



Test Report

Test Report No. IE1801-014T2
Date of Issue: 8th March, 2018

FCC Part 15 Subpart B

Radio Frequency Devices

Applicant Information

| | | |
|----------------------------|---|--|
| Name of Applicant | : | JAI CORPORATION |
| Address | : | 10-35 Sakae-Chou, Kanagawa-Ku, Yokohama, Kanagawa, 221-0052 Japan |
| Telephone | : | +81 45-440-0165 |
| Facsimile | : | +81 45-440-0167 |
| Equipment under Test (EUT) | : | 3 CMOS AREA SCAN CAMERA |
| Model Number | : | AP-1600T-PGE |
| Serial Number | : | JAI-15 |
| EUT Condition | : | Pre-Production |

Date of Test : 26th, 29th January, 2018

Test Result : **PASS**

- The results in this report are applicable only to the equipment tested.
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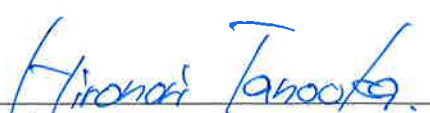
Signature: 
Hironori Tanooka
Director



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1. Summary of Test

1.1. Test Standard

FCC Part15 SubpartB (§ 15.107, § 15.109) ClassB

1.2. List of Applied Test to the EUT

| Test Item | Test Method | Test |
|----------------------------------|-----------------|---------|
| Conducted Emission at Mains Port | ANSI C63.4:2014 | N/A* |
| Radiated Emission | ANSI C63.4:2014 | Applied |

*: These tests are not applicable as per customer's request.

1.3. Test Procedure

| Test Item | Test Procedure | Internal Test Procedure |
|-------------------|----------------------------|--|
| Radiated Emission | ANSI C63.4:2014 / Clause 8 | IT04-P007 Rev. 3.01 IT04-P009 Rev. 4.01 |

2. Equipment under Test

2.1. EUT Information

| No. | EUT | Manufacturer | Model No. | Serial No. | FCC ID / DoC |
|-----|-------------------------|-----------------|--------------|------------|--------------|
| A | 3 CMOS AREA SCAN CAMERA | JAI CORPORATION | AP-1600T-PGE | JAI-15 | None |

Note : The EUT was tested as tabletop.

Internal Max. Frequency : 297 MHz

| EUT Clock Frequency | Oscillator | Clock Frequency | Name of Board | Note |
|---------------------|------------|-----------------|---------------|------|
| | 74.25 MHz | 297 MHz | Main Board | — |
| | 25 MHz | 125 MHz | Main Board | — |

Power Rating :

Input (PoE) DC 36-57 V, 8.7 W

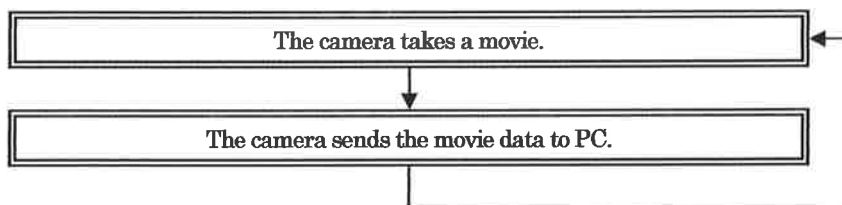
| Port(s) | Connector Type | Connector Pin |
|---------------------|----------------|---------------|
| 1000BASE-T Ethernet | RJ45 | 8 Pins |

| Dimensions of the EUT | Width (mm) | Depth (mm) | Height (mm) |
|-----------------------|------------|------------|-------------|
| | 44 | 84 | 44 |

| Weight of the EUT | Weight (kg) |
|-------------------|-------------|
| | 0.20 |

2.2. Operating Mode

• Continuous Mode



3. Configuration of Equipment

3.1. Peripherals used

| No. | Equipment | Manufacturer | Model No. | Serial No. | FCC ID / DoC |
|-----|-------------------|---------------------|----------------------|------------------------------------|--------------|
| B | LENS | VS TECHNOLOGY CORP. | VS-1218H | V17009604 | None |
| C | LCD MONITOR | DELL | E2417H | CN-0VJ9GK-74261-68M-1FTU-A00B0-120 | DoC |
| D | Personal Computer | DELL | Precision Tower 5810 | GRCPB22 | DoC |
| E | KEYBOARD | DELL | KB212-B | CN-0N290F-71581-5A9-07J2-A01 | DoC |
| F | MOUSE | DELL | MS-111-L | CN-09RRC7-48729-54S-0RKM | DoC |

3.2. Cables used

AC Power Cable

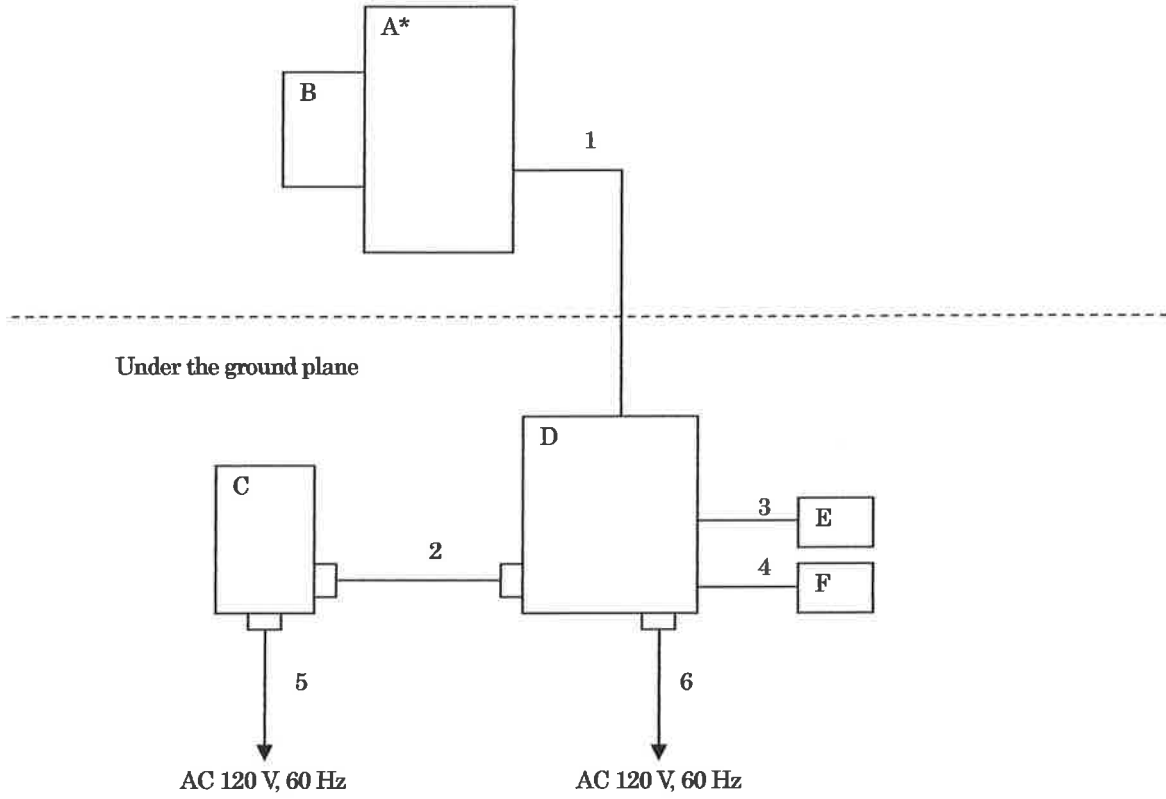
| No. | Cable(s) Name | Length (m) | Shielding | Ferrite Core | Comment |
|-----|--------------------------------------|------------|------------|--------------|---------|
| 5 | AC Power Cable for LCD MONITOR | 1.5 | Unshielded | None | — |
| 6 | AC Power Cable for Personal Computer | 1.5 | Unshielded | None | — |

Interface Cable

| No. | Cable(s) Name | Length (m) | Shielding | Ferrite Core | Comment |
|-----|-----------------------|------------|-----------|--------------|---------|
| 1 | Ethernet Cable CAT 5e | 7.0 | Shielded | None | — |
| 2 | LCD MONITOR Cable | 1.5 | Shielded | None | — |
| 3 | KEYBOARD Cable | 2.0 | Shielded | None | — |
| 4 | MOUSE Cable | 1.5 | Shielded | None | — |



3.3. System Configuration



*: EUT

4. Radiated Emission

4.1. Measurement Procedure

4.1.1. Test Receiver Condition

Below 1000 MHz: Detector: Quasi-peak
Bandwidth: 120 kHz
Above 1000 MHz: Detector: Average, Peak
Bandwidth: 1 MHz

4.1.2. Frequency Range

30 MHz – 2000 MHz

4.1.3. Measuring Distance

3 m

4.1.4. Turn Table

Rotated 0 to 360 degrees

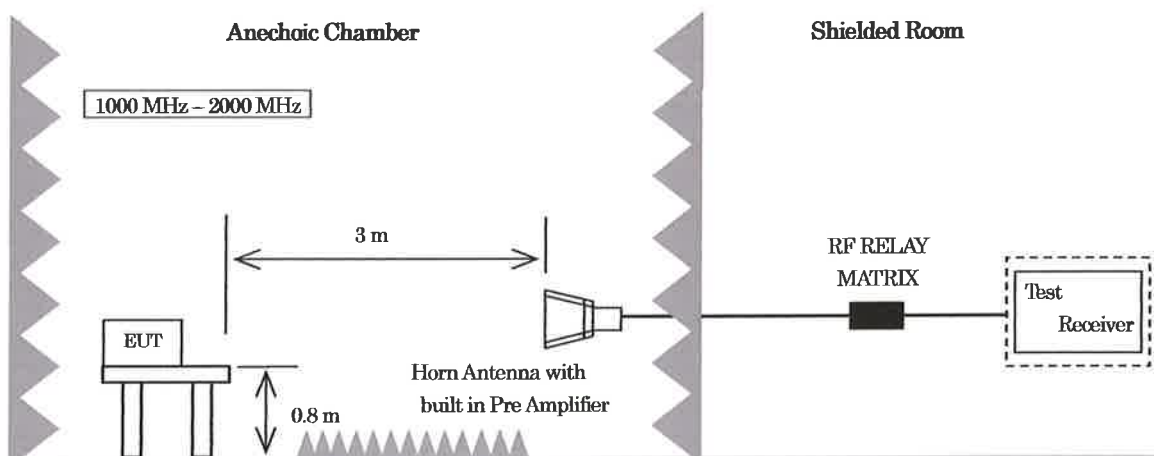
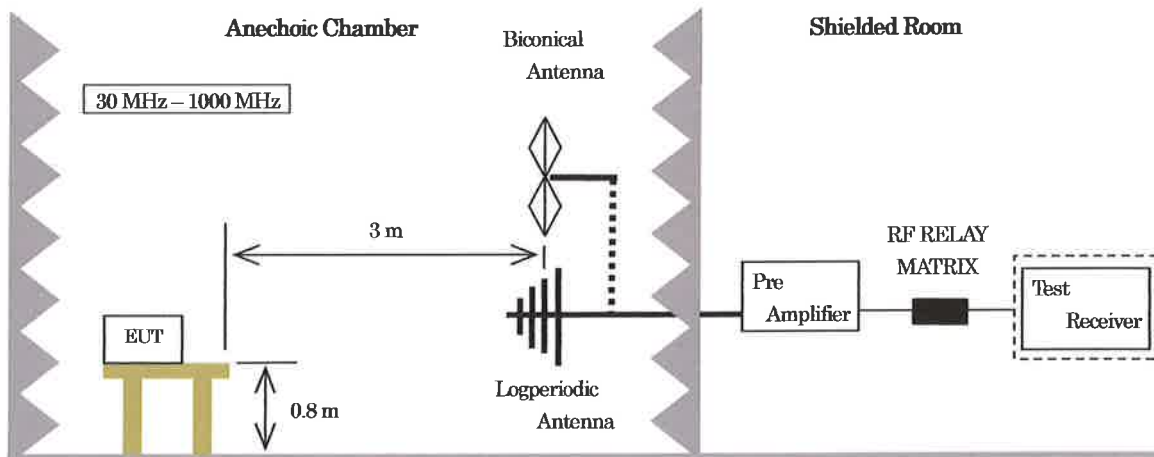
4.1.5. Antenna Position

Antenna height: 1 m to 4 m
Polarization: Horizontal and Vertical

4.1.6. Reported Emissions

At least the 6 points corresponding to the highest disturbance are reported.

4.1.7. Test Configuration



4.2. Test Equipment

| Equipment | Manufacturer | Model No. | Serial or ID No. | Calibration Due |
|--------------------------------|-----------------|------------------|------------------|-----------------|
| Test Receiver | Rohde & Schwarz | ESU26 | 100299 | Apr-2018 |
| Pre Amplifier | Sonoma | 310N | 243232 | Aug-2018 |
| RF RELAY MATRIX | tsj | RFMI2A2M | 03153 | Aug-2018 |
| Biconical Antenna | Schwarzbeck | BBA9106(VHA9103) | 91032277 | Feb-2018 |
| Logperiodic Antenna | Schwarzbeck | UHALP9108A | 0720 | Feb-2018 |
| Horn Antenna | EMCO | 3115 | 8912-3303 | Dec-2018 |
| Pre Amplifier for Horn Antenna | tsj | MLA-0108AD-39 | 005 | Dec-2018 |
| Attenuator | SUHNER | 6803.17.A | 003 | Aug-2018 |
| Attenuator | SUHNER | 6803.17.A | 004 | Aug-2018 |
| Coaxial Cable (1) | SUHNER | RG400 | 259 | Aug-2018 |
| Coaxial Cable (2) | SUHNER | RG400 | 260 | Aug-2018 |
| Coaxial Cable (3) | SUHNER | S04272B | 612 | Aug-2018 |
| Coaxial Cable (4) | SUHNER | S04272B | 376 | Aug-2018 |
| Coaxial Cable (5) | SUHNER | SF106 | 32550/6 | Aug-2018 |
| Coaxial Cable (6) | SUHNER | SF104EA | MY4490/4EA | Aug-2018 |
| Software | tsj | TEPTO-DV/RE | v1.90.0098 | N/A |

Note 1: All testing equipment is calibrated with measuring equipment which are traceable to national or international standards.

Note 2: The pre-amplifier is connected to the horn antenna. (3115)

4.3. Sample Calculation

Radiated Emission Class B Limit*

| Frequency Range (MHz) | Limit(dBuV/m) |
|-----------------------|---------------|
| | Quasi Peak |
| 30 – 88 | 40.0 |
| 88 – 216 | 43.5 |
| 216 – 960 | 46.0 |
| 960 – 1000 | 54.0 |

*: The lower limits apply at the transition frequency.

Radiated Emission Class B Limit

| Frequency range (MHz) | Limit(dBuV/m) | |
|-----------------------|---------------|------|
| | Average | Peak |
| Above 1000 | 54.0 | 74.0 |

• Example @ 57.790 MHz for Continuous Mode

$$\begin{array}{rcl}
 \text{Disturbance Level} & = & \text{Reading} & 48.4 & \text{dBuV} \\
 & + & \text{Correction Factor*} & -14.7 & \text{dB/m} \\
 & & & \hline
 & & & = & 33.7 & \text{dBuV/m}
 \end{array}$$

$$\begin{array}{rcl}
 \text{Margin} & = & \text{Limit} & 40.0 & \text{dBuV/m} \\
 & - & \text{Disturbance Level} & 33.7 & \text{dBuV/m} \\
 & & & \hline
 & & & = & 6.3 & \text{dB}
 \end{array}$$

*: Correction Factor = Antenna Factor (dB/m) + Cable Loss (dB) [include 3dB attenuator×2] – Pre Amplifier Gain (dB)

Note: The sample calculation above is the minimum margin at the measuring frequency.

4.4. Uncertainty

Expanded uncertainties were calculated with a coverage factor k = 2 for Radiated Emission.

• 30 MHz – 1000 MHz

| |
|---------------------|
| +3.48 dB / -3.02 dB |
|---------------------|

• 1000 MHz – 8000 MHz

| |
|---------------------|
| +3.73 dB / -3.80 dB |
|---------------------|

4.5. Test Data

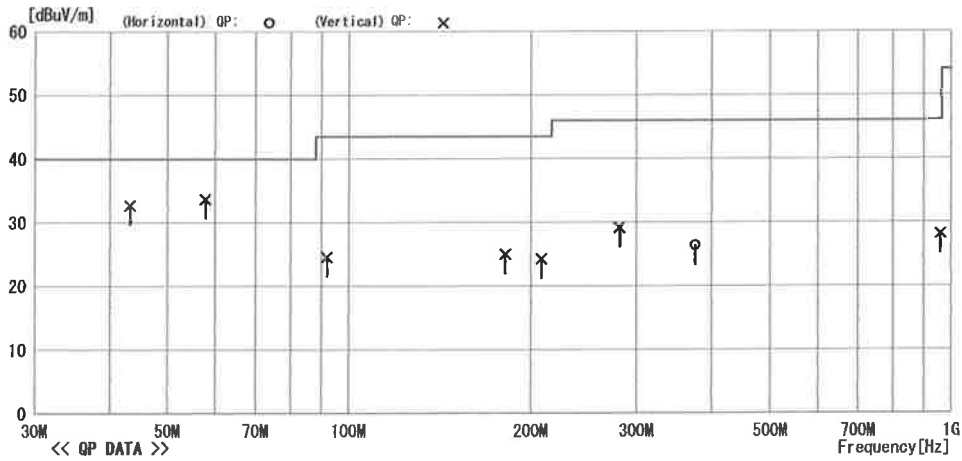
Radiated Emission

10m A/C
 Date : 2018/01/26 16:37

Model Name : 3 CMOS AREA SCAN CAMERA
 Model No. : AP-1600T-PGE
 Serial No. : JAI-15
 Test Condition : Continuous Mode
 Data No. : IE1801-014A-08
 Power Supply : PoE
 Temp./Humi. : 21°C / 23%
 Operator : T. Kofudo

Memo :

LIMIT : FCC Part15 SubpartB ClassB(3m)



| No | Freq. | Reading | Ant. Fac | Loss | Gain | Result | Limit | Margin | Pola. | Height | Angle | Ant |
|----|---------|---------|----------|------|------|----------|----------|--------|-------|--------|-------|------|
| | [MHz] | [dBuV] | [dB/m] | [dB] | [dB] | [dBuV/m] | [dBuV/m] | [dB] | [H/V] | [cm] | [deg] | Type |
| 1 | 43.302 | 42.9 | 13.8 | 7.6 | 31.6 | 32.7 | 40.0 | 7.3 | Vert. | 100 | 194 | BIC |
| 2 | 57.790 | 48.4 | 9.1 | 7.8 | 31.6 | 33.7 | 40.0 | 6.3 | Vert. | 100 | 160 | BIC |
| 3 | 91.819 | 39.4 | 8.5 | 8.3 | 31.6 | 24.6 | 43.5 | 18.9 | Vert. | 100 | 95 | BIC |
| 4 | 181.164 | 31.4 | 16.1 | 9.1 | 31.6 | 25.0 | 43.5 | 18.5 | Vert. | 100 | 22 | BIC |
| 5 | 207.875 | 29.7 | 16.8 | 9.3 | 31.5 | 24.3 | 43.5 | 19.2 | Vert. | 200 | 6 | BIC |
| 6 | 280.731 | 32.1 | 18.8 | 9.8 | 31.5 | 29.2 | 46.0 | 16.8 | Vert. | 100 | 172 | BIC |
| 7 | 374.995 | 31.6 | 15.9 | 10.4 | 31.5 | 26.4 | 46.0 | 19.6 | Hori. | 100 | 293 | LPD |
| 8 | 955.927 | 23.3 | 22.7 | 13.1 | 30.9 | 28.2 | 46.0 | 17.8 | Vert. | 100 | 358 | LPD |

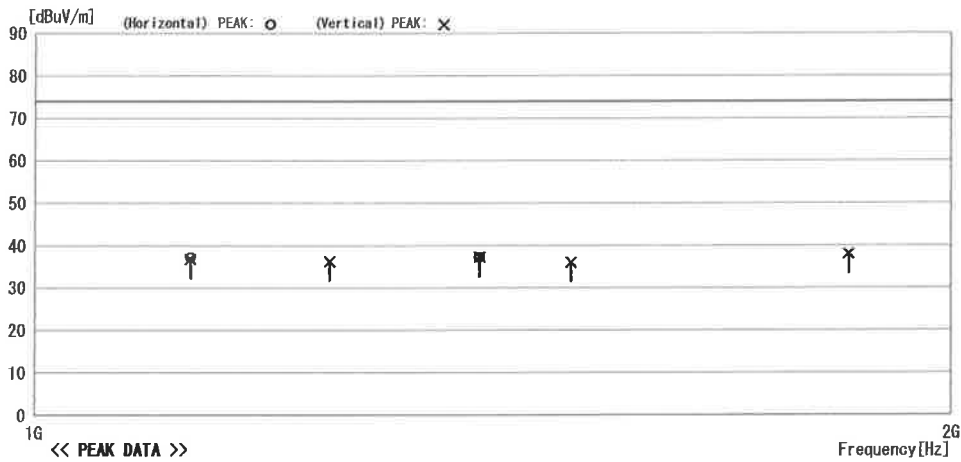
Radiated Emission

10m A/C
 Date : 2018/01/29 14:29

| | |
|--------------------------------------|---------------------------|
| Model Name : 3 CMOS AREA SCAN CAMERA | Data No. : IE1801-014A-19 |
| Model No. : AP-1600T-PGE | Power Supply : PoE |
| Serial No. : JAI-15 | Temp/Humi : 22°C / 25% |
| Test Condition : Continuous Mode | Operator : T. Kofudo |

Memo :

LIMIT : FCC Part15 SubpartB ClassB(3m)Peak



| No | Freq. | Reading | Ant. Fac | Loss | Gain | Result | Limit | Margin | Pola. | Height | Angle | Ant |
|----|----------|---------|----------|------|------|----------|----------|--------|-------|--------|-------|------|
| | [MHz] | [dBuV] | [dB/m] | [dB] | [dB] | [dBuV/m] | [dBuV/m] | [dB] | [H/V] | [cm] | [deg] | Type |
| 1 | 1124.999 | 46.0 | 26.4 | 6.3 | 41.4 | 37.3 | 74.0 | 36.7 | Hori. | 118 | 214 | HOR |
| 2 | 1124.999 | 45.6 | 26.4 | 6.3 | 41.4 | 36.9 | 74.0 | 37.1 | Vert. | 100 | 94 | HOR |
| 3 | 1249.985 | 44.9 | 26.2 | 6.7 | 41.6 | 36.2 | 74.0 | 37.8 | Vert. | 100 | 174 | HOR |
| 4 | 1399.987 | 45.7 | 26.0 | 7.1 | 41.7 | 37.1 | 74.0 | 36.9 | Hori. | 242 | 140 | HOR |
| 5 | 1399.988 | 45.9 | 26.0 | 7.1 | 41.7 | 37.3 | 74.0 | 36.7 | Vert. | 110 | 177 | HOR |
| 6 | 1499.981 | 44.5 | 26.1 | 7.3 | 41.9 | 36.0 | 74.0 | 38.0 | Vert. | 100 | 356 | HOR |
| 7 | 1850.000 | 44.6 | 27.4 | 8.1 | 42.1 | 38.0 | 74.0 | 36.0 | Vert. | 100 | 94 | HOR |

Radiated Emission

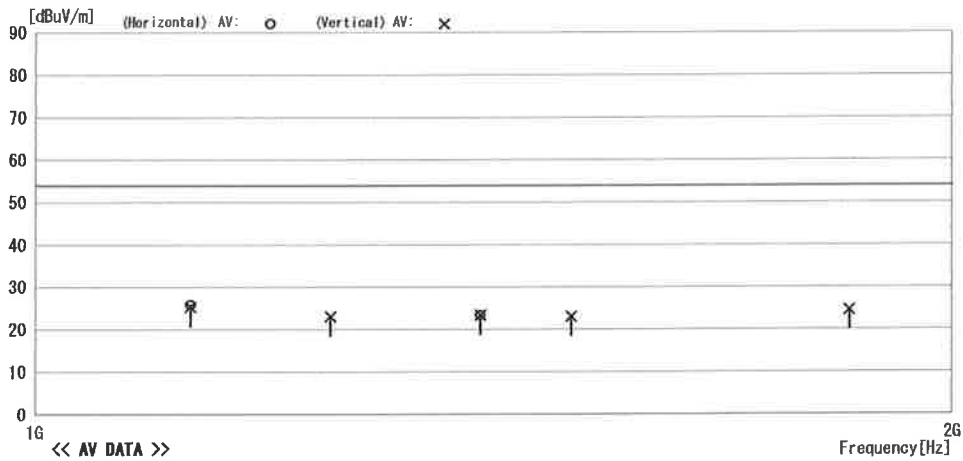
10m A/C
 Date : 2018/01/29 14:29

Model Name : 3 CMOS AREA SCAN CAMERA
 Model No. : AP-1600T-PGE
 Serial No. : JA1-15
 Test Condition : Continuous Mode

Data No. : IE1801-014A-20
 Power Supply : PoE
 Temp/Humi : 22°C / 25%
 Operator : T. Kofudo

Memo :

LIMIT : FCC Part15 SubpartB ClassB(3m)



| No | Freq. | Reading | Ant. Fac | Loss | Gain | Result | Limit | Margin | Pola. | Height | Angle | Ant |
|----|----------|---------|----------|------|------|----------|----------|--------|-------|--------|-------|------|
| | [MHz] | [dBuV] | [dB/m] | [dB] | [dB] | [dBuV/m] | [dBuV/m] | [dB] | [H/V] | [cm] | [deg] | Type |
| 1 | 1124.999 | 34.5 | 26.4 | 6.3 | 41.4 | 25.8 | 54.0 | 28.2 | Hori. | 118 | 214 | HOR |
| 2 | 1124.999 | 34.0 | 26.4 | 6.3 | 41.4 | 25.3 | 54.0 | 28.7 | Vert. | 100 | 94 | HOR |
| 3 | 1249.985 | 31.8 | 26.2 | 6.7 | 41.6 | 23.1 | 54.0 | 30.9 | Vert. | 100 | 174 | HOR |
| 4 | 1399.987 | 32.0 | 26.0 | 7.1 | 41.7 | 23.4 | 54.0 | 30.6 | Hori. | 242 | 140 | HOR |
| 5 | 1399.986 | 32.0 | 26.0 | 7.1 | 41.7 | 23.4 | 54.0 | 30.6 | Vert. | 110 | 177 | HOR |
| 6 | 1499.981 | 31.6 | 26.1 | 7.3 | 41.9 | 23.1 | 54.0 | 30.9 | Vert. | 100 | 356 | HOR |
| 7 | 1850.000 | 31.2 | 27.4 | 8.1 | 42.1 | 24.6 | 54.0 | 29.4 | Vert. | 100 | 94 | HOR |

5. Photographs

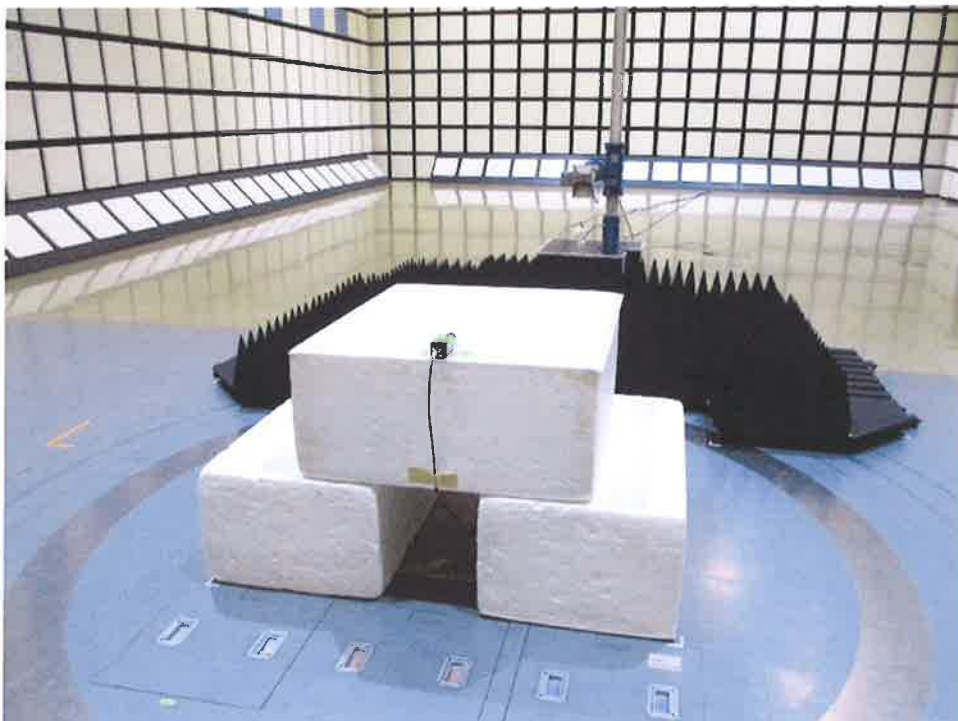
5.1. Radiated Emission

• 30 MHz – 1000 MHz





• 1000 MHz – 2000 MHz



ISHIKAWA Co., Ltd. EMC Laboratory
2-3-18, Namamugi, Tsurumi-ku, Yokohama, Kanagawa 230-0052 Japan
TEL: +81 45-500-2255 FAX: +81 45-500-2256

6. Laboratory Description

6.1. Location

ISHIKAWA Co., Ltd. EMC Laboratory
2-3-18, Namamugi, Tsurumi-ku, Yokohama, Kanagawa 230-0052 Japan
TEL: +81 45-500-2255 FAX: +81 45-500-2256

6.2. Laboratory Equipment

| Site Name | Shielded room Volume | Turn table | Weight proof |
|----------------------|----------------------|-------------|--------------|
| Shielded room No. 1 | 4.9m × 2.9m × 2.8m | ----- | ----- |
| Shielded room No. 2 | 8m × 5m × 2.8m | ----- | ----- |
| 10m Anechoic chamber | 21.5m × 13.5m × 8.9m | 4m diameter | 3,000 kg |
| 3m Anechoic chamber | 9m × 6m × 5.7m | 2m diameter | 500 kg |

6.3. Laboratory Filing or Certificate Information

6.3.1. VCCI Site Registration pursuant to V-5 & VCCI 32-2

| Site Name | Registration No. | Expiry Date |
|--------------------|------------------|---------------|
| ISHIKAWA Co., Ltd. | A-0105 | July 14, 2019 |

6.3.2. FCC Site Filing pursuant to CFR 47 § 2.948

| Site Name | Test Firm Registration No. | Expiry Date |
|--------------------|----------------------------|---------------|
| ISHIKAWA Co., Ltd. | 743690 | July 14, 2019 |

6.3.3. VLAC Accreditation

| Site Name | Accreditation No. | Expiry Date |
|-----------------------------------|-------------------|---------------|
| ISHIKAWA Co., Ltd. EMC Laboratory | VLAC-025 | July 14, 2019 |

6.3.4. TÜV Rheinland Certificate of Appointment Laboratory

| Site Name | Registration No. | Expiry Date |
|-----------------------------------|------------------|--------------|
| ISHIKAWA Co., Ltd. EMC Laboratory | UA50060145-0013 | June 1, 2018 |

6.3.5. Industry Canada site filing pursuant to RSS-Gen

| Site Name | File No. | Expiry Date |
|----------------------|----------|-----------------|
| 10m Anechoic chamber | 5804A-1 | August 19, 2018 |
| 3m Anechoic chamber | 5804A-2 | August 19, 2018 |