 Class B  
 Date of test : 29 September, 2022 06:13  
 Operator : Tsuyoshi Okumura  
 Temp, Hum, Atm : 21.9 [°C], 57.8 [%], 983 [hPa]  
 Supply power : DC 5 V

\*\*\*\*\* RADIATED EMISSION \*\*\*\*\*  
 [ 10m Semi-anechoic chamber #1 ]



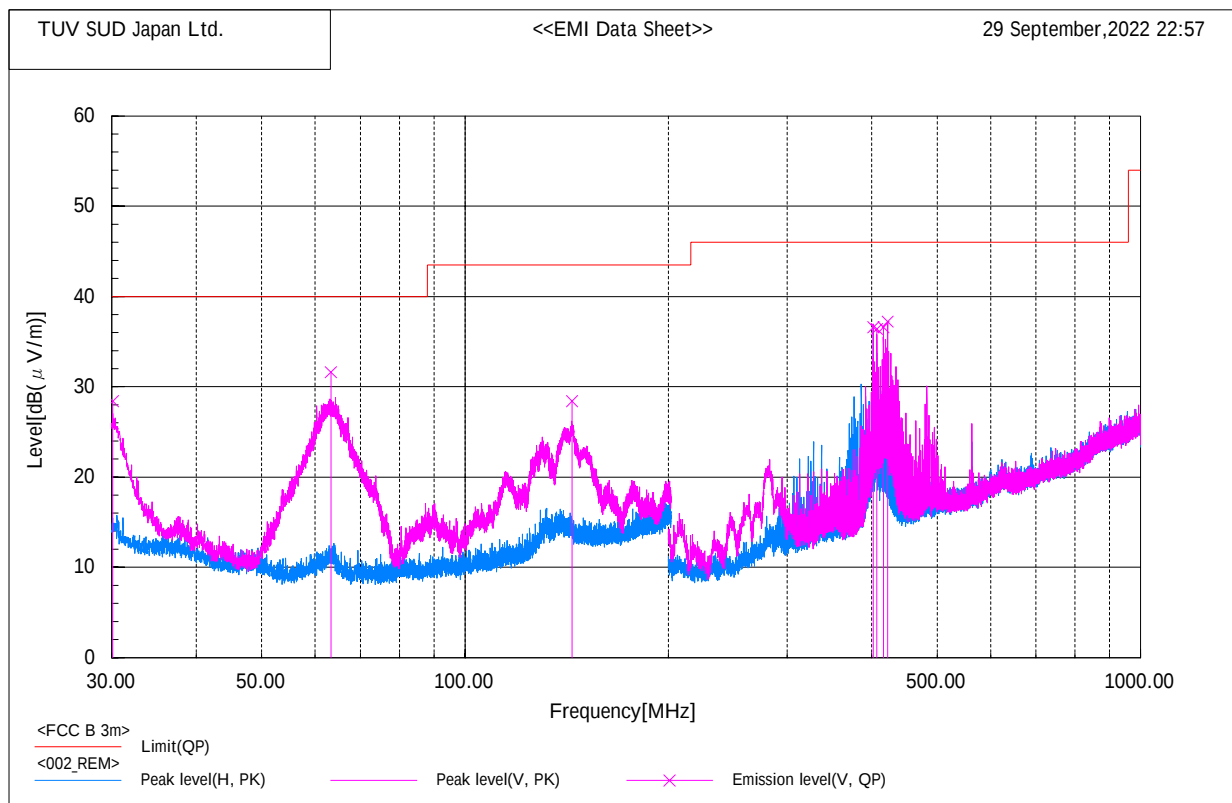
### Final Result

| Frequency | Pol. | Reading | Factor  | Level    | Limit    | Margin | Height | Angle |
|-----------|------|---------|---------|----------|----------|--------|--------|-------|
| MHz       |      | dB(μV)  | dB(1/m) | dB(μV/m) | dB(μV/m) | dB     | cm     | deg   |
|           |      | QP      |         | QP       | QP       | QP     |        |       |
| 30.274    | V    | 41.8    | -12.8   | 29.0     | 40.0     | 11.0   | 100.0  | 63.0  |
| 61.818    | V    | 49.2    | -17.0   | 32.2     | 40.0     | 7.8    | 100.0  | 167.0 |
| 145.245   | V    | 44.5    | -13.1   | 31.4     | 43.5     | 12.1   | 100.0  | 108.0 |
| 151.255   | V    | 43.4    | -12.8   | 30.6     | 43.5     | 12.9   | 100.0  | 161.0 |
| 297.620   | V    | 39.6    | -13.4   | 26.2     | 46.0     | 19.8   | 165.0  | 179.0 |
| 355.330   | V    | 35.3    | -11.6   | 23.7     | 46.0     | 22.3   | 150.0  | 46.0  |
| 419.106   | V    | 37.5    | -10.3   | 27.2     | 46.0     | 18.8   | 152.0  | 12.0  |

S/N: 354649890001395, Case 4

Standard : FCC Part 15 Class B  
 Date of test : 29 September, 2022 22:57  
 Operator : Tsuyoshi Okumura  
 Temp, Hum, Atm : 21.6 [°C], 56.2 [%], 987 [hPa]  
 Supply power : DC 5 V

\*\*\*\*\* RADIATED EMISSION \*\*\*\*\*  
 [ 10m Semi-anechoic chamber #1 ]

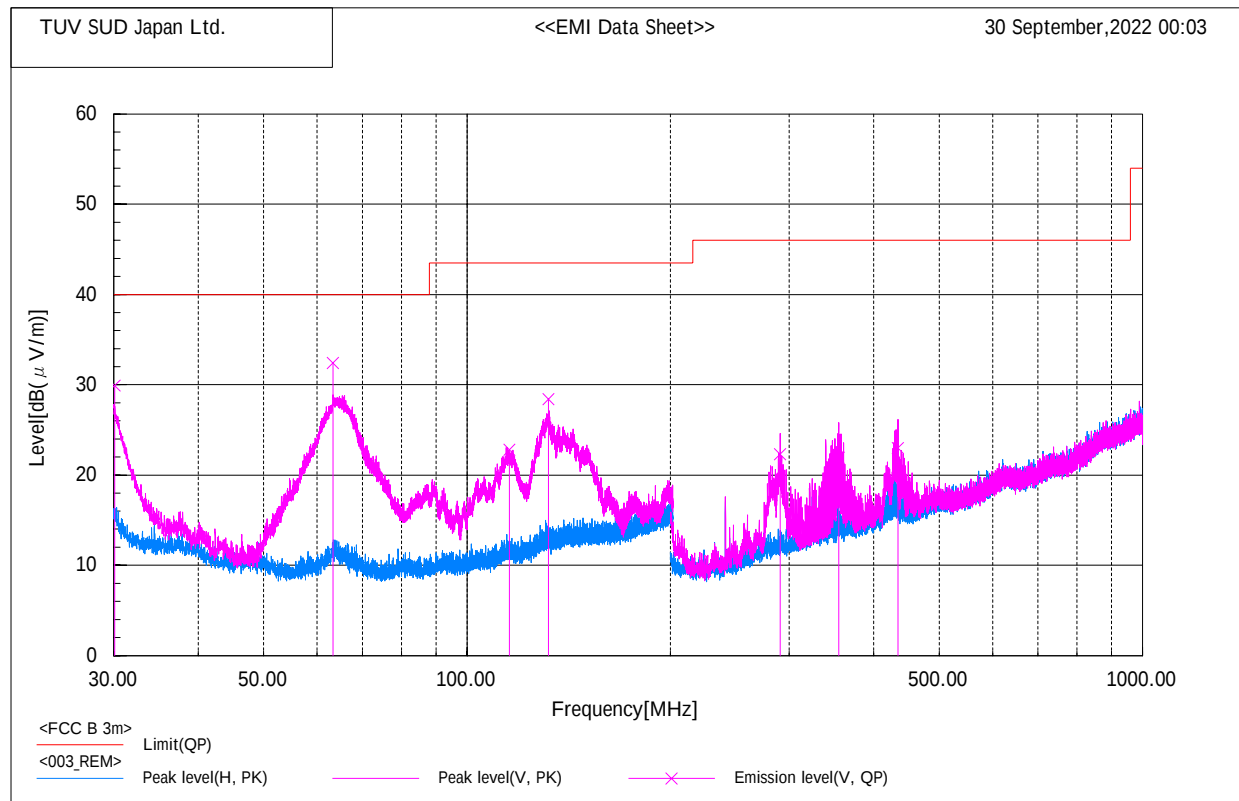
**Final Result**

| Frequency | Pol. | Reading | Factor  | Level    | Limit    | Margin | Height | Angle |
|-----------|------|---------|---------|----------|----------|--------|--------|-------|
| MHz       |      | dB(μV)  |         | dB(μV/m) | dB(μV/m) | dB     | cm     | deg   |
|           |      | QP      | dB(1/m) | QP       | QP       | QP     |        |       |
| 30.096    | V    | 41.1    | -12.7   | 28.4     | 40.0     | 11.6   | 100.0  | 119.0 |
| 63.293    | V    | 48.6    | -17.0   | 31.6     | 40.0     | 8.4    | 100.0  | 174.0 |
| 144.095   | V    | 41.5    | -13.1   | 28.4     | 43.5     | 15.1   | 100.0  | 144.0 |
| 402.200   | V    | 47.3    | -10.7   | 36.6     | 46.0     | 9.4    | 151.0  | 210.0 |
| 407.140   | V    | 47.0    | -10.6   | 36.4     | 46.0     | 9.6    | 131.0  | 147.0 |
| 416.256   | V    | 47.0    | -10.4   | 36.6     | 46.0     | 9.4    | 113.0  | 147.0 |
| 422.311   | V    | 47.4    | -10.2   | 37.2     | 46.0     | 8.8    | 128.0  | 149.0 |

S/N: 354649890001379, Case 2

Standard : FCC Part 15 Class B  
 Date of test : 30 September, 2022 00:03  
 Operator : Tsuyoshi Okumura  
 Temp, Hum, Atm : 21.6 [°C], 56.2 [%], 987 [hPa]  
 Supply power : DC 5 V

\*\*\*\*\* RADIATED EMISSION \*\*\*\*\*  
 [ 10m Semi-anechoic chamber #1 ]

**Final Result**

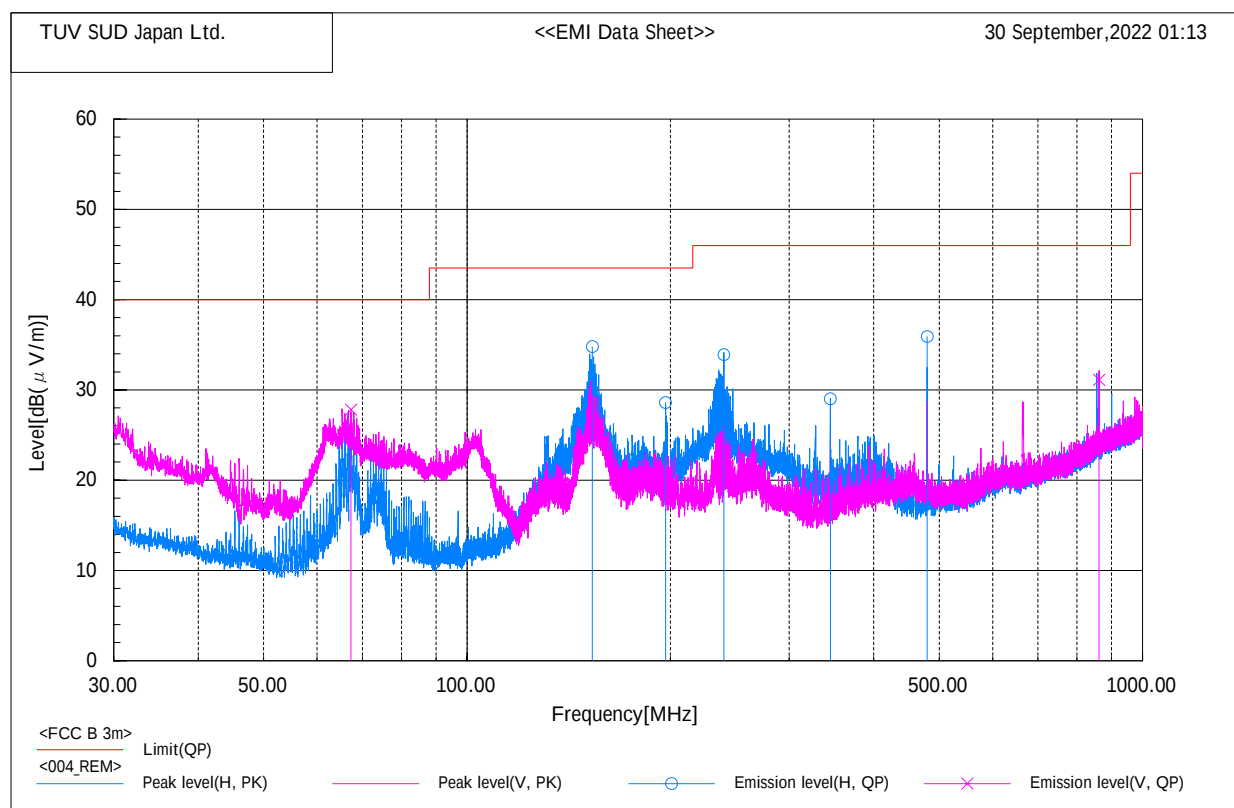
| Frequency | Pol. | Reading | Factor  | Level    | Limit    | Margin | Height | Angle |
|-----------|------|---------|---------|----------|----------|--------|--------|-------|
| MHz       |      | dB(μV)  | dB(1/m) | dB(μV/m) | dB(μV/m) | dB     | cm     | deg   |
|           |      | QP      |         | QP       | QP       | QP     |        |       |
| 30.080    | V    | 42.6    | -12.7   | 29.9     | 40.0     | 10.1   | 100.0  | 107.0 |
| 63.320    | V    | 49.4    | -17.0   | 32.4     | 40.0     | 7.6    | 100.0  | 168.0 |
| 115.541   | V    | 37.6    | -14.8   | 22.8     | 43.5     | 20.7   | 100.0  | 145.0 |
| 131.967   | V    | 42.2    | -13.8   | 28.4     | 43.5     | 15.1   | 100.0  | 189.0 |
| 290.738   | V    | 35.8    | -13.5   | 22.3     | 46.0     | 23.7   | 172.0  | 182.0 |
| 355.055   | V    | 33.5    | -11.6   | 21.9     | 46.0     | 24.1   | 100.0  | 216.0 |
| 434.562   | V    | 33.0    | -10.0   | 23.0     | 46.0     | 23.0   | 172.0  | 146.0 |

|                |                                                     |
|----------------|-----------------------------------------------------|
| Operation mode | MP4 + USB Read with PC mode                         |
| EUT            | EB1136, S/N: 354649890001379 - Modification State 0 |

S/N: 354649890001379, Case 2

Standard : FCC Part 15 Class B  
 Date of test : 30 September, 2022 01:13  
 Operator : Tsuyoshi Okumura  
 Temp, Hum, Atm : 21.6 [°C], 56.2 [%], 987 [hPa]  
 Supply power : AC 120 V, 60 Hz, 1 phase

\*\*\*\*\* RADIATED EMISSION \*\*\*\*\*  
 [ 10m Semi-anechoic chamber #1 ]

**Final Result**

| Frequency | Pol. | Reading | Factor  | Level    | Limit    | Margin | Height | Angle |
|-----------|------|---------|---------|----------|----------|--------|--------|-------|
| MHz       |      | dB(μV)  |         | dB(μV/m) | dB(μV/m) | dB     | cm     | deg   |
|           |      | QP      | dB(1/m) | QP       | QP       | QP     |        |       |
| 67.343    | V    | 44.8    | -17.0   | 27.8     | 40.0     | 12.2   | 100.0  | 199.0 |
| 153.332   | H    | 47.5    | -12.7   | 34.8     | 43.5     | 8.7    | 219.0  | 216.0 |
| 196.760   | H    | 39.2    | -10.6   | 28.6     | 43.5     | 14.9   | 187.0  | 191.0 |
| 240.000   | H    | 49.7    | -15.8   | 33.9     | 46.0     | 12.1   | 208.0  | 4.0   |
| 345.000   | H    | 40.8    | -11.8   | 29.0     | 46.0     | 17.0   | 100.0  | 170.0 |
| 480.000   | H    | 45.0    | -9.1    | 35.9     | 46.0     | 10.1   | 100.0  | 272.0 |
| 862.465   | V    | 32.5    | -1.4    | 31.1     | 46.0     | 14.9   | 100.0  | 4.0   |

### 4.3 Radiated emission (above 1 GHz)

#### 4.3.1 Measurement condition

|                       |                                                                           |
|-----------------------|---------------------------------------------------------------------------|
| Frequency range       | 1000 MHz-10000 MHz                                                        |
| Test place            | 10 m Semi-Anechoic Chamber No. 1                                          |
| EUT was placed on     | Styrene foam table (W) 2.0 × (D) 1.0 × (H) 0.8 m                          |
| Axis                  | 0°-360°                                                                   |
| Antenna               | Distance: 3.95m, 4.03 m<br>Height: 1-4 m<br>Polarity: Horizontal/Vertical |
| Test receiver setting | Detector: Peak, Average<br>Bandwidth: 1 MHz                               |

EUT is placed on a styrene form table for table-top equipment or on insulation material for a floor-standing equipment. The styrene form table or the insulation material is placed on a rotating turn table.

Excess cables between equipment are bundled in the center. The length of bundling is 0.3-0.4 m.

Absorbers are placed between the EUT and an antenna.

The antenna is adjusted between 1-4 m in height and varied its polarization (horizontal and vertical), and the EUT azimuth is varied by the rotating turntable 0 to 360 degrees. Where height of the antenna is changed, its angle is also adjusted to the position of the EUT.

After overall frequency range is investigated with spectrum analyzer using peak detector, measurements are performed with test receiver in setting to the defined values.

The antenna is positioned from the test volume that was predetermined by the site VSWR measurement. Since this predetermined test volume is different from maximum circumference where the EUT and the peripheral devices are actually placed, the measurement distance conversion factor is added to the measurement data.

Antenna 3 dB beamwidth

Antenna: 3117

| Frequency (GHz) | θ3 dB (°) | 3 dB beamwidth w (m) |
|-----------------|-----------|----------------------|
| 1.0             | 82        | 5.22                 |
| 2.0             | 56        | 3.19                 |
| 3.0             | 61        | 3.53                 |
| 4.0             | 50        | 2.80                 |
| 5.0             | 53        | 2.99                 |
| 6.0             | 50        | 2.80                 |

Measurement distance:  $d = 3.0 \text{ m}$

$W = 2 \times d \times \tan(0.5 \times \theta_{3 \text{ dB}})$

#### 4.3.2 Calculation method

Emission level = Reading + CF\*

Margin = Limit - Emission level

\*Note: CF (correction factor) = TF (Transducer Factor; Antenna factor)  
+ PF (Path Factor; Cable system loss + ATT. loss - Amplifier Gain) +  
DF (Distance correction Factor)

Example)

Limit @ 1100.0 MHz: 70.0 dB $\mu$ V/m (Peak)  
50.0 dB $\mu$ V/m (Average)

Measurement distance: 3.25 m

Distance conversion Factor:  $20 \log (3.25\text{m}/3.0\text{m}) = 0.7 \text{ dB}$

Peak                      Reading = 50.2 dB $\mu$ V    CF = 2.4 dB  
Emission level = 50.2 + 2.4 = 52.6 dB $\mu$ V/m  
Margin = 70.0 - 52.6 = 17.4 dB

Average                      Reading = 32.0 dB $\mu$ V    CF = 2.4 dB  
Emission level = 32.0 + 2.4 = 34.4 dB $\mu$ V/m  
Margin = 50.0 - 34.4 = 15.6 dB

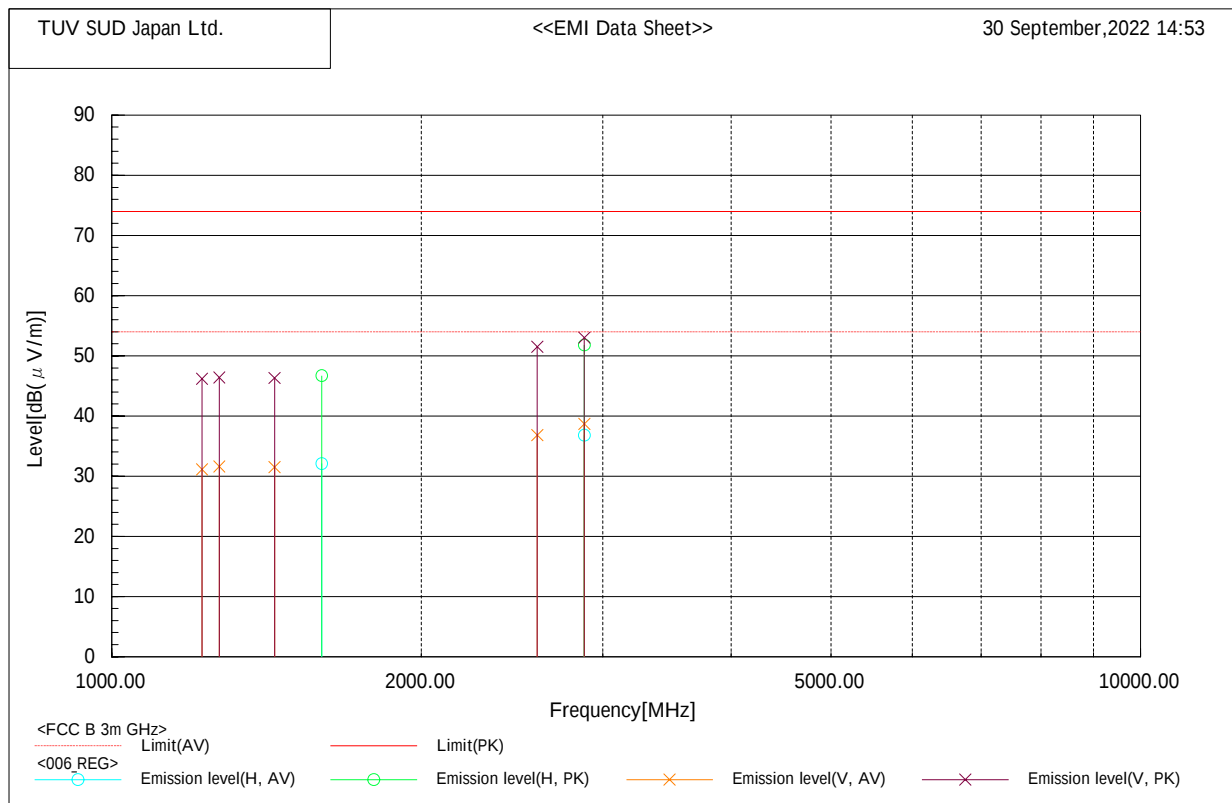
### 4.3.3 Test data and Configuration photographs

|                |                                                                                                                                                                   |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Operation mode | Out Camera with ADP mode                                                                                                                                          |
| EUT            | EB1136, S/N: 354649890001379 - Modification State 0<br>EB1136, S/N: 354649890001387 - Modification State 0<br>EB1136, S/N: 354649890001395 - Modification State 0 |

S/N: 354649890001387, Case 3

Standard : FCC Part 15 Class B  
 Date of test : 30 September, 2022 14:53  
 Operator : Nobuhiko Iwasawa  
 Temp, Hum, Atm : 20.8 [°C], 61.6 [%], 988 [hPa]  
 Supply power : DC 5 V  
 Antenna distance : 4.03 m  
 Antenna height : 1.00 m - 4.00 m

\*\*\*\*\* RADIATED EMISSION \*\*\*\*\*  
[ 10m Semi-anechoic chamber #1 ]



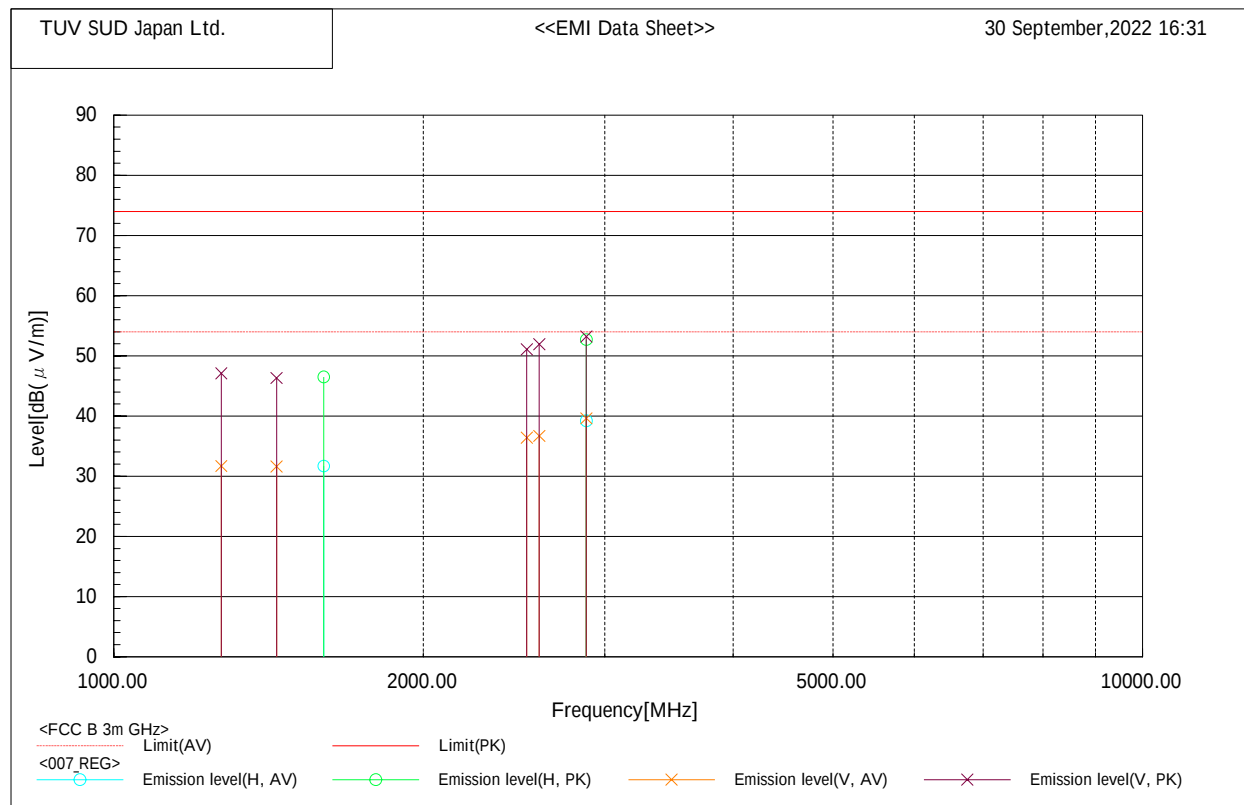
### Final Result

| Frequency<br>MHz | Pol. | Reading<br>dB(μV) |      | Factor<br>dB(1/m) |      |       |     | Level<br>dB(μV/m) |      | Limit<br>dB(μV/m) |      | Margin<br>dB |      | Height<br>cm | Angle<br>deg | Tilt<br>deg |
|------------------|------|-------------------|------|-------------------|------|-------|-----|-------------------|------|-------------------|------|--------------|------|--------------|--------------|-------------|
|                  |      | AV                | PK   | CF                | TF   | PF    | DF  | AV                | PK   | AV                | PK   | AV           | PK   |              |              |             |
| 1224.000         | V    | 35.4              | 50.5 | -4.3              | 28.8 | -35.7 | 2.6 | 31.1              | 46.2 | 54.0              | 74.0 | 22.9         | 27.8 | 270.0        | 135.0        | 29          |
| 1272.000         | V    | 35.3              | 50.1 | -3.7              | 29.2 | -35.5 | 2.6 | 31.6              | 46.4 | 54.0              | 74.0 | 22.4         | 27.6 | 240.0        | 277.0        | 24          |
| 1440.000         | V    | 35.4              | 50.2 | -3.9              | 28.4 | -34.9 | 2.6 | 31.5              | 46.3 | 54.0              | 74.0 | 22.5         | 27.7 | 277.0        | 154.0        | 30          |
| 1600.000         | H    | 35.8              | 50.4 | -3.7              | 28.0 | -34.3 | 2.6 | 32.1              | 46.7 | 54.0              | 74.0 | 21.9         | 27.3 | 303.0        | 214.0        | 33          |
| 2591.997         | V    | 33.7              | 48.4 | 3.1               | 32.6 | -32.1 | 2.6 | 36.8              | 51.5 | 54.0              | 74.0 | 17.2         | 22.5 | 264.0        | 86.0         | 28          |
| 2880.000         | H    | 33.6              | 48.6 | 3.2               | 32.3 | -31.7 | 2.6 | 36.8              | 51.8 | 54.0              | 74.0 | 17.2         | 22.2 | 344.0        | 36.0         | 35          |
| 2880.001         | V    | 35.5              | 49.8 | 3.2               | 32.3 | -31.7 | 2.6 | 38.7              | 53.0 | 54.0              | 74.0 | 15.3         | 21.0 | 286.0        | 31.0         | 31          |

S/N: 354649890001395, Case 4

Standard : FCC Part 15 Class B  
 Date of test : 30 September, 2022 16:31  
 Operator : Nobuhiko Iwasawa  
 Temp, Hum, Atm : 20.8 [°C], 61.6 [%], 988 [hPa]  
 Supply power : DC 5 V  
 Antenna distance : 4.03 m  
 Antenna height : 1.00 m - 4.00 m

\*\*\*\*\* RADIATED EMISSION \*\*\*\*\*  
 [ 10m Semi-anechoic chamber #1 ]



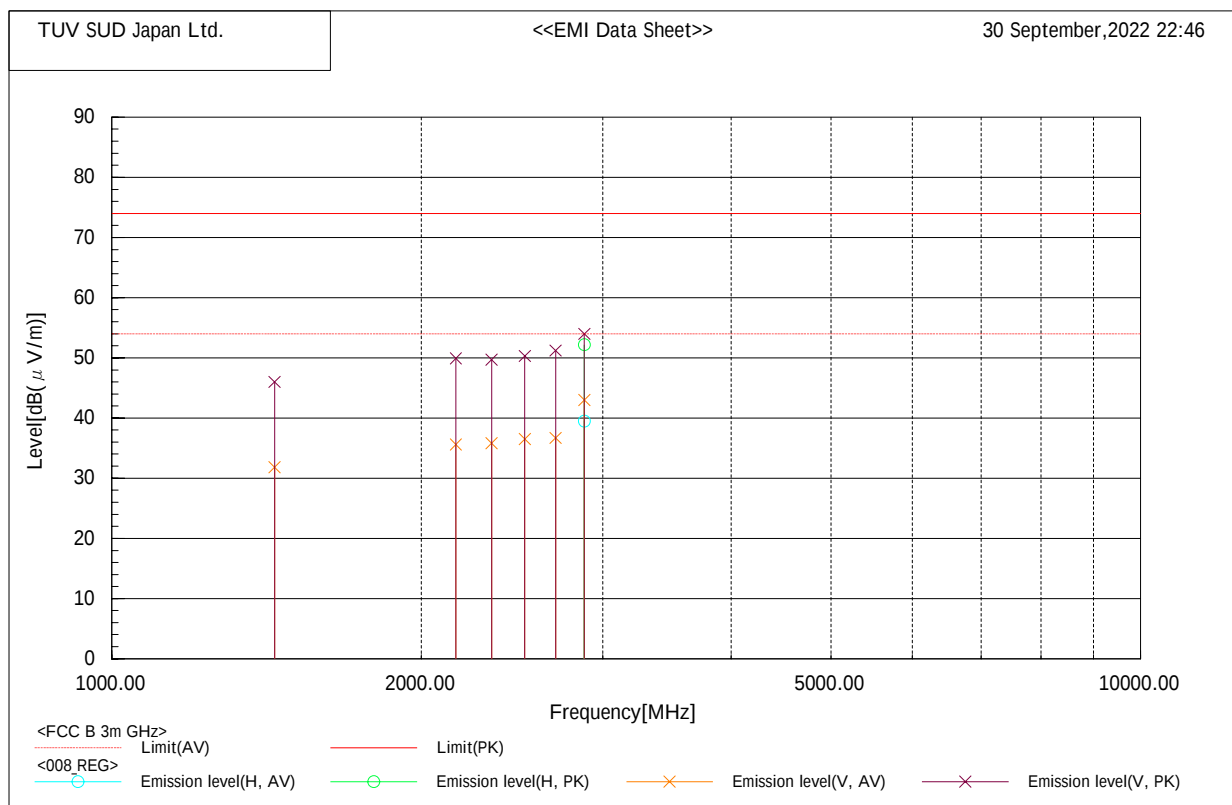
## Final Result

| Frequency | Pol. | Reading |      | Factor  |      |       |     | Level    |      | Limit    |      | Margin |      | Height | Angle | Tilt |
|-----------|------|---------|------|---------|------|-------|-----|----------|------|----------|------|--------|------|--------|-------|------|
| MHz       |      | dB(μV)  |      | dB(1/m) |      |       |     | dB(μV/m) |      | dB(μV/m) |      | dB     |      | cm     | deg   | deg  |
|           |      | AV      | PK   | CF      | TF   | PF    | DF  | AV       | PK   | AV       | PK   | AV     | PK   |        |       |      |
| 1272.000  | V    | 35.4    | 50.8 | -3.7    | 29.2 | -35.5 | 2.6 | 31.7     | 47.1 | 54.0     | 74.0 | 22.3   | 26.9 | 311.0  | 102.0 | 34   |
| 1440.001  | V    | 35.5    | 50.2 | -3.9    | 28.4 | -34.9 | 2.6 | 31.6     | 46.3 | 54.0     | 74.0 | 22.4   | 27.7 | 269.0  | 202.0 | 28   |
| 1600.000  | H    | 35.4    | 50.2 | -3.7    | 28.0 | -34.3 | 2.6 | 31.7     | 46.5 | 54.0     | 74.0 | 22.3   | 27.5 | 261.0  | 35.0  | 27   |
| 2519.997  | V    | 33.8    | 48.5 | 2.6     | 32.3 | -32.3 | 2.6 | 36.4     | 51.1 | 54.0     | 74.0 | 17.6   | 22.9 | 373.0  | 105.0 | 36   |
| 2591.996  | V    | 33.6    | 48.8 | 3.1     | 32.6 | -32.1 | 2.6 | 36.7     | 51.9 | 54.0     | 74.0 | 17.3   | 22.1 | 231.0  | 325.0 | 23   |
| 2880.000  | H    | 36.0    | 49.5 | 3.2     | 32.3 | -31.7 | 2.6 | 39.2     | 52.7 | 54.0     | 74.0 | 14.8   | 21.3 | 268.0  | 49.0  | 28   |
| 2880.001  | V    | 36.4    | 50.0 | 3.2     | 32.3 | -31.7 | 2.6 | 39.6     | 53.2 | 54.0     | 74.0 | 14.4   | 20.8 | 295.0  | 26.0  | 32   |

S/N: 354649890001379, Case 2

Standard : FCC Part 15 Class B  
 Date of test : 30 September, 2022 22:46  
 Operator : Tsuyoshi Okumura  
 Temp, Hum, Atm : 20.8 [°C], 61.6 [%], 987 [hPa]  
 Supply power : DC 5 V  
 Antenna distance : 4.03 m  
 Antenna height : 1.00 m - 4.00 m

\*\*\*\*\* RADIATED EMISSION \*\*\*\*\*  
 [ 10m Semi-anechoic chamber #1 ]



## Final Result

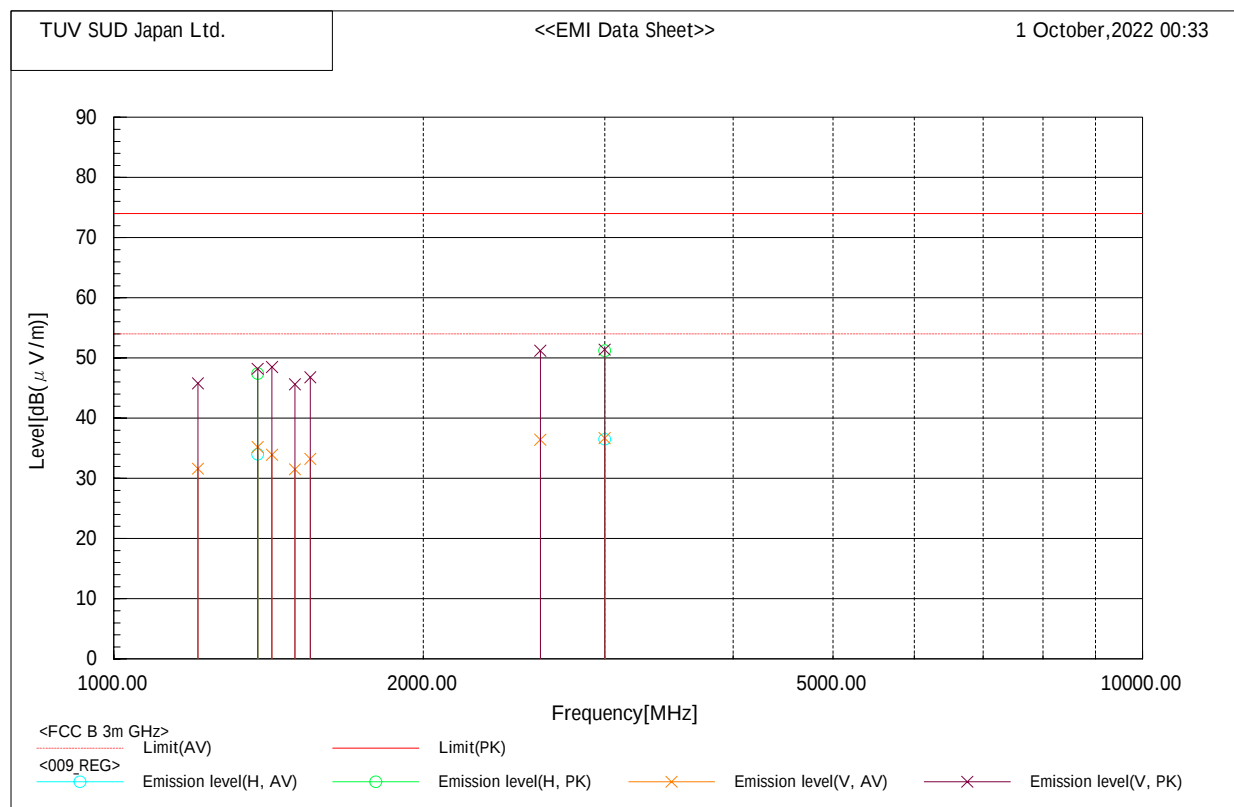
| Frequency | Pol. | Reading |      | Factor  |      |       |     | Level    |      | Limit    |      | Margin |      | Height | Angle | Tilt |
|-----------|------|---------|------|---------|------|-------|-----|----------|------|----------|------|--------|------|--------|-------|------|
| MHz       |      | dB(μV)  |      | dB(1/m) |      |       |     | dB(μV/m) |      | dB(μV/m) |      | dB     |      | cm     | deg   | deg  |
|           |      | AV      | PK   | CF      | TF   | PF    | DF  | AV       | PK   | AV       | PK   | AV     | PK   |        |       |      |
| 1440.000  | V    | 35.7    | 49.9 | -3.9    | 28.4 | -34.9 | 2.6 | 31.8     | 46.0 | 54.0     | 74.0 | 22.2   | 28.0 | 119.0  | 202.0 | 4    |
| 2160.000  | V    | 34.4    | 48.7 | 1.2     | 31.4 | -32.8 | 2.6 | 35.6     | 49.9 | 54.0     | 74.0 | 18.4   | 24.1 | 288.0  | 244.0 | 31   |
| 2340.000  | V    | 34.0    | 47.9 | 1.8     | 31.7 | -32.5 | 2.6 | 35.8     | 49.7 | 54.0     | 74.0 | 18.2   | 24.3 | 321.0  | 14.0  | 35   |
| 2520.000  | V    | 33.9    | 47.7 | 2.6     | 32.3 | -32.3 | 2.6 | 36.5     | 50.3 | 54.0     | 74.0 | 17.5   | 23.7 | 188.0  | 195.0 | 16   |
| 2700.000  | V    | 33.7    | 48.2 | 3.0     | 32.4 | -32.0 | 2.6 | 36.7     | 51.2 | 54.0     | 74.0 | 17.3   | 22.8 | 225.0  | 180.0 | 22   |
| 2880.001  | V    | 39.8    | 50.8 | 3.2     | 32.3 | -31.7 | 2.6 | 43.0     | 54.0 | 54.0     | 74.0 | 11.0   | 20.0 | 349.0  | 125.0 | 35   |
| 2880.001  | H    | 36.3    | 49.0 | 3.2     | 32.3 | -31.7 | 2.6 | 39.5     | 52.2 | 54.0     | 74.0 | 14.5   | 21.8 | 299.0  | 42.0  | 32   |

|                |                                                     |
|----------------|-----------------------------------------------------|
| Operation mode | MP4 + USB Read with PC mode                         |
| EUT            | EB1136, S/N: 354649890001379 - Modification State 0 |

S/N: 354649890001379, Case 2

Standard : FCC Part 15 Class B  
 Date of test : 1 October, 2022 00:33  
 Operator : Tsuyoshi Okumura  
 Temp, Hum, Atm : 20.8 [°C], 61.6 [%], 987 [hPa]  
 Supply power : AC 120 V, 60 Hz, 1 phase  
 Antenna distance : 3.95 m  
 Antenna height : 1.00 m - 4.00 m

\*\*\*\*\* RADIATED EMISSION \*\*\*\*\*  
 [ 10m Semi-anechoic chamber #1 ]



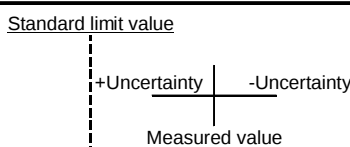
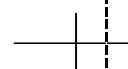
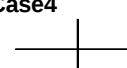
## Final Result

| Frequency<br>MHz | Pol. | Reading<br>dB(μV) |      | Factor<br>dB(1/m) |      |       |     | Level<br>dB(μV/m) |      | Limit<br>dB(μV/m) |      | Margin<br>dB |      | Height<br>cm | Angle<br>deg | Tilt<br>deg |
|------------------|------|-------------------|------|-------------------|------|-------|-----|-------------------|------|-------------------|------|--------------|------|--------------|--------------|-------------|
|                  |      | AV                | PK   | CF                | TF   | PF    | DF  | AV                | PK   | AV                | PK   | AV           | PK   |              |              |             |
| 1207.455         | V    | 36.3              | 50.5 | -4.7              | 28.7 | -35.8 | 2.4 | 31.6              | 45.8 | 54.0              | 74.0 | 22.4         | 28.2 | 242.0        | 238.0        | 25          |
| 1379.951         | V    | 39.2              | 52.2 | -4.0              | 28.7 | -35.1 | 2.4 | 35.2              | 48.2 | 54.0              | 74.0 | 18.8         | 25.8 | 326.0        | 315.0        | 35          |
| 1379.951         | H    | 38.0              | 51.4 | -4.0              | 28.7 | -35.1 | 2.4 | 34.0              | 47.4 | 54.0              | 74.0 | 20.0         | 26.6 | 369.0        | 308.0        | 37          |
| 1424.947         | V    | 38.0              | 52.6 | -4.1              | 28.4 | -34.9 | 2.4 | 33.9              | 48.5 | 54.0              | 74.0 | 20.1         | 25.5 | 291.0        | 342.0        | 31          |
| 1499.944         | V    | 35.5              | 49.6 | -4.0              | 28.2 | -34.6 | 2.4 | 31.5              | 45.6 | 54.0              | 74.0 | 22.5         | 28.4 | 157.0        | 194.0        | 11          |
| 1552.441         | V    | 37.2              | 50.8 | -4.0              | 28.1 | -34.5 | 2.4 | 33.2              | 46.8 | 54.0              | 74.0 | 20.8         | 27.2 | 178.0        | 216.0        | 14          |
| 2598.540         | V    | 33.5              | 48.3 | 2.9               | 32.7 | -32.2 | 2.4 | 36.4              | 51.2 | 54.0              | 74.0 | 17.6         | 22.8 | 226.0        | 190.0        | 22          |
| 2999.900         | V    | 33.3              | 48.0 | 3.4               | 32.6 | -31.6 | 2.4 | 36.7              | 51.4 | 54.0              | 74.0 | 17.3         | 22.6 | 249.0        | 205.0        | 26          |
| 2999.900         | H    | 33.1              | 47.8 | 3.4               | 32.6 | -31.6 | 2.4 | 36.5              | 51.2 | 54.0              | 74.0 | 17.5         | 22.8 | 211.0        | 158.0        | 20          |

## 5 Measurement Uncertainty

The reported measurement uncertainty is based on a value obtained by multiplying standard uncertainty by coverage factor of  $k=2$ , and a level of confidence becomes 95 %.

| Item                              | Parameter        | $U_{lab}$    | $U_{cisp}$   |
|-----------------------------------|------------------|--------------|--------------|
| Conducted Emission, V-AMN         | 9kHz to 150kHz   | $\pm 3.7$ dB | $\pm 3.8$ dB |
| Conducted Emission, V-AMN         | 150kHz to 30MHz  | $\pm 3.3$ dB | $\pm 3.4$ dB |
| Conducted Emission, $\Delta$ -AN  | 150kHz to 30MHz  | $\pm 4.9$ dB | -            |
| Conducted Emission, AN            | 150kHz to 30MHz  | $\pm 4.3$ dB | -            |
| Conducted Emission, AAN           | 150kHz to 30MHz  | $\pm 4.8$ dB | $\pm 5.0$ dB |
| Conducted Emission, Voltage Probe | 9kHz to 30MHz    | $\pm 2.8$ dB | $\pm 2.9$ dB |
| Conducted Emission, Current Probe | 150kHz to 30MHz  | $\pm 2.9$ dB | $\pm 2.9$ dB |
| Disturbance Power                 | 30MHz to 300MHz  | $\pm 3.8$ dB | $\pm 4.5$ dB |
| Radiated Emission                 | 30MHz to 1000MHz | $\pm 5.5$ dB | $\pm 6.3$ dB |
| Radiated Emission                 | 1GHz to 6GHz     | $\pm 4.9$ dB | $\pm 5.2$ dB |
| Radiated Emission                 | 6GHz to 18GHz    | $\pm 4.7$ dB | $\pm 5.5$ dB |
| Radiated Emission                 | 9kHz to 30MHz    | $\pm 3.2$ dB | -            |

| Judge | Measured value and standard limit value                                                                                                                                                                                                            |  |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| PASS  | <p><b>Case1</b></p>  <p>Even if it takes uncertainty into consideration, a standard limit value is fulfilled.</p>                                               |  |
|       | <p><b>Case2</b></p>  <p>Although measured value is in a standard limit value, a limit value won't be fulfilled if uncertainty is taken into consideration.</p>  |  |
| FAIL  | <p><b>Case3</b></p>  <p>Although measured value exceeds a standard limit value, a limit value will be fulfilled if uncertainty is taken into consideration.</p> |  |
|       | <p><b>Case4</b></p>  <p>Even if it takes uncertainty into consideration, a standard limit value isn't fulfilled.</p>                                            |  |



Japan

## 6 Laboratory Information

Testing was performed and the report was issued at:

**TÜV SÜD Japan Ltd. Yonezawa Testing Center**

Address: 5-4149-7 Hachimanpara, Yonezawa-shi, Yamagata, 992-1128 Japan  
Phone: +81-238-28-2881

**Accreditation and Registration**

A2LA  
Certificate #3686.03

VLAC  
Accreditation No.: VLAC-013

BSMI  
Laboratory Code: SL2-IN-E-6018, SL2-A1-E-6018

Innovation, Science and Economic Development Canada  
ISED#: 4224A

VCCI Council  
Registration number: A-0166

## Appendix A. Test Equipment

### Conducted emission at mains port

| Equipment                            | Company                         | Model No.      | Serial No.      | Cal. due    | Cal. Date   |
|--------------------------------------|---------------------------------|----------------|-----------------|-------------|-------------|
| EMI receiver                         | ROHDE&SCHWARZ                   | ESR7           | 102352          | 31-Dec-2022 | 14-Dec-2021 |
| Line impedance stabilization network | Kyoritsu Technology Corporation | TNW-407F2      | 12-17-110-2     | 30-Jun-2023 | 15-Jun-2022 |
| Attenuator                           | HUBER+SUHNER                    | 6810.01.A      | N/A(S442)       | 28-Feb-2023 | 01-Feb-2022 |
| Coaxial cable                        | FUJIKURA                        | 5D-2W/4m       | N/A(S349)       | 31-Oct-2022 | 27-Oct-2021 |
| Microwave cable                      | HUBER+SUHNER                    | SUCOFLEX104/2m | 317672/4        | 31-Oct-2022 | 28-Oct-2021 |
| Coaxial cable                        | HUBER+SUHNER                    | RG214/U/25m    | N/A(S191)       | 31-Oct-2022 | 27-Oct-2021 |
| Software                             | TOYO Technica                   | ES10/CE-AJ     | Ver.2021.10.001 | N/A         | N/A         |

### Radiated emission (below 1 GHz)

| Equipment                 | Company       | Model No.        | Serial No.      | Cal. due    | Cal. date   |
|---------------------------|---------------|------------------|-----------------|-------------|-------------|
| EMI receiver              | ROHDE&SCHWARZ | ESR7             | 102352          | 31-Dec-2022 | 14-Dec-2021 |
| Biconical antenna         | Schwarzbeck   | VHBB9124/BBA9106 | 1344            | 31-May-2023 | 27-May-2022 |
| Log-periodic antenna      | Schwarzbeck   | VUSLP9111B       | 344             | 30-Jun-2023 | 28-Jun-2022 |
| Attenuator                | TDC           | TAT-43B-06       | N/A(S209)       | 31-Jul-2023 | 14-Jul-2022 |
| Attenuator                | TAMAGAWA.ELEC | CFA-10/3dB       | N/A(S504)       | 31-Jul-2023 | 14-Jul-2022 |
| Microwave cable           | HUBER+SUHNER  | SUCOFLEX104/9m   | MY23758/4       | 31-Oct-2022 | 28-Oct-2021 |
| Microwave cable           | HUBER+SUHNER  | SUCOFLEX104/1m   | MY24628/4       | 31-Oct-2022 | 28-Oct-2021 |
| Microwave cable           | HUBER+SUHNER  | SUCOFLEX104/2m   | SN MY28398/4    | 31-Oct-2022 | 28-Oct-2021 |
| Microwave cable           | HUBER+SUHNER  | SUCOFLEX106/13m  | MY1159/6        | 31-Oct-2022 | 27-Oct-2021 |
| Preamplifier              | SONOMA        | 310              | 400315          | 31-Mar-2023 | 03-Mar-2022 |
| 10m Semi-anechoic Chamber | TOKIN         | N/A              | N/A(9001-NSA3m) | 31-May-2023 | 29-May-2022 |
| Software                  | TOYO Technica | ES10/RE-AJ       | Ver.2021.10.001 | N/A         | N/A         |

### Radiated emission (above 1 GHz)

| Equipment                   | Company              | Model No.        | Serial No.      | Cal. due    | Cal. date   |
|-----------------------------|----------------------|------------------|-----------------|-------------|-------------|
| Spectrum analyzer           | ROHDE&SCHWARZ        | FSV40            | 101732          | 31-Mar-2023 | 03-Mar-2022 |
| Preamplifier                | TSJ                  | MLA-0118-J02-40  | 14882           | 31-Oct-2022 | 27-Oct-2021 |
| Double ridged guide antenna | ETS LINDGREN         | 3117             | 00209352        | 31-Jan-2023 | 28-Jan-2022 |
| Attenuator                  | Agilent Technologies | 8491B            | MY39268633      | 30-Jun-2023 | 16-Jun-2022 |
| Microwave cable             | HUBER+SUHNER         | SUCOFLEX104/9m   | 811445/4        | 31-Oct-2022 | 27-Oct-2021 |
| Microwave cable             | HUBER+SUHNER         | SUCOFLEX104/1.5m | SN MY19304/4    | 31-Oct-2022 | 27-Oct-2021 |
| Microwave cable             | HUBER+SUHNER         | SUCOFLEX104/2m   | SN MY28398/4    | 31-Oct-2022 | 28-Oct-2021 |
| Microwave cable             | HUBER+SUHNER         | SUCOFLEX106/13m  | MY1159/6        | 31-Oct-2022 | 27-Oct-2021 |
| Absorber                    | RIKEN                | PFP30            | N/A             | N/A         | N/A         |
| 10m Semi-anechoic Chamber   | TOKIN                | N/A              | N/A(9001-SVSWR) | 31-May-2023 | 30-May-2022 |
| Software                    | TOYO Technica        | ES10/RE-AJ       | Ver.2021.10.001 | N/A         | N/A         |