



FCC SDOC TEST REPORT

Equipment	: IP Camera
Model No.	: GV-XBL470X-XX (X=0-9, A-Z, or Blank)
Trade Name	: GeoVision
Applicant	: GeoVision Inc.
Address	: 9F, No. 246, Sec.1, Neihu Rd., Neihu District, Taipei 114, Taiwan
Standard	: ANSI C63.4 FCC Part 15 Subpart B

HEREBY CERTIFY THAT :

The sample was received on : Jun. 11, 2019

The testing was carried out on : Jun. 13, 2019

The test result refers exclusively to the test presented test model / sample.

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Approved by:


Kero Kuo / EMC/RF Manager





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History of this test report

Report No.	Issue Date	Description	Version
TEFV1906015	Aug. 19, 2019	Original	A



Summary of Test Results

1. Applicable Standards

The measurements shown in this test report were made in accordance with the procedures given in ANSI C63.4 – 2014 and the energy emitted by this equipment was passed Part 2, Part 15, CISPR PUB. 22.

The energy emitted by this equipment was passed both Radiated and Conducted Emissions **Class A** limits.

Test Item	Normative References	Test Result
Conducted Emission	ANSI C63.4-2014 FCC Part 15 Subpart B	N/A
Radiated Emission	ANSI C63.4-2014 FCC Part 15 Subpart B	PASS

Note*: Pass criterion is defined by the applicant. The test report is to follow the applicant specification.

The principle of judgment is made according to the laboratory's test report and measurement uncertainty standard procedures.

2. General Description

2.1. Product Details

Please refer to user manual.

2.2. Accessories

N/A



3. Test Configuration of Equipment under Test

3.1. Test Software

- a. An executive program, "Web Page" was executed to capture image.
- b. An executive program, "Ping.exe" was executed to capture image via the EUT to the remote workstation through LAN.

3.2. Test Manner

- a. During testing, the interface cables and equipment positions were varied according to ANSI C63.4-2014.
- b. The test modes of EMI test as follow:

Radiated Emissions	
Test Mode 1	Live View + Link LAN (100Mbps), Power from PoE
Test Mode 2	Live View + Link LAN (100Mbps), Power from Adapter
caused "Test Mode 1" generates the worst case, it was reported as the final data.	

- c. The maximum operating frequency is above 108MHz, the test frequency range is from 30MHz to 18GHz.

3.3. Description of Support Unit

No	Device	Manufacturer	Model No.	Description
For Local				
1	Adapter	DVE	DSA-12PFT	N/A
For Remote workstation				
1	Notebook	DELL	Latitude E5440	Power Cable, Unshielding 1.8m
2	PoE	CERIO	POE-S53VG	Power Cable, Unshielding 1.8m RJ45 Cable, Unshielding 1.8m
Use Cable				
1	RJ45	N/A	N/A	Unshielding 15m
2	RJ45	N/A	N/A	Unshielding, 1.8m



3.4. General Information of Test

Test Site	CerpPASS Technology Corporation Test Laboratory
	Address: No.10, Ln. 2, Lianfu St., Luzhu Dist., Taoyuan City 33848, Taiwan (R.O.C.) Tel:+886-3-3226-888 Fax:+886-3-3226-881
	<input type="checkbox"/> Conducted emission test (CON01-NK) <input type="checkbox"/> Conducted emission test (CON02-NK) <input checked="" type="checkbox"/> Radiated emission test (10M01-NK) <input type="checkbox"/> Radiated emission test (3M01-NK) <input type="checkbox"/> Radiated emission test (3M02-NK) <input checked="" type="checkbox"/> Radiated disturbance above 1GHz (10M01-NK) <input type="checkbox"/> Radiated disturbance above 1GHz (3M01-NK) <input type="checkbox"/> Radiated disturbance above 1GHz (3M02-NK)
	TW1079, TW1439
Frequency Range Investigated:	Conducted: from 150 kHz to 30 MHz Radiation: from 30 MHz to 18,000 MHz
Test Distance :	The test distance of radiated emission below 1GHz from antenna to EUT is 10 M. The test distance of radiated emission above 1GHz from antenna to EUT is 3 M.



4. Test of Conducted Emission

4.1. Test Limit

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz, according to the methods defined in ANSI C63.4-2014. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

Table 1 Conducted Emission Limits (dB μ V):

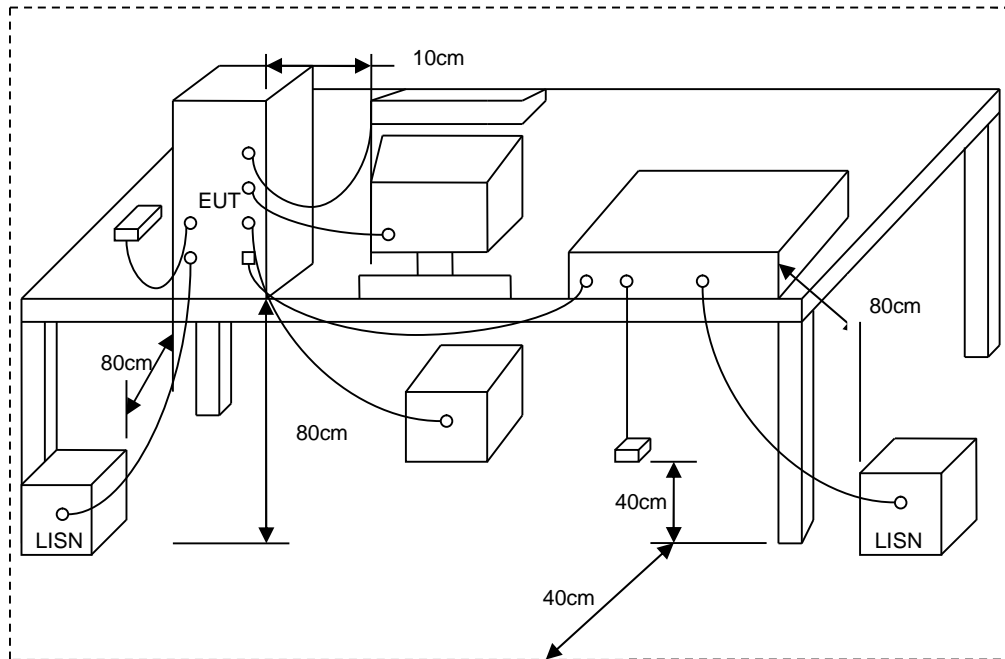
Frequency range (MHz)	Class A Equipment		Class B Equipment	
	Quasi Peak	Average	Quasi Peak	Average
0.15 to 0.50	79	66	66 to 56*	56 to 46*
0.50 to 5	73	60	56	46
5. to 30.	73	60	60	50

*The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5MHz.

4.2. Test Procedures

- The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- Connect EUT to the power mains through a line impedance stabilization network (LISN).
- All the support units are connecting to the other LISN.
- The LISN provides 50 ohm coupling impedance for the measuring instrument.
- The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
- Both sides of AC line were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30 MHz was searched.
- Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

4.3. Typical Test Setup



4.4. Test Result and Data of Power Port

The EUT is powered from PoE & DC Source, this test item is not applicable.



5. Test of Radiated Emission

5.1. Test Limit

Radiated emissions from 30 MHz to 18,000 MHz were measured with a bandwidth of 120 kHz according to the methods defines in ANSI C63.4-2014. The EUT was placed on a nonmetallic stand in the open-field site, 0.8 meter above the ground plane. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions.

For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Table 1 – Frequency below 1GHz

Frequency (MHz)	Distance Meters	Class A(dBµV/m)	Class B(dBµV/m)t
30-230	10	40	30
230-1000	10	47	37

Note: The limit for radiated test was performed according to CISPR 22, which was specified in FCC PART 15B 15.109(g).

Table 2 –Frequency above 1GHz

Frequency (MHz)	Distance Meters	Class A(dBµV/m)		Class B(dBµV/m)t	
		Peak	Average	Peak	Average
Above 1GHz	3	80.0	60.0	74.0	54.0

Note: (1) The lower limit shall apply at the transition frequencies.

(2) Emission level (dBµV/m)= 20 log Emission level(µV/m)

(3) All emission from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

Table 3 –Frequency range of radiated measurement (for unintentional radiators)

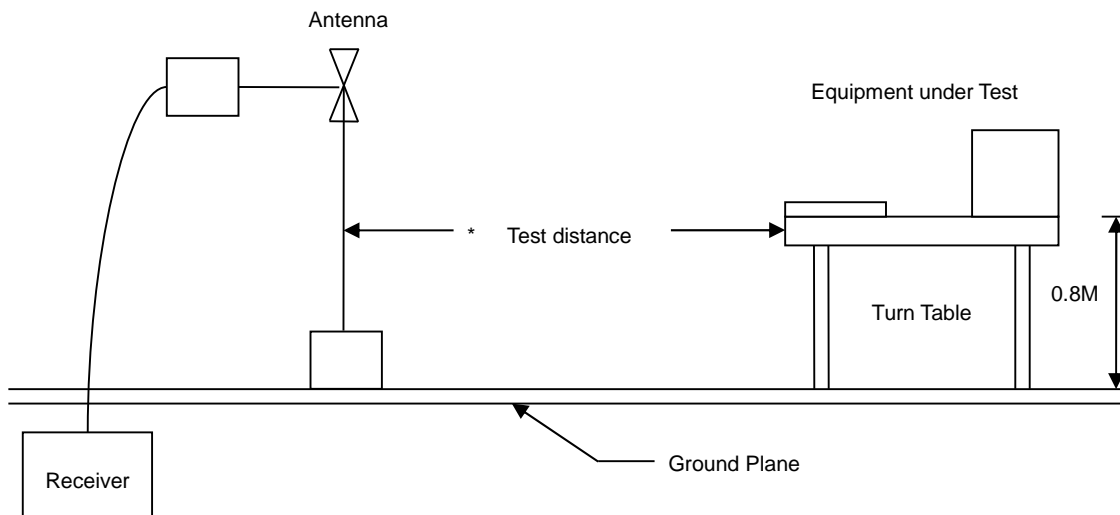
Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes(MHz)	Range(MHz)
Below 1.705	30
1.705-108	1000
108-500	2000
500-1000	5000
Above 1000	5th harmonic of the highest frequency or 40GHz, which is lower

5.2. Test Procedures

- a. The EUT was placed on a rotatable table top 0.8 meter above ground.
- b. The EUT was set 3/10 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest radiation.
- d. The antenna is a half wave dipole and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
- f. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 6 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 6 dB margin will be repeated one by one using the quasi-peak method and reported.

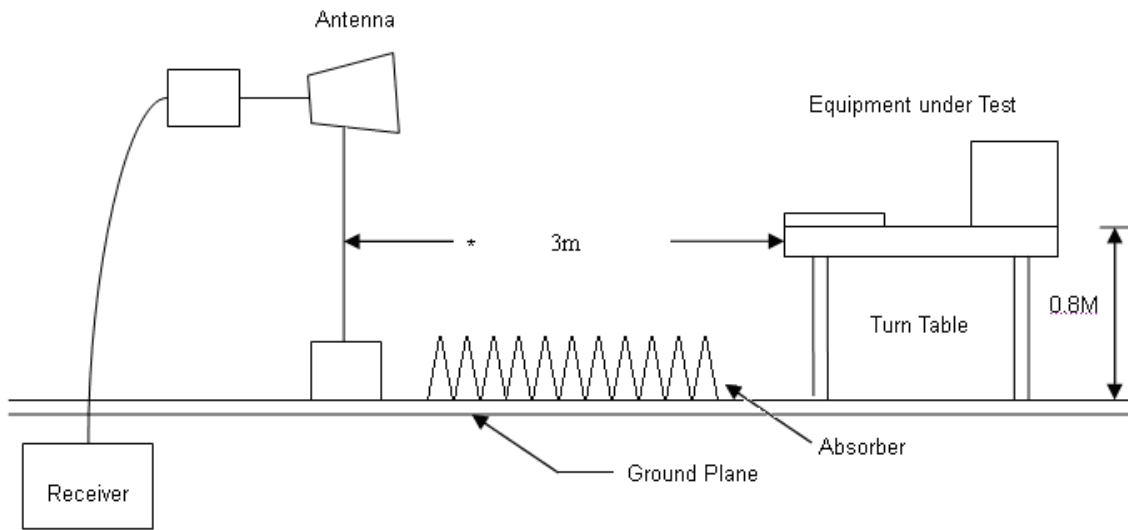
5.3. Typical Test Setup

Below 1GHz Test Setup





Above 1GHz Test Setup

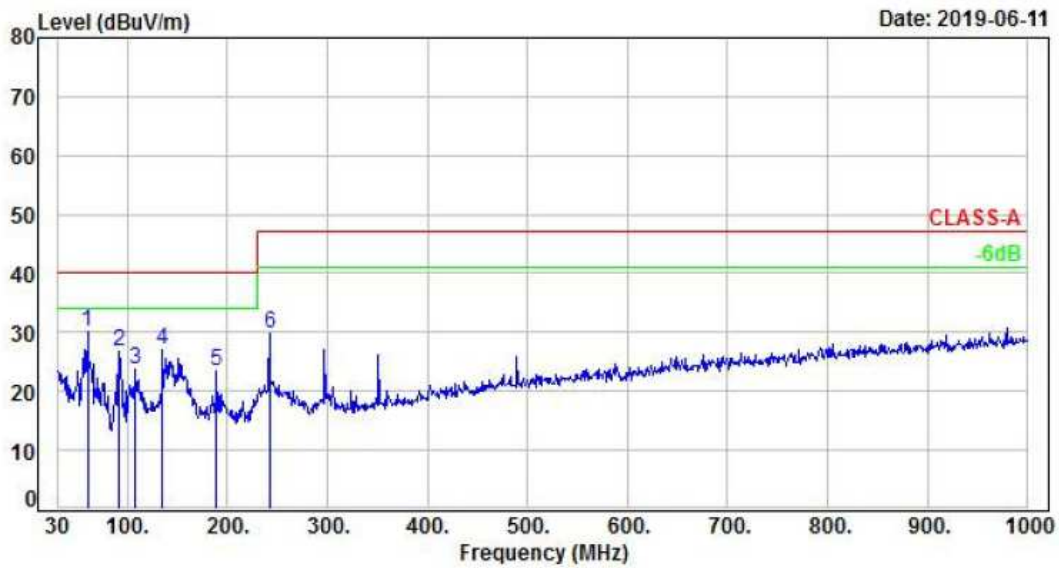




5.4. Test Result and Data (30MHz ~ 1GHz)

Test Mode	Mode 1	Pol/Phase	VERTICAL
Test Frequency	30 MHz ~ 1 GHz	Test Voltage	From PoE
Test Date	Jun. 11, 2019	Test Engineer	Ming
Temperature	20 °C	Relative Humidity	40%

Note : Level = Reading + Factor
 Margin = Level – Limit
 Factor = Antenna Factor + Cable Loss – Amplifier Factor

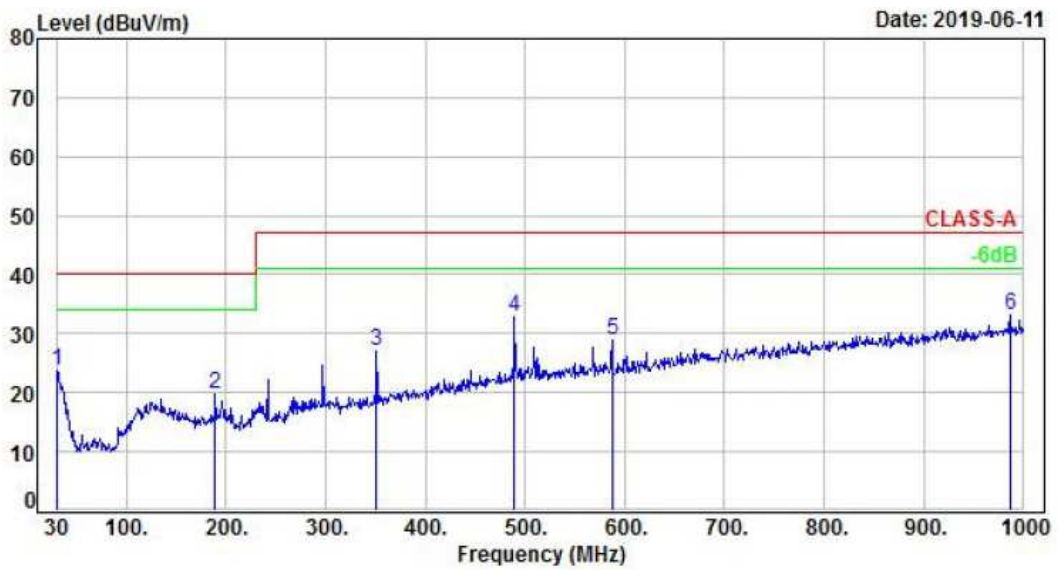


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	60.07	-15.84	45.84	30.00	40.00	-10.00	Peak	100	343	P
2	92.08	-15.48	42.28	26.80	40.00	-13.20	Peak	400	36	P
3	108.57	-10.99	34.80	23.81	40.00	-16.19	Peak	400	112	P
4	134.76	-9.44	36.43	26.99	40.00	-13.01	Peak	100	360	P
5	189.08	-11.61	35.13	23.52	40.00	-16.48	Peak	100	340	P
6	242.43	-11.02	40.97	29.95	47.00	-17.05	Peak	100	350	P



Test Mode	Mode 1	Pol/Phase	HORIZONTAL
Test Frequency	30 MHz ~ 1 GHz	Test Voltage	From PoE
Test Date	Jun. 11, 2019	Test Engineer	Ming
Temperature	20 °C	Relative Humidity	40%

Note : Level = Reading + Factor
 Margin = Level – Limit
 Factor = Antenna Factor + Cable Loss – Amplifier Factor



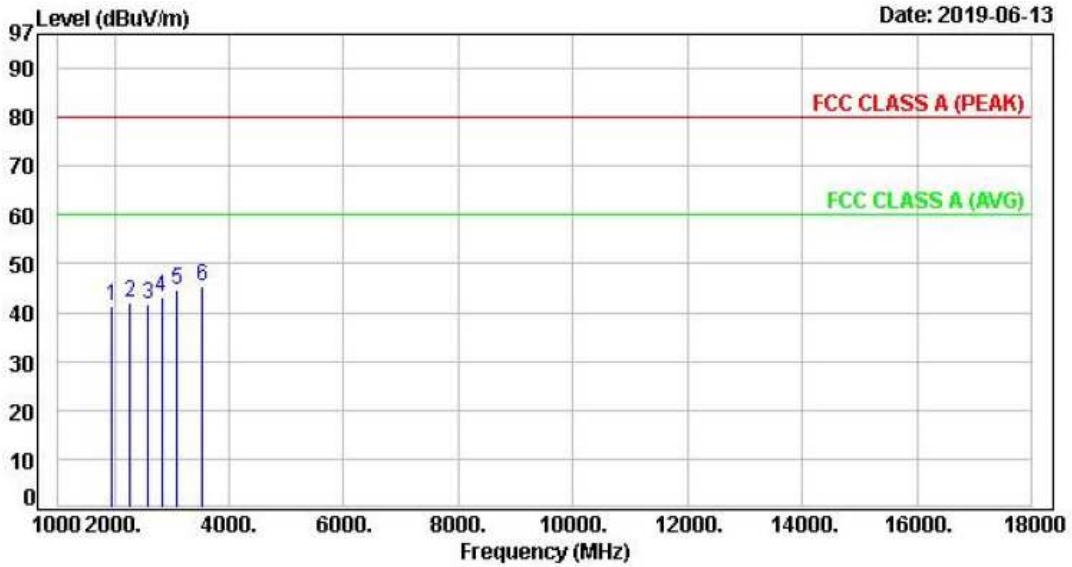
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	30.00	-2.48	26.19	23.71	40.00	-16.29	Peak	400	205	P
2	189.08	-11.11	30.75	19.64	40.00	-20.36	Peak	400	284	P
3	351.07	-6.90	34.09	27.19	47.00	-19.81	Peak	400	251	P
4	489.78	-2.83	35.79	32.96	47.00	-14.04	Peak	100	272	P
5	587.75	-1.32	30.12	28.80	47.00	-18.20	Peak	100	83	P
6	986.42	6.09	27.11	33.20	47.00	-13.80	Peak	400	123	P



5.5. Test Result and Data (1GHz ~ 18GHz)

Test Mode	Mode 1	Pol/Phase	VERTICAL
Test Frequency	1 GHz ~ 18 GHz	Test Voltage	From PoE
Test Date	Jun. 13, 2019	Test Engineer	Ming
Temperature	20 °C	Relative Humidity	40 %

Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor

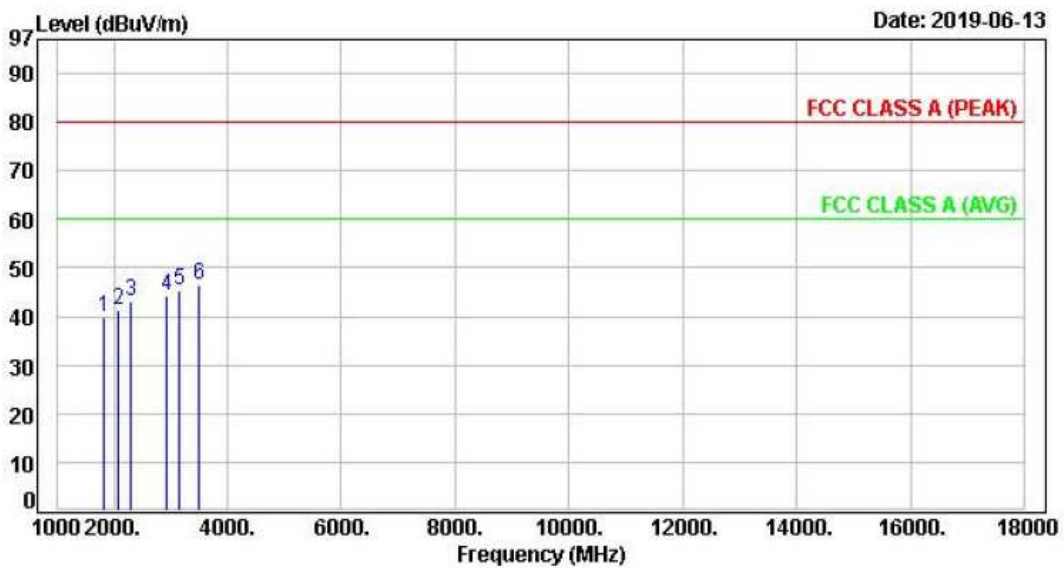


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	1952.00	-2.73	43.96	41.23	80.00	-38.77	Peak	400	0	P
2	2275.00	-1.30	43.23	41.93	80.00	-38.07	Peak	400	0	P
3	2581.00	-0.02	41.84	41.82	80.00	-38.18	Peak	400	0	P
4	2819.00	1.11	42.21	43.32	80.00	-36.68	Peak	400	0	P
5	3091.00	2.30	42.21	44.51	80.00	-35.49	Peak	400	0	P
6	3533.00	3.90	41.56	45.46	80.00	-34.54	Peak	400	0	P



Test Mode	Mode 1	Pol/Phase	HORIZONTAL
Test Frequency	1 GHz ~ 18 GHz	Test Voltage	From PoE
Test Date	Jun. 13, 2019	Test Engineer	Ming
Temperature	20 °C	Relative Humidity	40 %

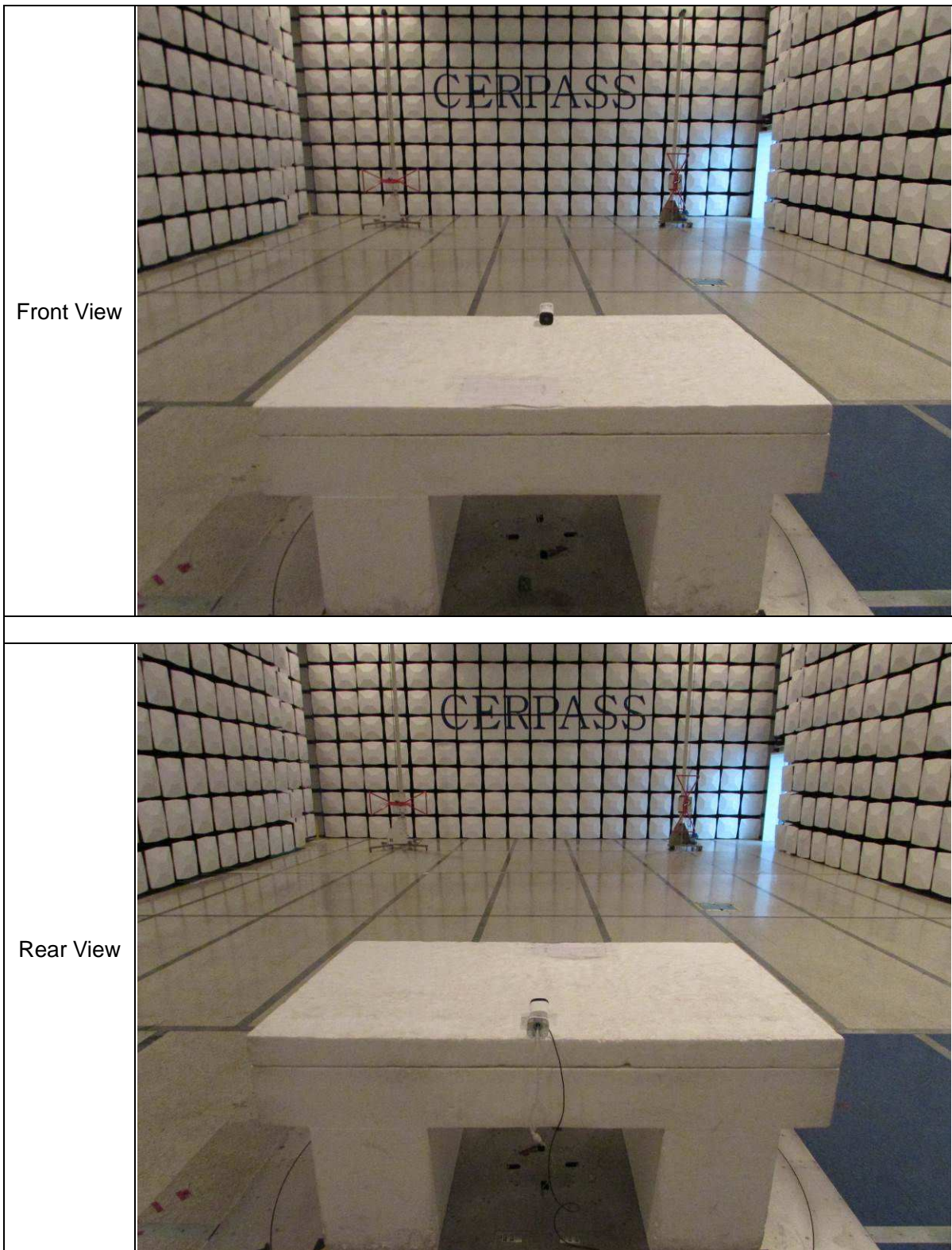
Note : Level = Reading + Factor
 Margin = Level – Limit
 Factor = Antenna Factor + Cable Loss – Amplifier Factor



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	1816.00	-3.75	43.42	39.67	80.00	-40.33	Peak	100	0	P
2	2088.00	-2.02	43.24	41.22	80.00	-38.78	Peak	100	0	P
3	2309.00	-1.16	44.49	43.33	80.00	-36.67	Peak	100	0	P
4	2921.00	1.61	42.52	44.13	80.00	-35.87	Peak	100	0	P
5	3159.00	2.56	42.84	45.40	80.00	-34.60	Peak	100	0	P
6	3482.00	3.69	42.60	46.29	80.00	-33.71	Peak	100	0	P

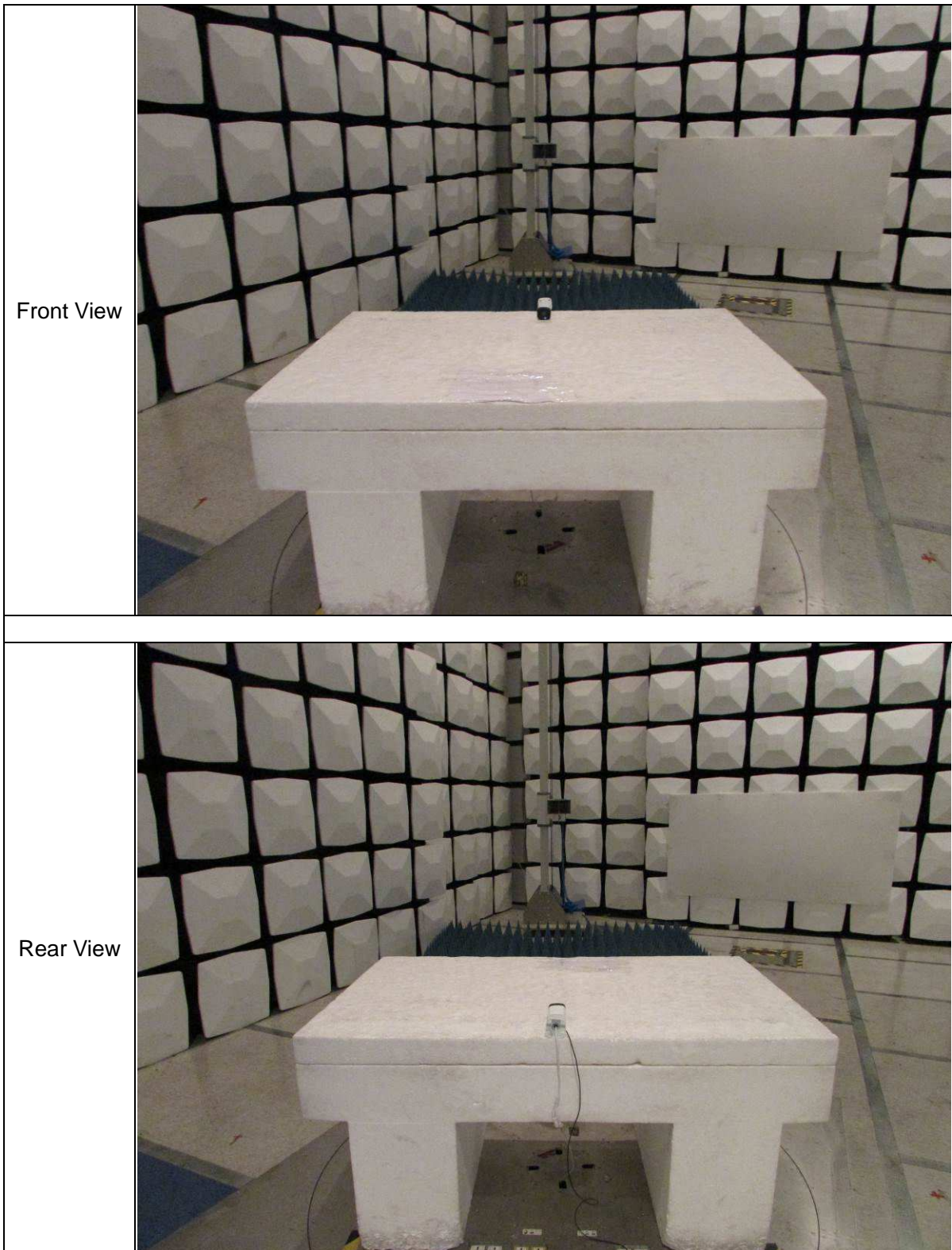


5.6. Test Photographs (30MHz ~ 1GHz)





5.7. Test Photographs (1GHz ~ 18GHz)





6. Measurement Uncertainty

Measurement Item	Measurement Frequency	Polarization	Uncertainty
Conducted Emission	9 kHz ~ 30 MHz	LINE / NEUTRAL	±3.25 dB
Radiated Emission	30 MHz ~ 1,000 MHz	Vertical / Horizontal	±3.93 dB
	1,000 MHz ~ 6,000 MHz	Vertical / Horizontal	±3.82 dB
	6,000 MHz ~ 18,000 MHz	Vertical / Horizontal	±4.62 dB

The measurement uncertainty will be considered, when test result margin to the limit.

7. List of Measuring Equipment

Radiated Emission below 1GHz (Test date: 2019/06/11)					
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
Bilog Antenna(H)	Sunol	JB1	A020514-1	2019/03/26	2020/03/25
Bilog Antenna(V)	Sunol	JB1	A020514-2	2019/04/23	2020/04/22
EMI Receiver(V)	R&S	ESCI	101402	2019/03/14	2020/03/13
EMI Receiver(H)	R&S	ESCI 7	100963	2019/03/29	2020/03/28
Preamplifier(V)	EM Electronics corp.	EM330	60610	2019/03/11	2020/03/10
Preamplifier(H)	EM Electronics corp.	EM330	60611	2019/03/11	2020/03/10
Cable-16m (30M-1G)(H)	HUBER SUHNER	RG-214	01110M	2019/06/20	2020/06/19
Cable-4m (30M-1G)(H)	HUBER SUHNER	RG-214	02951M	2019/06/21	2020/06/20
Cable-1m (30M-1G)(H)	HUBER SUHNER	RG-214	01098M	2019/06/21	2020/06/20
Cable-10m (30M-1G)(V)	HUBER SUHNER	RG-214	01126M	2019/06/21	2020/06/20
Cable-4m (30M-1G)(V)	HUBER SUHNER	RG-214	02953M	2019/06/21	2020/06/20
Cable-1m (30M-1G)(V)	HUBER SUHNER	RG-214	01099M	2019/06/21	2020/06/20
Software	AUDIX	E3	Version: 8.2014-6-4	N/A	N/A

Radiated Emission above 1GHz (Test date: 2019/06/13)					
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
Horn Antenna	EMCO	3115	31601	2018/09/26	2019/09/25
Spectrum Analyzer	R&S	FSP 40	100047	2019/03/28	2020/03/27
Preamplifier	Agilent	8449B	3008A01954	2019/03/11	2020/03/10
Cable-0.5m (30M-40G)	HUBER SUHNER	SUCOFLEX 102	36270/2	2019/03/14	2020/03/13
Cable-3m (1G-26.5G)	HUBER SUHNER	SUCOFLEX 102	28417/2	2019/03/13	2020/03/12
Software	AUDIX	E3	Version: 8.2014-6-4	N/A	N/A