

FCC Part 15B

Measurement and Test Report

For

Intracom Asia Co., Ltd.

4F., No. 77, Sec. 1, Xintai 5th Rd., Xinzhi Dist., New Taipei City 221,

Taiwan

FCC ID: 2ADQY525756

Test Rule(s):	<u>FCC Part 15 Subpart B</u>
Product Description:	<u>Wireless 300N Range Extender</u>
Tested Model:	<u>525756</u>
Report No.:	<u>STR15048243I-2</u>
Tested Date:	<u>2015-04-29 to 2015-05-12</u>
Issued Date:	<u>2015-05-14</u>
Tested By:	<u>Susan Su / Engineer</u> <i>Susan Su</i>
Reviewed By:	<u>Lahm Peng / EMC Manager</u> <i>Lahm peng</i>
Approved & Authorized By:	<u>Jandy so / PSQ Manager</u> <i>Jandyso</i>
Prepared By:	

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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: Intracom Asia Co., Ltd.
 Address of applicant: 4F., No. 77, Sec. 1, Xintai 5th Rd., Xinzhi Dist., New Taipei City 221, Taiwan
 Manufacturer: Intracom Asia Co., Ltd.
 Address of manufacturer: 4F., No. 77, Sec. 1, Xintai 5th Rd., Xinzhi Dist., New Taipei City 221, Taiwan

General Description of EUT	
Product Name:	Wireless 300N Range Extender
Trade Name:	Manhattan
Model No.:	525756
Adding Model(s):	/
<i>Note: The test data is gathered from a production sample, provided by the manufacturer.</i>	

Technical Characteristics of EUT	
Rated Voltage:	AC 100-240V
Rated Current:	50mA
Rated Power:	/
Lowest Internal Frequency:	40MHz
Highest Internal Frequency:	40MHz
Classification of ITE:	Class B

1.2 Test Standards

The following report is prepared on behalf of the Intracom Asia Co., Ltd. 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	PING IP	/

EUT Cable List and Details

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

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
Notebook	IBM	E10	/

Special Cable List and Details

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

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.

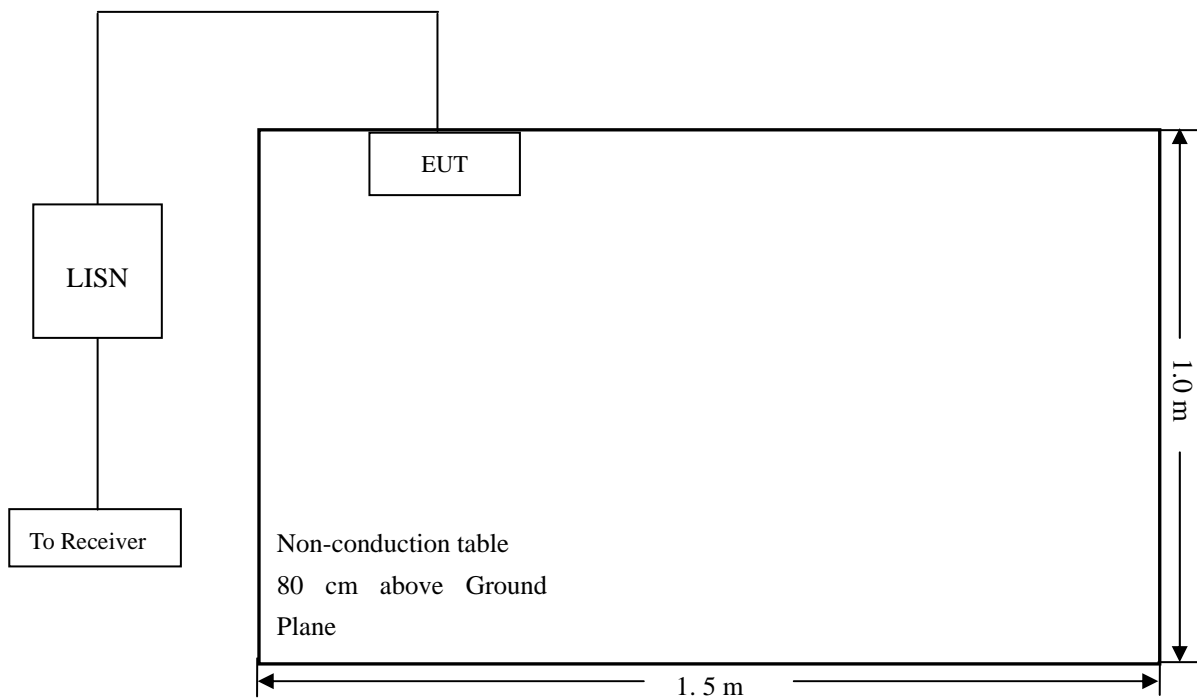
3.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2014-05-28	2015-05-27
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2014-05-28	2015-05-27
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2014-05-28	2015-05-27

3.3 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.

3.4 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:

-10.58 dB at 0.4220 MHz in the Neutral mode, Peak detector, 0.15-30MHz

3.7 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

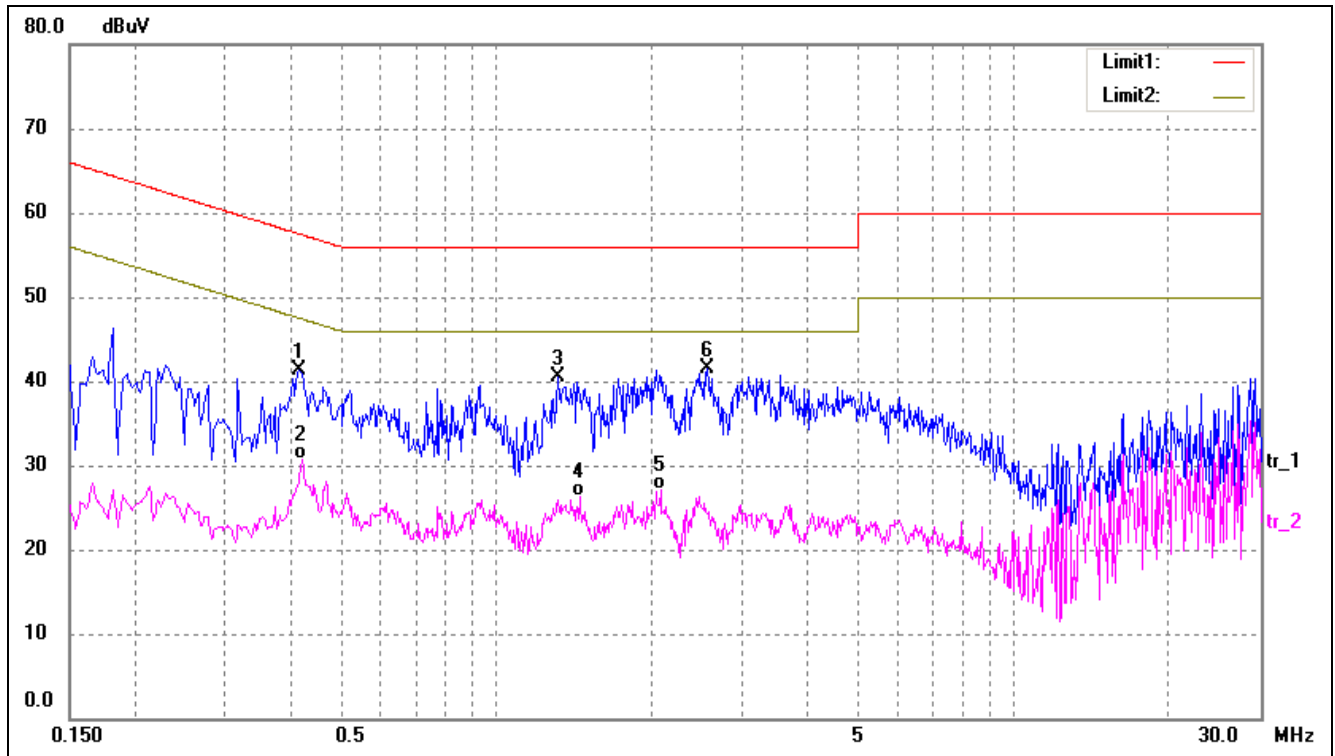
EUT: *Wireless 300N Range Extender*

Tested Model: *525756*

Operating Condition: *TM1*

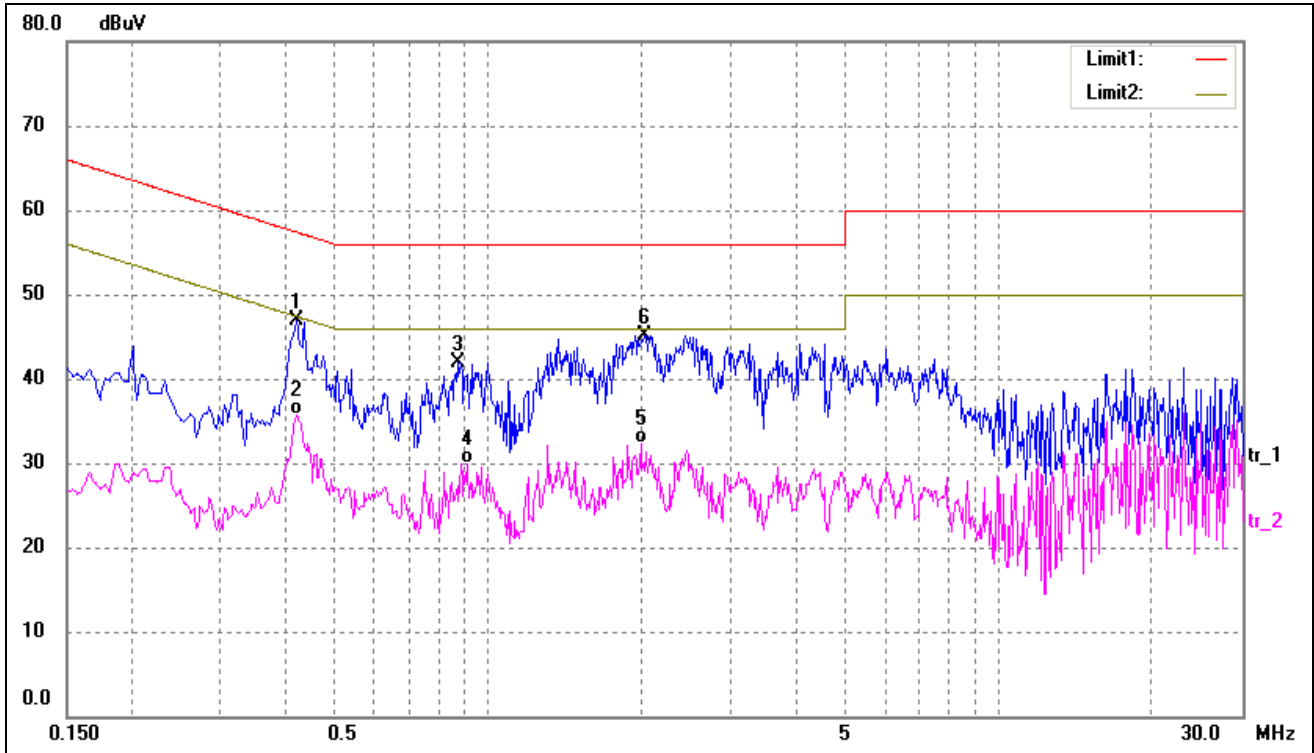
Comment: *AC 120V/60Hz*

Test Specification: *Neutral*



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.4180	31.83	9.50	41.33	57.49	-16.16	peak
2	0.4220	21.11	9.50	30.61	47.41	-16.80	AVG
3	1.3180	30.44	10.00	40.44	56.00	-15.56	peak
4	1.4500	16.21	10.00	26.21	46.00	-19.79	AVG
5	2.0860	17.02	10.00	27.02	46.00	-18.98	AVG
6*	2.5620	31.43	10.00	41.43	56.00	-14.57	peak

Test Specification: Line



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.4220	37.33	9.50	46.83	57.41	-10.58	peak
2	0.4220	26.23	9.50	35.73	47.41	-11.68	AVG
3	0.8740	32.13	9.87	42.00	56.00	-14.00	peak
4	0.9100	20.07	9.91	29.98	46.00	-16.02	AVG
5	1.9940	22.21	10.00	32.21	46.00	-13.79	AVG
6	2.0300	35.10	10.00	45.10	56.00	-10.90	peak

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

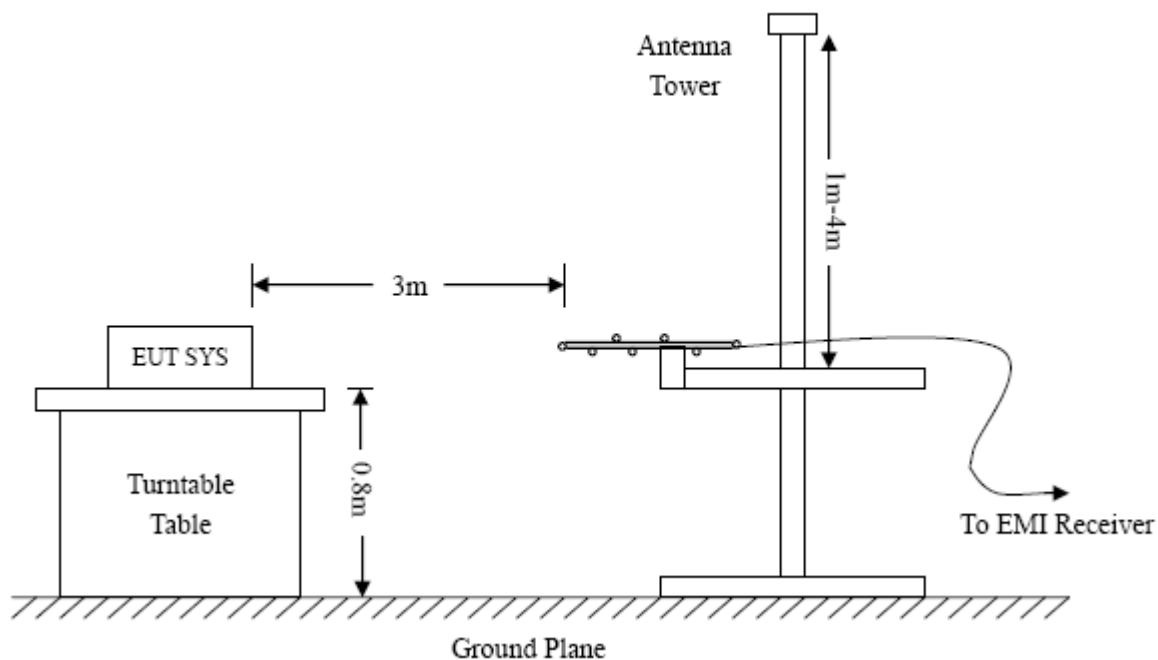
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2014-05-28	2015-05-27
EMI Test Receiver	R&S	ESVB	825471/005	2014-05-28	2015-05-27
Pre-amplifier	Agilent	8447F	3113A06717	2014-05-28	2015-05-27
Pre-amplifier	Compliance Direction	PAP-0118	24002	2014-05-28	2015-05-27
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2014-05-24	2015-05-23
Horn Antenna	ETS	3117	00086197	2014-05-24	2015-05-23
Loop Antenna	SCHWARZECK	HFRA 5165	9365	2014-05-24	2015-05-23

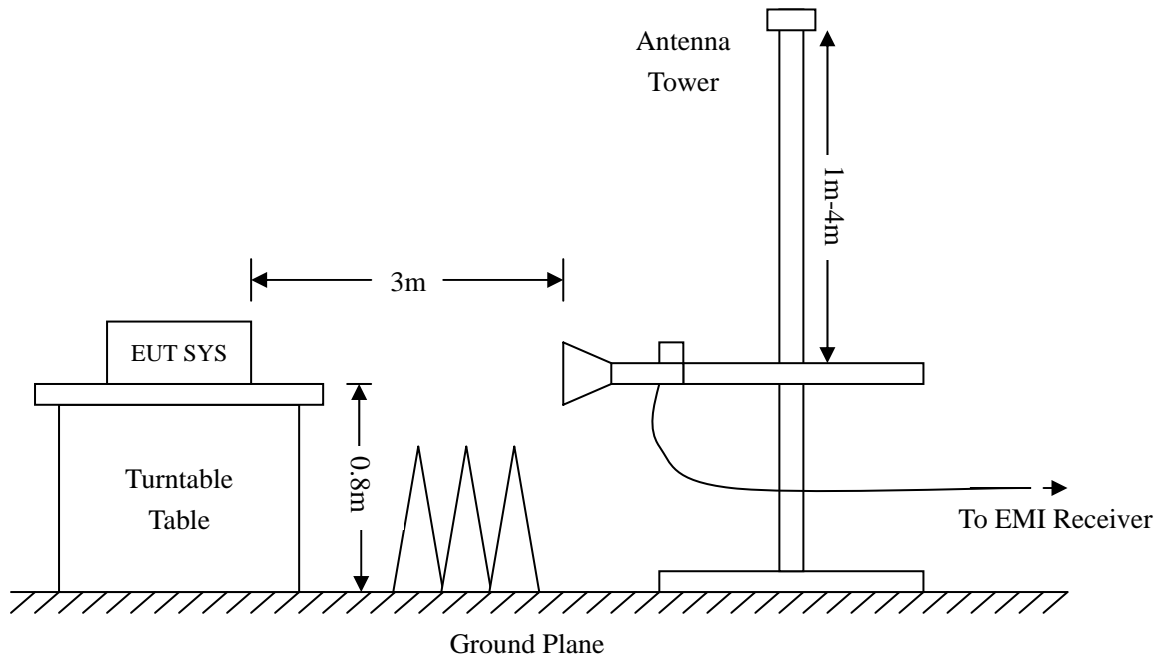
4.3 Test Procedure

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.





4.4 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

4.5 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:

-1.71 dB at 262.8955 MHz in the Vertical polarization, 30MHz to 1 GHz, 3Meters

Plot of Radiated Emissions Test Data

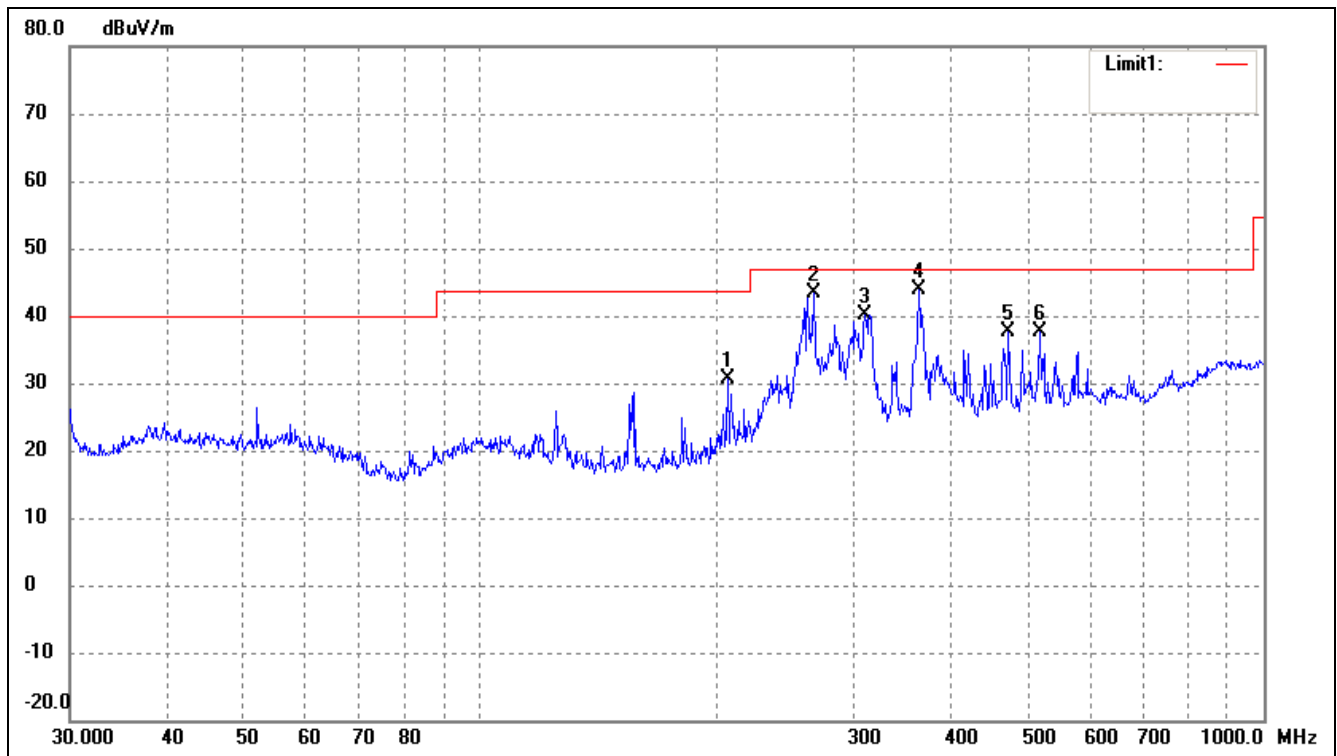
EUT: *Wireless 300N Range Extender*

Tested Model: *525756*

Operating Condition: *TM1*

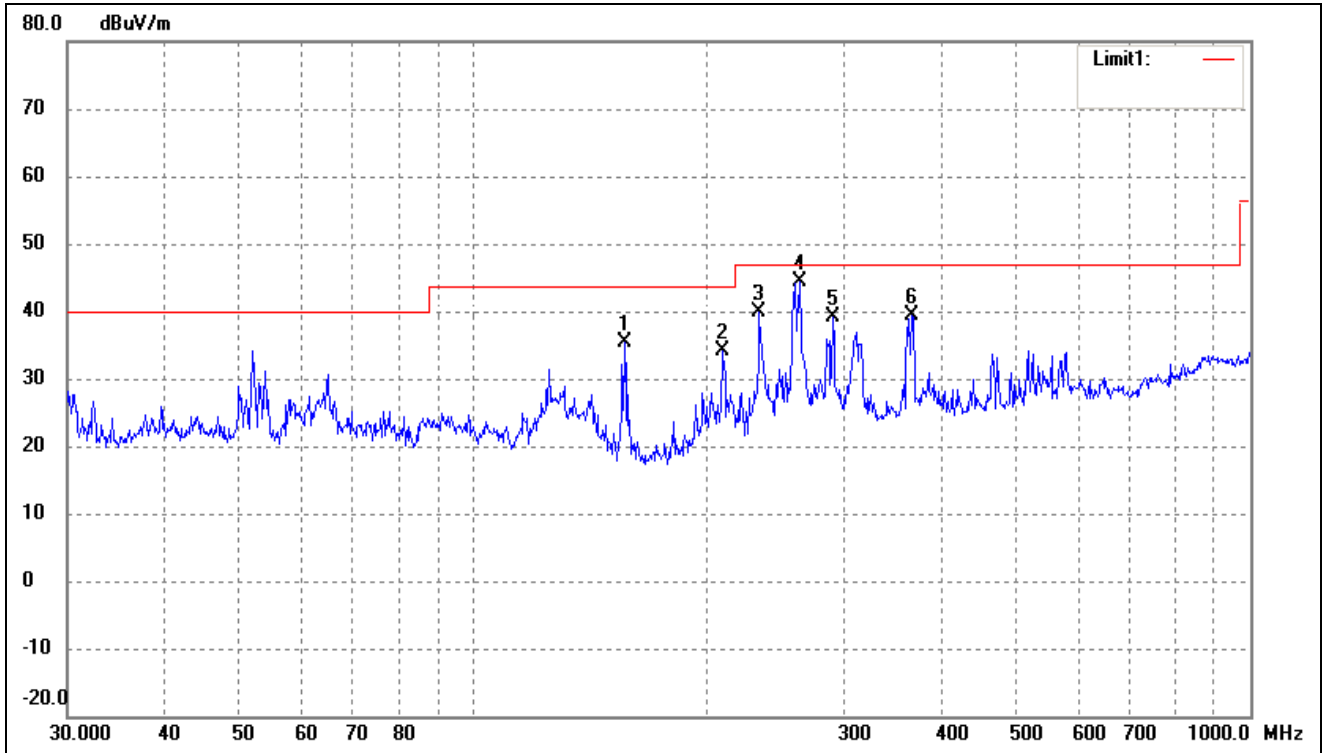
Comment: *AC 120V/60Hz*

Test Specification: *Horizontal*



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Detector
1	207.1226	26.52	4.18	30.70	43.50	-12.80	51	100	peak
2	266.6089	35.92	7.49	43.41	46.00	-2.59	308	100	peak
3	309.9977	30.88	9.23	40.11	46.00	-5.89	120	100	peak
4*	362.9845	34.61	9.24	43.85	46.00	-2.15	359	100	peak
5	472.1760	27.34	10.28	37.62	46.00	-8.38	359	100	peak
6	517.2480	26.44	11.30	37.74	46.00	-8.26	145	100	peak

Test Specification: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Detector
1	156.4578	32.85	2.58	35.43	43.50	-8.07	163	100	peak
2	209.3129	29.80	4.35	34.15	43.50	-9.35	247	100	peak
3	233.3487	33.90	5.92	39.82	46.00	-6.18	59	100	peak
4*	262.8955	37.06	7.23	44.29	46.00	-1.71	127	100	peak
5	290.0172	30.38	8.79	39.17	46.00	-6.83	136	100	peak
6	366.8231	30.25	9.22	39.47	46.00	-6.53	54	100	peak

Note: Testing is carried out with frequency rang 30 MHz to the 1GHz.

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