

FCC Part 15B Measurement and Test Report

For

Orantek Distribution Limited

5/F, Building E, Dakan Tech Park, Dakan Village, Xili Town, Nanshan

District, Shenzhen, China

FCC ID: WHLIP326

Test Standards:	<u>FCC Part 15 Subpart B</u>
Product Description:	<u>Network Camera</u>
Tested Model:	<u>IP326</u>
Report No.:	<u>STR12088414I-2</u>
Tested Date:	<u>2012-08-31 to 2012-12-21</u>
Issued Date:	<u>2012-12-24</u>
Tested By:	<u>Vigoss Xiong / Engineer</u>
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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 SEM.Test Compliance Service Co., Ltd

TABLE OF CONTENTS

1. GENERAL INFORMATION.....	3
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....	3
1.2 TEST STANDARDS.....	4
1.3 TEST METHODOLOGY.....	4
1.4 TEST FACILITY.....	4
1.5 EUT SETUP AND OPERATION MODE.....	5
2. SUMMARY OF TEST RESULTS.....	6
3. CONDUCTED EMISSIONS.....	7
3.1 MEASUREMENT UNCERTAINTY.....	7
3.2 TEST EQUIPMENT LIST AND DETAILS.....	7
3.3 TEST PROCEDURE.....	7
3.4 BASIC TEST SETUP BLOCK DIAGRAM.....	7
3.5 ENVIRONMENTAL CONDITIONS.....	8
3.6 SUMMARY OF TEST RESULTS/PLOTS.....	8
3.7 CONDUCTED EMISSIONS TEST DATA.....	8
4. RADIATED EMISSIONS.....	11
4.1 MEASUREMENT UNCERTAINTY.....	11
4.2 TEST EQUIPMENT LIST AND DETAILS.....	11
4.3 TEST PROCEDURE.....	11
4.4 TEST RECEIVER SETUP.....	12
4.5 CORRECTED AMPLITUDE & MARGIN CALCULATION.....	12
4.6 ENVIRONMENTAL CONDITIONS.....	12
4.7 SUMMARY OF TEST RESULTS/PLOTS.....	12

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: Orantek Distribution Limited
Address of applicant: 5/F, Building E, Dakan Tech Park, Dakan Village, Xili Town, Nanshan District, Shenzhen, China
Manufacturer: Orantek Distribution Limited
Address of manufacturer: 5/F, Building E, Dakan Tech Park, Dakan Village, Xili Town, Nanshan District, Shenzhen, China

General Description of EUT	
Product Name:	Network Camera
Trade Name:	/
Model No.:	IP326
Adding Model(s):	MD326, HD326
Rated Voltage:	DC 12V
<i>Note: The test data is gathered from a production sample, provided by the manufacturer. The other model listed in the report has different color only of IP326 without circuit and electronic construction changed, declared by the manufacturer.</i>	

Technical Characteristics of EUT	
Highest Internal Frequency:	133MHz
Classification of ITE:	Class B
Power Adapter Model:	FKS308HSC-1201000N (Input: AC 100-240V, Output: DC 12V)
Support Interface:	RJ45 Port

1.2 Test Standards

The following report is prepared on behalf of the Orantek Distribution Limited 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 C63.4-2003, 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.: 994117**

SEM.Test Compliance Services 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 994117.

- **Industry Canada (IC) Registration No.: 7673A**

The 3m Semi-anechoic chamber of SEM.Test Compliance Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 7673A.

- **CNAS Registration No.: L4062**

Shenzhen SEM.Test Electronics Service 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 3/F, Jinbao Commerce Building, Xin'an Fanshen 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	Connect to PC	With RJ45 Cable
TM2	/	/

EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
DC and RJ45 Cable	1.0	Unshielded	Without Ferrite

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
Notebook	SAMSUNG	NP-R20	124V93FP300082V

Special Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
RJ45 Cable	3.0	Unshielded	Without Ferrite

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 Measurement Uncertainty

Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is ± 2.88 dB.

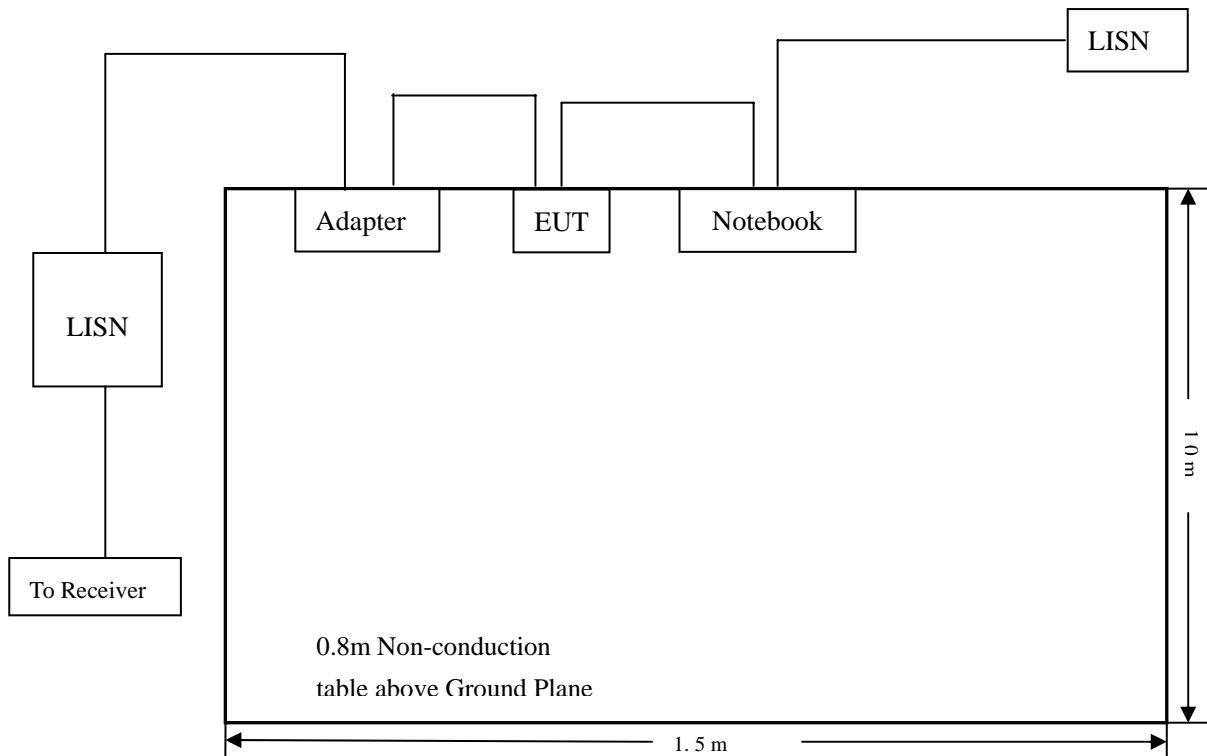
3.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2012-03-28	2013-03-27
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2012-03-28	2013-03-27
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2012-03-28	2013-03-27

3.3 Test Procedure

Test is conducting under the description of ANSI C63.4-2003, 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.

3.4 Basic Test Setup Block Diagram



3.5 Environmental Conditions

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

3.6 Summary of Test Results/Plots

According to the data in section 3.7, the EUT complied with the FCC Part 15.107(a) Conducted margin for a Class B device, with the *worst* margin reading of:

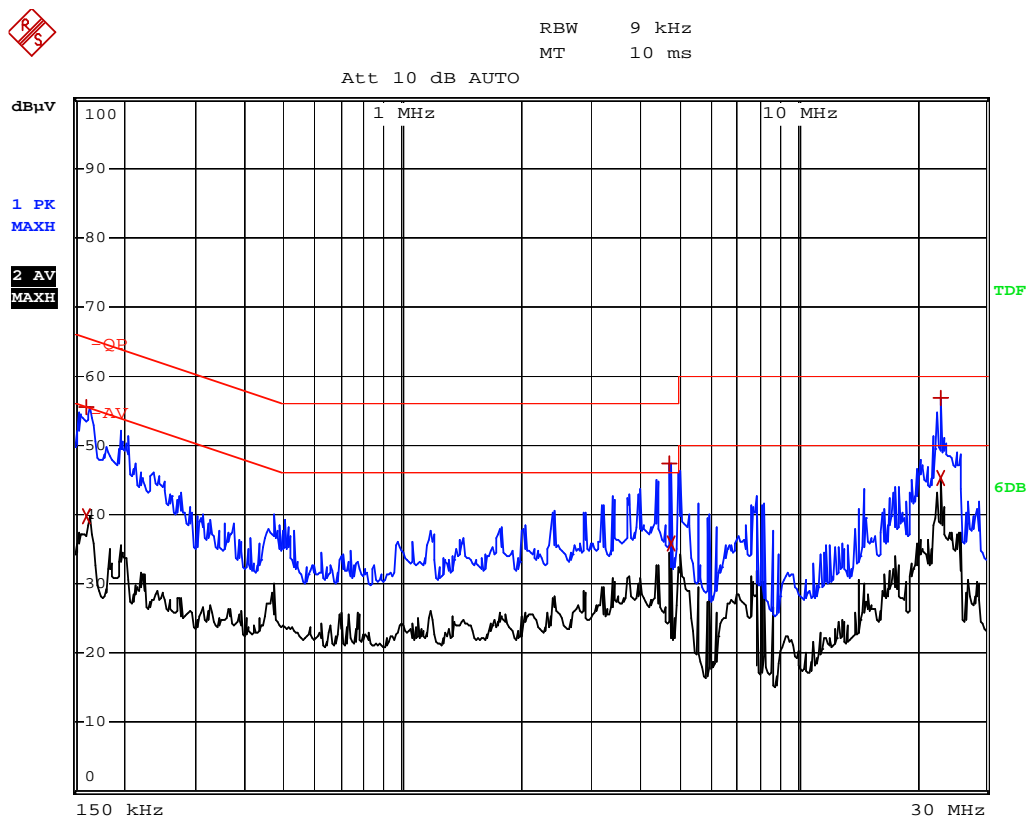
-3.130 dB at 22.986 MHz in the Neutral mode, Peak detector, 0.15-30MHz

3.7 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

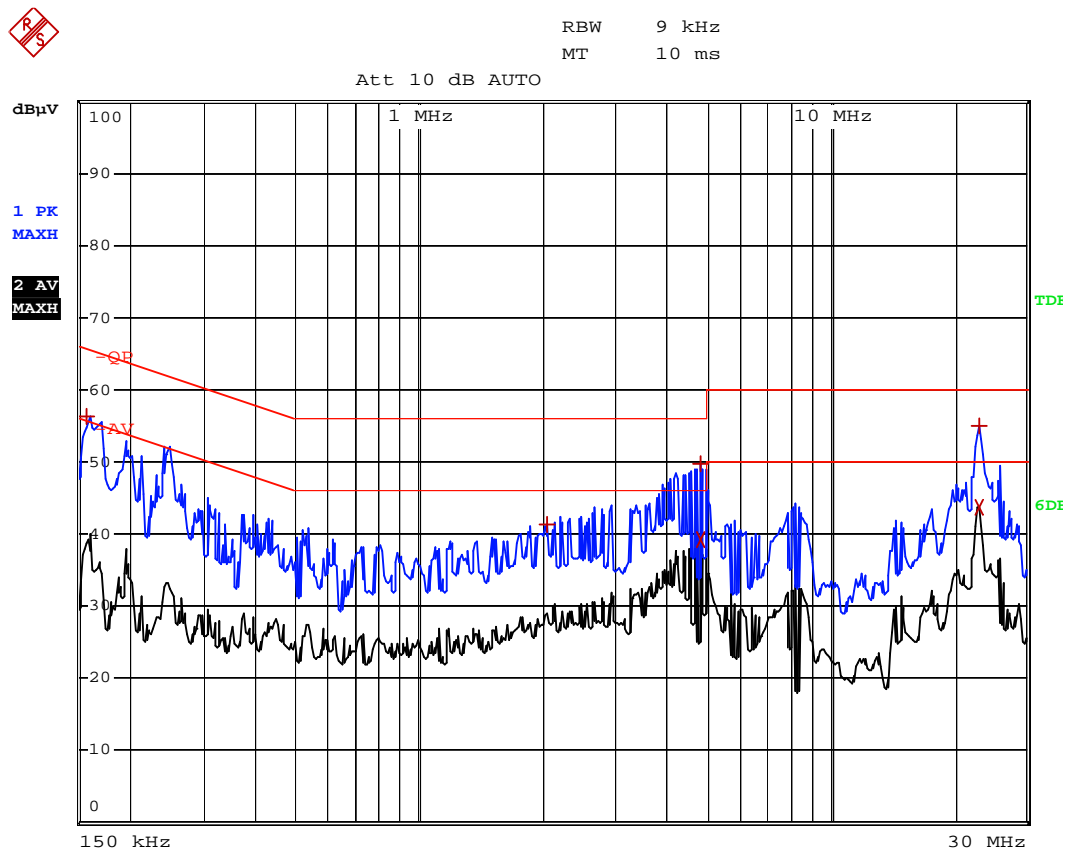
EUT: Network Camera
Tested Model: IP326
Operating Condiation: Connect to PC
Comment: AC 120V/60Hz, Adapter 12V

Test Specification: Neutral



EDIT PEAK LIST (Prescan Results)			
Trace1:	-QP		
Trace2:	-AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1 Max Peak	162 kHz	55.51	-9.85
2 Average	162 kHz	39.85	-15.50
1 Max Peak	4.746 MHz	47.27	-8.72
2 Average	4.778 MHz	35.73	-10.26
2 Average	22.97 MHz	45.25	-4.74
1 Max Peak	22.986 MHz	56.86	-3.13

Test Specification:	Line
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EDIT PEAK LIST (Prescan Results)			
Trace1:	-QP		
Trace2:	-AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV	DELTA LIMIT dB
1 Max Peak	158 kHz	56.31	-9.25
1 Max Peak	2.046 MHz	41.35	-14.64
2 Average	4.85 MHz	39.16	-6.83
1 Max Peak	4.858 MHz	49.74	-6.25
2 Average	22.898 MHz	43.71	-6.28
1 Max Peak	23.102 MHz	54.86	-5.13

4. Radiated Emissions

4.1 Measurement Uncertainty

Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any radiation emissions measurement is ± 5.10 dB.

4.2 Test Equipment List and Details

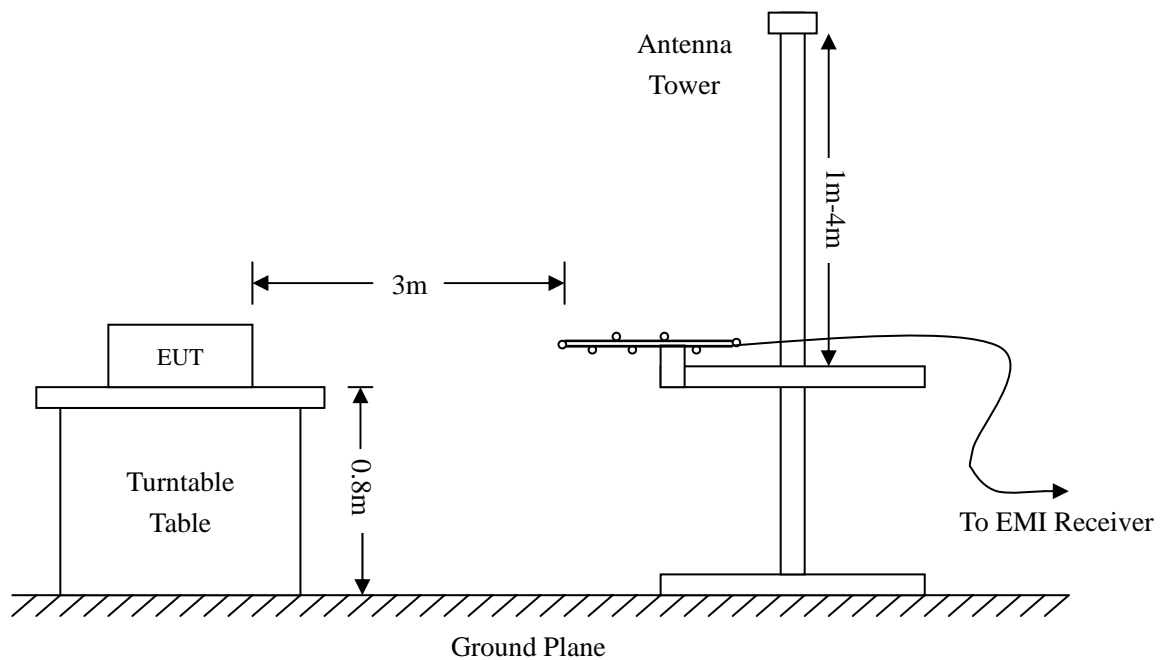
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2012-03-28	2013-03-27
EMI Test Receiver	R&S	ESVB	825471/005	2012-03-28	2013-03-27
Pre-amplifier	Agilent	8447F	3113A06717	2012-03-28	2013-03-27
Pre-amplifier	Compliance Direction	PAP-0118	24002	2012-03-28	2013-03-27
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2012-02-25	2013-02-24
Horn Antenna	ETS	3117	00086197	2012-02-25	2013-02-24

4.3 Test Procedure

The setup of EUT is according with per ANSI C63.4-2003 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.



4.4 Test Receiver Setup

During the radiated emission test for above 1GHz, the test receiver was set with the following configurations:

For peak detector:

RBW = 1000kHz, VBW = 3000kHz, Sweep Time = Auto

For average detector:

RBW = 1000kHz, VBW = 10Hz, Sweep Time = Auto

4.5 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:

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

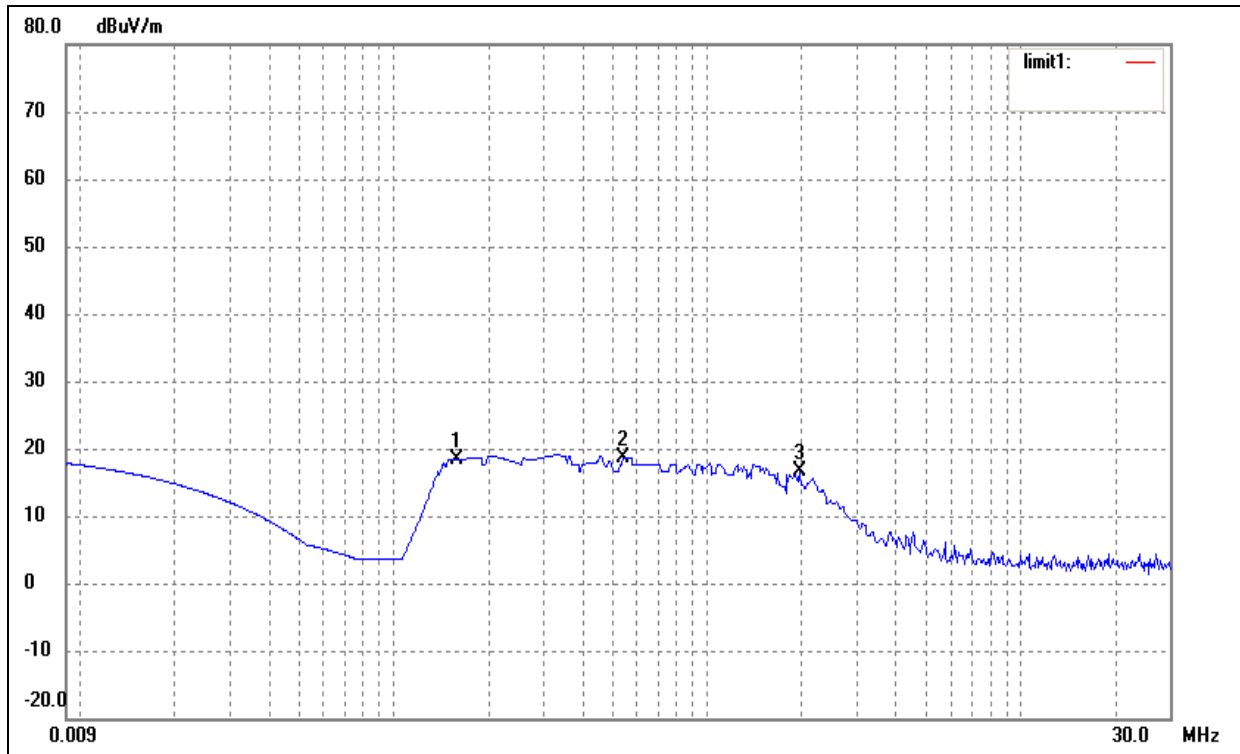
4.6 Environmental Conditions

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

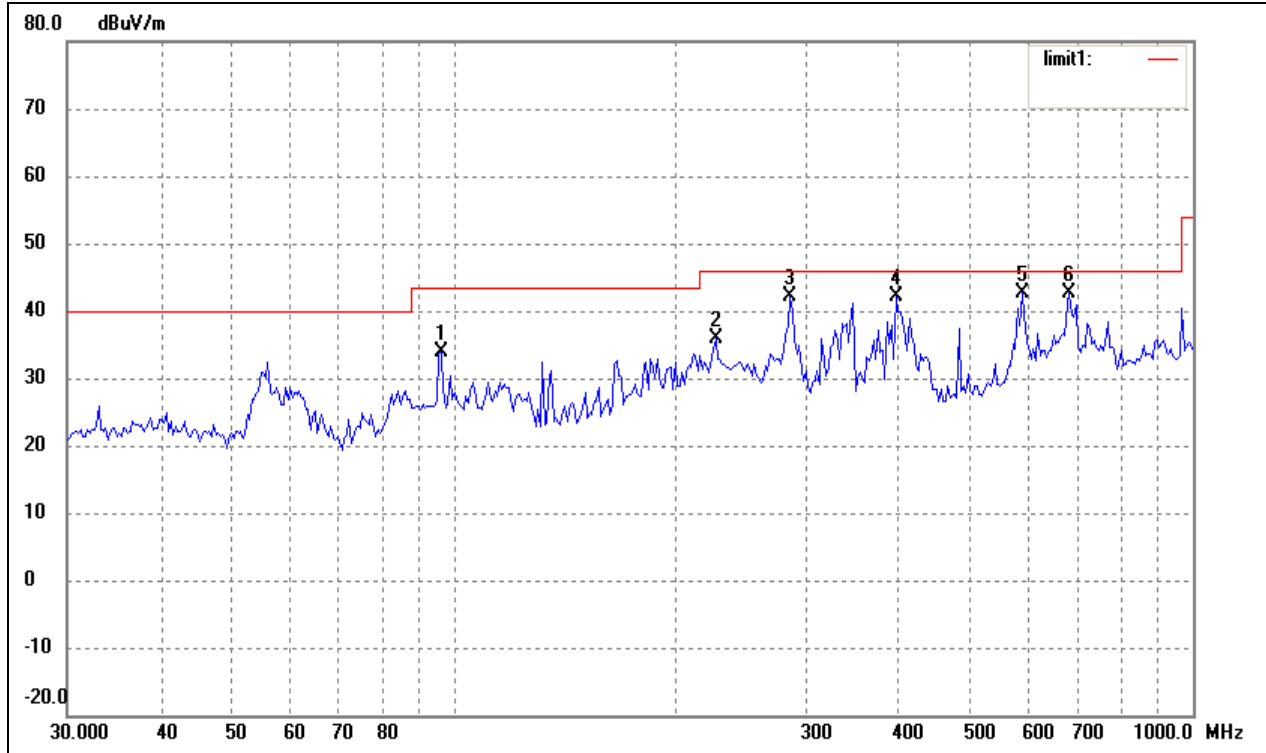
4.7 Summary of Test Results/Plots

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

-2.27 dB at 422.0577 MHz in the Vertical polarization, 9 kHz to 5 GHz, 3Meters

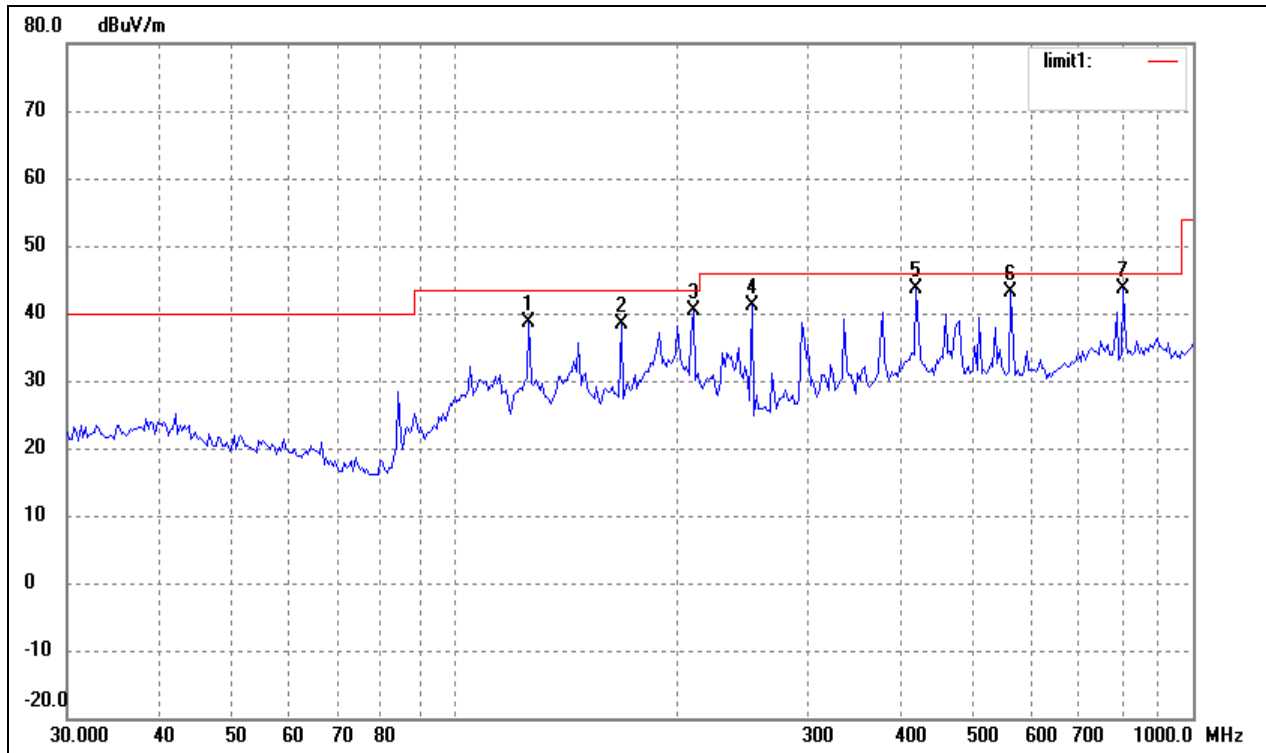
Plot of Radiated Emissions Test Data (9kHz to 30MHz)*EUT:* Network Camera*Tested Model:* IP326*Operating Condition:* Connect to PC*Comment:* AC 120V/60Hz, Adapter 12V*Test Specification:* Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	0.1548	18.76	0.21	18.97	39.56	-20.59	0	100	peak
2	0.5334	16.90	1.03	17.93	37.49	-19.56	0	100	peak
3	1.9549	16.23	1.34	17.57	35.56	-17.99	0	100	peak

Plot of Radiated Emissions Test Data(30MHz to 1GHz)*EUT:* Network Camera*Tested Model:* IP326*Operating Condition:* Connect to PC*Comment:* AC 120V/60Hz, Adapter 12V*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	96.0986	28.12	5.87	33.99	43.50	-9.51	12	100	peak
2	226.0994	29.57	6.26	35.83	46.00	-10.17	0	100	peak
3	284.9766	32.78	9.47	42.25	46.00	-3.75	116	200	peak
4	396.2413	30.83	11.37	42.20	46.00	-3.80	36	200	peak
5	586.8437	28.31	14.39	42.70	46.00	-3.30	0	100	peak
6	679.9600	27.00	15.55	42.55	46.00	-3.45	0	100	peak

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	126.3285	34.17	4.39	38.56	43.50	-4.94	113	100	peak
2	168.4138	34.62	3.69	38.31	43.50	-5.19	270	100	peak
3	210.7860	35.10	5.33	40.43	43.50	-3.07	113	100	peak
4	252.9482	33.66	7.41	41.07	46.00	-4.93	270	100	peak
5	422.0577	32.97	10.76	43.73	46.00	-2.27	0	100	peak
6	566.6222	29.58	13.58	43.16	46.00	-2.84	0	100	peak
7	804.6028	27.26	16.42	43.68	46.00	-2.32	0	100	peak

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, which above 1GHz are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.