



# Test Report

Test Report No. IE1807-019T2  
Date of Issue: 27<sup>th</sup> August, 2018

## FCC Part 15 Subpart B

Radio Frequency Devices

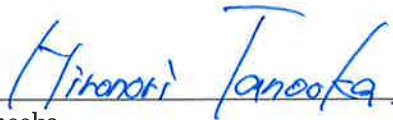
### Applicant Information

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)	:	CMOS AREA SCAN CAMERA
Model Number	:	GO-5100MP-USB
Serial Number	:	U510301
EUT Condition	:	Pre-Production

Date of Test : 18<sup>th</sup> July, 2018

Test Result : **PASS**

- The results in this report are applicable only to the equipment tested.
- This report shall not be reproduced except in full without written acceptance of ISHIKAWA Co., Ltd.

Signature:   
Hironori Tanooka  
Director



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## 1. Summary of Test

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### 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

\*: This test is 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. 3.02 IT04-P009 Rev. 4.02

## 2. Equipment under Test

### 2.1. EUT Information

No.	EUT	Manufacturer	Model No.	Serial No.	FCC ID / DoC
A	CMOS AREA SCAN CAMERA	JAI CORPORATION	GO-5100MP-USB	U510301	None

Note : The EUT was tested as tabletop.

Internal Max. Frequency : 2500 MHz

EUT Clock Frequency	Oscillator	Clock Frequency	Name of Board	Note
	74.25 MHz	297 MHz	Main Board	—
	19.20 MHz	2500 MHz	Main Board	—

Power Rating :

Input DC 12-24 V, 450 mA  
 Input DC 5 V (USB Bus Power), 4.35 W

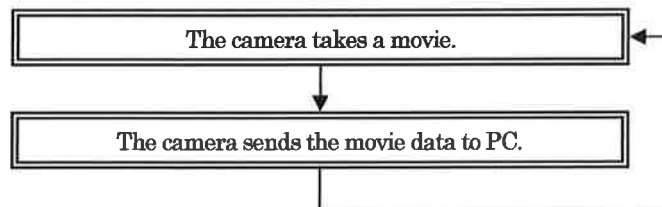
Port(s)	Connector Type	Connector Pin
USB	USB3.0 micro-B	9 Pins

Dimensions of the EUT	Width (mm)	Depth (mm)	Height (mm)
	29.0	41.5	29.0

Weight of the EUT	Weight (kg)
	0.046

### 2.2. Operating Mode

#### • Continuous Mode



### 3. Configuration of Equipment

#### 3.1. Peripherals used

No.	Equipment	Manufacturer	Model No.	Serial No.	FCCID/DoC
B	LENS	RICOH	B1214D-2	139569	None
C	LCD MONITOR	DELL	E2009Wt	CN-0X553D-74445-932-922L	DoC
D	Personal Computer	DELL	D06S001	CN-0YV6K5-70163340-00XF-A00	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

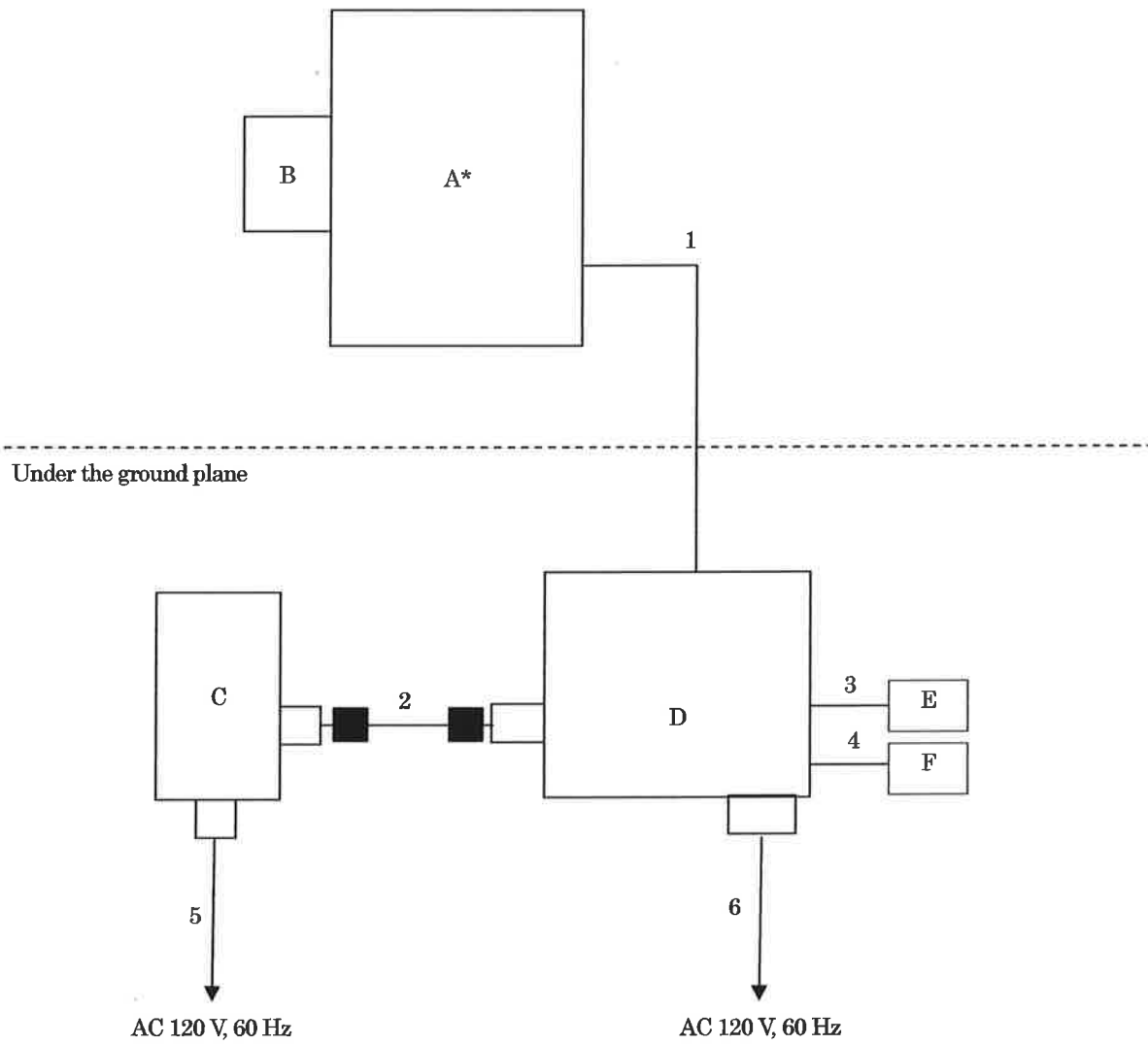
No.	Cable(s) Name	Length (m)	Shielding	Ferrite Core	Comment
5	AC Power Cable for LCD MONITOR	1.5	Unshielded	None	—
6	AC Power Cable for Personal Computer	1.5	Unshielded	None	—

##### Interface Cable

No.	Cable(s) Name	Length (m)	Shielding	Ferrite Core	Comment
1	USB Cable	5.0	Shielded	None	—
2	LCD MONITOR Cable	1.5	Unshielded	Fixed × 2	Refer to Note
3	KEYBOARD Cable	2.0	Unshielded	None	—
4	MOUSE Cable	1.5	Unshielded	None	—

Note: The fixed ferrite core is attached to the peripheral.

### 3.3. System Configuration



\*: EUT

■: Ferrite Core

## 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 – 12500 MHz

#### 4.1.3. Measuring Distance

3 m

#### 4.1.4. Turn Table

Rotated 0 to 360 degrees

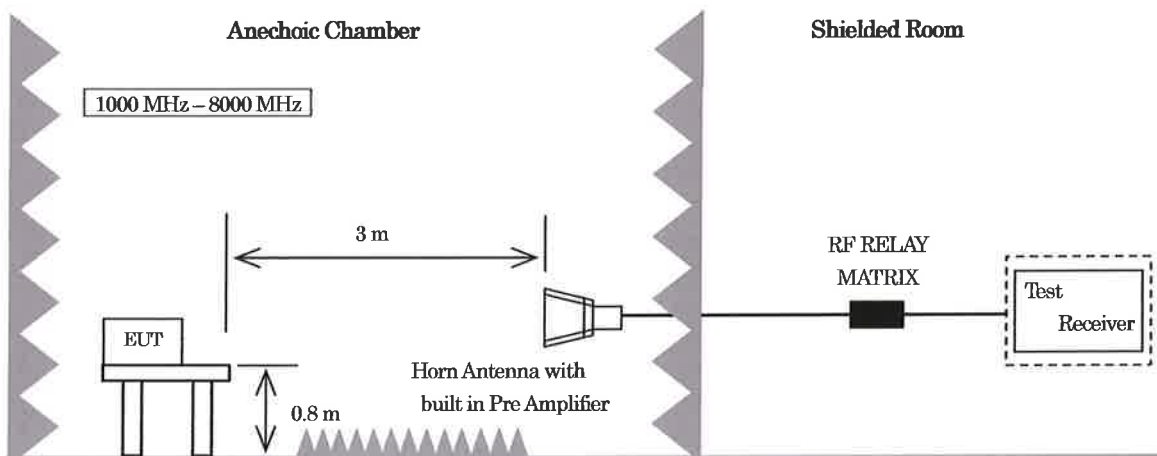
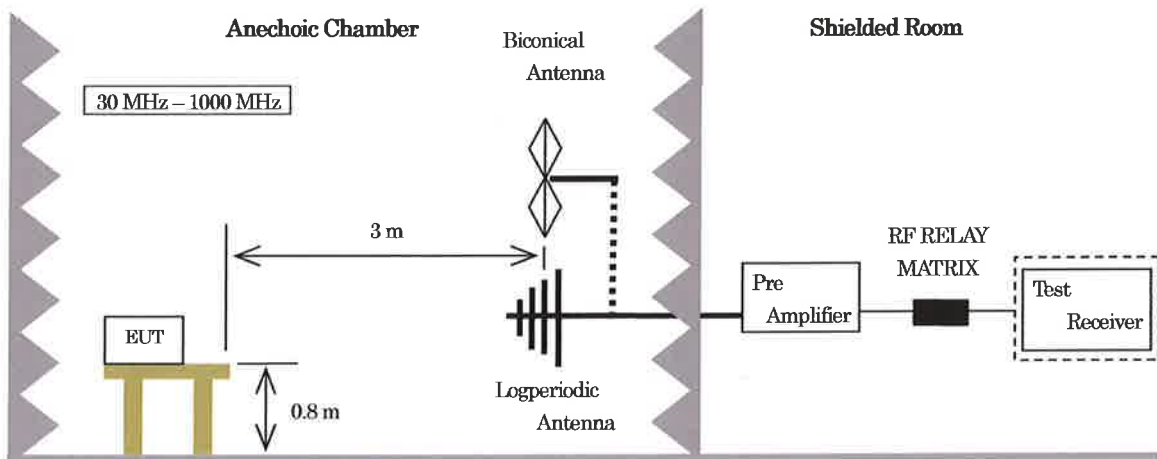
#### 4.1.5. Antenna Position

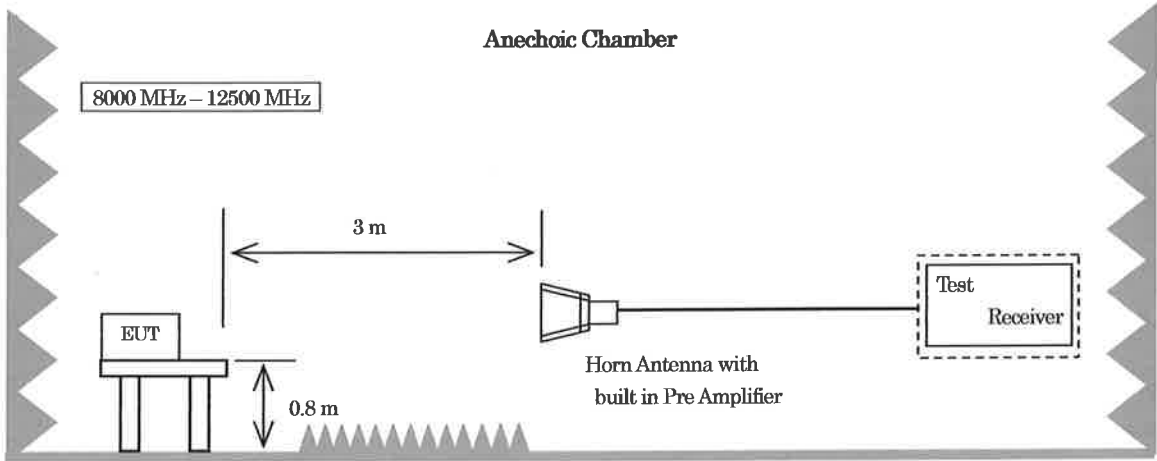
Antenna height: 1 m to 4 m  
Polarization: Horizontal and Vertical

#### 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	May-2019
Pre Amplifier	Sonoma	310N	243232	Aug-2018
RF RELAY MATRIX	tsj	RFMI2A2M	03153	Aug-2018
Biconical Antenna	Schwarzbeck	BBA9106(VHA9103)	91032277	Feb-2019
Logperiodic Antenna	Schwarzbeck	UHALP9108A	0720	Feb-2019
Horn Antenna	EMCO	3115	8912-3303	Dec-2018
Pre Amplifier for Horn Antenna	tsj	MLA-0108AD-39	005	Dec-2018
Horn Antenna with built in Pre Amplifier	ETS·LINDGREN	3161-04EJ338	00040843	May-2020
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
Coaxial Cable (7)	SUHNER	SF104EA	10450/4EA	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 @ 698.411 MHz for Continuous Mode

Disturbance Level	=	Reading	36.9	dBuV
	+	Correction Factor*	+ 0.1	dB/m
			= 37.0	dBuV/m

Margin	=	Limit	46.0	dBuV/m
	-	Disturbance Level	- 37.0	dBuV/m
			= 9.0	dB

\*: 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
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• 1000 MHz – 18000 MHz

+3.84 dB / -3.90 dB
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4.5. Test Data

**Radiated Emission**

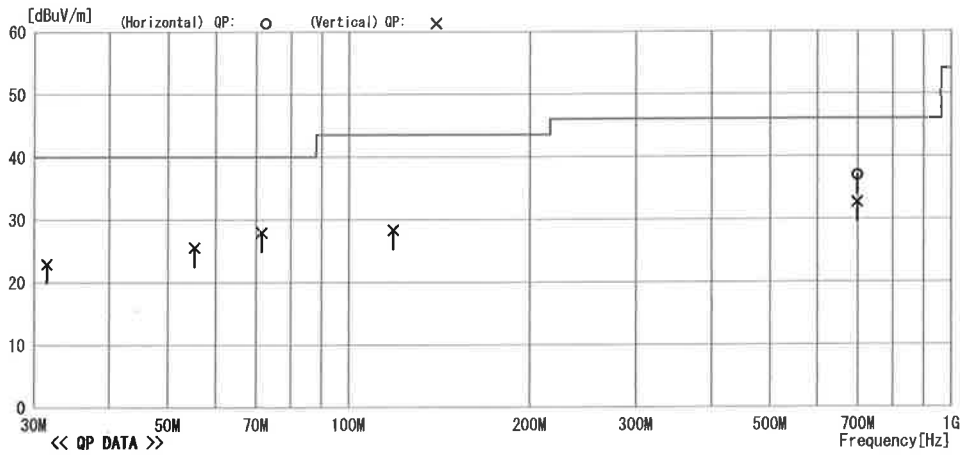
10m A/C  
 Date : 2018/07/18 11:56

Model Name : CMOS AREA SCAN CAMERA  
 Model No. : GO-5100MP-USB  
 Serial No. : U510301  
 Test Condition : Continuous Mode

Data No. : IE1807-019A-04  
 Power Supply : DC 5V  
 Temp./Humi. : 24°C / 58%  
 Operator : K. Okada

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	31.473	29.9	17.4	7.4	31.7	23.0	40.0	17.0	Vert.	100	63	BIC
2	55.253	40.2	9.2	7.8	31.6	25.6	40.0	14.4	Vert.	100	352	BIC
3	71.382	45.4	6.2	8.0	31.6	28.0	40.0	12.0	Vert.	100	173	BIC
4	118.326	39.1	12.4	8.5	31.6	28.4	43.5	15.1	Vert.	100	173	BIC
5	698.411	32.6	19.8	12.0	31.7	32.7	46.0	13.3	Vert.	100	97	LPD
6	698.411	36.9	19.8	12.0	31.7	37.0	46.0	9.0	Hori.	142	72	LPD

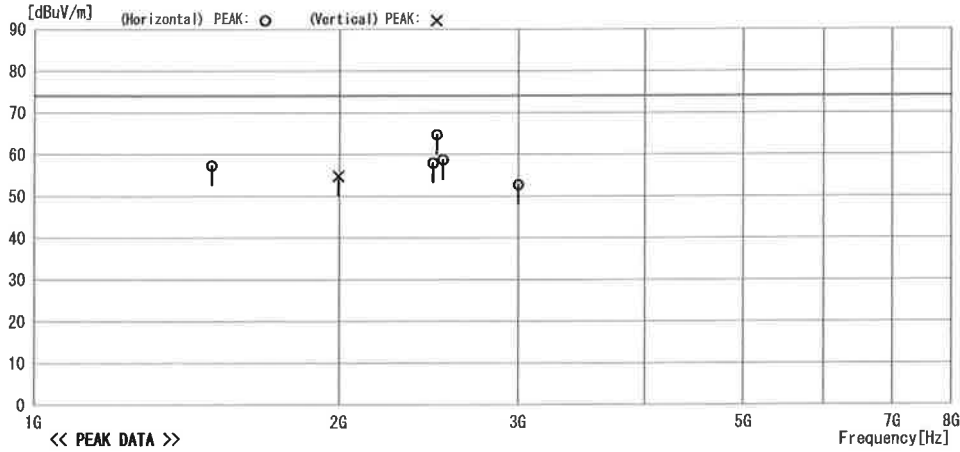
## Radiated Emission

10m A/C  
 Date : 2018/07/18 13:52

Model Name : CMOS AREA SCAN CAMERA	Data No. : IE1807-019A-05
Model No. : GO-5100MP-USB	Power Supply : DC 5V
Serial No. : U510301	Temp/Humi : 24°C / 58%
Test Condition : Continuous Mode	Operator : K. Okada

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	1496.282	65.3	26.2	7.3	41.5	57.3	74.0	16.7	Hor i.	183	58	HOR
2	1995.462	60.3	27.7	8.4	41.6	54.8	74.0	19.2	Ver t.	156	322	HOR
3	2468.067	62.3	28.5	9.3	42.2	57.9	74.0	16.1	Hor i.	177	41	HOR
4	2488.481	69.0	28.5	9.4	42.2	64.7	74.0	9.3	Hor i.	100	314	HOR
5	2523.872	63.0	28.6	9.4	42.3	58.7	74.0	15.3	Hor i.	214	321	HOR
6	2997.295	55.0	29.9	10.4	42.6	52.7	74.0	21.3	Hor i.	216	32	HOR

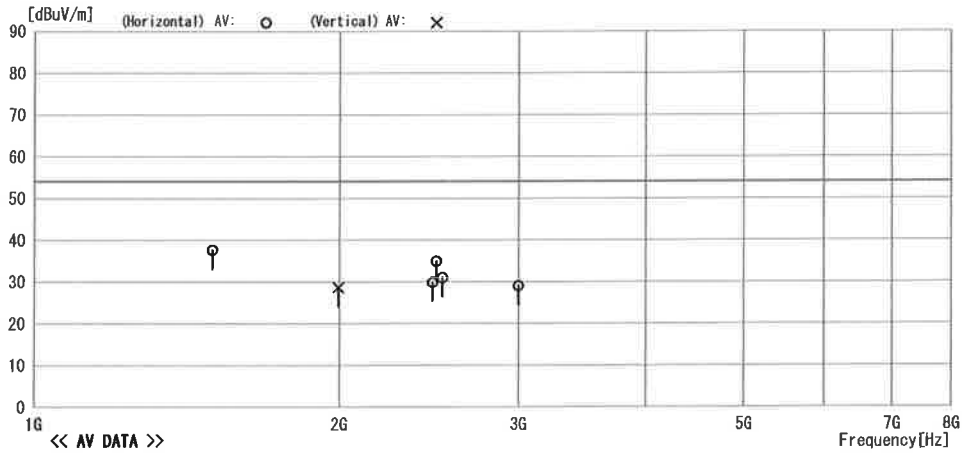
## Radiated Emission

10m A/C  
 Date : 2018/07/18 13:52

Model Name : CMOS AREA SCAN CAMERA	Data No. : IE1807-019A-06
Model No. : GO-5100MP-USB	Power Supply : DC 5V
Serial No. : U510301	Temp/Humi : 24°C / 58%
Test Condition : Continuous Mode	Operator : K. Okada

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	1496.282	45.5	26.2	7.3	41.5	37.5	54.0	16.5	Hori.	183	58	HOR
2	1995.462	34.1	27.7	8.4	41.6	28.6	54.0	25.4	Vert.	156	322	HOR
3	2468.067	34.2	28.5	9.3	42.2	29.8	54.0	24.2	Hori.	177	41	HOR
4	2468.481	39.1	28.5	9.4	42.2	34.8	54.0	19.2	Hori.	100	314	HOR
5	2523.872	35.2	28.6	9.4	42.3	30.9	54.0	23.1	Hori.	214	321	HOR
6	2997.295	31.3	29.9	10.4	42.6	29.0	54.0	25.0	Hori.	216	32	HOR

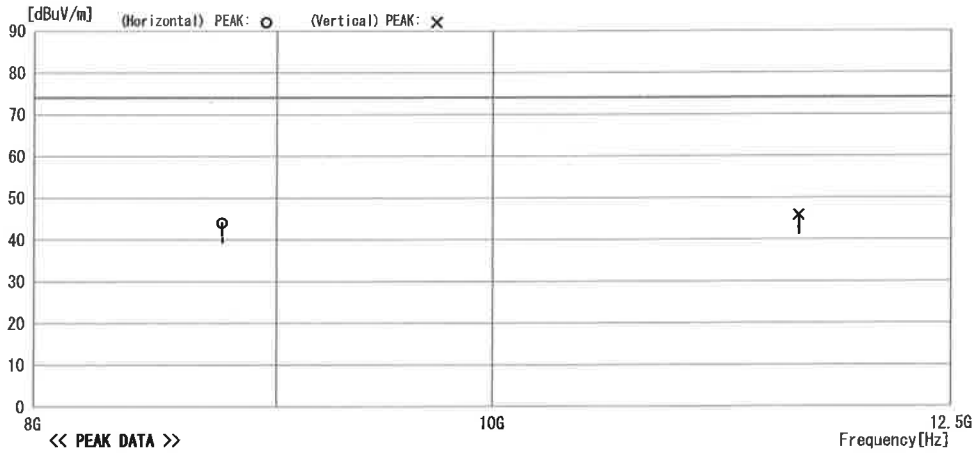
## Radiated Emission

10m A/C  
 Date : 2018/07/18 16:42

Model Name : CMOS AREA SCAN CAMERA	Data No. : IE1807-019A-11
Model No. : GO-5100MP-USB	Power Supply : DC 5V
Serial No. : U510301	Temp/Humi : 24°C / 58%
Test Condition : Continuous Mode	Operator : K. Okada

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	8765.297	41.7	-2.2	4.4	0.0	43.9	74.0	30.1	Hor.	100	140	HOR
2	11605.410	41.9	-1.3	5.1	0.0	45.7	74.0	28.3	Vert.	100	188	HOR

Note: All the other disturbances lower than 20dB below the margin are not reported.

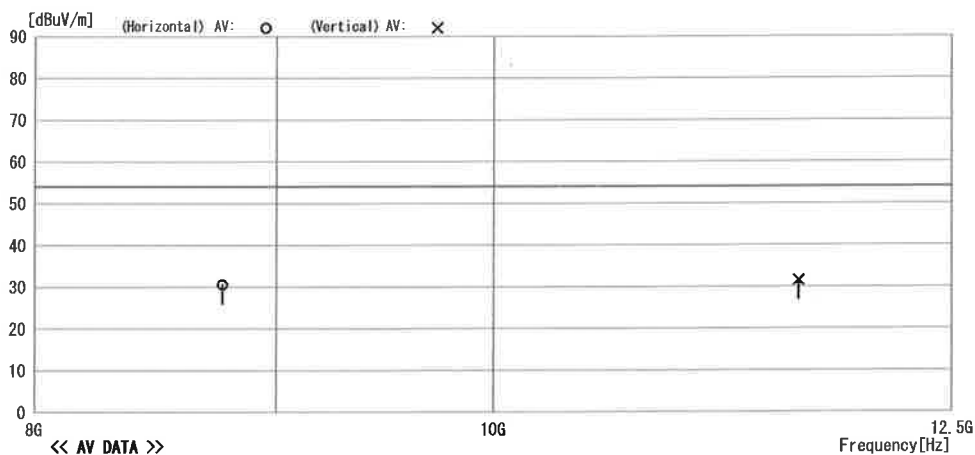
## Radiated Emission

10m A/C  
 Date : 2018/07/18 16:42

Model Name : CMOS AREA SCAN CAMERA	Data No. : IE1807-019A-12
Model No. : GO-5100MP-USB	Power Supply : DC 5V
Serial No. : U510301	Temp/Humi : 24°C / 58%
Test Condition : Continuous Mode	Operator : K. Okada

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	9765.297	28.4	-2.2	4.4	0.0	30.6	54.0	23.4	Hori.	100	140	HOR
2	11605.410	27.8	-1.3	5.1	0.0	31.6	54.0	22.4	Vert.	100	188	HOR

Note: All the other disturbances lower than 20dB below the margin are not reported.

## 5. Photographs

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### 5.1. Radiated Emission

- 30 MHz – 1000 MHz





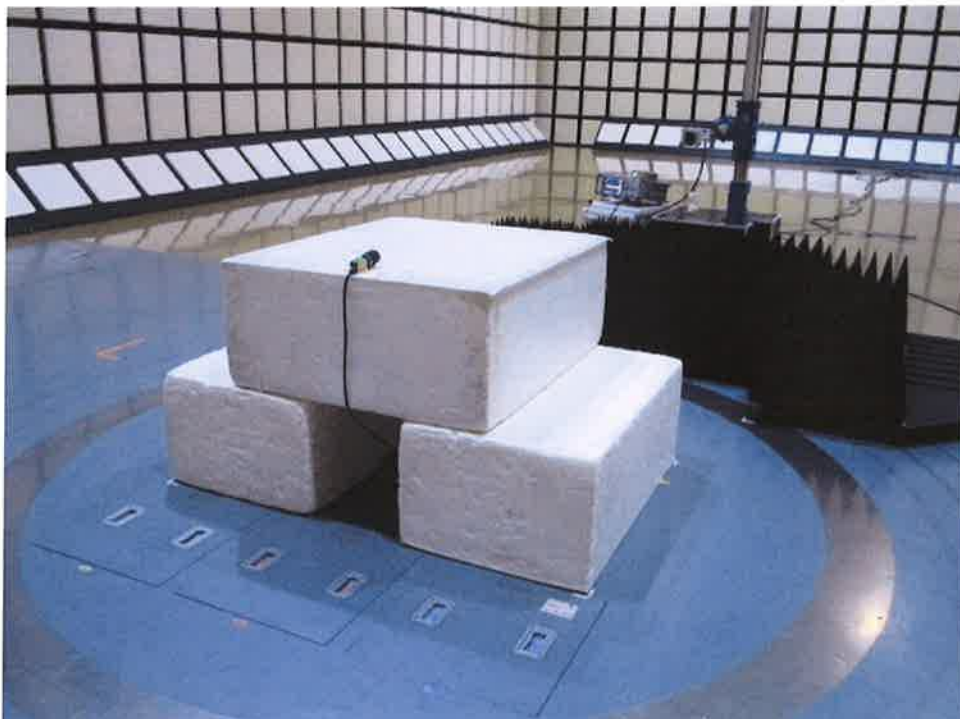


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• 1000 MHz – 8000 MHz



• 8000 MHz – 12500 MHz



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## 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	UA50060145-0014	June 1, 2019