

FCC Part 15B Measurement and Test Report

For

IRINET S.A.

GESTIDO 2435 OF. 102, Montevideo, Uruguay

FCC ID: 2AMV9HD002

Test Rule(s): FCC Part 15 Subpart B

Product Description: IP camera

Tested Model: HD002

Report No.: STR17048086I-2

Tested Date: 2017-04-10 to 2017-07-07

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Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Shenzhen SEM.Test Technology Co., Ltd.

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: IRINET S.A.
Address of applicant: GESTIDO 2435 OF. 102, Montevideo, Uruguay

Manufacturer: Shenzhen SiGo Electronic Co.,LTD
Address of manufacturer: 3/F, Build 8, FuLongTe Industrial Park, HuaXing Road Dalang street , Shenzhen City, China

General Description of EUT	
Product Name:	IP camera
Trade Name:	/
Model No.:	HD002
Adding Model(s):	HD003, HD004, HD005, HD006, HD007, HD008, HD009, HD10, HD20
<i>Note: The test data is gathered from a production sample, provided by the manufacturer. The appearance of others models listed in the report is different from main-test model HD002, but the circuit and the electronic construction do not change, declared by the manufacturer.</i>	

Technical Characteristics of EUT	
Rated Voltage:	DC 3.7V
Rated Current:	/
Rated Power:	/
Power Adapter Model:	XHY050200LUC
Highest Internal Frequency:	1.5GHz
Classification of ITE:	Class B

1.2 Test Standards

The following report is prepared on behalf of the IRINET S.A. in accordance with Part 2, Subpart J, and Part 15, Subparts A and B of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15, Subpart B, and section 15.205, 15.107, and 15.109 rules.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

1.4 Test Facility

FCC – Registration No.: 934118

Shenzhen SEM.Test Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files and the Registration is 934118.

Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Shenzhen SEM.Test Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

CNAS Registration No.: L4062

Shenzhen SEM.Test Technology Co., Ltd. is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L4062. All measurement facilities used to collect the measurement data are located at 1/F, Building A, Hongwei Industrial Park, Liuxian 2nd Road, Bao'an District, Shenzhen, P.R.C (518101).

1.5 EUT Setup and Operation Mode

The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted according to the operation manual for use, more detailed description as follows:

Test Mode List:

Test Mode	Description	Remark
TM1	Charging And Camera On	Connected to Adapter
TM2	Downloading	Connected to PC

EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
/	/	/	/

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
Notebook	Lenovo	E443	

Special Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
USB Cable	1.0	Shielded	Without Core

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
Conducted Emissions	Conducted	$\pm 2.88\text{dB}$
Transmitter Spurious Emissions	Radiated	$\pm 5.1\text{dB}$

1.7 Test Equipment List and Details

No.	Description	Manufacturer	Model	Serial No.	Cal Date	Due Date
SEMT-1072	Spectrum Analyzer	Agilent	E4407B	MY41440400	2017-06-12	2018-06-11
SEMT-1031	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2017-06-12	2018-06-11
SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2017-06-12	2018-06-11
SEMT-1008	Amplifier	Agilent	8447F	3113A06717	2017-06-12	2018-06-11
SEMT-1043	Amplifier	C&D	PAP-1G18	2002	2017-06-12	2018-06-11
SEMT-1011	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2017-06-12	2018-06-11
SEMT-1042	Horn Antenna	ETS	3117	00086197	2017-06-12	2018-06-11
SEMT-1069	Loop Antenna	Schwarz beck	FMZB 1516	9773	2017-06-12	2018-06-11
SEMT-1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2017-06-12	2018-06-11
SEMT-1003	L.I.S.N	Schwarz beck	NSLK8126	8126-224	2017-06-12	2018-06-11
SEMT-1002	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2017-06-12	2018-06-11

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§ 15.107 (a)	Conducted Emissions	Compliant
§ 15.109 (a)	Radiated Emissions	Compliant

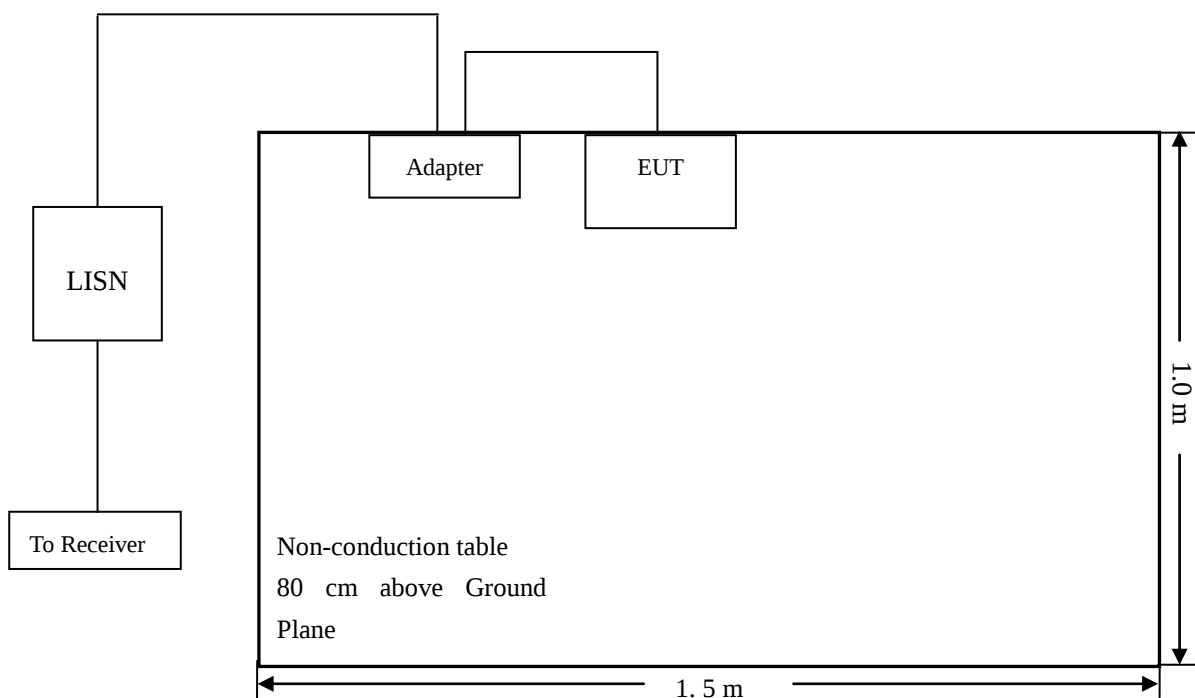
N/A: not applicable

3. Conducted Emissions

3.1 Test Procedure

Test is conducting under the description of ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

3.2 Basic Test Setup Block Diagram



3.3 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	52%
ATM Pressure:	1011 mbar

3.4 Summary of Test Results/Plots

According to the data in section 3.6, the EUT complied with the FCC Part 15.107(a) Conducted margin for a Class B device, with the *worst* margin reading of:

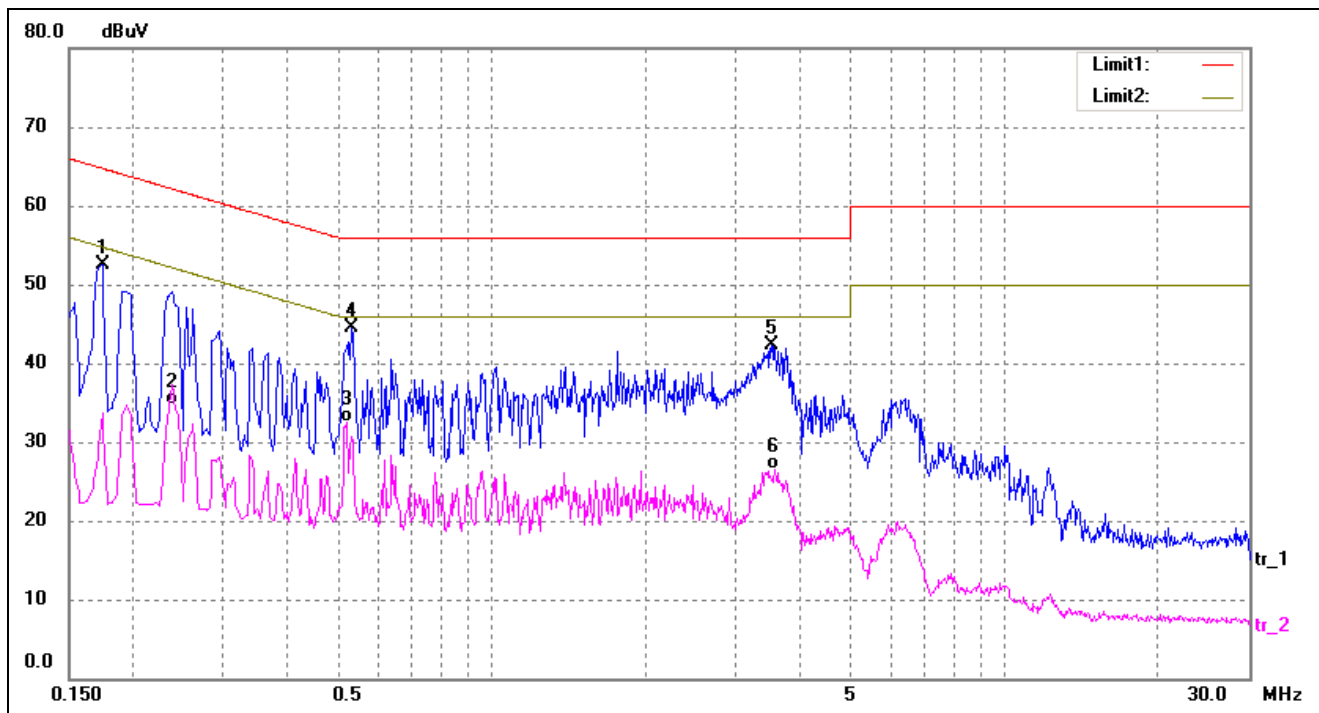
-9.31 dB at **0.5260 MHz** in the **Line, Average** detector, **TM1** Mode, 0.15-30MHz

3.5 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

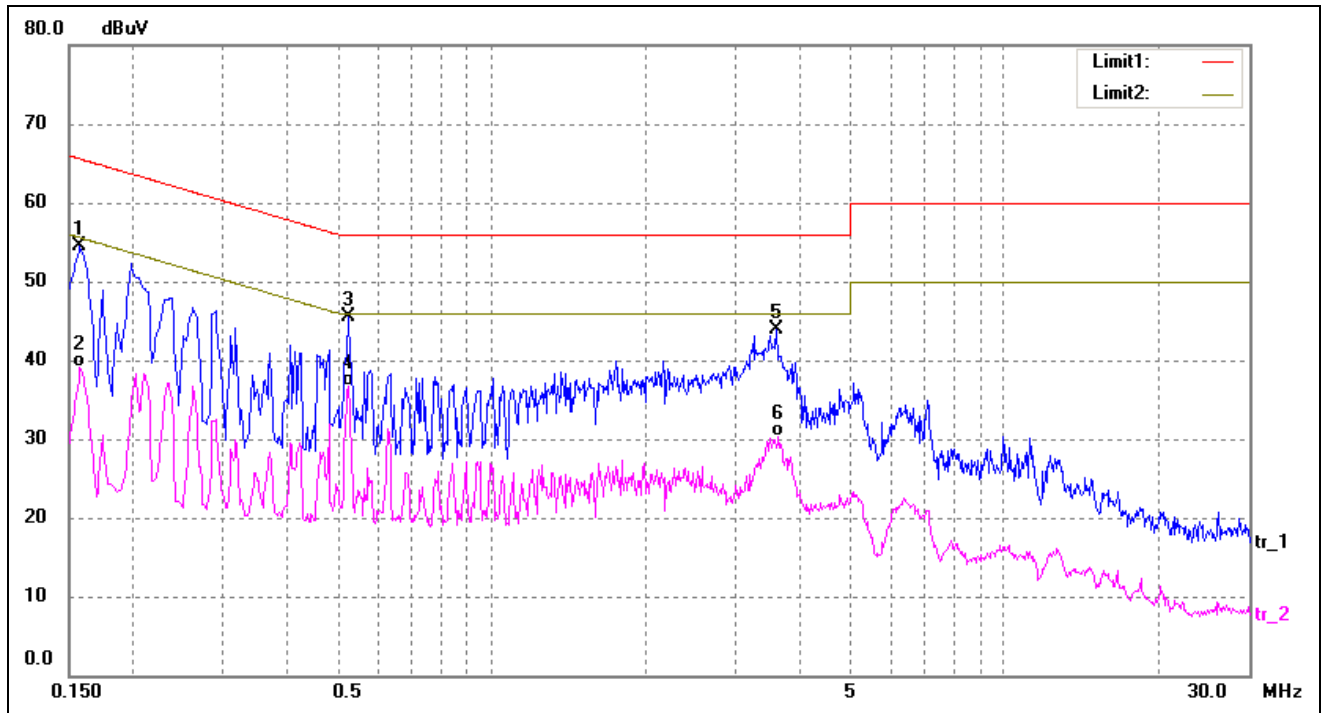
EUT: IP camera
 Tested Model: HD002
 Operating Condition: TM1
 Comment: AC 120V/60Hz; Adapter DC 5V

Test Specification: Neutral



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1740	42.76	9.83	52.59	64.77	-12.18	QP
2	0.2353	24.96	9.80	34.76	52.26	-17.50	AVG
3	0.5220	22.61	9.80	32.41	46.00	-13.59	AVG
4*	0.5340	34.71	9.80	44.51	56.00	-11.49	QP
5	3.5180	32.69	9.70	42.39	56.00	-13.61	QP
6	3.5660	16.82	9.70	26.52	46.00	-19.48	AVG

Test Specification: Line



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1580	44.62	9.84	54.46	65.57	-11.11	QP
2	0.1580	29.30	9.84	39.14	55.57	-16.43	AVG
3	0.5260	35.61	9.80	45.41	56.00	-10.59	QP
4*	0.5260	26.89	9.80	36.69	46.00	-9.31	AVG
5	3.5980	34.13	9.70	43.83	56.00	-12.17	QP
6	3.6380	20.58	9.69	30.27	46.00	-15.73	AVG

Plot of Conducted Emissions Test Data

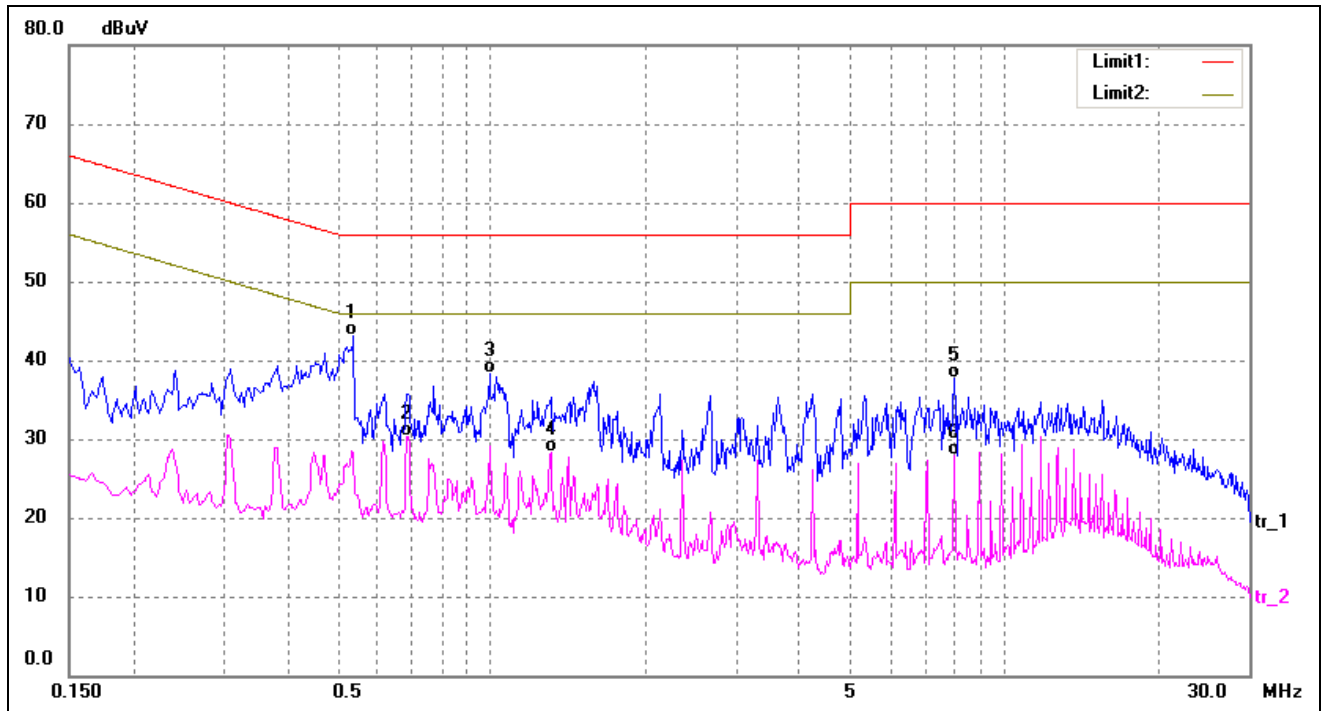
EUT: IP camera

Tested Model: HD002

Operating Condition: TM2

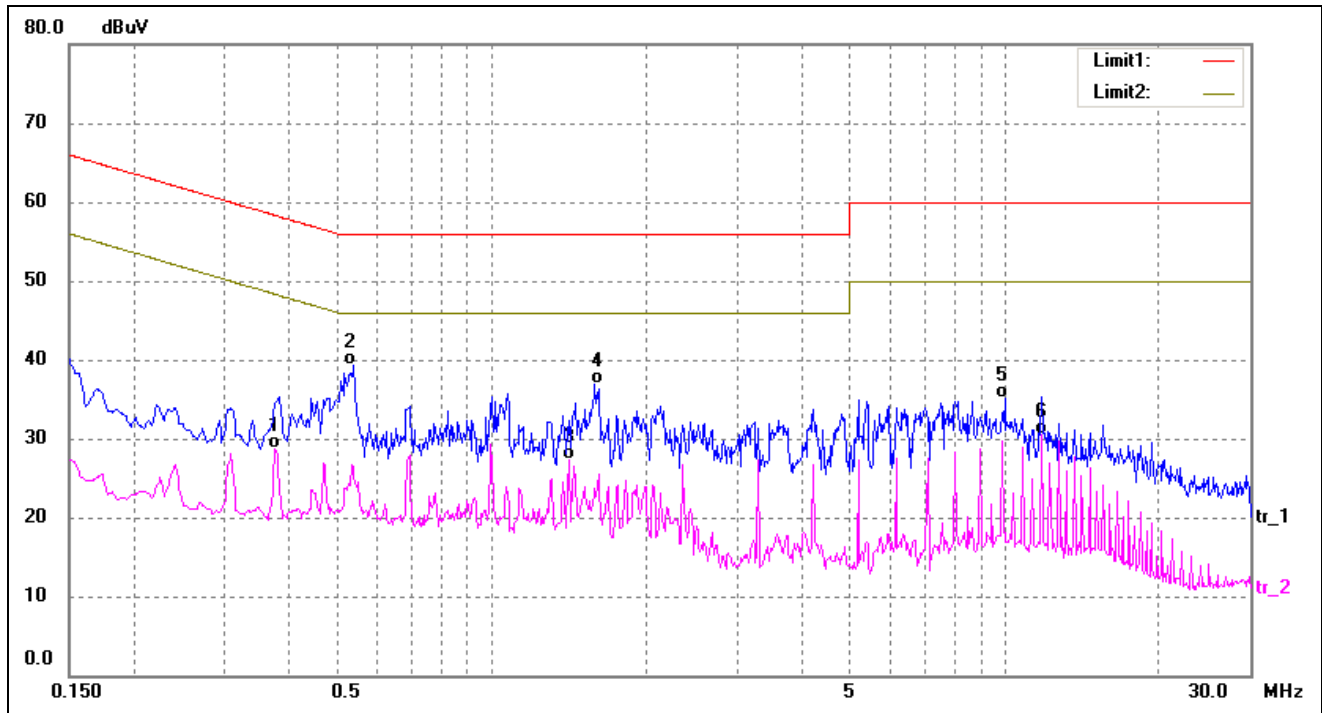
Comment: DC 5V

Test Specification: Neutral



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1*	0.5380	33.27	9.80	43.07	56.00	-12.93	QP
2	0.6860	20.52	9.79	30.31	46.00	-15.69	AVG
3	0.9900	28.46	9.76	38.22	56.00	-17.78	QP
4	1.3060	18.46	9.75	28.21	46.00	-17.79	AVG
5	8.0060	28.15	9.58	37.73	60.00	-22.27	QP
6	8.0060	18.31	9.58	27.89	50.00	-22.11	AVG

Test Specification: Line



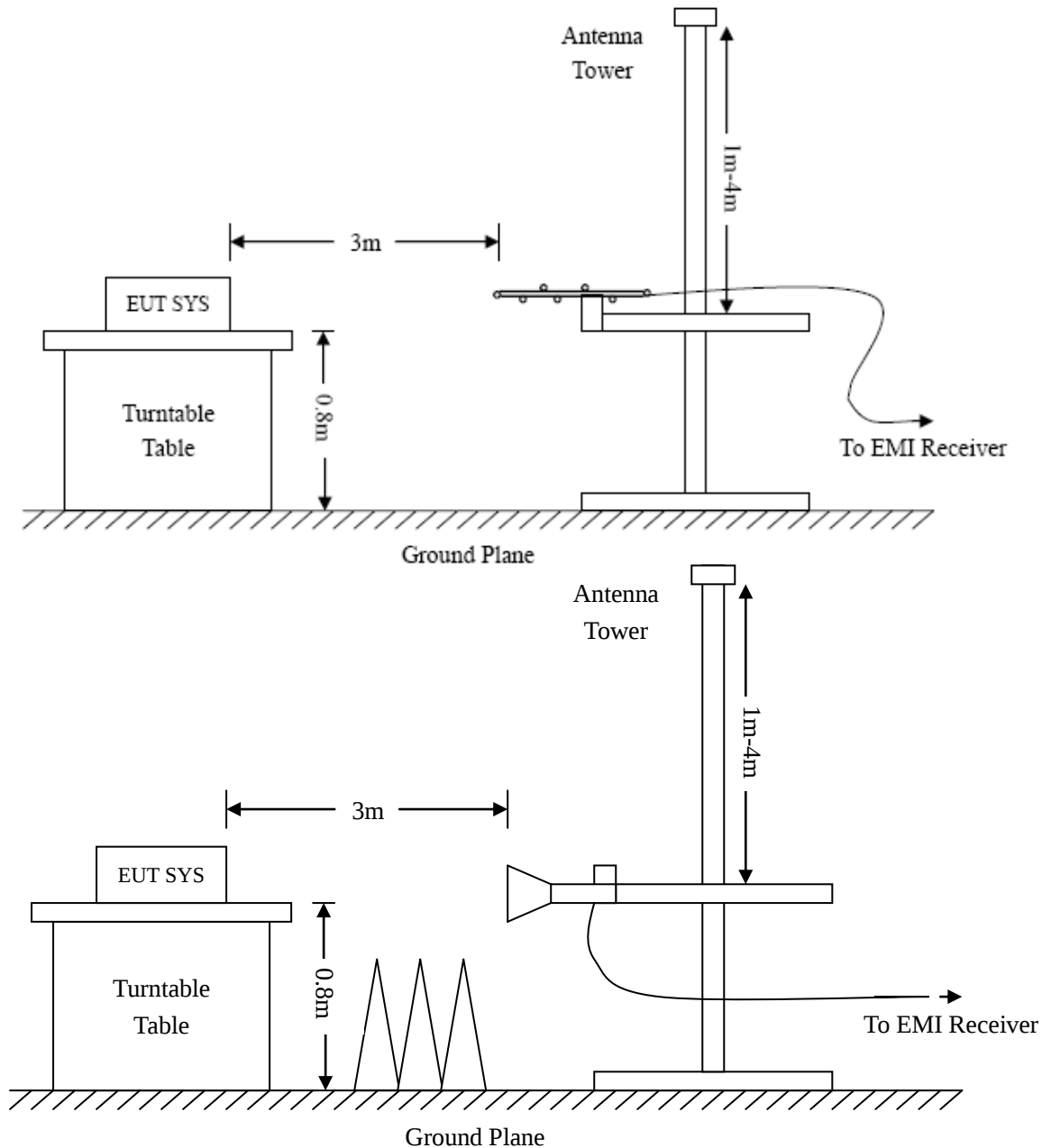
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.3780	18.97	9.80	28.77	48.32	-19.55	AVG
2*	0.5380	29.55	9.80	39.35	56.00	-16.65	QP
3	1.4140	17.50	9.75	27.25	46.00	-18.75	AVG
4	1.5860	27.09	9.75	36.84	56.00	-19.16	QP
5	9.9900	25.56	9.52	35.08	60.00	-24.92	QP
6	11.7780	20.97	9.55	30.52	50.00	-19.48	AVG

4. Radiated Emissions

4.1 Test Procedure

The setup of EUT is according with per ANSI C63.4-2014 measurement procedure. The specification used was with the FCC Part 15.109 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle. The spacing between the peripherals was 10 cm.



4.2 Test Receiver Setup

Frequency :9kHz-30MHz

RBW=10KHz,

VBW =30KHz

Sweep time= Auto

Trace = max hold

Detector function = peak

Frequency :30MHz-1GHz

RBW=120KHz,

VBW=300KHz

Sweep time= Auto

Trace = max hold

Detector function = peak, QP

Frequency :Above 1GHz

RBW=1MHz,

VBW=3MHz(Peak), 10Hz(AV)

Sweep time= Auto

Trace = max hold

Detector function = peak, AV

4.3 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} - \text{Corr. Factor}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dB μ V means the emission is 6dB μ V below the maximum limit for a Class B device. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15.109(a) Limit}$$

4.4 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	55 %
ATM Pressure:	1011 mbar

4.5 Summary of Test Results/Plots

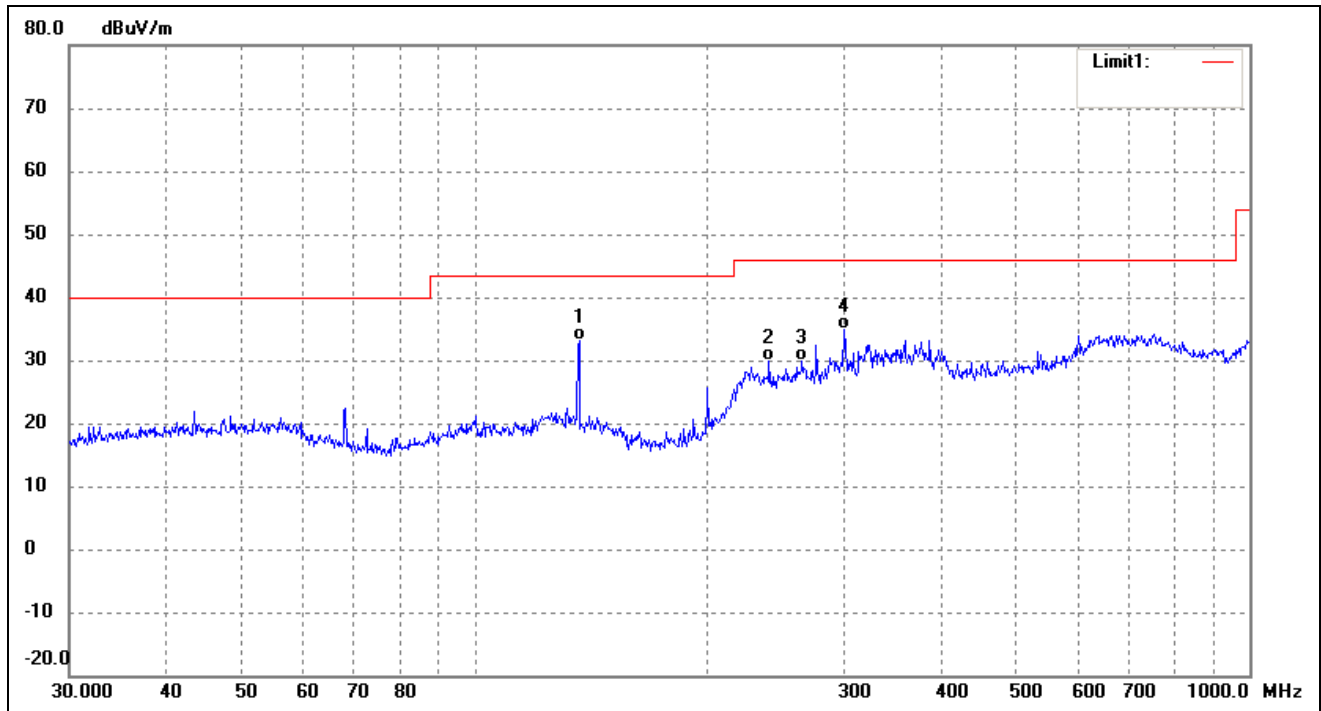
According to the data, the EUT complied with the FCC Part 15.109(a) rule, and had the worst margin of:

-2.79 dB at 651.9416 MHz in the Vertical polarization, TM2 Mode, 30MHz to 1 GHz, 3Meters

Plot of Radiated Emissions Test Data

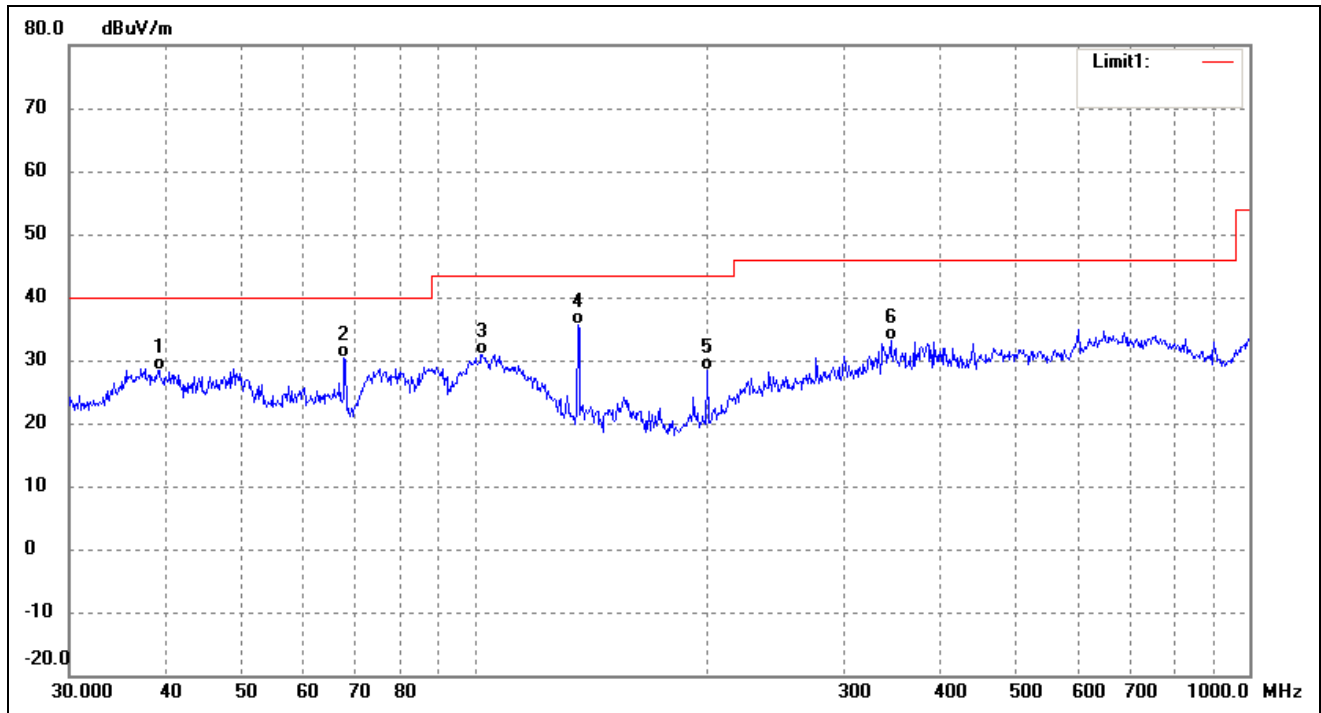
EUT: IP camera
 Tested Model: HD002
 Operating Condition: TM1
 Comment: AC 120V/60Hz; Adapter DC 5V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	136.4598	29.58	3.44	33.02	43.50	-10.48	266	100	QP
2	239.9874	20.84	8.93	29.77	46.00	-16.23	297	100	QP
3	264.7456	19.97	10.03	30.00	46.00	-16.00	75	100	QP
4	300.3673	23.00	11.95	34.95	46.00	-11.05	99	100	QP

Test Specification: Vertical

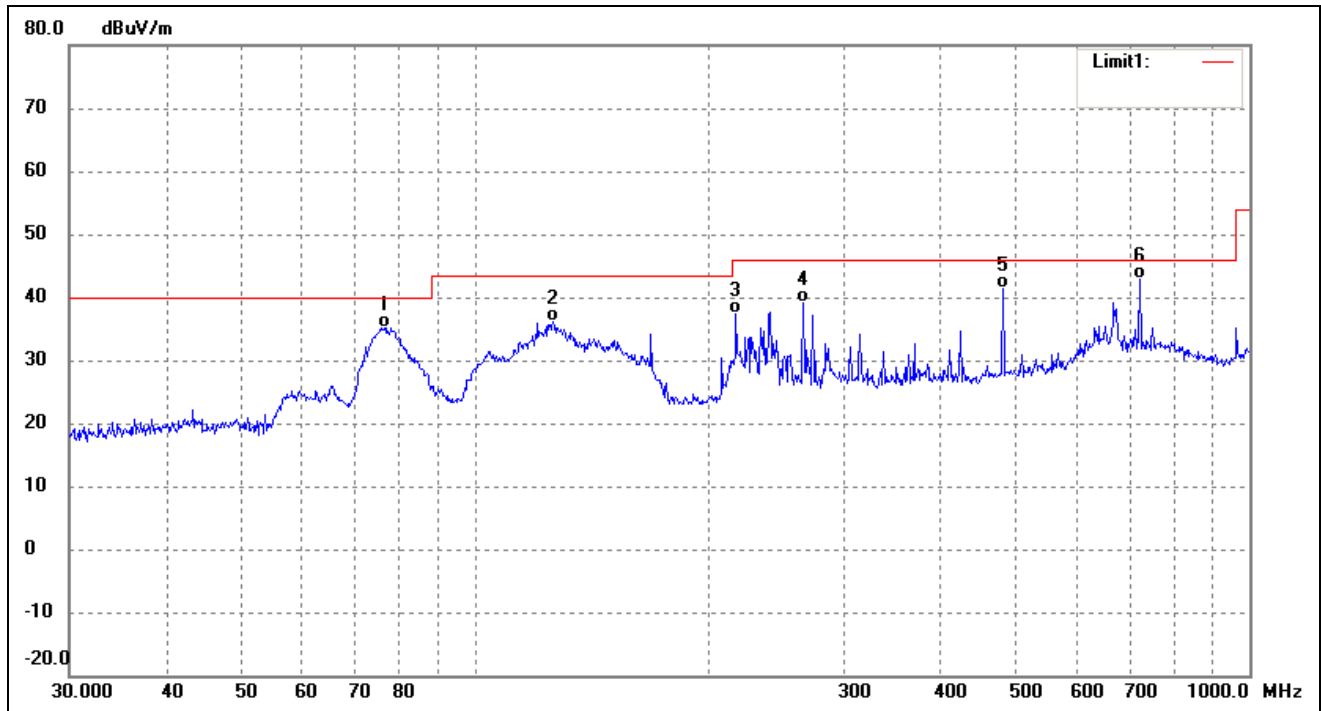


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	39.1615	23.59	4.80	28.39	40.00	-11.61	100	100	QP
2	67.9128	27.01	3.34	30.35	40.00	-9.65	197	100	QP
3	102.3597	26.02	4.91	30.93	43.50	-12.57	103	100	QP
4	135.9822	32.14	3.48	35.62	43.50	-7.88	130	100	QP
5	199.9856	25.07	3.36	28.43	43.50	-15.07	341	100	QP
6	344.3854	21.54	11.48	33.02	46.00	-12.98	100	100	QP

Plot of Radiated Emissions Test Data

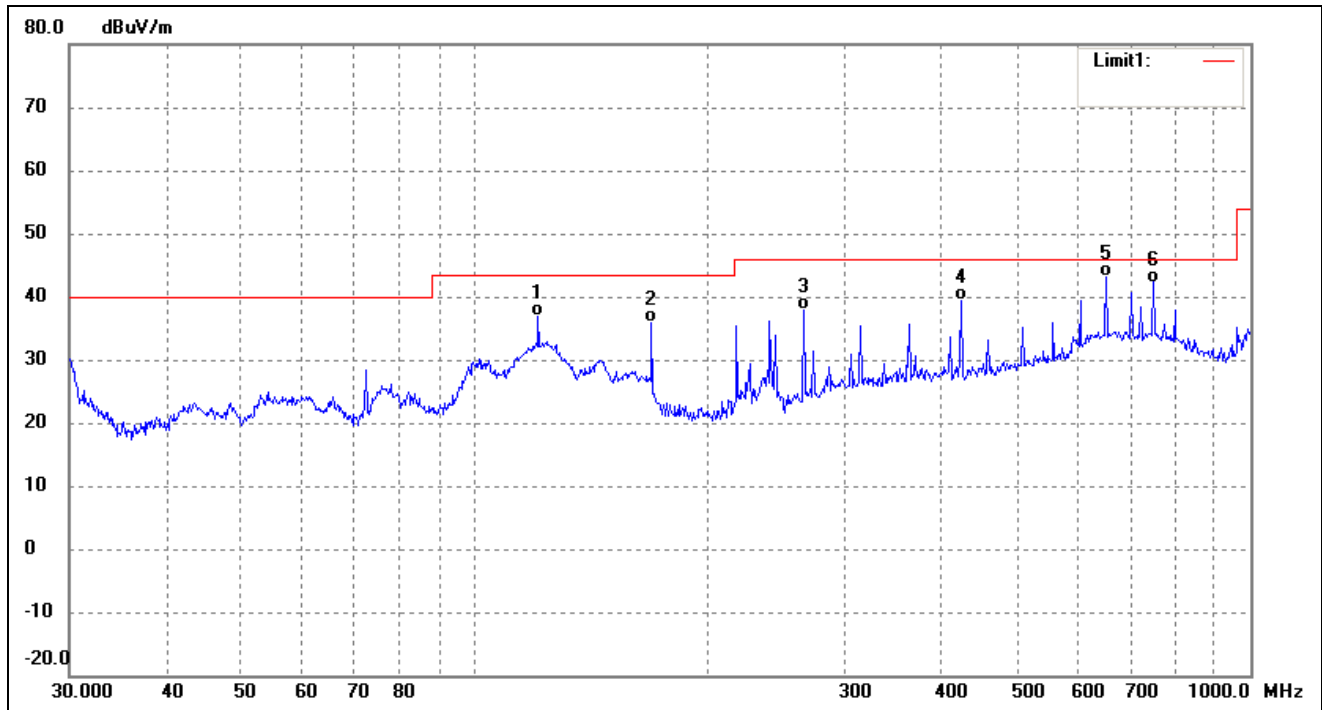
EUT: IP camera
 Tested Model: HD002
 Operating Condition: TM2
 Comment: DC 5V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	76.5121	33.09	2.12	35.21	40.00	-4.79	172	100	QP
2	126.3285	31.76	4.29	36.05	43.50	-7.45	243	100	QP
3	217.5441	30.16	7.15	37.31	46.00	-8.69	69	100	QP
4	265.6757	28.98	10.10	39.08	46.00	-6.92	143	100	QP
5	480.5276	28.83	12.58	41.41	46.00	-4.59	167	100	QP
6	721.7259	24.97	17.91	42.88	46.00	-3.12	317	100	QP

Test Specification: Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	120.6991	32.13	4.76	36.89	43.50	-6.61	69	100	QP
2	169.0054	33.31	2.46	35.77	43.50	-7.73	148	100	QP
3	265.6757	27.67	10.10	37.77	46.00	-8.23	137	100	QP
4	423.5403	27.32	11.99	39.31	46.00	-6.69	135	100	QP
5	651.9416	25.44	17.77	43.21	46.00	-2.79	75	100	QP
6	750.1082	23.67	18.58	42.25	46.00	-3.75	330	100	QP

Note: Testing is carried out with frequency rang 30MHz to the 12.75GHz, which above 1GHz are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

***** END OF REPORT *****