



Test Report

Test Report No. IE1801-014T5

Date of Issue: 8th March, 2018

EN 61000-4-3:2006/A1:2008/A2:2010

Radiated, radio-frequency, electromagnetic field immunity test

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-USB
Serial Number	: JAI-13
EUT Condition	: Pre-Production

Date of Test : 30th, 31st January, 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



Table of Contents

1.	Summary of Test.....	3
2.	Equipment under Test	4
3.	Configuration of Equipment.....	5
4.	RF Electromagnetic Field	7
5.	Photographs	11
6.	Laboratory Description	13

1. Summary of Test

1.1. Test Standard

EN 61000-4-3:2006/A1:2008/A2:2010

1.2. List of Applied Test to the EUT

Test Item	Test Method	Performance Criterion	Test
RF Electromagnetic Field	EN 61000-4-3:2006/A1:2008/A2:2010	A	Applied

1.3. Test Procedure

Test Item	Test Procedure	Internal Test Procedures
RF Electromagnetic Field	EN 61000-4-3:2006/A1:2008/A2:2010 / Clause 8	IT04-P015 Rev. 2.01

1.4. Definition of Performance Criteria

A functional description and a definition of performance criteria, during or as a consequence of the EMC testing, shall be provided by the manufacturer and noted in this report, based on the following criteria.

Performance Criterion	Description
A	The apparatus shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either or these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.
B	The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed. No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.
C	Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.

2. Equipment under Test

2.1. EUT Information

No.	EUT	Manufacturer	Model No.	Serial No.
A	3 CMOS AREA SCAN CAMERA	JAI CORPORATION	AP-1600T-USB	JAI-13

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, 600 mA

Port(s) : Connector Type Connector Pin

USB USB3.0 micro-B 9 Pins

Dimensions of the EUT : Width (mm) Depth (mm) Height (mm)

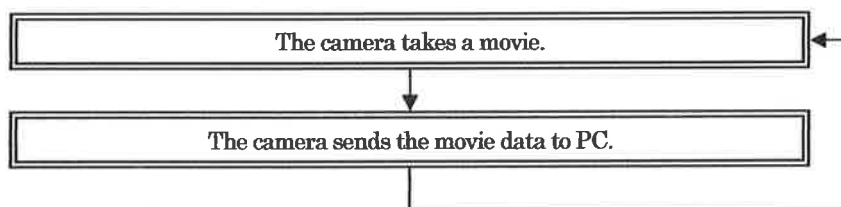
44 74 44

Weight of the EUT : Weight (kg)

0.17

2.2. Operating Mode

• Continuous Mode



3. Configuration of Equipment

3.1. Peripherals used

No.	Equipment	Manufacturer	Model No.	Serial No.
B	LENS	VS TECHNOLOGY CORP.	VS-1218H	V17009604
C	LCD MONITOR	DELL	E2417H	CN-0VJ9GK-74261-68M-1FTU-A00B0-120
D	Personal Computer	DELL	Precision Tower 5810	GRCPB22
E	KEYBOARD	DELL	KB212-B	CN-0N290F-71581-5A9-07J2-A01
F	MOUSE	DELL	MS-111-L	CN-09RRC7-48729-54S-0RK M
G	DC POWER SUPPLY	TAKASAGO	TM018-3	28387152

3.2. Cables used

AC Power Cable

No.	Cable(s) Name	Length (m)	Shielding	Ferrite Core	Comment
6	AC Power Cable for LCD MONITOR	1.5	Unshielded	None	—
7	AC Power Cable for Personal Computer	1.5	Unshielded	None	—
8	AC Power Cable for DC POWER SUPPLY	1.5	Unshielded	Removable × 4	Refer to Note

Interface Cable

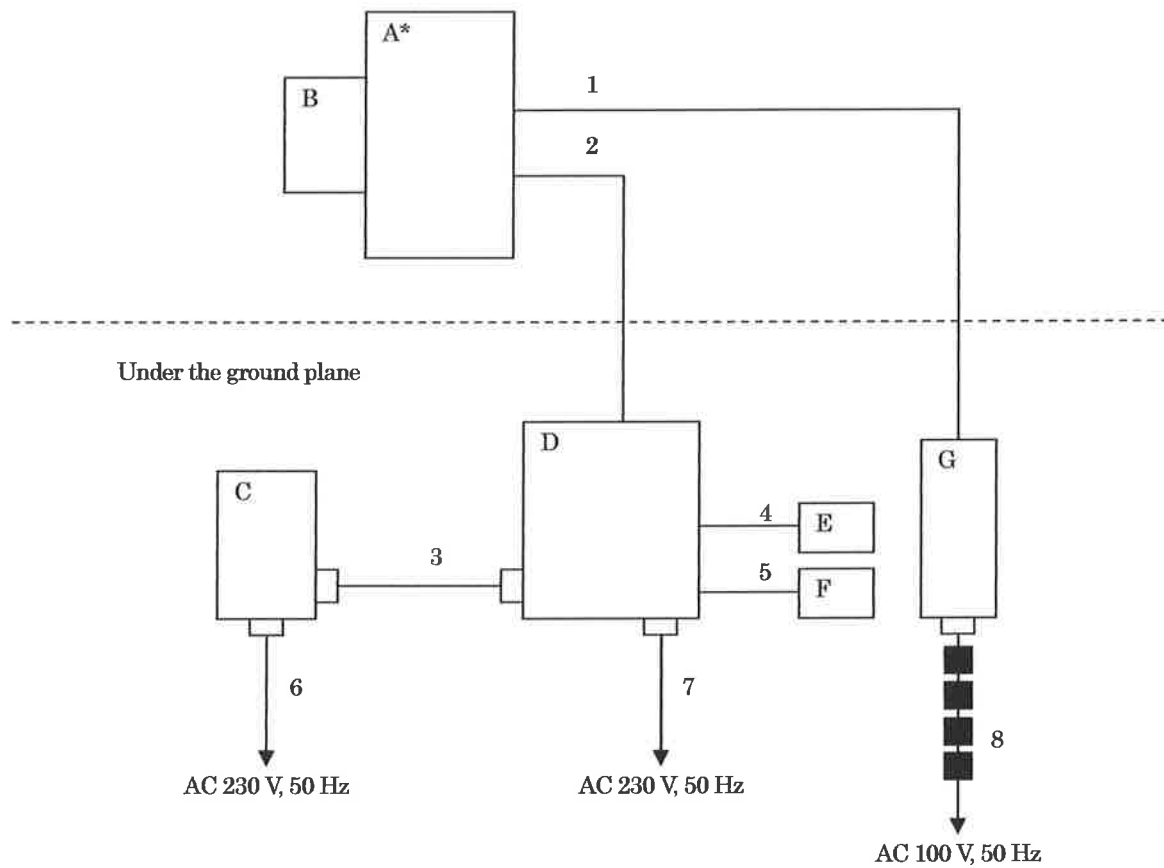
No.	Cable(s) Name	Length (m)	Shielding	Ferrite Core	Comment
1	DC Power Cable for CAMERA	10.0	Shielded	None	—

Interface Cable

No.	Cable(s) Name	Length (m)	Shielding	Ferrite Core	Comment
2	USB Cable	7.0	Shielded	None	—
3	LCD MONITOR Cable	1.5	Shielded	None	—
4	KEYBOARD Cable	2.0	Shielded	None	—
5	MOUSE Cable	1.5	Shielded	None	—

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

3.3. System Configuration



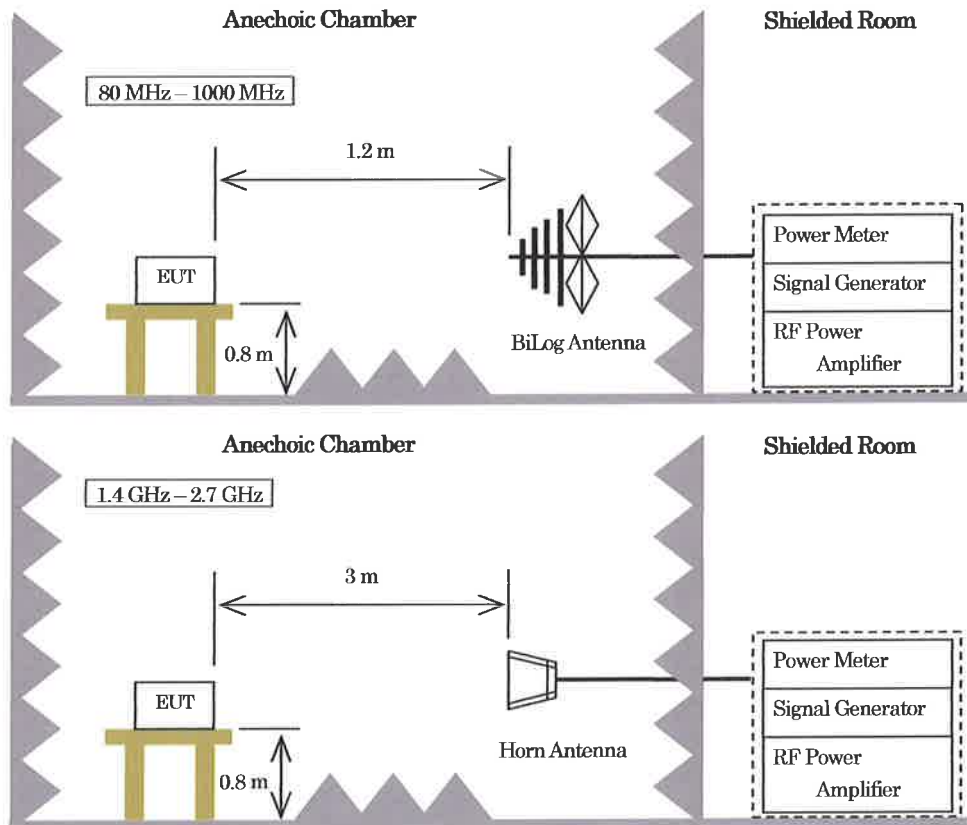
* : EUT
■ : Ferrite Core

4. RF Electromagnetic Field

4.1. Applied Condition

Test Items	Description
Test Method	EN 61000-4-3:2006/A1:2008/A2:2010
Performance Criterion	A
Test Port	Enclosure
Operating Mode	As described in sub-clause 2.2
Test Level	10 V/m (80 MHz to 1000 MHz), 3 V/m(1.4 GHz to 2.0 GHz), 1 V/m (2.0 GHz to 2.7 GHz)
Frequency Range	80 MHz to 1000 MHz, 1.4 GHz to 2.0 GHz, 2.0 GHz to 2.7 GHz
Dwell Time	1 s
Modulation	1 kHz AM 80%
Frequency Step	1 %
Test Distance	1.2 m (80 MHz to 1000 MHz) 3.0 m (1.4 GHz to 2.7 GHz)
Antenna Polarization	Horizontal / Vertical
Antenna Height	1.55 m
Antenna Type	BiLog (80 MHz to 1000 MHz), Horn (1.4 GHz to 2.7 GHz)

4.2. Test Configuration



4.3. Test Equipment

Equipment	Manufacturer	Model No.	Serial No. or ID No.	Calibration Due
Signal Generator	Rohde & Schwarz	SMC100A	105954	Oct-2018
RF RELAY MATRIX	tsj	RFM-S3A2CIL	4229	Jun-2018
Power Amplifier (1)	Schaffner	CBA9433	43524	Jun-2018
Power Amplifier (2)	MILMEGA	AS0827-110	1045580	Jun-2018
Power Meter	Rohde & Schwarz	NRVD	101133	Nov-2018
Bilog Antenna	Schaffner	CBL6112B	2954	Jun-2018
Horn Antenna	Schwarzbeck	BBHA9120L3F	324	Jun-2018
Electric Field Monitor	Narda	EMC-300	C-0028	Feb-2018
E-field Probe	Narda	Type8.3	AV-0081	Feb-2018
Software	TOYO Corporation	IM5/RS	v7.5.010	N/A

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

4.4. Test Results

Test Conditions

Date of Test	Location	Temperature (°C)	Humidity (%)	Atm. Pressure (kPa)	Test Engineer
2018/01/30	Anechoic chamber (3m)	22	20	102.0	T. Akiyama
2018/01/31	Anechoic chamber (3m)	18	25	102.4	T. Akiyama

· Operating Mode: Continuous Mode

Frequency Range : 80 MHz to 1000 MHz

Test Point	Test Level (V/m)	Polarization	Performance Criterion	Result
Front	10	Hor.	A	PASS
		Ver.		
Rear	10	Hor.	A	PASS
		Ver.		
Right	10	Hor.	A	PASS
		Ver.		
Left	10	Hor.	A	PASS
		Ver.		
Top	10	Hor.	A	PASS
		Ver.		
Bottom	10	Hor.	A	PASS
		Ver.		

Frequency Range : 1.4 GHz to 2.0 GHz

Test Point	Test Level (V/m)	Polarization	Performance Criterion	Result
Front	3	Hor.	A	PASS
		Ver.		
Rear	3	Hor.	A	PASS
		Ver.		
Right	3	Hor.	A	PASS
		Ver.		
Left	3	Hor.	A	PASS
		Ver.		
Top	3	Hor.	A	PASS
		Ver.		
Bottom	3	Hor.	A	PASS
		Ver.		

Frequency Range : 2.0 GHz to 2.7 GHz

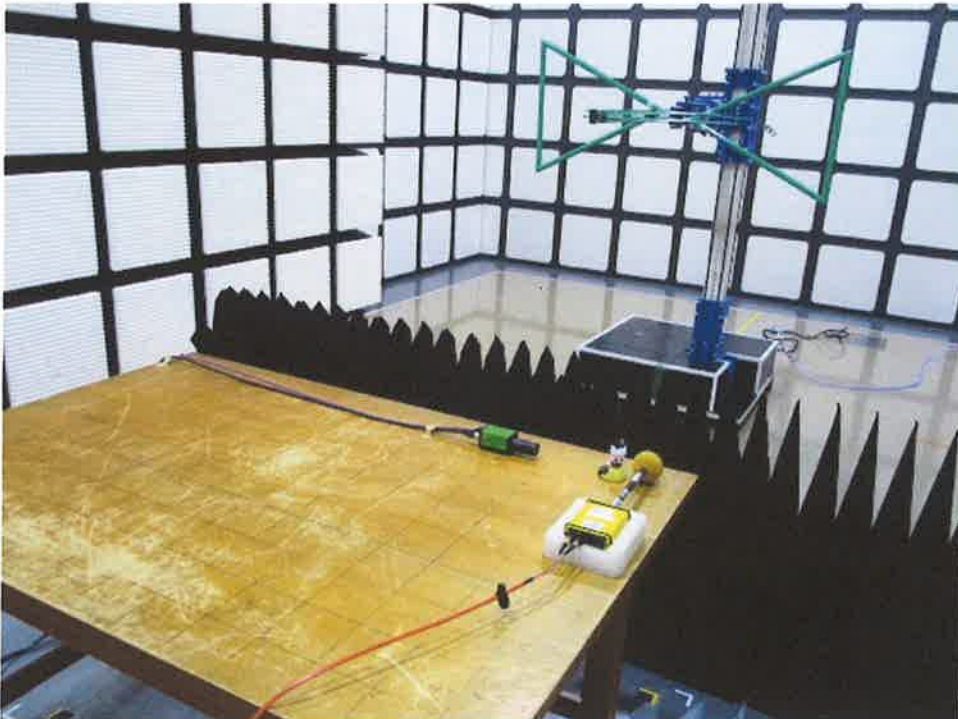
Test Point	Test Level (V/m)	Polarization	Performance Criterion	Result
Front	1	Hor.	A	PASS
		Ver.		
Rear	1	Hor.	A	PASS
		Ver.		
Right	1	Hor.	A	PASS
		Ver.		
Left	1	Hor.	A	PASS
		Ver.		
Top	1	Hor.	A	PASS
		Ver.		
Bottom	1	Hor.	A	PASS
		Ver.		



5. Photographs

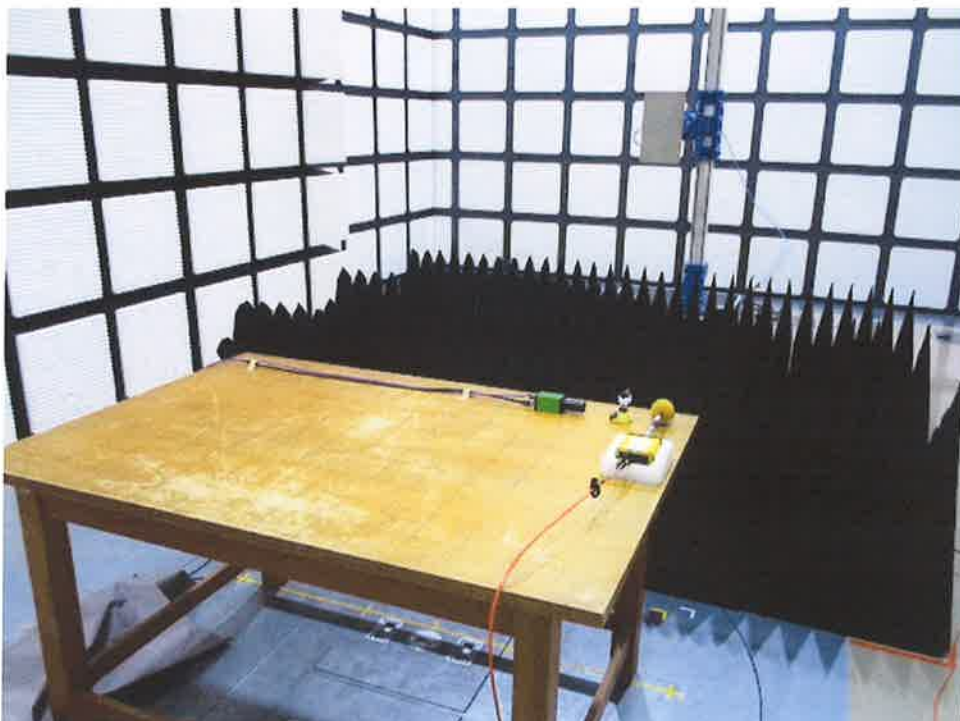
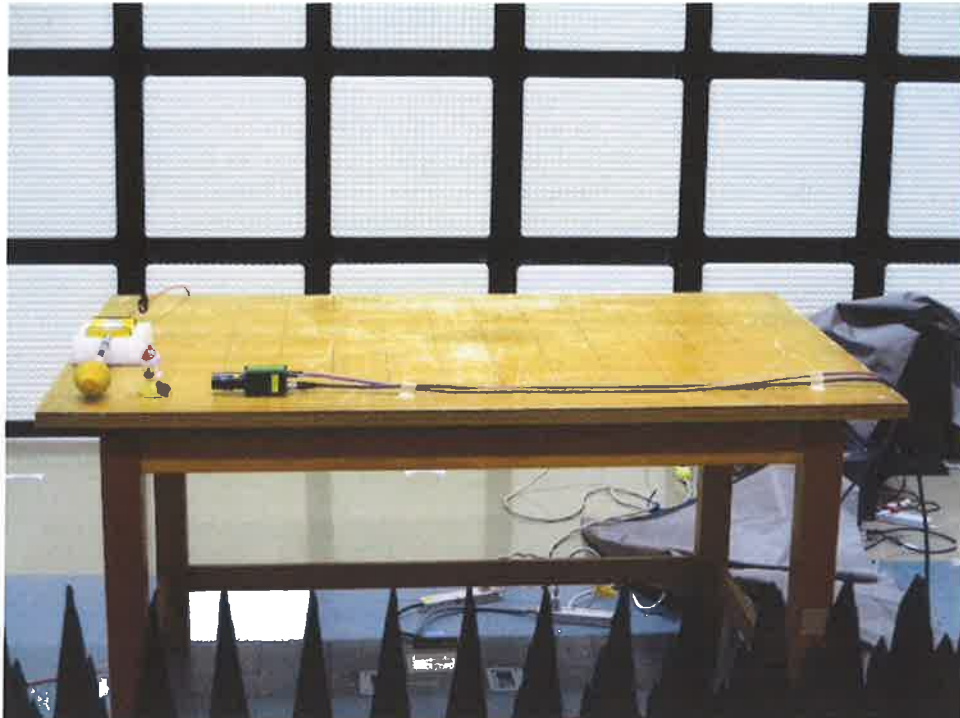
5.1. RF Electromagnetic Field

• 80 MHz – 1000 MHz





• 1.4 GHz – 2.7 GHz



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