



MEASUREMENT REPORT

FCC Part 15B

APPLICANT : ZHEJIANG DAHUA VISION TECHNOLOGY CO.,LTD.

ADDRESS : No.1199, Bin'an Road, Binjiang District, Hangzhou, P.R. China

Application Type : Declaration of Conformity

Product : IP CAMERA

Model Number : DH-IPC-HDW5830RP-Z, DH-IPC-HDW2231RP-ZS

FCC Rule Part(s) : FCC Part 15 Subpart B: 2016

IC Rule Part(s) : IC ICES 003 (Class B) Issue 6: 2016

Test Procedure(s) : ANSI C63.4: 2014


Test Date : December 27~29, 2016

Reviewed By

: 
(Paddy Chen)



Approved By

: 
(Chenz Ker)

The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-2014. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Taiwan) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
1701TW0103-U1	1.0	Original Report	2017-01-09	
1701TW0103-U1	2.0	Add IC Standard in P1	2017-02-17	
1701TW0105-U1	3.0	Add Serial Model on P6	2017-06-08	

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§2.1033 General Information

Applicant:	ZHEJIANG DAHUA VISION TECHNOLOGY CO.,LTD.
Applicant Address:	No.1199, Bin'an Road, Binjiang District, Hangzhou, P.R. China
Manufacturer:	ZHEJIANG DAHUA VISION TECHNOLOGY CO.,LTD.
Manufacturer Address:	No.1199, Bin'an Road, Binjiang District, Hangzhou, P.R. China
Test Site:	MRT Technology (Taiwan) Co., Ltd
Test Site Address:	No. 38, Fuxing Second Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C)
MRT FCC Registration No.:	153292
Test Device Serial No.:	N/A <input type="checkbox"/> Production <input checked="" type="checkbox"/> Pre-Production <input type="checkbox"/> Engineering

Test Facility / Accreditations

Measurements were performed at MRT Laboratory located in Fuxing Rd., Taoyuan, Taiwan (R.O.C)

- MRT facility is a FCC registered (Reg. No. 153292) test facility with the site description report on file and is designated by the FCC as an Accredited Test Film.
- MRT facility is an IC registered (MRT Reg. No. 21723-1) test laboratory with the site description on file at Industry Canada.
- MRT Lab is accredited to ISO 17025 by the Taiwan Accreditation Foundation (TAF Cert. No. 3261) in EMC, Telecommunications and Radio testing for FCC, Industry Taiwan, EU and TELEC Rules.

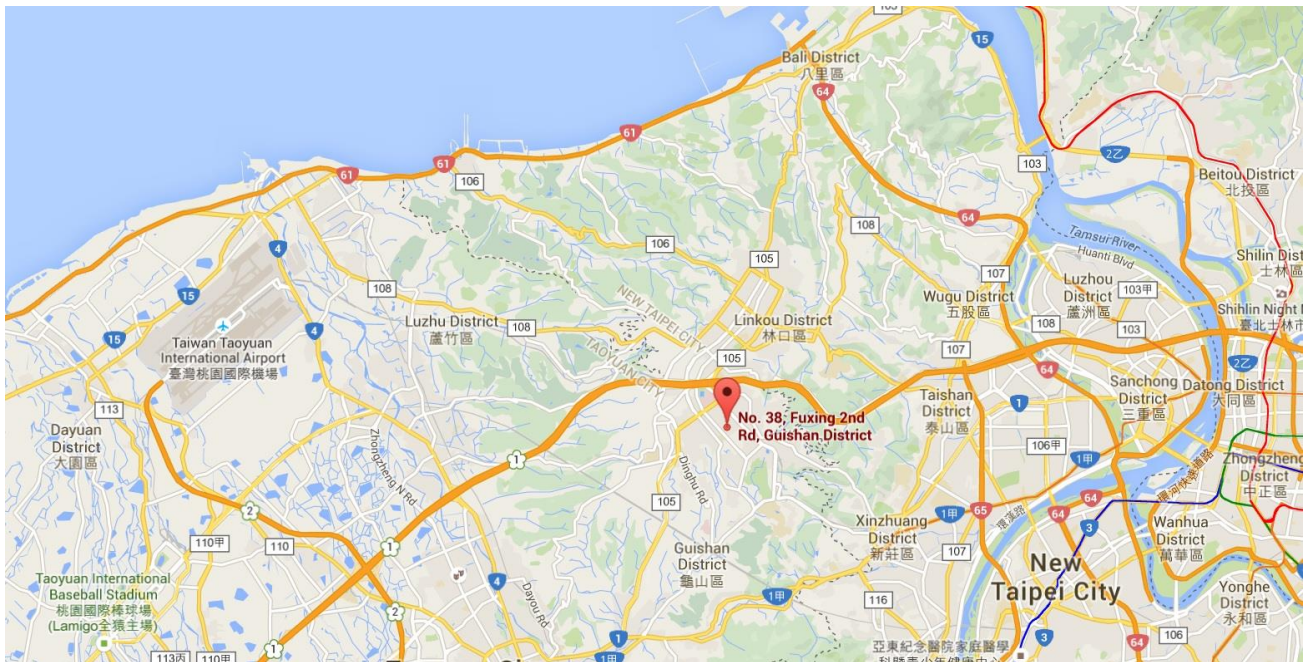
1. INTRODUCTION

1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Industry Canada Certification and Engineering Bureau.

1.2. MRT Test Location

The map below shows the location of the MRT LABORATORY, its proximity to the Taoyuan City. These measurement tests were conducted at the MRT Technology (Taiwan) Co., Ltd. Facility located at No.38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 33377, Taiwan (R.O.C).



2. PRODUCT INFORMATION

2.1. Equipment Description

Product Name	IP CAMERA
Product Voltage	POE: 48V, 200mA / Adaptor
Model Number	DH-IPC-HDW5830RP-Z, DH-IPC-HDW2231RP-ZS
Serial Model	DH-IPC-HDW5231RN-Z、DH-IPC-HDW5231RP-Z、IPC-HDW5231RN-Z、 IPC-HDW5231RP-Z、DH-IPC-HDW5231RP-Z-S2、 DH-IPC-HDW5431RN-Z、DH-IPC-HDW5431RP-Z、IPC-HDW5431RN-Z、 IPC-HDW5431RP-Z、DH-IPC-HDW5431RP-Z-S2、 DH-IPC-HDW5830RN-Z、DH-IPC-HDW5830RP-Z、IPC-HDW5830RN-Z、 DH-IPC-HDW5830RP-Z-S2、DH-IPC-HDW5830RP、N58BH4Z、 N58BH4ZI、IPC-HDW2231RP-ZS、IPC-HDW2231RN-ZS、 DH-IPC-HDW2231RP-ZS、DH-IPC-HDW2231RN-ZS、 IPC-HDW2231RP-ZS-S2、IPC-HDW2230RP-ZS、 DH-IPC-HDW2230RP-ZS、DH-IPC-HDW2230RN-ZS、 IPC-HDW2230RN-ZS、IPC-HDW2431RN-ZS、IPC-HDW2431RP-ZS、 DH-IPC-HDW2431RP-ZS、DH-IPC-HDW2431RN-ZS、 IPC-HDW2431RP-ZS-S2、DH-IPC-HDW2531RP-ZS-27135、 DH-IPC-HDW2531RN-ZS-27135、IPC-HDW2531RP-ZS-27135、 IPC-HDW2531RN-ZS-27135、DH-IPC-HDW2531RP-ZS、 DH-IPC-HDW2531RN-ZS、IPC-HDW2531RP-ZS、IPC-HDW2531RN-ZS
Adapter	Manufacturers: SHENZHEN HONOR ELECTRONICS Model No.: ADS-12AM-12 12012EPCU Input Power: 100-240V~50/60Hz Max. 0.3A Output Power: DC 12V 1.0A DC Cable Out: 2.0m

Note: The Model difference is

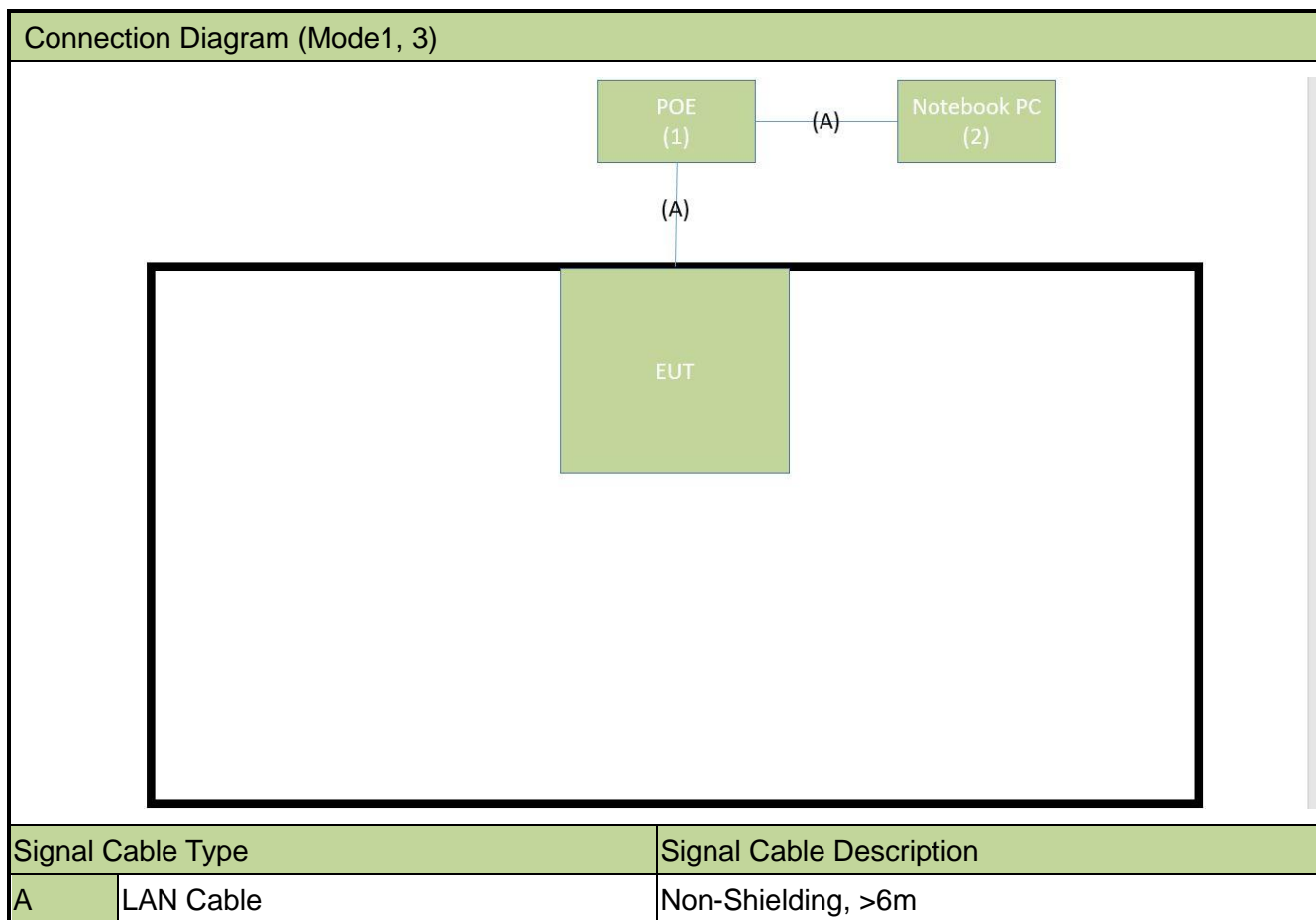
- (1) The motherboard are the same but they differ in sensor pixels.
- (2) HD5W is auto iris while HD2W is fixed iris
- (3) The others are aimed at different market segment.

2.2. Test Mode

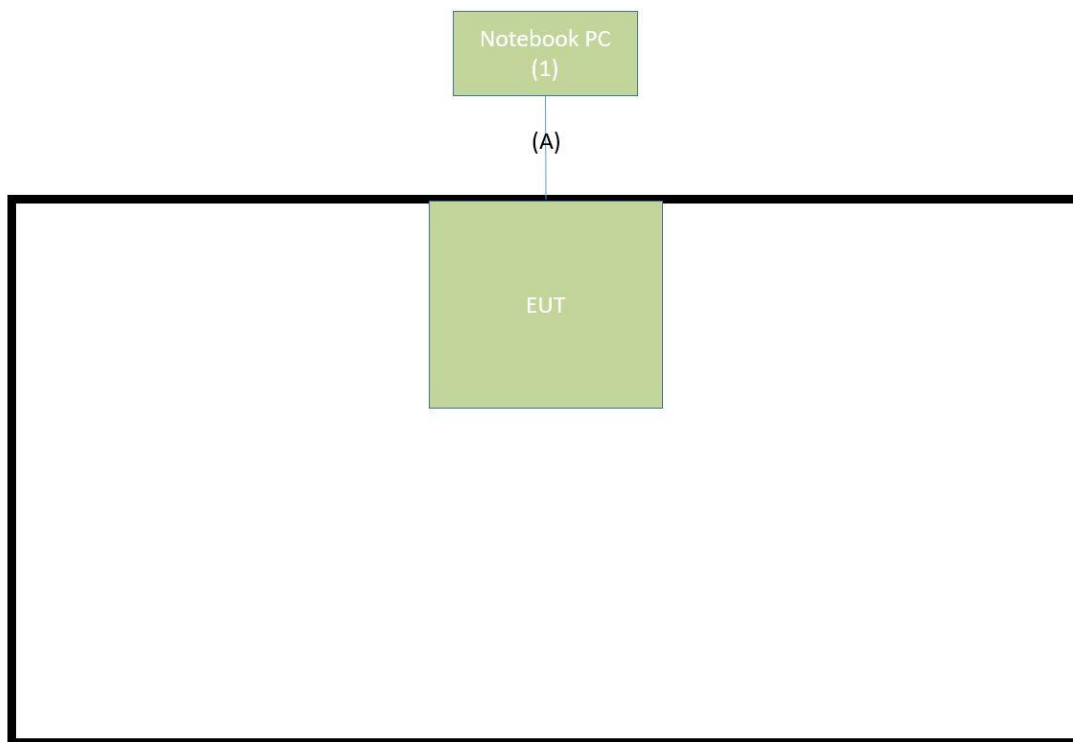
Pre-Test Mode	
EMI Mode	Mode1: DH-IPC-HDW5830RP-Z with POE Mode2: DH-IPC-HDW5830RP-Z with Adapter Mode3: DH-IPC-HDW2231RP-ZS with POE Mode4: DH-IPC-HDW2231RP-ZS with Adapter
Final Test Mode	
EMI Mode	Mode1: DH-IPC-HDW5830RP-Z with POE Mode2: DH-IPC-HDW5830RP-Z with Adapter Mode3: DH-IPC-HDW2231RP-ZS with POE Mode4: DH-IPC-HDW2231RP-ZS with Adapter

2.3. Test Configuration

The IP CAMERA was tested per the guidance FCC Part 15 Subpart B: 2016 and ANSI C63.4: 2014 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing.



Connection Diagram (Mode2, 4)



Signal Cable Type		Signal Cable Description
A	LAN Cable	Non-Shielding, >6m

2.4. Test System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Mode 1, 3:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	POE Adapter	CERIO	POE-S53VG	BWHH00978A1	Non-shielding, 1.8m
2	Notebook PC	Lenovo	ThinkPad T450	PC0BH4FR	Non-shielding, 0.8m

Mode 2, 4:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook PC	Lenovo	ThinkPad T450	PC0BH4FR	Non-shielding, 0.8m

2.5. Test Software

Not applicable.

2.6. EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

3. DESCRIPTION OF TEST

3.1. Evaluation Procedure

The measurement procedures described in the American National Standard for Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical Equipment in the Range of 9kHz to 18GHz (ANSI C63.4-2014) was used in the measurement of the **IP CAMERA**.

Deviation from measurement procedure.....None

3.2. AC Line Conducted Emissions

The line-conducted facility is located inside an 9'x4'x3' shielded enclosure. A 1m x 2m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz, 50Ω/50uH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.

The EUT is powered from one LISN and the support equipment is powered from the second LISN. If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and this supply line(s) will be connected to the second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference ground-plane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the receiver and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The receiver was scanned from 150 kHz to 30 MHz. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 9 kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Each emission was also maximized by varying: power lines, the mode of operation or resolution, clock or data exchange speed, scrolling H pattern to the EUT and/or support equipment whichever determined the worst-case emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions are used for final measurements on the same test site. Line conducted emissions test results are shown in Section 6.2.

3.3. Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. An MF Model 210SS turntable is used for radiated measurement. It is a continuously rotatable, remote controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm high PVC support structure is placed on top of the turntable.

For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30 MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30 MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up was placed on top of the 0.8 meter high, 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, mode of operation, if applicable, turntable azimuth, and receive antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, whichever produced the worst-case emissions. According to 3dB beam-width of horn antenna, the horn antenna should be always directed to the EUT when rising height.

Radiated emissions test results are shown in Section 6.3.

4. TEST EQUIPMENT CALIBRATION DATE

Conducted Emissions - SR2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTTWA00045	1 year	2017/03/17
Two-Line V-Network	R&S	ENV216	MRTTWA00019	1 year	2017/03/23
Two-Line V-Network	R&S	ENV216	MRTTWA00020	1 year	2017/03/23

Radiated Emissions – AC1

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTTWA00009	1 year	2017/03/16
Signal Analyzer	R&S	FSV40	MRTTWA00007	1 year	2017/03/02
Broadband Preamplifier	Schwarzbeck	BBV 9718	MRTTWA00005	1 year	2017/04/06
Broadband TRILOG Antenna	Schwarzbeck	VULB 9162	MRTTWA00001	1 year	2017/04/06
Broadband Horn antenna	Schwarzbeck	BBHA 9120D	MRTTWA00003	1 year	2017/04/06

Software	Version	Function
e3	9.160520a	EMI Test Software

5. MEASUREMENT UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

AC Conducted Emission Measurement – SR2	
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$):	
150kHz~30MHz: 2.42dB	
Radiated Emission Measurement – AC1	
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$):	
Horizontal: 30MHz~1GHz: 4.22dB	
1GHz~18GHz: 4.05dB	
Vertical: 30MHz~1GHz: 3.37dB	
1GHz~18GHz: 4.08dB	

6. TEST RESULT

6.1. Summary

Product Name: IP CAMERA
Applicant: ZHEJIANG DAHUA VISION TECHNOLOGY CO.,LTD.
Test Mode: Mode1, 2, 3, 4

FCC Part Section(s)	Test Description	Test Result
15.107	Conducted Emissions	Pass
15.109	Radiated Emissions	Pass

6.2. Conducted Emission Measurement

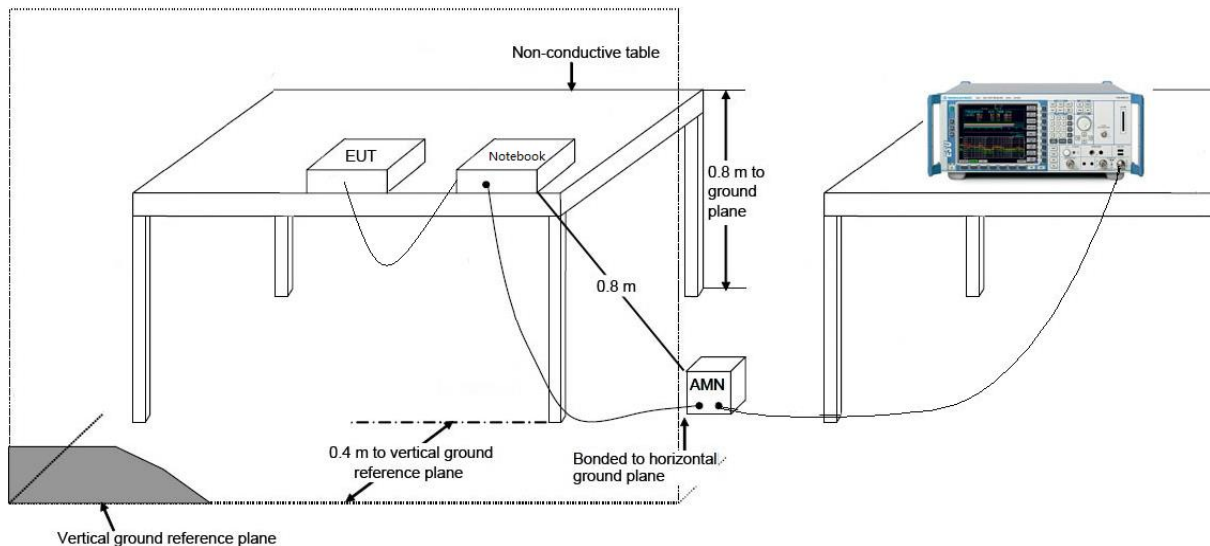
6.2.1. Test Limit

FCC Part 15.107 Limits		
Frequency (MHz)	QP (dB μ V)	AV (dB μ V)
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

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

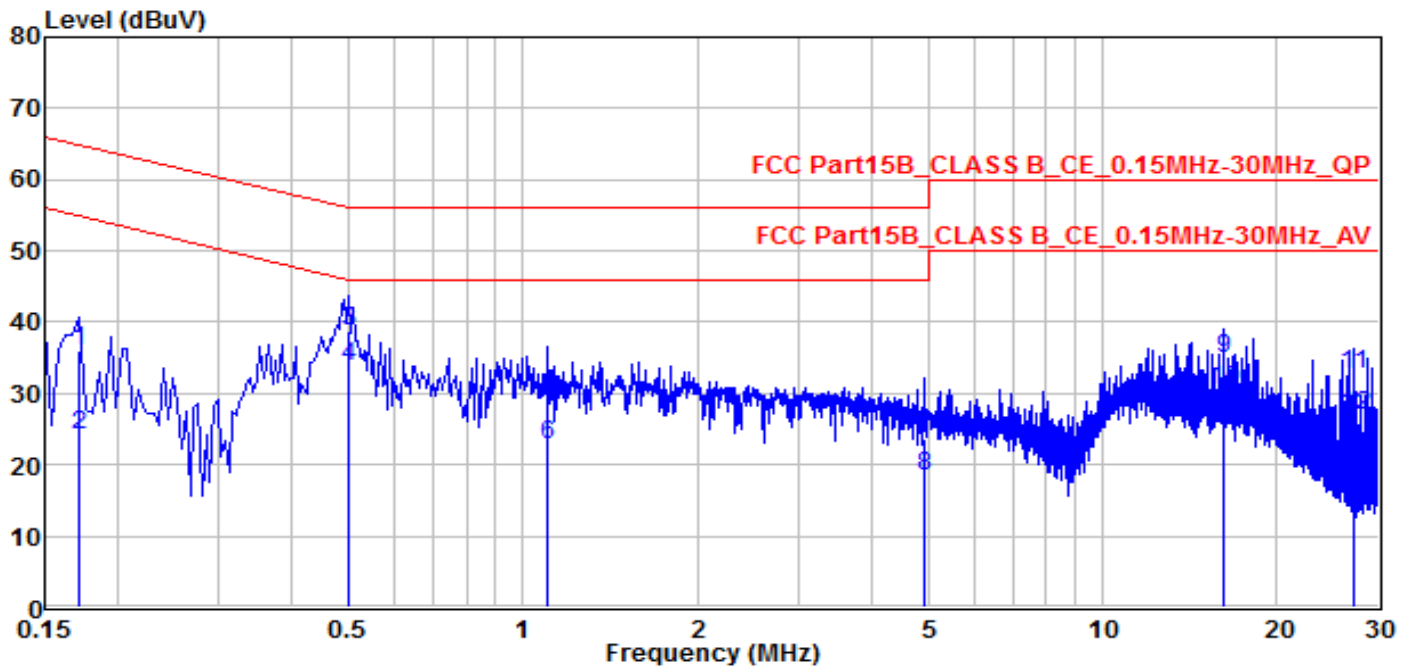
Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

6.2.2. Test Setup



6.2.3. Test Result of Conducted Emissions

EUT	IP CAMERA	Date of Test	2016/12/29
Factor	CE_ENV216-L1 (Filter ON)	Temp. / Humidity	24°C / 58%
Polarity	Line	Site / Test Engineer	SR2 / Kevin
Test Mode	Mode2	Test Voltage	AC 120V/60Hz



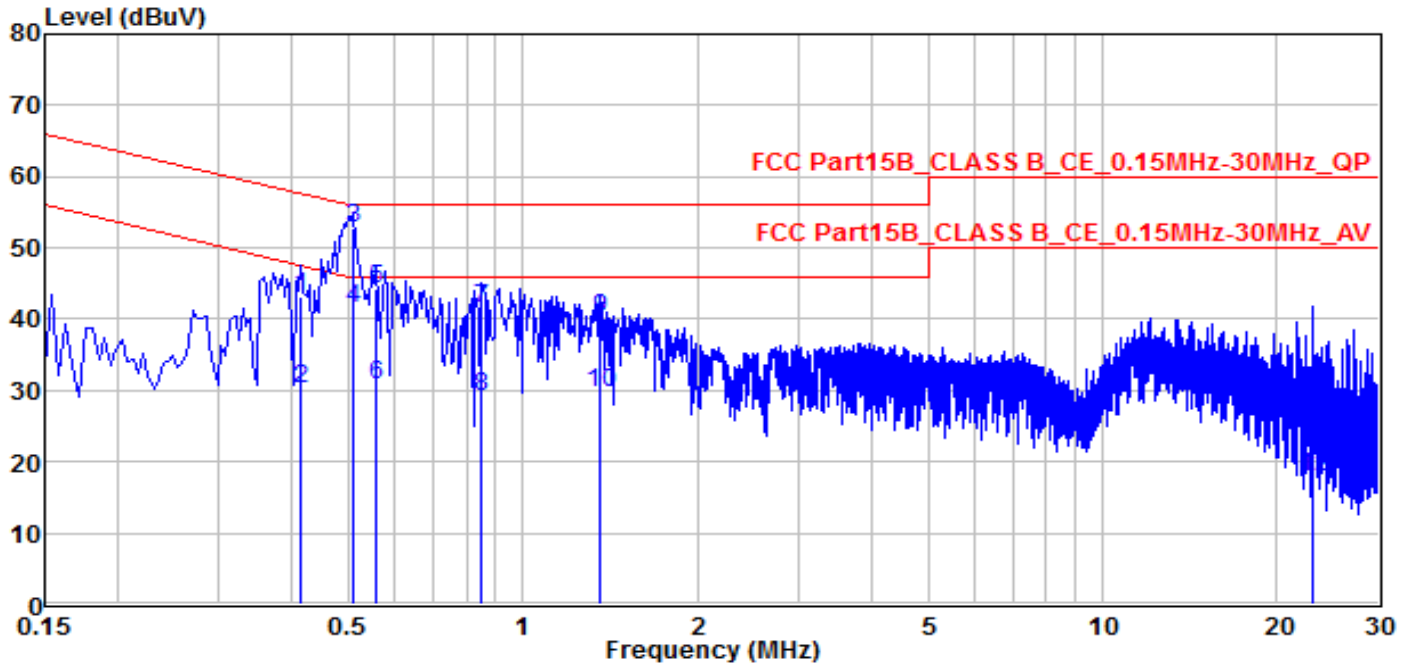
No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV)	Margin (dB)	Limit (dBuV)	Remark (QP/PK/AV)
1		0.1725	25.89	10.13	36.02	-28.82	64.84	QP
2		0.1725	14.11	10.13	24.24	-30.6	54.84	Average
3	*	0.50096	28.72	10.09	38.81	-17.19	56	QP
4	*	0.50096	23.62	10.09	33.71	-12.29	46	Average
5		1.108	19.28	9.88	29.16	-26.84	56	QP
6		1.108	13.07	9.88	22.95	-23.05	46	Average
7		4.929	14.03	9.75	23.78	-32.22	56	QP
8		4.929	8.74	9.75	18.49	-27.51	46	Average
9		16.231	25.01	9.98	34.99	-25.01	60	QP
10		16.231	20.46	9.98	30.44	-19.56	50	Average
11		27.161	22.6	10.03	32.63	-27.37	60	QP
12		27.161	17	10.03	27.03	-22.97	50	Average

Note : 1. " * ", means this data is the worst emission level.

2. C.F (Correction Factor) = Factor (dB)+ Cable Loss (dB)

3. Measurement (dBuV) = Reading(dBuV)+ C.F (Correction Factor)

EUT	IP CAMERA	Date of Test	2016/12/29
Factor	CE_ENV216-N (Filter ON)	Temp. / Humidity	24°C / 58%
Polarity	Neutral	Site / Test Engineer	SR2 / Kevin
Test Mode	Mode2	Test Voltage	AC 120V/60Hz



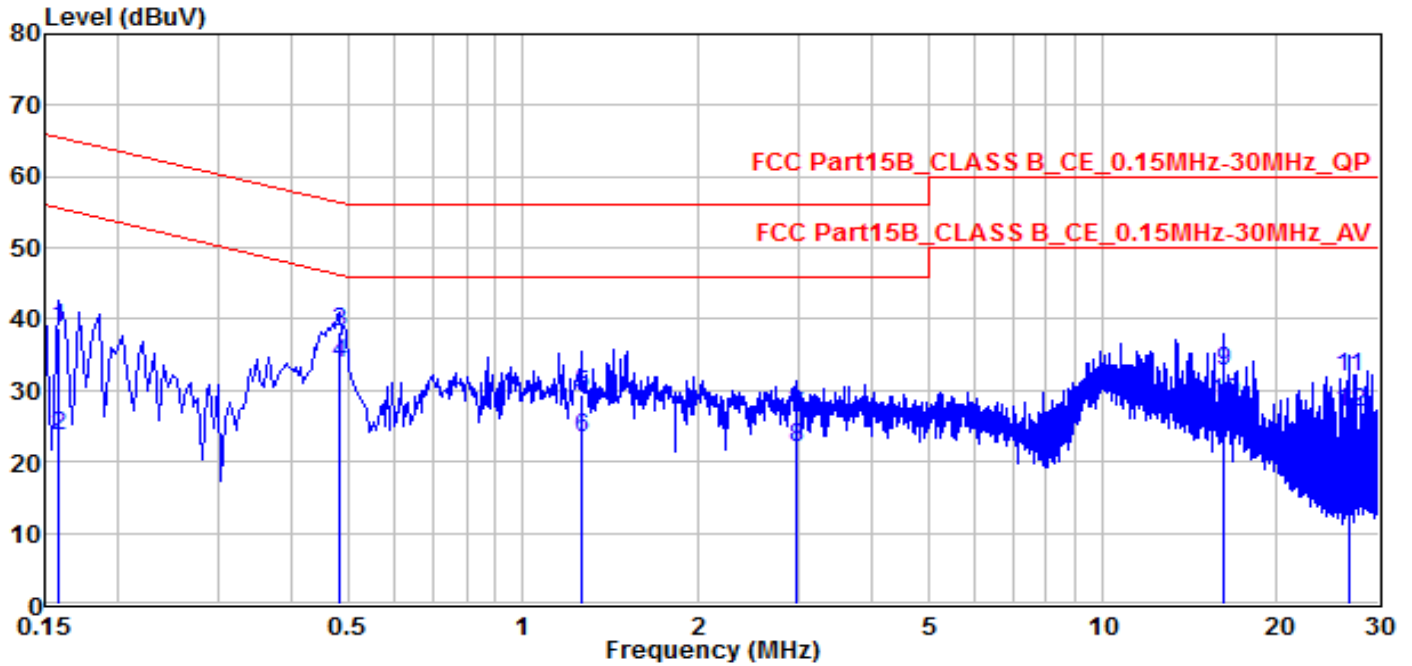
No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV)	Margin (dB)	Limit (dBuV)	Remark (QP/PK/AV)
1		0.41547	32.98	10.07	43.05	-14.49	57.54	QP
2		0.41547	20.27	10.07	30.34	-17.2	47.54	Average
3	*	0.50996	42.79	10.11	52.9	-3.1	56	QP
4	*	0.50996	31.49	10.11	41.6	-4.4	46	Average
5		0.55946	34.14	10.09	44.23	-11.77	56	QP
6		0.55946	20.74	10.09	30.83	-15.17	46	Average
7		0.85193	31.45	9.95	41.4	-14.6	56	QP
8		0.85193	19.23	9.95	29.18	-16.82	46	Average
9		1.36	30.2	9.88	40.08	-15.92	56	QP
10		1.36	19.68	9.88	29.56	-16.44	46	Average
11		23.12	16.89	10.07	26.96	-33.04	60	QP
12		23.12	7.81	10.07	17.88	-32.12	50	Average

Note : 1. " * ", means this data is the worst emission level.

2. C.F (Correction Factor) = Factor (dB)+ Cable Loss (dB)

3. Measurement (dBuV) = Reading(dBuV)+ C.F (Correction Factor)

EUT	IP CAMERA	Date of Test	2016/12/29
Factor	CE_ENV216-L1 (Filter ON)	Temp. / Humidity	24°C / 58%
Polarity	Line	Site / Test Engineer	SR2 / Kevin
Test Mode	Mode4	Test Voltage	AC 120V/60Hz



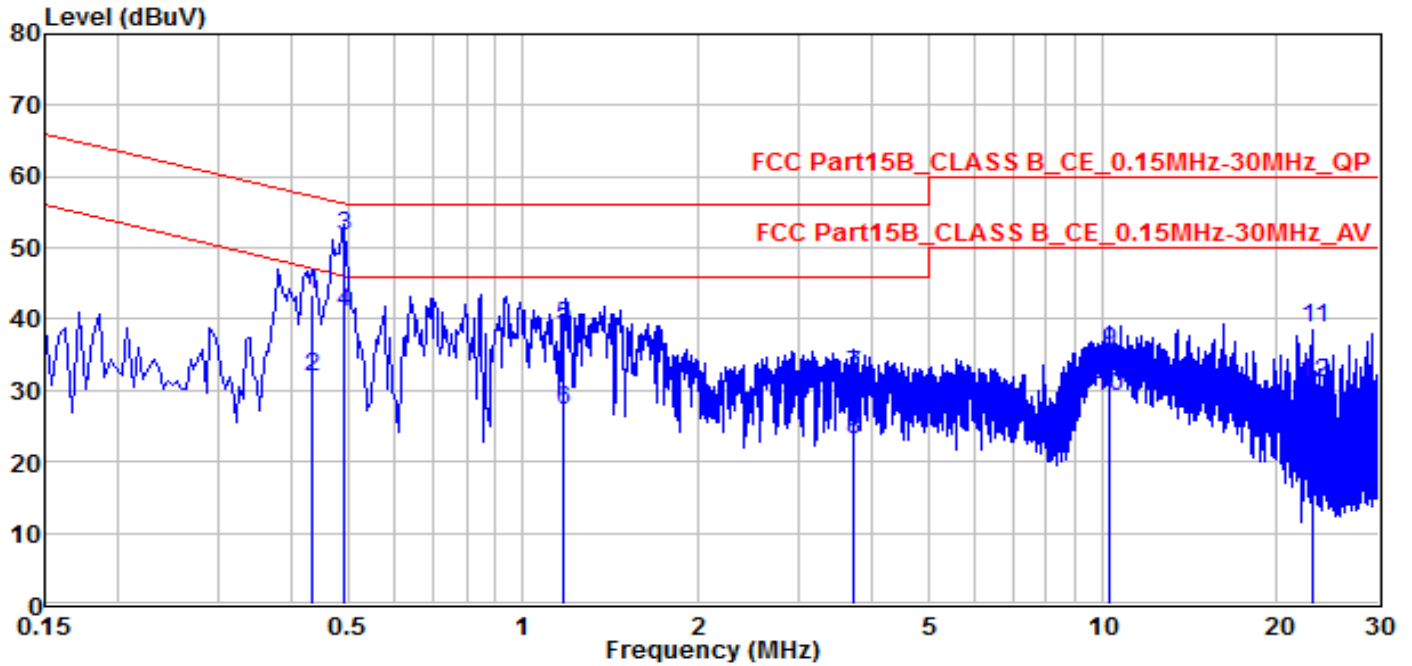
No		Frequency (MHz)	Reading (dBUV)	C.F (dB)	Measurement (dBUV)	Margin (dB)	Limit (dBUV)	Remark (QP/PK/AV)
1		0.159	28.77	10.03	38.8	-26.72	65.52	QP
2		0.159	13.56	10.03	23.59	-31.93	55.52	Average
3	*	0.48297	28.14	10.08	38.22	-18.07	56.29	QP
4	*	0.48297	23.6	10.08	33.68	-12.61	46.29	Average
5		1.261	19.64	9.89	29.53	-26.47	56	QP
6		1.261	13.4	9.89	23.29	-22.71	46	Average
7		2.98	16.63	9.83	26.46	-29.54	56	QP
8		2.98	12.17	9.83	22	-24	46	Average
9		16.231	22.86	9.98	32.84	-27.16	60	QP
10		16.231	18.33	9.98	28.31	-21.69	50	Average
11		26.612	21.81	10.03	31.84	-28.16	60	QP
12		26.612	16.85	10.03	26.88	-23.12	50	Average

Note : 1. " * ", means this data is the worst emission level.

2. C.F (Correction Factor) = Factor (dB)+ Cable Loss (dB)

3. Measurement (dBUV) = Reading(dBUV)+ C.F (Correction Factor)

EUT	IP CAMERA	Date of Test	2016/12/29
Factor	CE_ENV216-N (Filter ON)	Temp. / Humidity	24°C / 58%
Polarity	Neutral	Site / Test Engineer	SR2 / Kevin
Test Mode	Mode4	Test Voltage	AC 120V/60Hz



No		Frequency (MHz)	Reading (dBUV)	C.F (dB)	Measurement (dBUV)	Margin (dB)	Limit (dBUV)	Remark (QP/PK/AV)
1		0.43347	33.28	10.08	43.36	-13.83	57.19	QP
2		0.43347	21.85	10.08	31.93	-15.26	47.19	Average
3	*	0.49197	41.64	10.12	51.76	-4.37	56.13	QP
4	*	0.49197	30.72	10.12	40.84	-5.29	46.13	Average
5		1.18	29.28	9.87	39.15	-16.85	56	QP
6		1.18	17.31	9.87	27.18	-18.82	46	Average
7		3.709	22.3	9.81	32.11	-23.89	56	QP
8		3.709	13.33	9.81	23.14	-22.86	46	Average
9		10.242	25.58	9.86	35.44	-24.56	60	QP
10		10.242	19.24	9.86	29.1	-20.9	50	Average
11		23.129	28.8	10.07	38.87	-21.13	60	QP
12		23.129	20.93	10.07	31	-19	50	Average

Note : 1. " * ", means this data is the worst emission level.

2. C.F (Correction Factor) = Factor (dB)+ Cable Loss (dB)

3. Measurement (dBUV) = Reading(dBUV)+ C.F (Correction Factor)

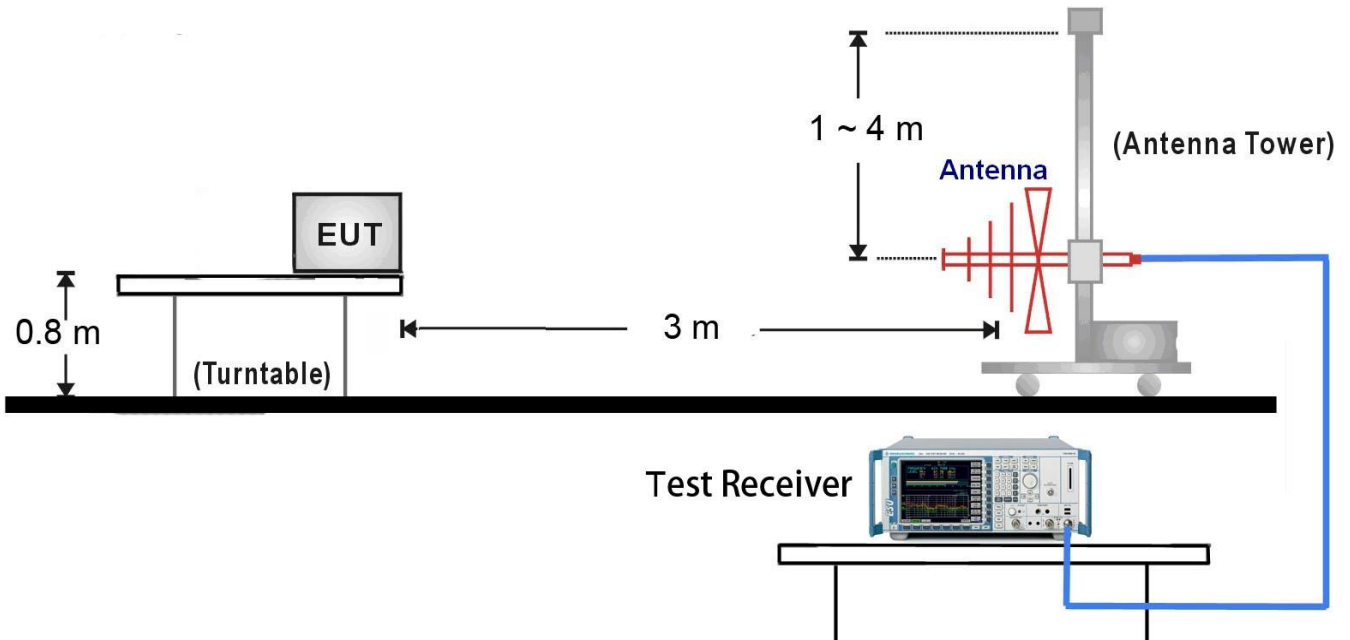
6.3. Radiated Emission Measurement

6.3.1. Test Limit

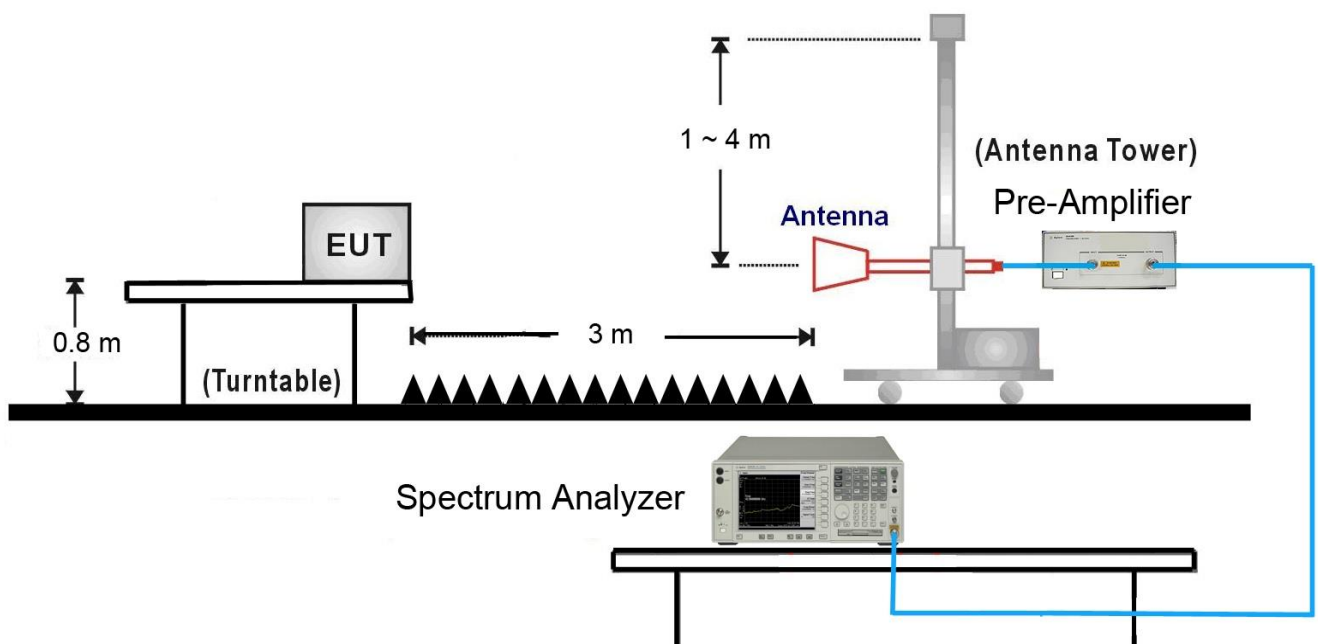
FCC Part 15.109 Limits		
Frequency (MHz)	Distance (m)	Level (dB μ V/m)
30 - 88	3	40
88 - 216	3	43.5
216 - 960	3	46
Above 960	3	54
<p>Note 1: The lower limit shall apply at the transition frequency.</p> <p>Note 2: Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.</p> <p>Note 3: E field strength (dBμV/m) = 20 log E field strength (uV/m)</p>		

6.3.2. Test Setup

30MHz ~ 1GHz Test Setup:

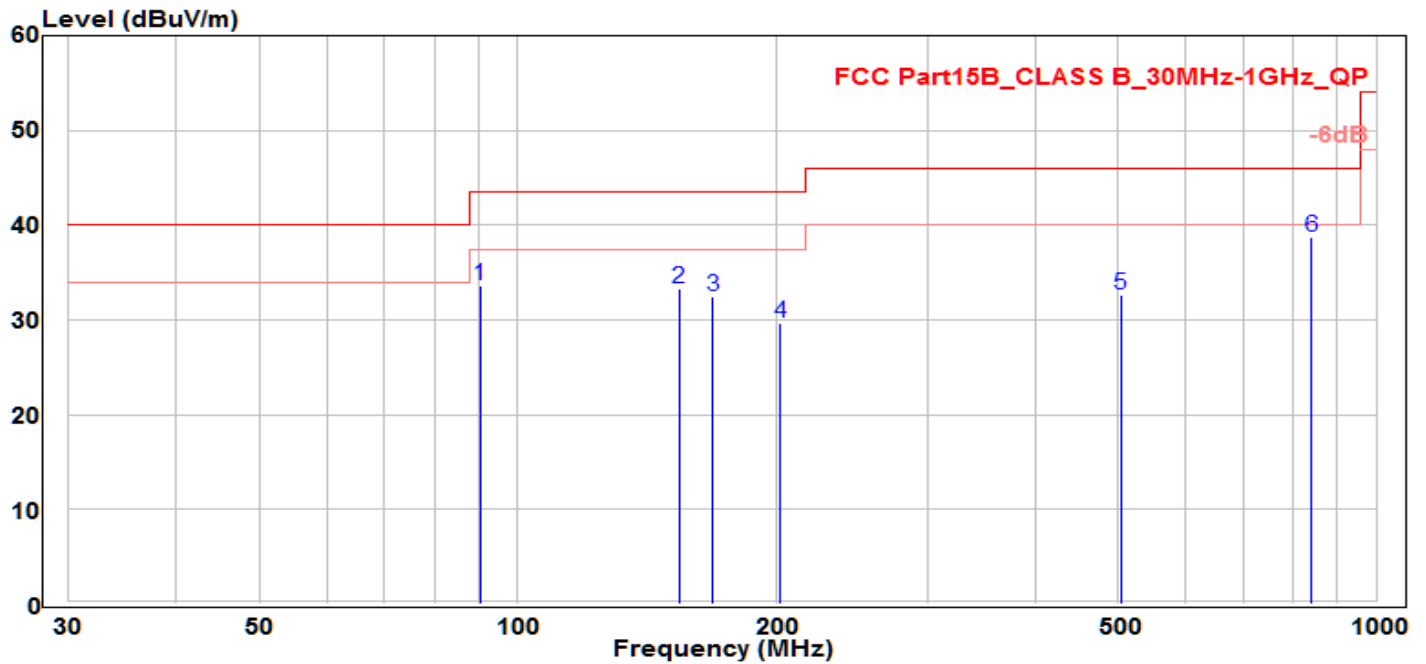


1GHz ~18GHz Test Setup:



6.3.3. Test Result

EUT	IP CAMERA	Date of Test	2016/12/29
Factor	VULB 9162 (30MHz~8GHz)	Temp. / Humidity	25°C / 55%
Polarity	Horizontal	Site / Test Engineer	AC1 / Kevin
Test Mode	Mode1	Test Voltage	By POE

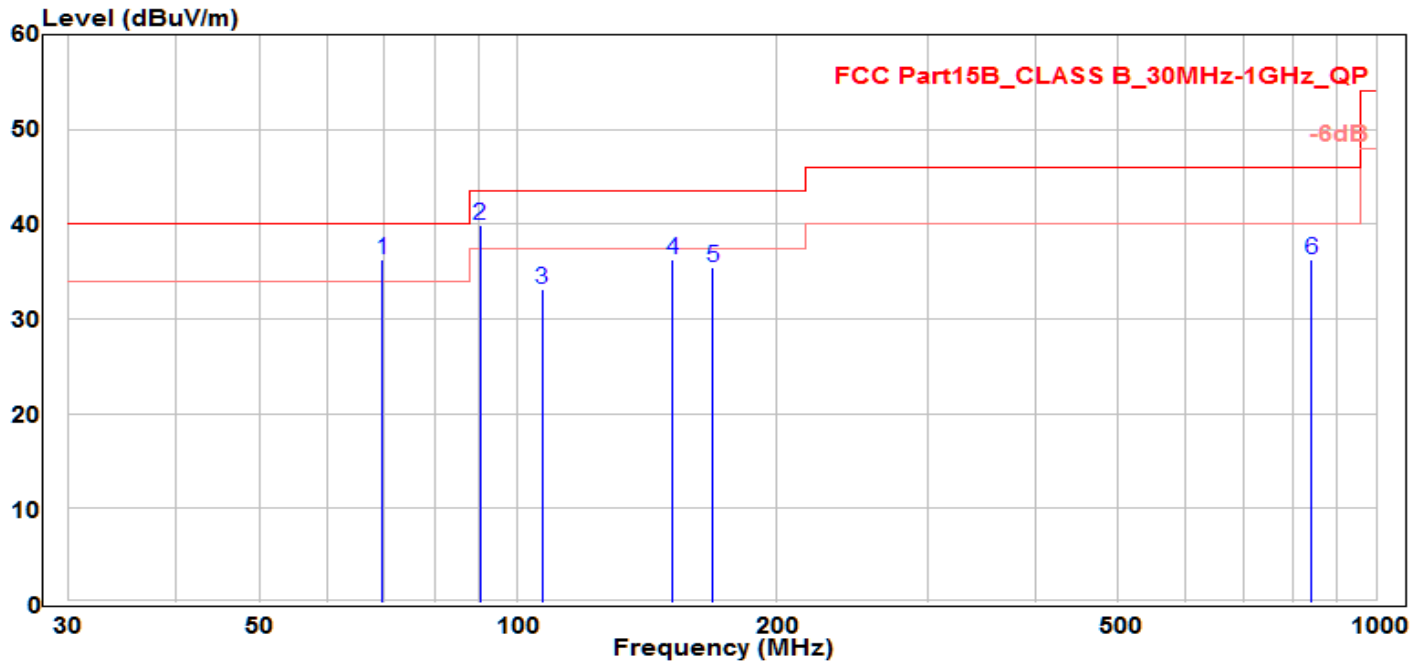


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	90.352	22.14	11.43	33.57	-9.93	43.5	200	350	QP
2	154.19	23.65	9.73	33.38	-10.12	43.5	150	-20	QP
3	168.771	22.11	10.3	32.41	-11.09	43.5	150	115	QP
4	202.205	17.25	12.46	29.71	-13.79	43.5	200	240	QP
5	503.997	14	18.64	32.64	-13.36	46	200	320	QP
6	* 840.011	14.92	23.76	38.68	-7.32	46	100	80	QP

Note :

1. " * ", means this data is the worst emission level.
2. C.F (Correction Factor) = Factor (dB)+ Cable Loss (dB)
3. Measurement (dBuV/m) = Reading(dBuV)+ C.F (Correction Factor)

EUT	IP CAMERA	Date of Test	2016/12/29
Factor	VULB 9162 (30MHz~8GHz)	Temp. / Humidity	25°C / 55%
Polarity	Vertical	Site / Test Engineer	AC1 / Kevin
Test Mode	Mode1	Test Voltage	By POE

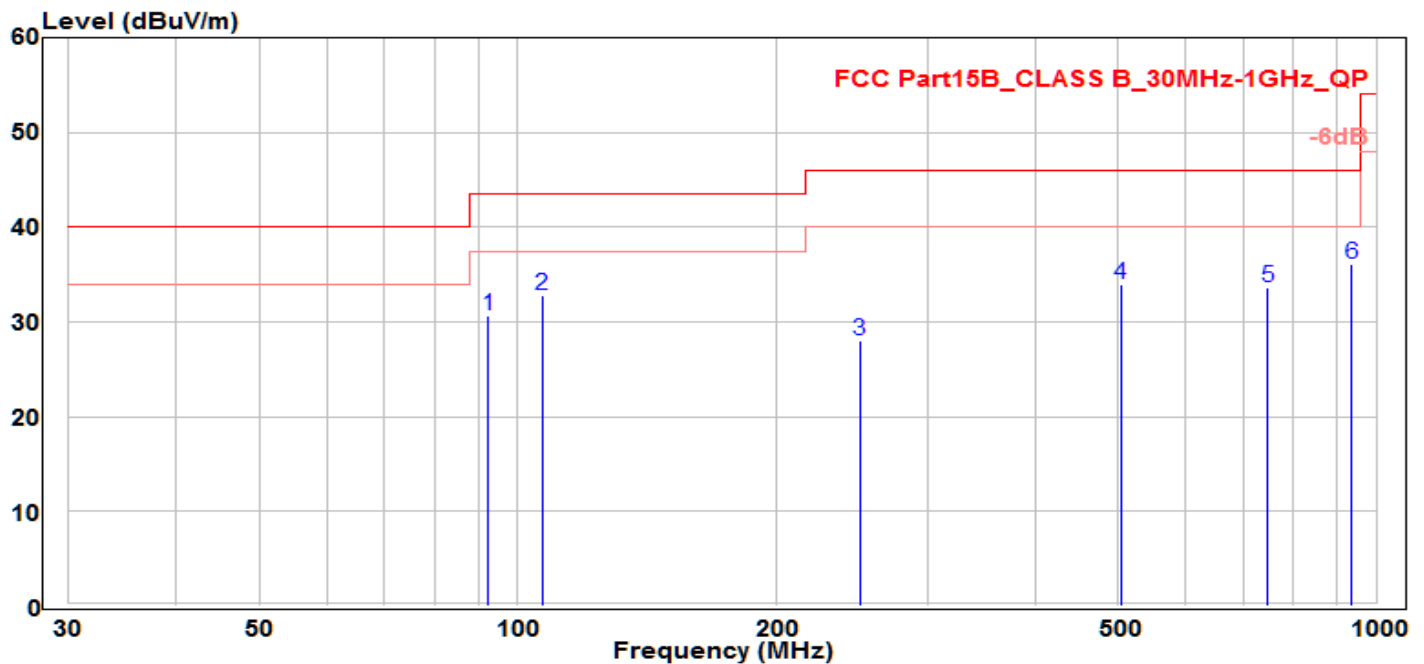


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1		69.649	25.19	11.06	36.25	-3.75	40	150	55	QP
2	*	90.352	28.5	11.43	39.93	-3.57	43.5	100	70	QP
3		106.691	19.84	13.29	33.13	-10.37	43.5	150	270	QP
4		151.553	26.68	9.64	36.32	-7.18	43.5	200	140	QP
5		168.801	25.13	10.3	35.43	-8.07	43.5	150	60	QP
6		840.011	12.47	23.76	36.23	-9.77	46	150	-10	QP

Note :

1. " * ", means this data is the worst emission level.
2. C.F (Correction Factor) = Factor (dB)+ Cable Loss (dB)
3. Measurement (dBuV/m) = Reading(dBuV)+ C.F (Correction Factor)

EUT	IP CAMERA	Date of Test	2016/12/29
Factor	VULB 9162 (30MHz~8GHz)	Temp. / Humidity	25°C / 55%
Polarity	Horizontal	Site / Test Engineer	AC1 / Kevin
Test Mode	Mode2	Test Voltage	AC 120V/60Hz

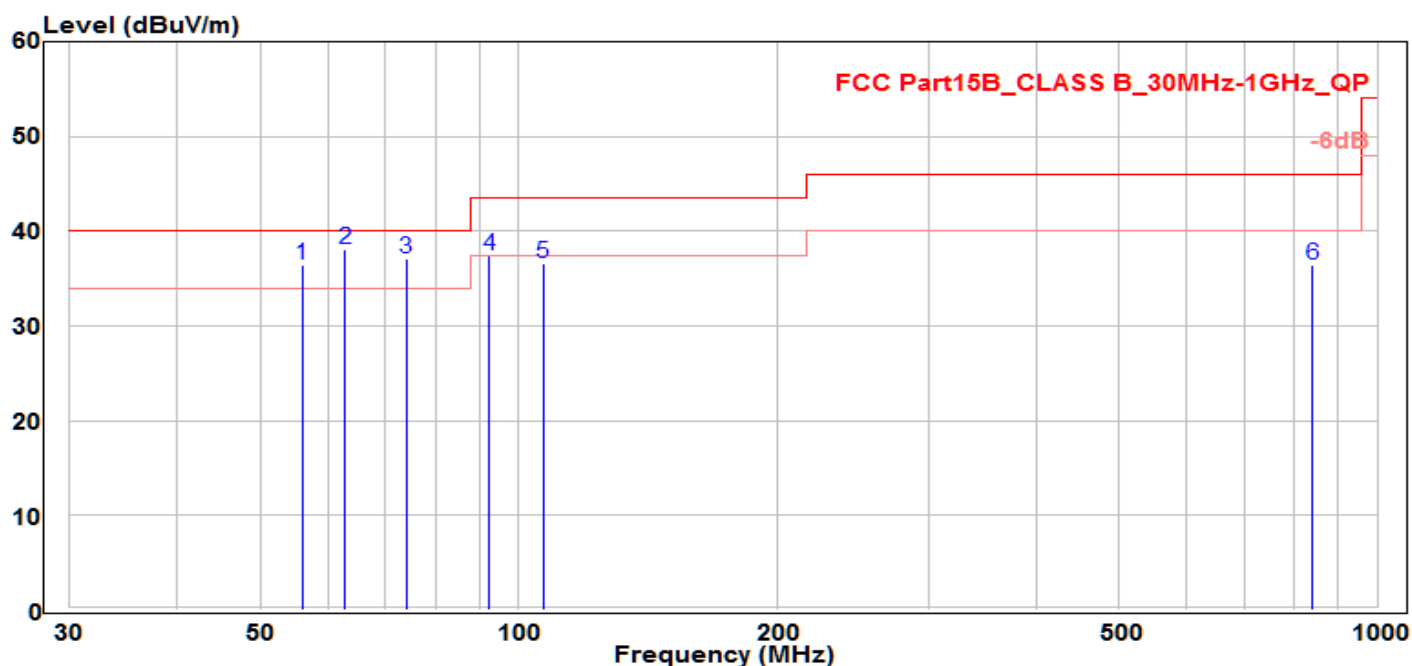


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	92.383	18.82	11.92	30.74	-12.76	43.5	150	110	QP
2	106.691	19.46	13.29	32.75	-10.75	43.5	200	210	QP
3	250.008	14.2	13.86	28.06	-17.94	46	150	310	QP
4	503.997	15.3	18.64	33.94	-12.06	46	150	90	QP
5	746.86	11.15	22.48	33.63	-12.37	46	200	-30	QP
6	* 936.01	11.36	24.68	36.04	-9.96	46	100	180	QP

Note :

1. " * ", means this data is the worst emission level.
2. C.F (Correction Factor) = Factor (dB)+ Cable Loss (dB)
3. Measurement (dBuV/m) = Reading(dBuV)+ C.F (Correction Factor)

EUT	IP CAMERA	Date of Test	2016/12/29
Factor	VULB 9162 (30MHz~8GHz)	Temp. / Humidity	25°C / 55%
Polarity	Vertical	Site / Test Engineer	AC1 / Kevin
Test Mode	Mode2	Test Voltage	AC 120V/60Hz

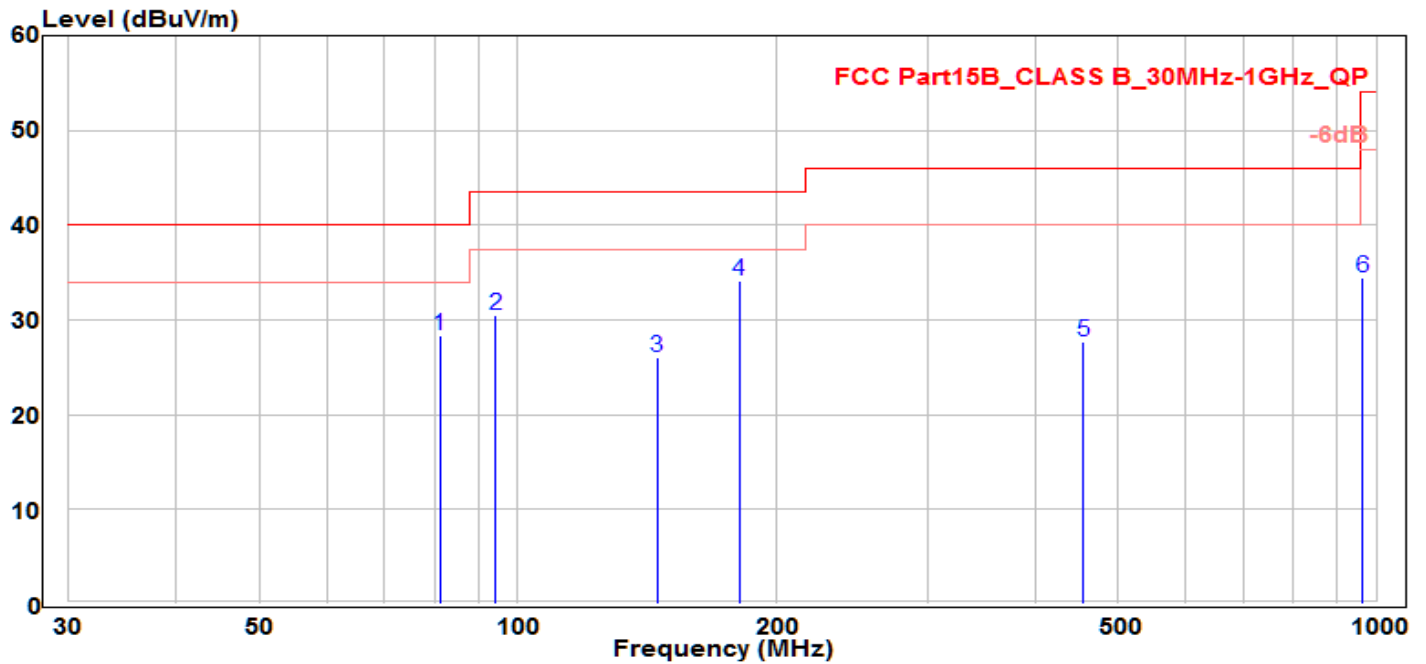


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1		55.978	21.8	14.68	36.48	-3.52	40	100	400	QP
2	*	62.768	24.7	13.39	38.09	-1.91	40	100	320	QP
3		73.923	27.5	9.61	37.11	-2.89	40	180	150	QP
4		92.383	25.58	11.92	37.5	-6	43.5	150	320	QP
5		106.691	23.34	13.29	36.63	-6.87	43.5	100	-10	QP
6		840.011	12.62	23.76	36.38	-9.62	46	100	70	QP

Note :

1. " * ", means this data is the worst emission level.
2. C.F (Correction Factor) = Factor (dB)+ Cable Loss (dB)
3. Measurement (dBuV/m) = Reading(dBuV)+ C.F (Correction Factor)

EUT	IP CAMERA	Date of Test	2016/12/29
Factor	VULB 9162 (30MHz~8GHz)	Temp. / Humidity	25°C / 55%
Polarity	Horizontal	Site / Test Engineer	AC1 / Kevin
Test Mode	Mode3	Test Voltage	By POE

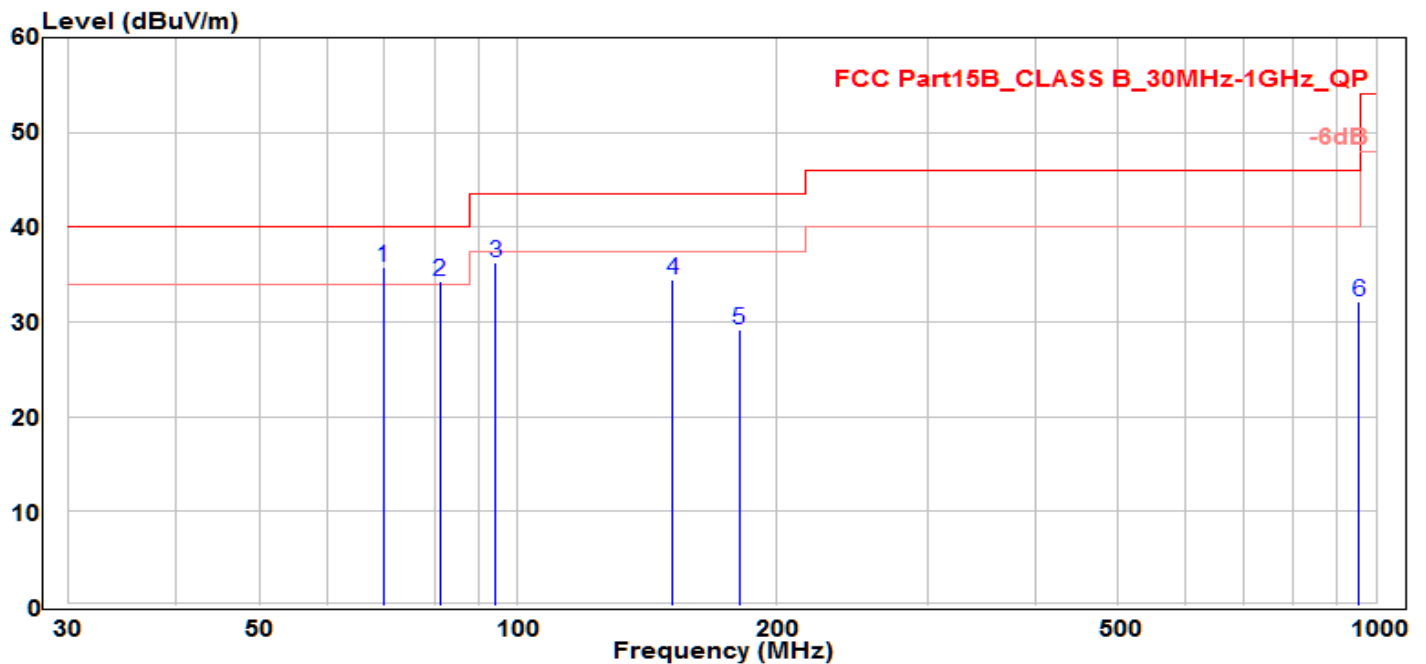


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	81.198	19.02	9.3	28.32	-11.68	40	200	370	QP
2	94.353	18.07	12.4	30.47	-13.03	43.5	200	170	QP
3	145.248	16.51	9.52	26.03	-17.47	43.5	150	90	QP
4	* 180.987	23.06	11.11	34.17	-9.33	43.5	100	-10	QP
5	455.982	9.87	17.76	27.63	-18.37	46	100	290	QP
6	963.292	9.51	24.94	34.45	-19.55	54	200	250	QP

Note :

1. " * ", means this data is the worst emission level.
2. C.F (Correction Factor) = Factor (dB)+ Cable Loss (dB)
3. Measurement (dBuV/m) = Reading(dBuV)+ C.F (Correction Factor)

EUT	IP CAMERA	Date of Test	2016/12/29
Factor	VULB 9162 (30MHz~8GHz)	Temp. / Humidity	25°C / 55%
Polarity	Vertical	Site / Test Engineer	AC1 / Kevin
Test Mode	Mode3	Test Voltage	By POE

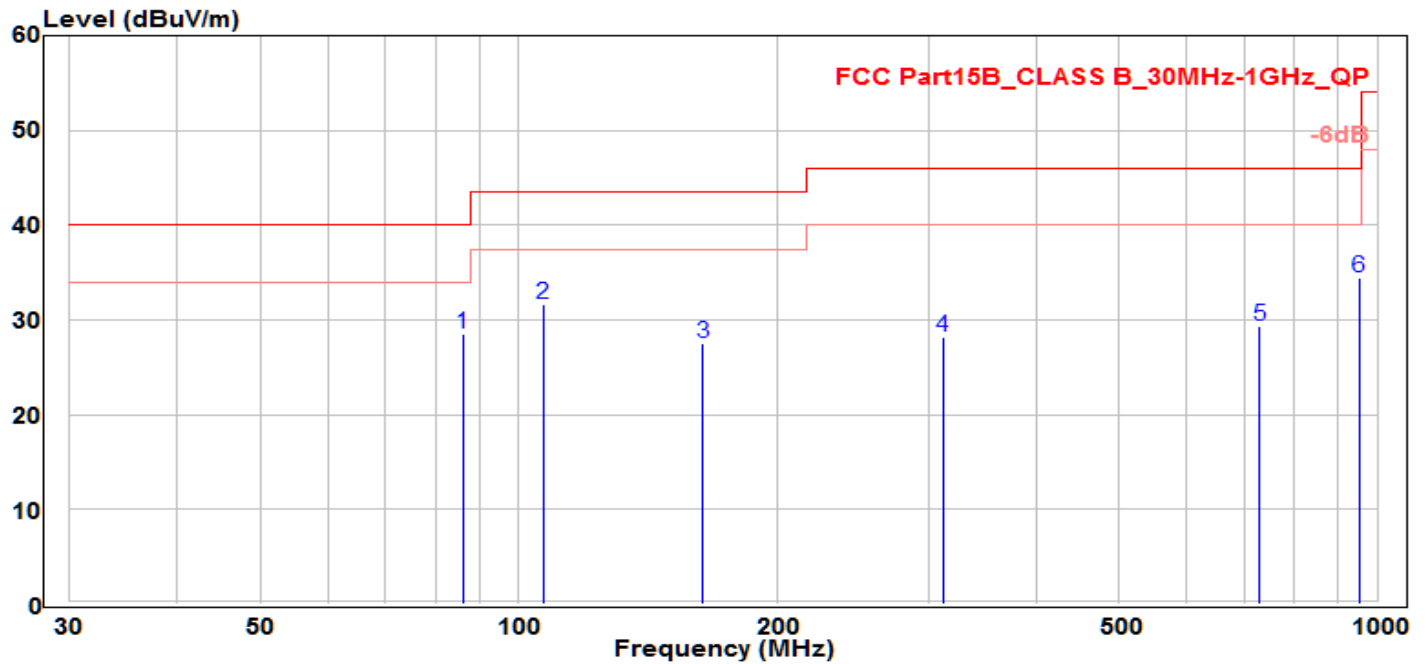


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	69.709	24.8	11.03	35.83	-4.17	40	150	400	QP
2		81.198	25.02	9.3	34.32	-5.68	40	100	230	QP
3		94.353	23.86	12.4	36.26	-7.24	43.5	150	350	QP
4		151.553	24.8	9.64	34.44	-9.06	43.5	100	190	QP
5		181.017	18.15	11.11	29.26	-14.24	43.5	100	-30	QP
6		953.47	7.27	24.85	32.12	-13.88	46	150	60	QP

Note :

1. " * ", means this data is the worst emission level.
2. C.F (Correction Factor) = Factor (dB)+ Cable Loss (dB)
3. Measurement (dBuV/m) = Reading(dBuV)+ C.F (Correction Factor)

EUT	IP CAMERA	Date of Test	2016/12/29
Factor	VULB 9162 (30MHz~8GHz)	Temp. / Humidity	25°C / 55%
Polarity	Horizontal	Site / Test Engineer	AC1 / Kevin
Test Mode	Mode4	Test Voltage	AC 120V/60Hz

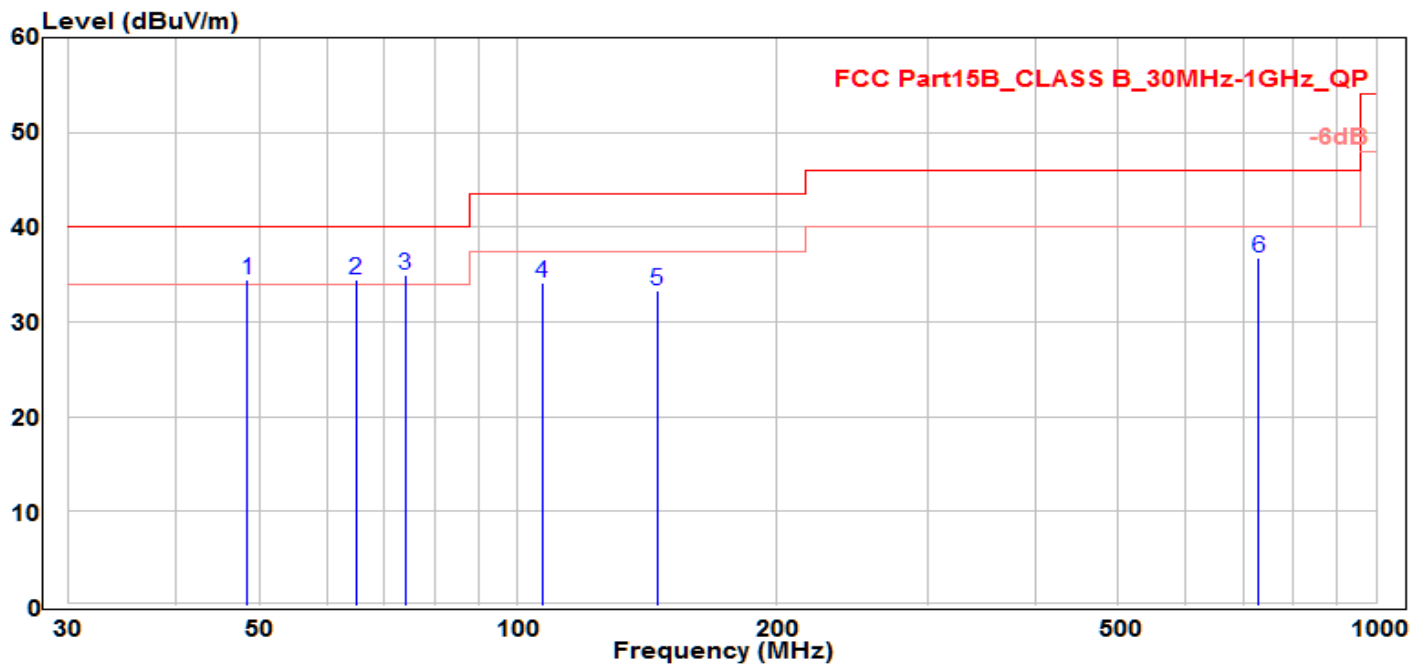


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	86.048	18.13	10.33	28.46	-11.54	40	150	170	QP
2	106.691	18.39	13.29	31.68	-11.82	43.5	100	210	QP
3	163.951	17.38	10.11	27.49	-16.01	43.5	100	90	QP
4	311.997	13.15	15.06	28.21	-17.79	46	150	320	QP
5	729.097	7.04	22.27	29.31	-16.69	46	150	-10	QP
6	* 952.349	9.67	24.83	34.5	-11.5	46	100	280	QP

Note :

1. " * ", means this data is the worst emission level.
2. C.F (Correction Factor) = Factor (dB)+ Cable Loss (dB)
3. Measurement (dBuV/m) = Reading(dBuV)+ C.F (Correction Factor)

EUT	IP CAMERA	Date of Test	2016/12/29
Factor	VULB 9162 (30MHz~8GHz)	Temp. / Humidity	25°C / 55%
Polarity	Vertical	Site / Test Engineer	AC1 / Kevin
Test Mode	Mode4	Test Voltage	AC 120V/60Hz

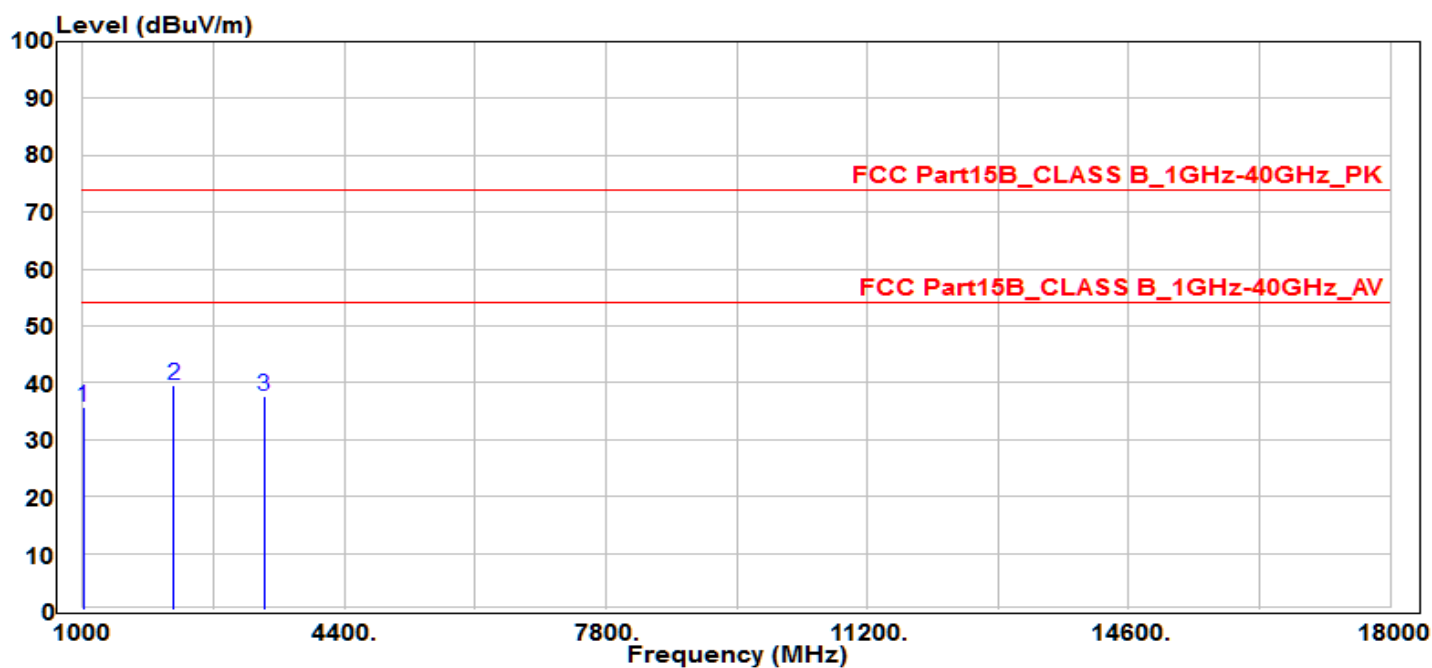


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1		48.43	19.2	15.2	34.4	-5.6	40	100	300	QP
2		64.768	21.6	12.89	34.49	-5.51	40	100	280	QP
3	*	73.923	25.39	9.61	35	-5	40	100	140	QP
4		106.691	20.9	13.29	34.19	-9.31	43.5	100	-10	QP
5		145.248	23.86	9.52	33.38	-10.12	43.5	150	240	QP
6		729.4	14.41	22.27	36.68	-9.32	46	150	80	QP

Note :

1. " * ", means this data is the worst emission level.
2. C.F (Correction Factor) = Factor (dB)+ Cable Loss (dB)
3. Measurement (dBuV/m) = Reading(dBuV)+ C.F (Correction Factor)

EUT	IP CAMERA	Date of Test	2016/12/28
Factor	BBHA 9120D (1GHz~18GHz)	Temp. / Humidity	25°C / 55%
Polarity	Horizontal	Site / Test Engineer	AC1 / Kevin
Test Mode	Mode1	Test Voltage	By POE

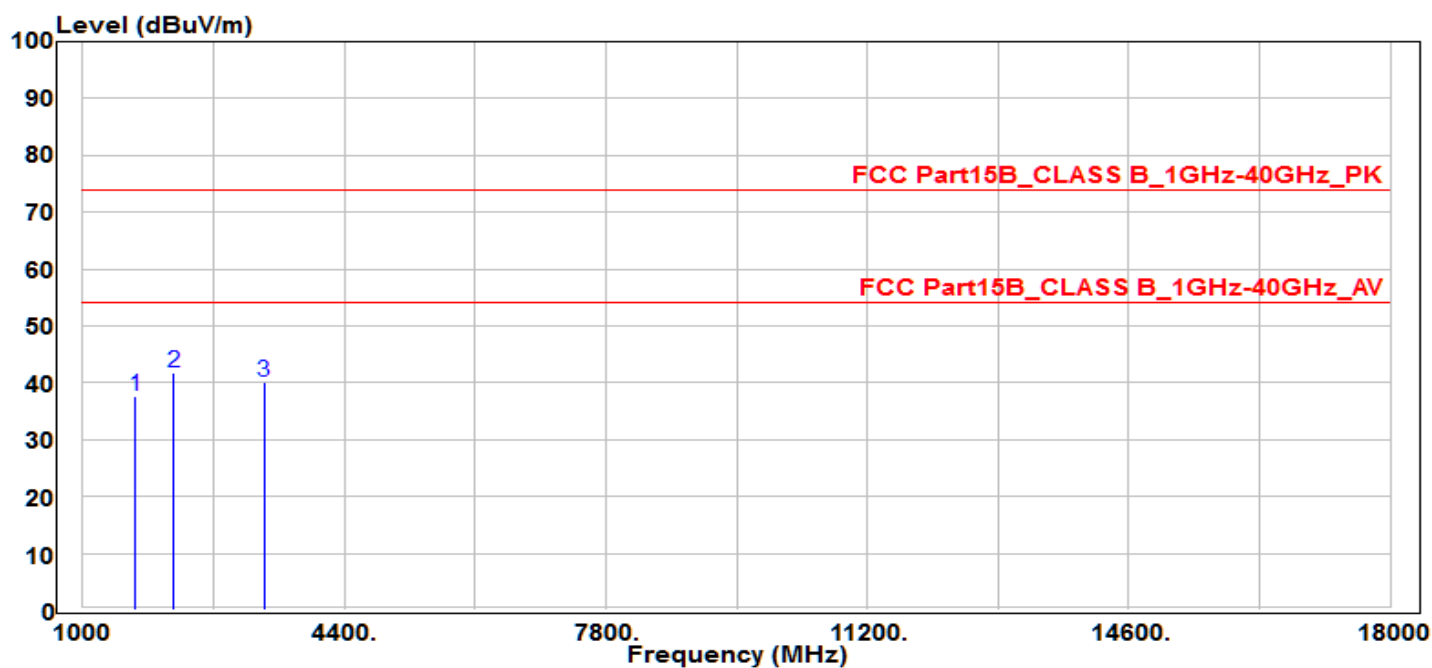


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1		1005.05	43.16	-7.51	35.65	-38.35	74	400	400	Peak
2	*	2177.48	41.51	-1.99	39.52	-34.48	74	400	400	Peak
3		3360	39.07	-1.5	37.57	-36.43	74	400	400	Peak

Note :

1. " * ", means this data is the worst emission level.
2. C.F (Correction Factor) = Factor (dB)+ Cable Loss (dB)
3. Measurement (dBuV/m) = Reading(dBuV)+ C.F (Correction Factor)

EUT	IP CAMERA	Date of Test	2016/12/28
Factor	BBHA 9120D (1GHz~18GHz)	Temp. / Humidity	25°C / 55%
Polarity	Vertical	Site / Test Engineer	AC1 / Kevin
Test Mode	Mode1	Test Voltage	By POE

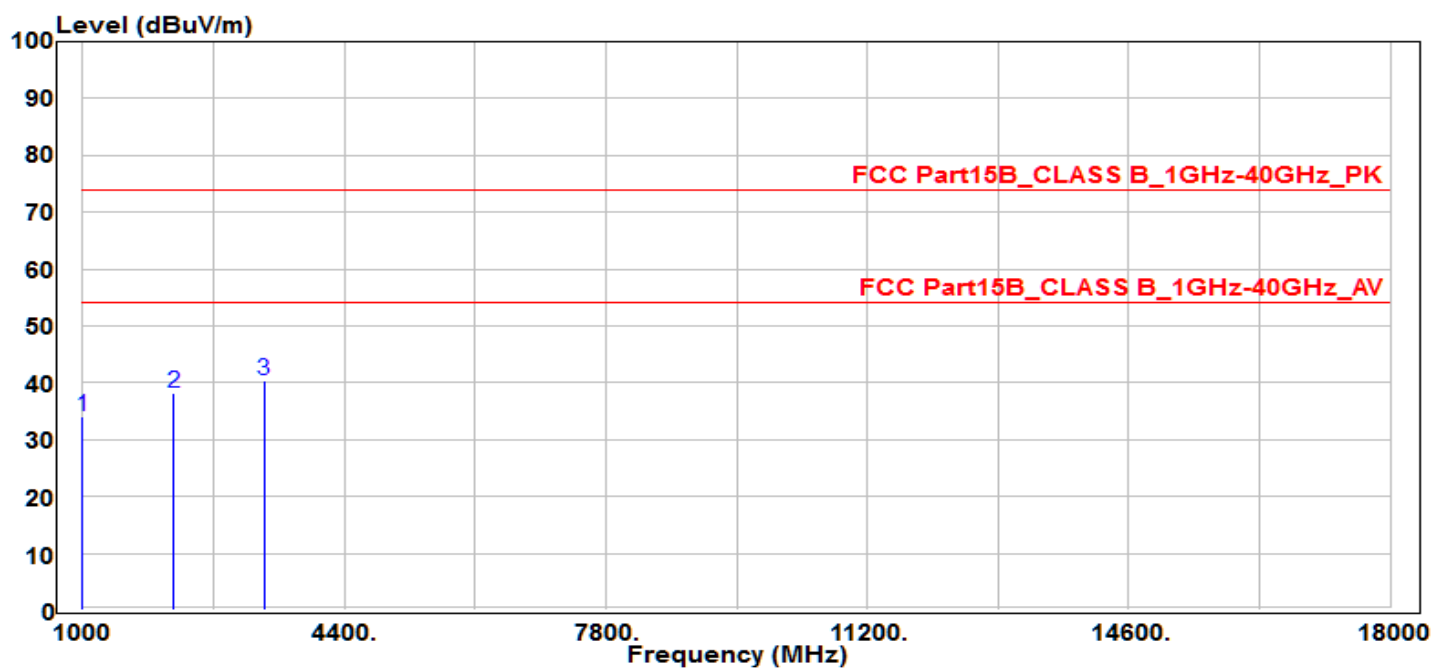


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	1680.24	43.51	-5.83	37.68	-36.32	74	400	400	Peak
2	* 2178.01	43.73	-1.99	41.74	-32.26	74	400	400	Peak
3	3360	41.61	-1.5	40.11	-33.89	74	400	400	Peak

Note :

1. " * ", means this data is the worst emission level.
2. C.F (Correction Factor) = Factor (dB)+ Cable Loss (dB)
3. Measurement (dBuV/m) = Reading(dBuV)+ C.F (Correction Factor)

EUT	IP CAMERA	Date of Test	2016/12/28
Factor	BBHA 9120D (1GHz~18GHz)	Temp. / Humidity	25°C / 55%
Polarity	Horizontal	Site / Test Engineer	AC1 / Kevin
Test Mode	Mode2	Test Voltage	AC 120V/60Hz

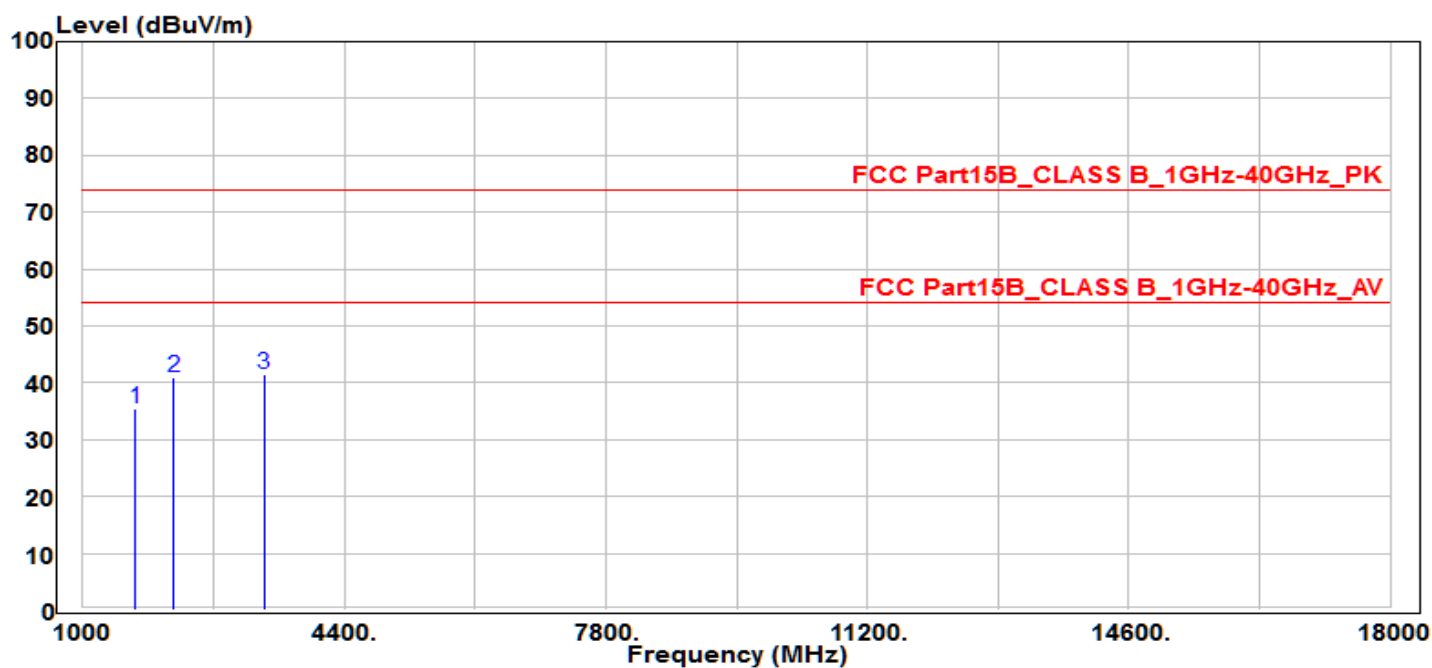


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	1001.33	41.64	-7.52	34.12	-39.88	74	400	400	Peak
2	2178.54	40.19	-1.97	38.22	-35.78	74	400	400	Peak
3	* 3360	41.93	-1.5	40.43	-33.57	74	400	400	Peak

Note :

1. " * ", means this data is the worst emission level.
2. C.F (Correction Factor) = Factor (dB)+ Cable Loss (dB)
3. Measurement (dBuV/m) = Reading(dBuV)+ C.F (Correction Factor)

EUT	IP CAMERA	Date of Test	2016/12/28
Factor	BBHA 9120D (1GHz~18GHz)	Temp. / Humidity	25°C / 55%
Polarity	Vertical	Site / Test Engineer	AC1 / Kevin
Test Mode	Mode2	Test Voltage	AC 120V/60Hz

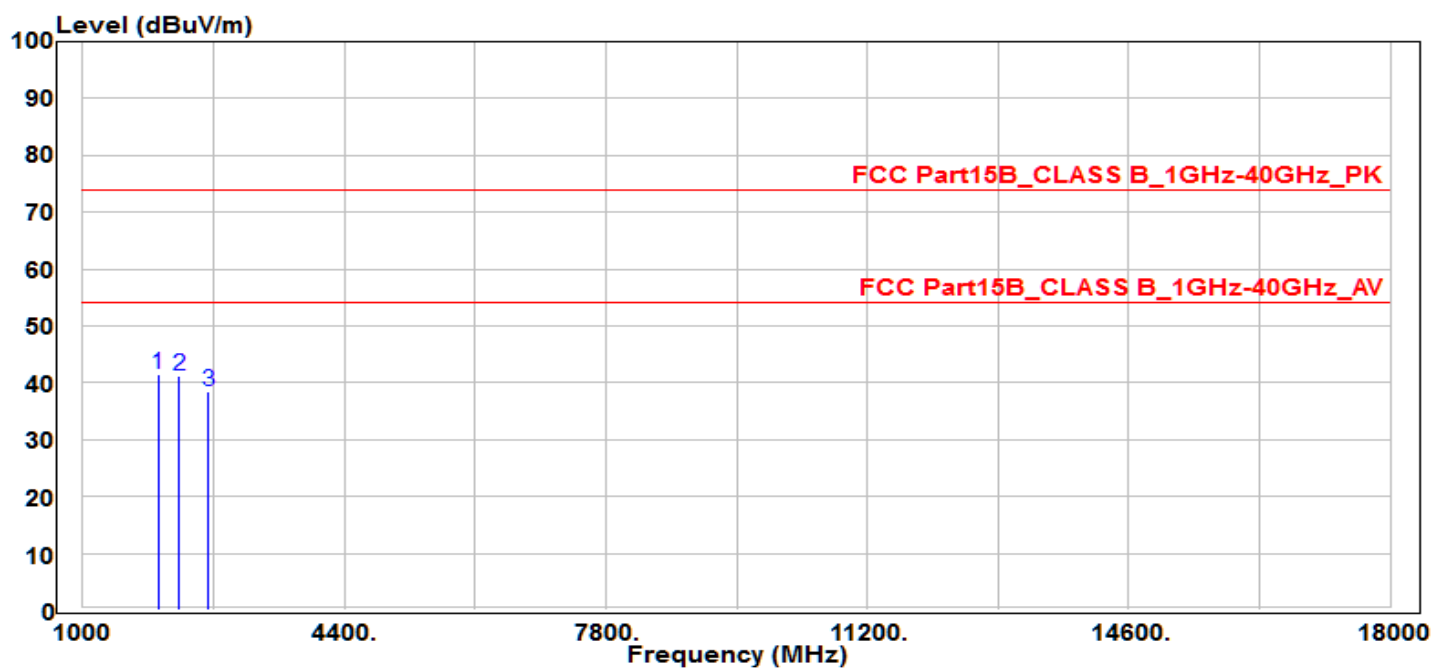


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	1679.71	41.26	-5.83	35.43	-38.57	74	400	400	Peak
2	2178.01	42.95	-1.99	40.96	-33.04	74	400	400	Peak
3	* 3360	42.99	-1.5	41.49	-32.51	74	400	400	Peak

Note :

1. " * ", means this data is the worst emission level.
2. C.F (Correction Factor) = Factor (dB)+ Cable Loss (dB)
3. Measurement (dBuV/m) = Reading(dBuV)+ C.F (Correction Factor)

EUT	IP CAMERA	Date of Test	2016/12/28
Factor	BBHA 9120D (1GHz~18GHz)	Temp. / Humidity	25°C / 55%
Polarity	Horizontal	Site / Test Engineer	AC1 / Kevin
Test Mode	Mode3	Test Voltage	By POE

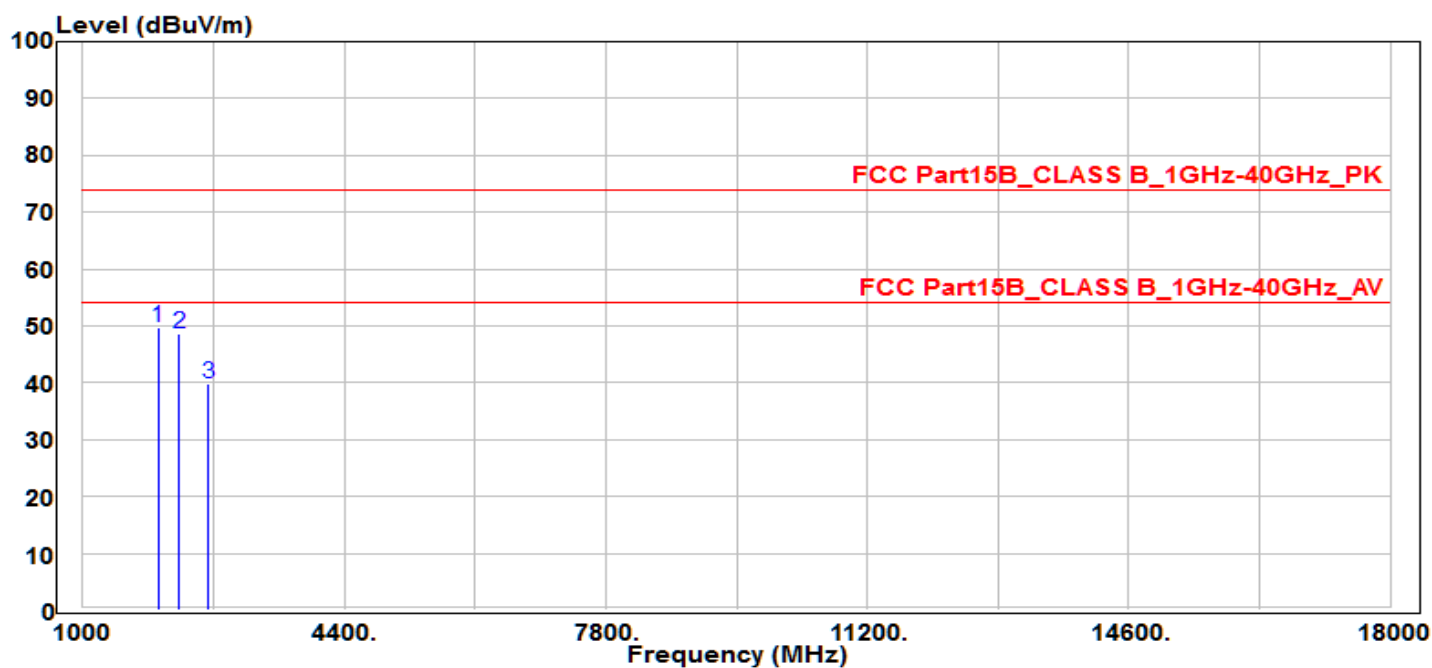


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	1979.86	45.58	-4.21	41.37	-32.63	74	400	400	Peak
2		2249.2	42.66	-1.56	41.1	-32.9	74	400	400	Peak
3		2639.65	40.68	-2.07	38.61	-35.39	74	400	400	Peak

Note :

1. " * ", means this data is the worst emission level.
2. C.F (Correction Factor) = Factor (dB)+ Cable Loss (dB)
3. Measurement (dBuV/m) = Reading(dBuV)+ C.F (Correction Factor)

EUT	IP CAMERA	Date of Test	2016/12/28
Factor	BBHA 9120D (1GHz~18GHz)	Temp. / Humidity	25°C / 55%
Polarity	Vertical	Site / Test Engineer	AC1 / Kevin
Test Mode	Mode3	Test Voltage	By POE

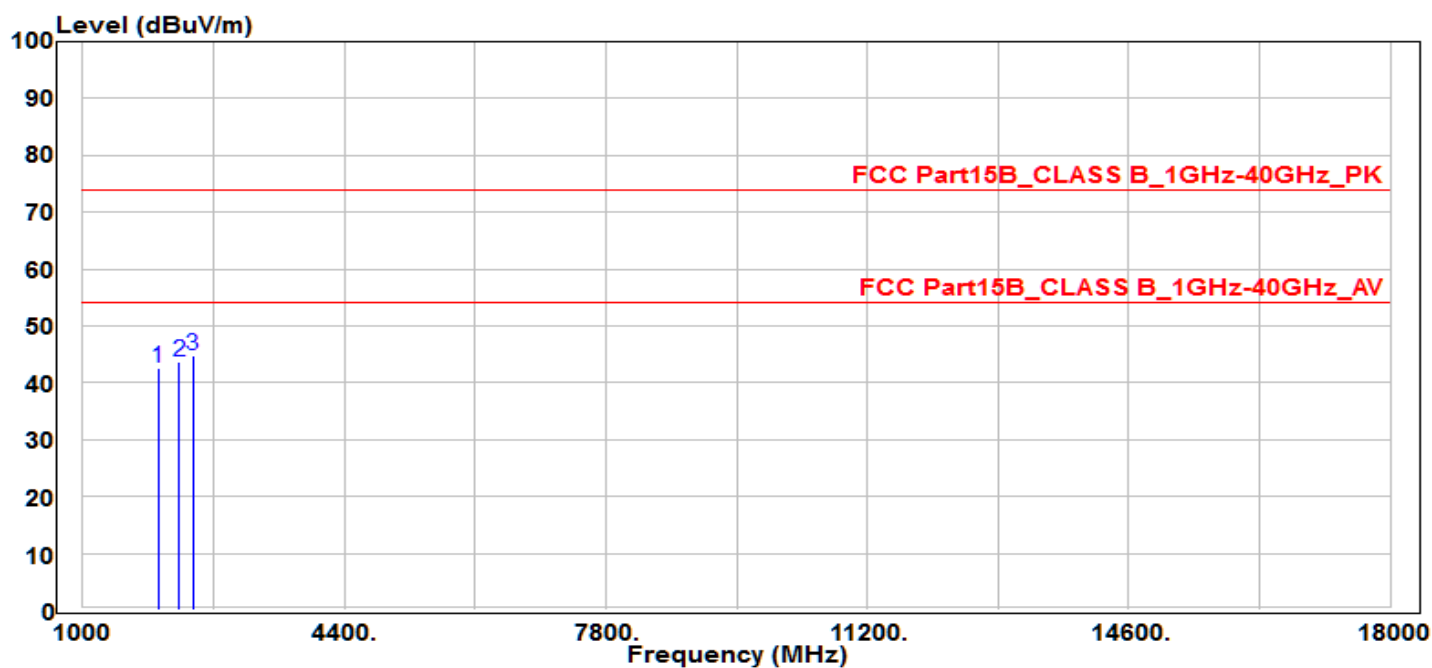


No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	1981.45	53.84	-4.2	49.64	-24.36	74	400	400	Peak
2		2248.66	50.1	-1.56	48.54	-25.46	74	400	400	Peak
3		2639.65	42.05	-2.07	39.98	-34.02	74	400	400	Peak

Note :

1. " * ", means this data is the worst emission level.
2. C.F (Correction Factor) = Factor (dB)+ Cable Loss (dB)
3. Measurement (dBuV/m) = Reading(dBuV)+ C.F (Correction Factor)

EUT	IP CAMERA	Date of Test	2016/12/28
Factor	BBHA 9120D (1GHz~18GHz)	Temp. / Humidity	25°C / 55%
Polarity	Horizontal	Site / Test Engineer	AC1 / Kevin
Test Mode	Mode4	Test Voltage	AC 120V/60Hz

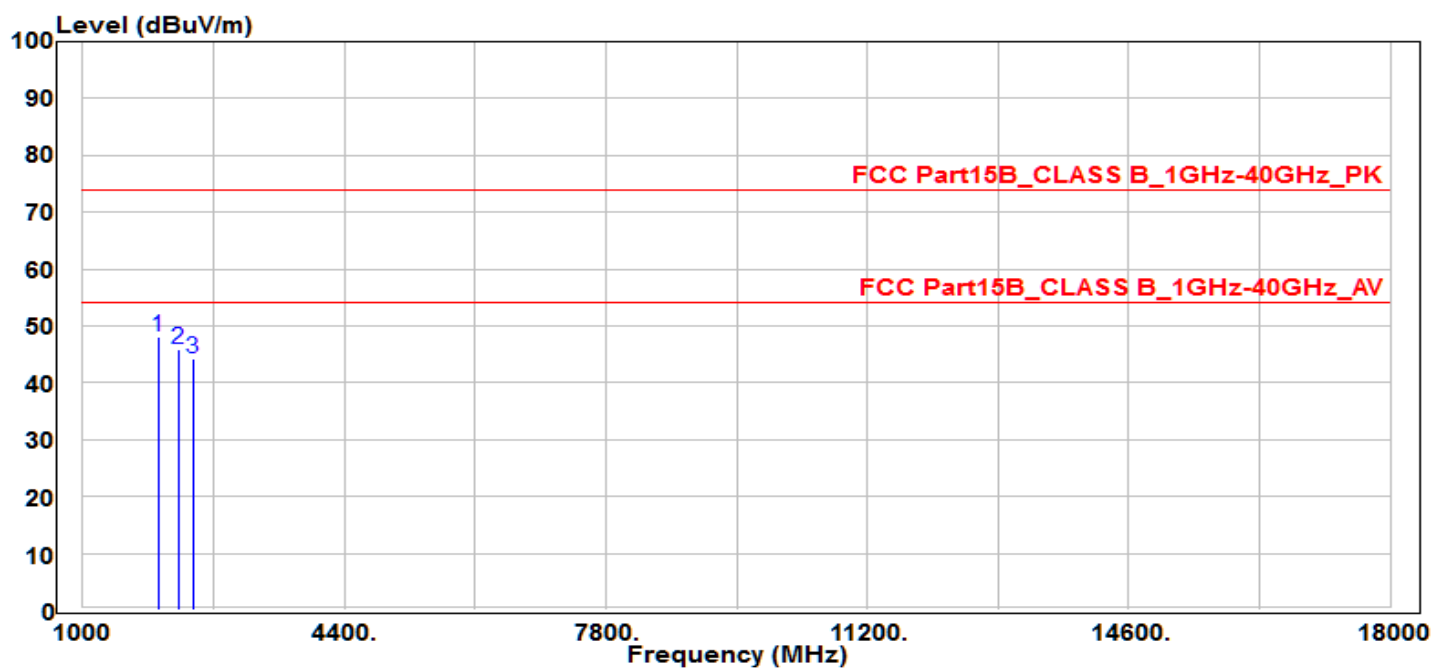


No	Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	1979.86	46.73	-4.21	42.52	-31.48	74	400	400	Peak
2	2249.2	45.14	-1.56	43.58	-30.42	74	400	400	Peak
3	* 2436.19	46.78	-2.02	44.76	-29.24	74	400	400	Peak

Note :

1. " * ", means this data is the worst emission level.
2. C.F (Correction Factor) = Factor (dB)+ Cable Loss (dB)
3. Measurement (dBuV/m) = Reading(dBuV)+ C.F (Correction Factor)

EUT	IP CAMERA	Date of Test	2016/12/28
Factor	BBHA 9120D (1GHz~18GHz)	Temp. / Humidity	25°C / 55%
Polarity	Vertical	Site / Test Engineer	AC1 / Kevin
Test Mode	Mode4	Test Voltage	AC 120V/60Hz



No		Frequency (MHz)	Reading (dBuV)	C.F (dB)	Measurement (dBuV/m)	Margin (dB)	Limit (dBuV)	Height (cm)	Angle (deg)	Remark (QP/PK/AV)
1	*	1976.67	52.38	-4.23	48.15	-25.85	74	400	400	Peak
2		2248.13	47.53	-1.56	45.97	-28.03	74	400	400	Peak
3		2434.06	46.24	-2.01	44.23	-29.77	74	400	400	Peak

Note :

1. " * ", means this data is the worst emission level.
2. C.F (Correction Factor) = Factor (dB)+ Cable Loss (dB)
3. Measurement (dBuV/m) = Reading(dBuV)+ C.F (Correction Factor)

7. CONCLUSION

The data collected relate only the item(s) tested and show that the **IP CAMERA** has been tested to comply with the requirements specified in §15.107 and §15.109 of the FCC Rules.

Appendix A - Test Photograph

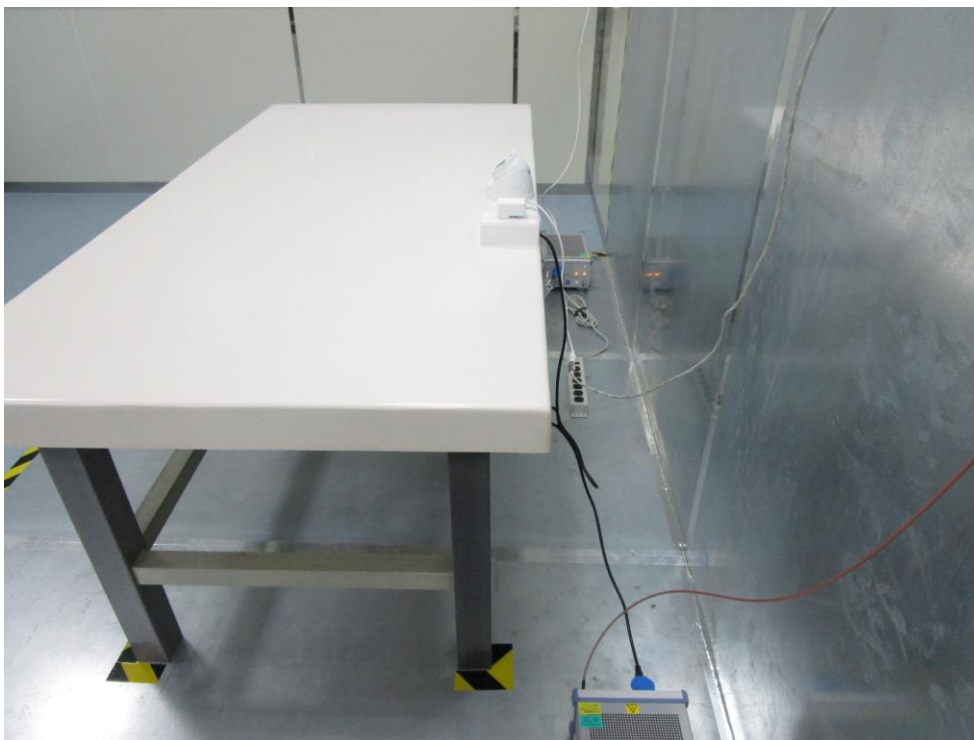
Test Mode 2,4

Description: Front View of Conducted Emission Test Setup



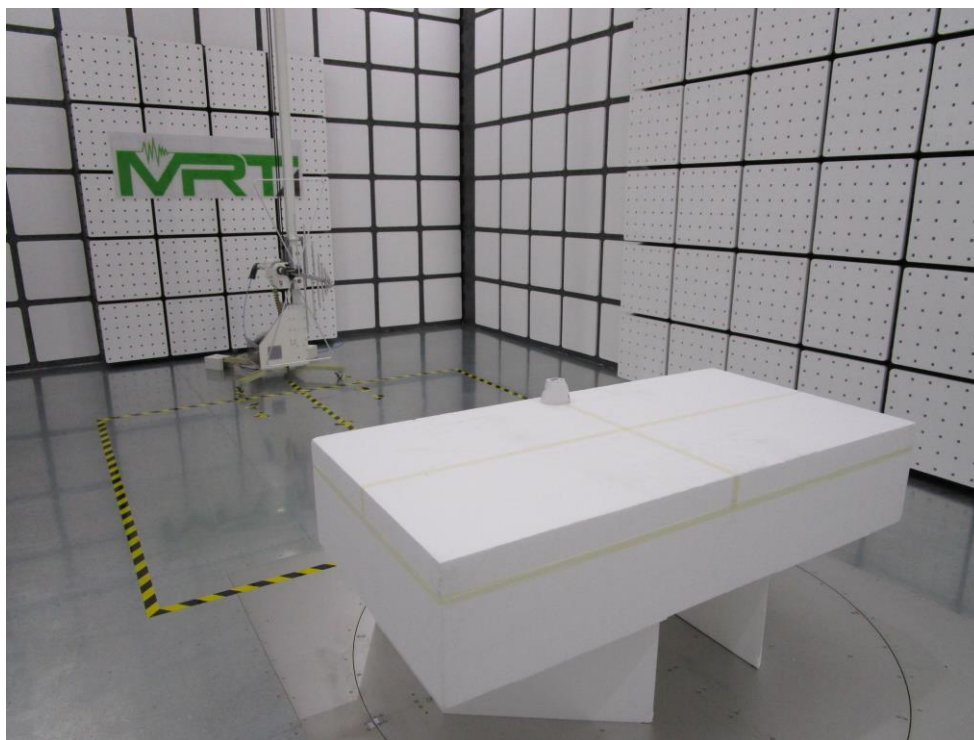
Test Mode 2,4

Description: Back View of Conducted Emission Test Setup



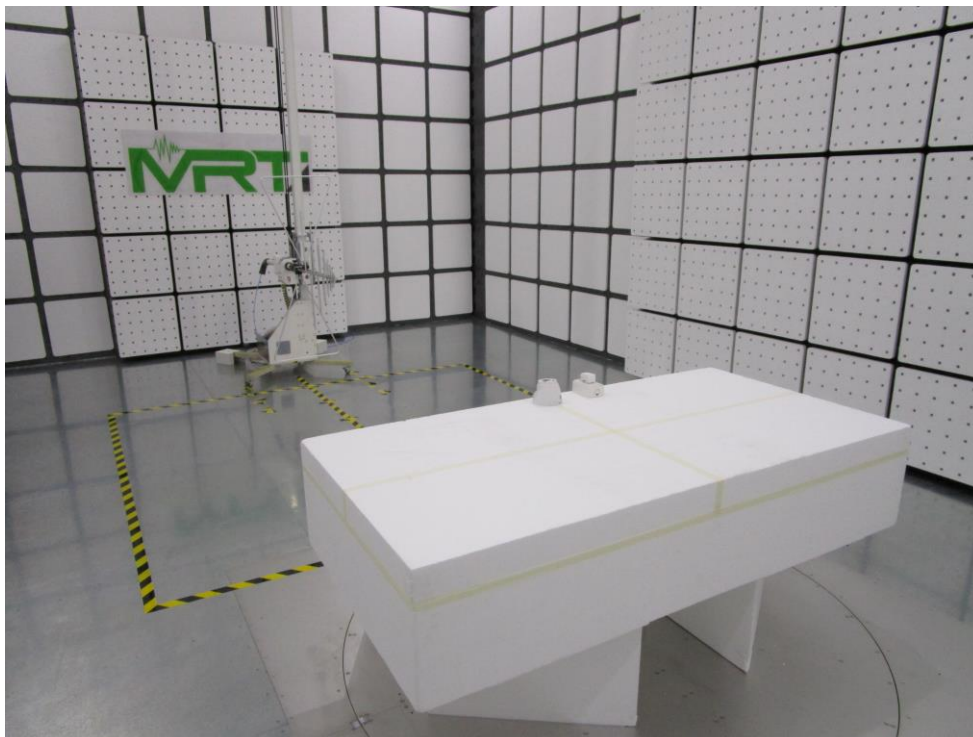
Test Mode: Mode 1,3

Description: Radiated Emission Test Setup for 30MHz ~ 1GHz



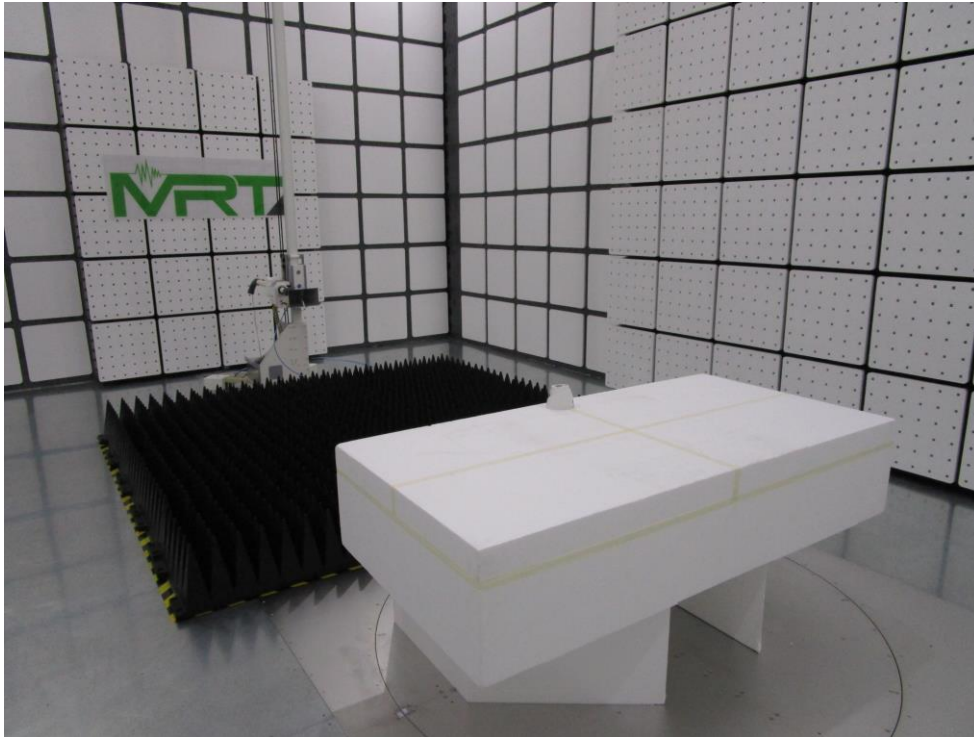
Test Mode: Mode 2,4

Description: Radiated Emission Test Setup for 30MHz ~ 1GHz



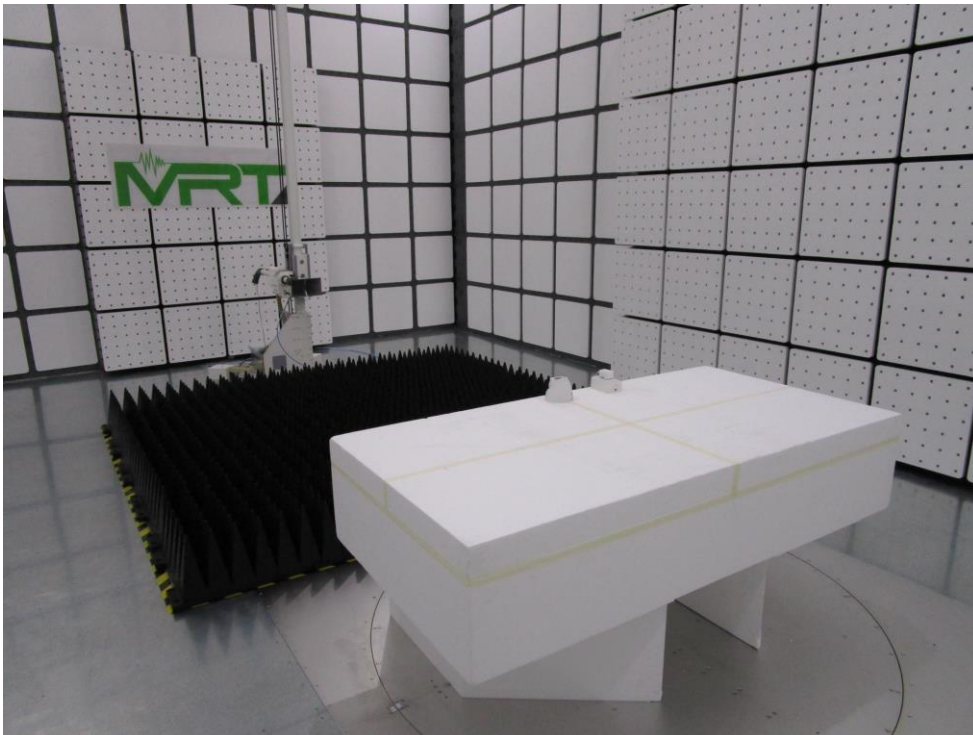
Test Mode: Mode 1,3

Description: Radiated Emission Test Setup for 1GHz ~ 18GHz



Test Mode: Mode 2,4

Description: Radiated Emission Test Setup for 1GHz ~ 18GHz



Appendix B - EUT Photograph

(1) EUT Photo (DH-IPC-HDW2231RP-ZS)



(2) EUT Photo (DH-IPC-HDW2231RP-ZS)



(3) EUT Photo (DH-IPC-HDW2231RP-ZS)



(4) EUT Photo (DH-IPC-HDW2231RP-ZS)



(5) EUT Photo (DH-IPC-HDW5830RP-Z)



(6) EUT Photo (DH-IPC-HDW5830RP-Z)



(7) EUT Photo (DH-IPC-HDW5830RP-Z)



(8) EUT Photo (DH-IPC-HDW5830RP-Z)



(9) EUT Photo



(10) EUT Photo



(11) EUT Photo



The End