

FCC Part 15B Measurement and Test Report

For

Abocom Systems Inc

No.77, Yu-Yih Rd, Chu-Nan, Miao-Lih Count 35059, Taiwan R.O.C

FCC ID: MQ4A08S

Test Rule(s):	<u>FCC Part 15 Subpart B</u>
Product Description:	<u>Android TV Dongle</u>
Tested Model:	<u>A08S</u>
Report No.:	<u>STR14048157I-2</u>
Tested Date:	<u>2014-04-10 to 2014-05-14</u>
Issued Date:	<u>2014-05-14</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 Shenzhen SEM.Test Technology 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.....	15
4.1 MEASUREMENT UNCERTAINTY	15
4.2 TEST EQUIPMENT LIST AND DETAILS	15
4.3 TEST PROCEDURE.....	15
4.4 TEST RECEIVER SETUP	16
4.5 CORRECTED AMPLITUDE & MARGIN CALCULATION.....	16
4.6 ENVIRONMENTAL CONDITIONS	16
4.7 SUMMARY OF TEST RESULTS/PLOTS	16

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: Abocom Systems Inc
Address of applicant: No.77, Yu-Yih Rd, Chu-Nan, Miao-Lih Count 35059,
Taiwan R.O.C.
Manufacturer: Abocom Systems Inc
Address of manufacturer: No.77, Yu-Yih Rd, Chu-Nan, Miao-Lih Count 35059,
Taiwan R.O.C.

General Description of EUT	
Product Name:	Android TV Dongle
Trade Name:	/
Model No.:	A08S
Adding Model(s):	/
Note: The test data is gathered from a production sample, provided by the manufacturer.	

Technical Characteristics of EUT	
Rated Voltage:	DC 5V
Rated Current:	2A
Rated Power:	10W
Power Adapter Model:	STC-B0502000-Z
Lowest Internal Frequency:	32.768KHz
Highest Internal Frequency:	40MHz
Classification of ITE:	Class B

1.2 Test Standards

The following report is prepared on behalf of the Abocom Systems Inc 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.: 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	Playing & TF Card	Connected to Display
TM2	Playing & U-Disk	Connected to Display
TM3	RJ45 Communication	Connected to PC
TM4	Downloading	Connected to PC

EUT Cable List and Details

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

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
Display	DELL	IN1920C	Q40G18N-700-1B ZA
Notebook	Lenovo	E23	EB12648265

Special Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
HDMI Cable	0.8	Unshielded	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

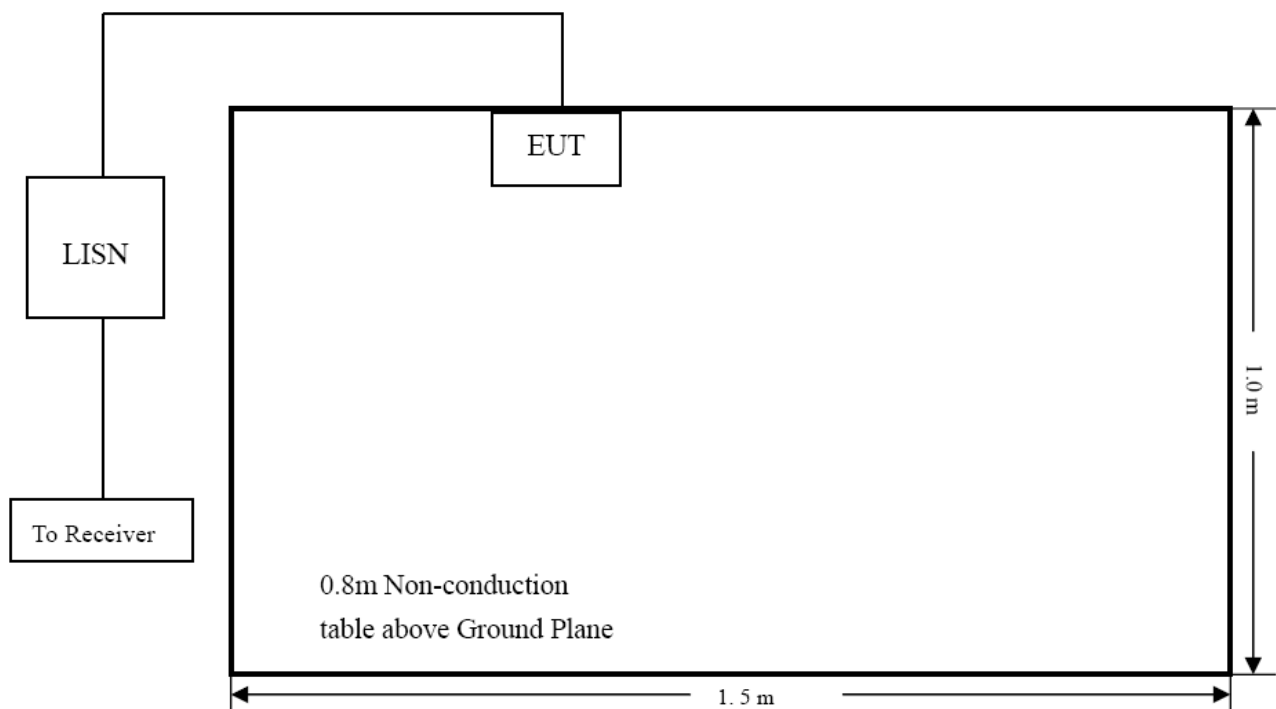
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2014-05-07	2015-05-06
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2014-05-07	2015-05-06
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2014-05-07	2015-05-06

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.

Note: Base on the calibrated result, for the impedance characteristic and insertion loss, the effect shall be ignored from the placed multiple outlet power strip between the device and LISN.

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:

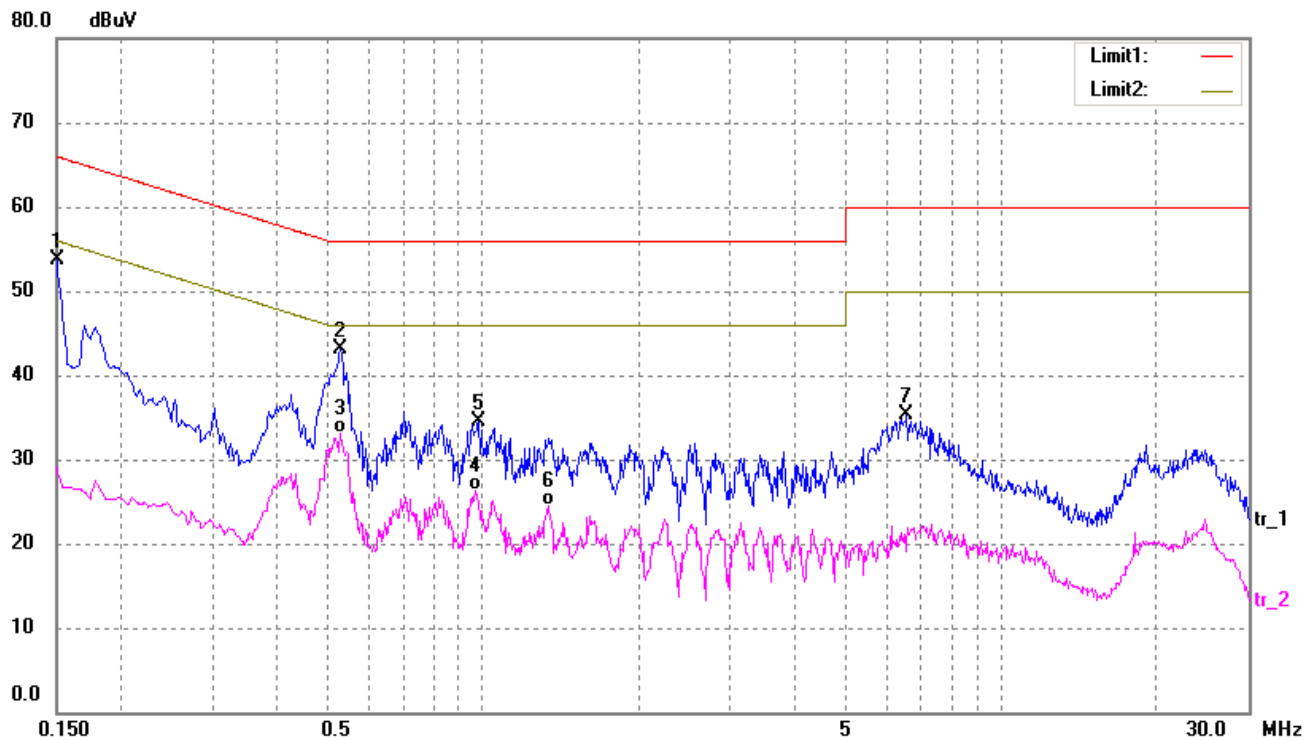
-5.60 dB at 0.5300 MHz in the **Line**, **TM2** mode, **Average** detector, 0.15-30MHz

3.7 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

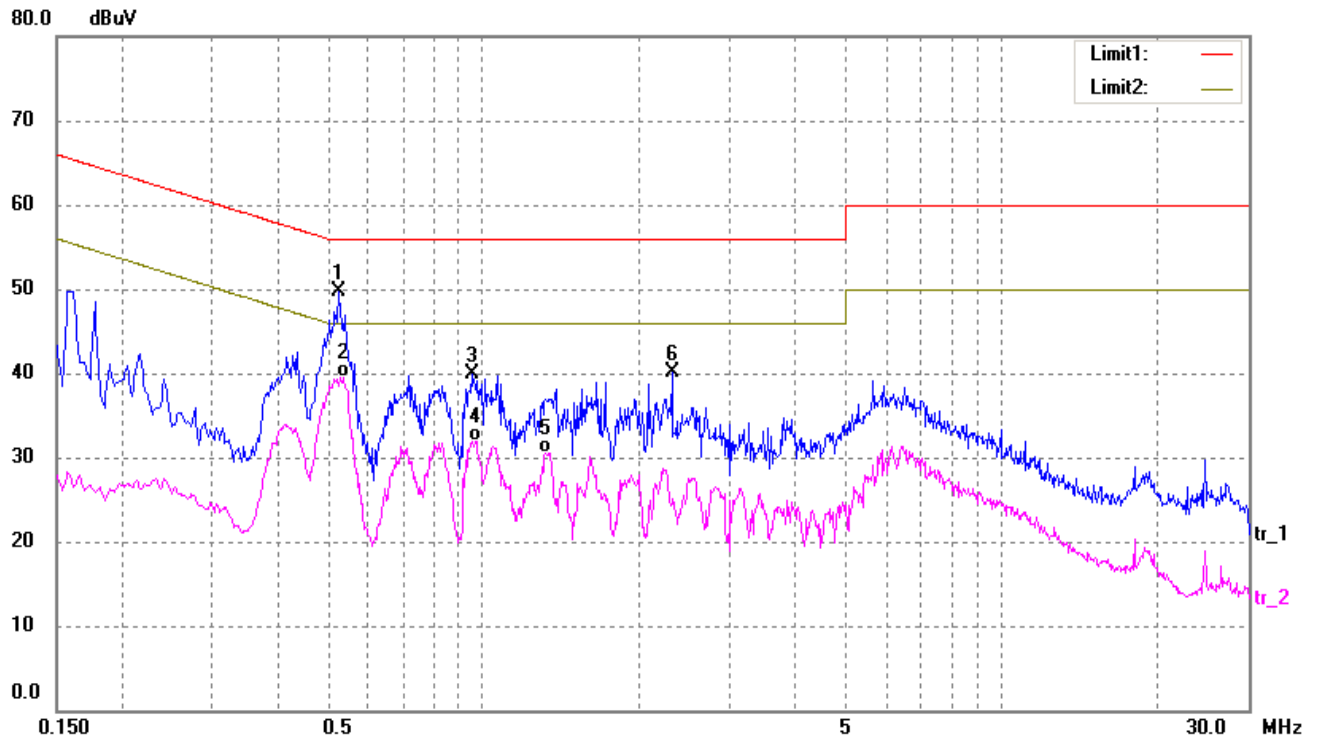
EUT: Android TV Dongle
 Tested Model: A08S
 Operating Condition: AC 120V/60Hz; Adapter DC 5V/2A
 Comment: TM1

Test Specification: Neutral



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	0.1500	44.20	9.50	53.70	66.00	-12.30	peak
2	0.5300	33.57	9.53	43.10	56.00	-12.90	peak
3	0.5300	23.52	9.53	33.05	46.00	-12.95	AVG
4	0.9660	16.38	9.97	26.35	46.00	-19.65	AVG
5	0.9820	24.45	9.98	34.43	56.00	-21.57	peak
6	1.3340	14.53	10.00	24.53	46.00	-21.47	AVG
7	6.5580	25.36	10.00	35.36	60.00	-24.64	peak

Test Specification: Line

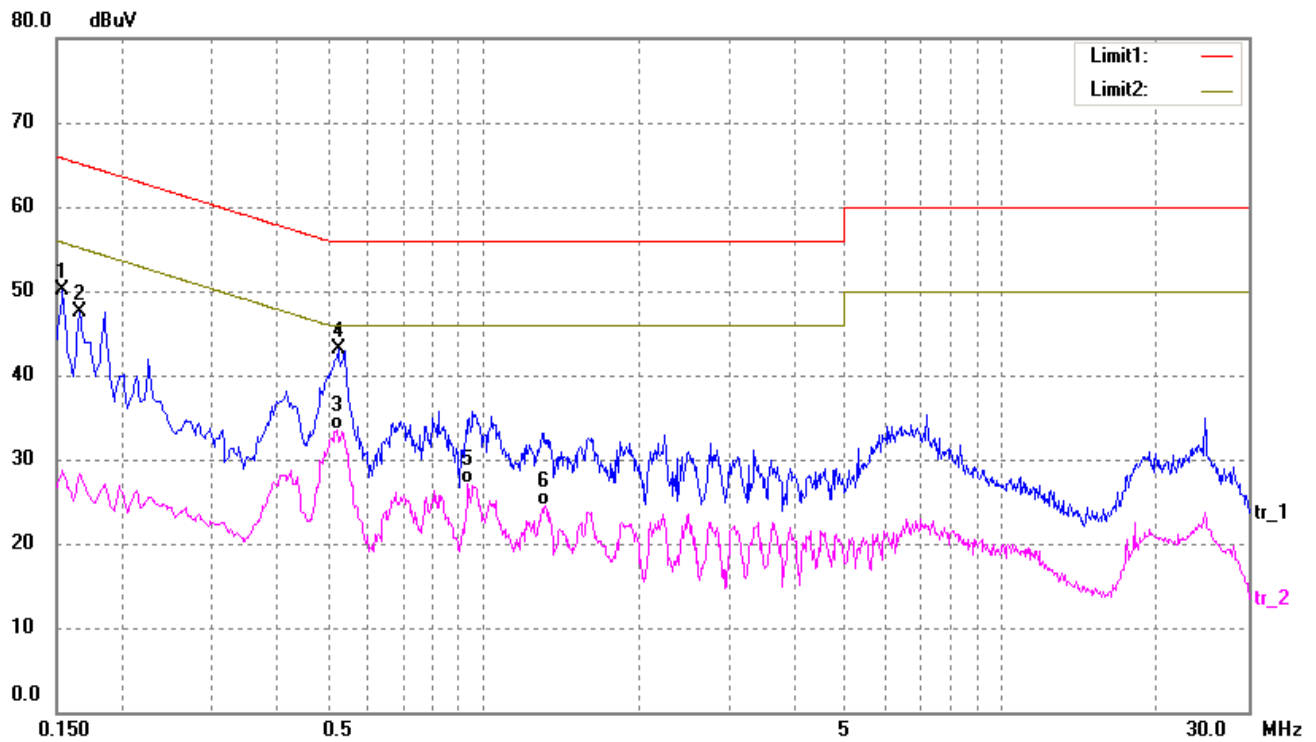


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.5260	40.09	9.53	49.62	56.00	-6.38	peak
2	0.5380	29.97	9.54	39.51	46.00	-6.49	AVG
3	0.9500	30.04	9.95	39.99	56.00	-16.01	peak
4	0.9700	21.97	9.97	31.94	46.00	-14.06	AVG
5	1.3220	20.53	10.00	30.53	46.00	-15.47	AVG
6	2.3180	30.05	10.00	40.05	56.00	-15.95	peak

Plot of Conducted Emissions Test Data

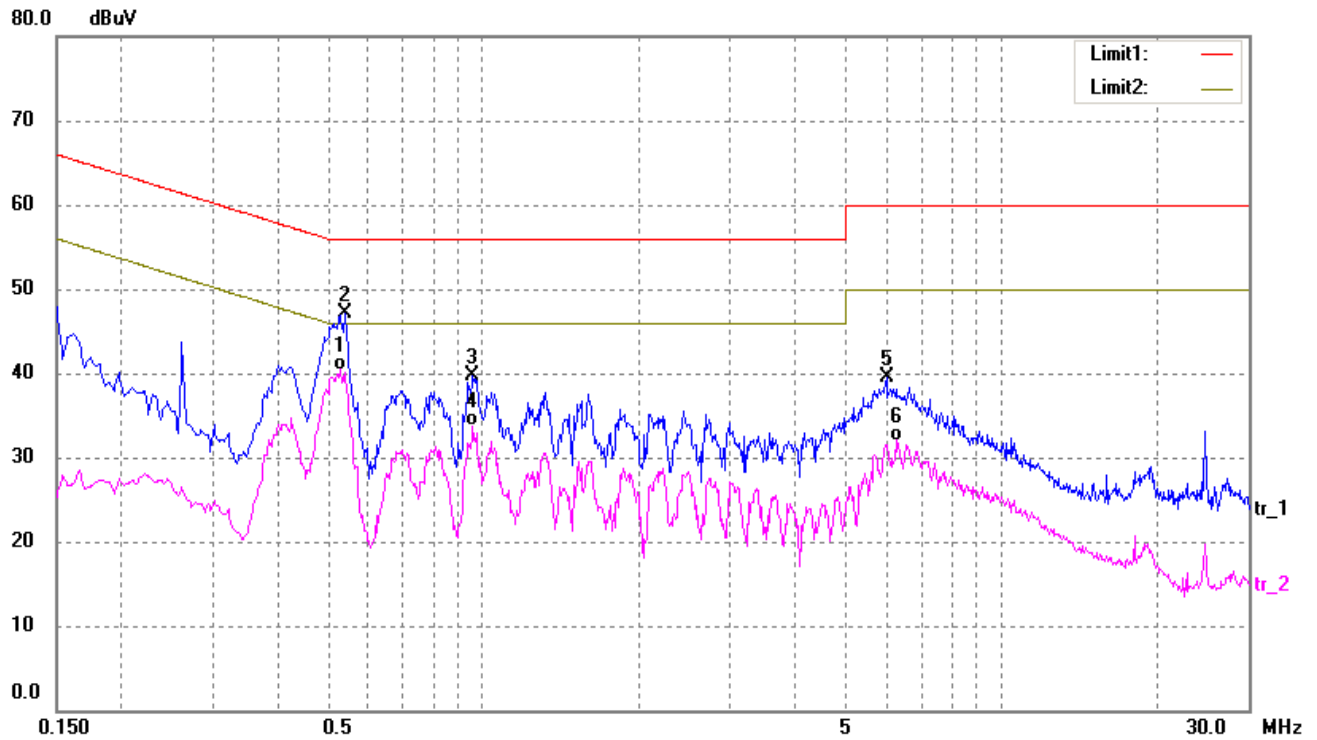
EUT: Android TV Dongle
 Tested Model: A08S
 Operating Condition: AC 120V/60Hz; Adapter DC 5V/2A
 Comment: TM2

Test Specification: Neutral



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	0.1540	40.55	9.50	50.05	65.78	-15.73	peak
2	0.1660	38.02	9.50	47.52	65.16	-17.64	peak
3	0.5220	23.90	9.52	33.42	46.00	-12.58	AVG
4	0.5260	33.63	9.53	43.16	56.00	-12.84	peak
5	0.9380	17.07	9.94	27.01	46.00	-18.99	AVG
6	1.3180	14.54	10.00	24.54	46.00	-21.46	AVG

Test Specification: Line

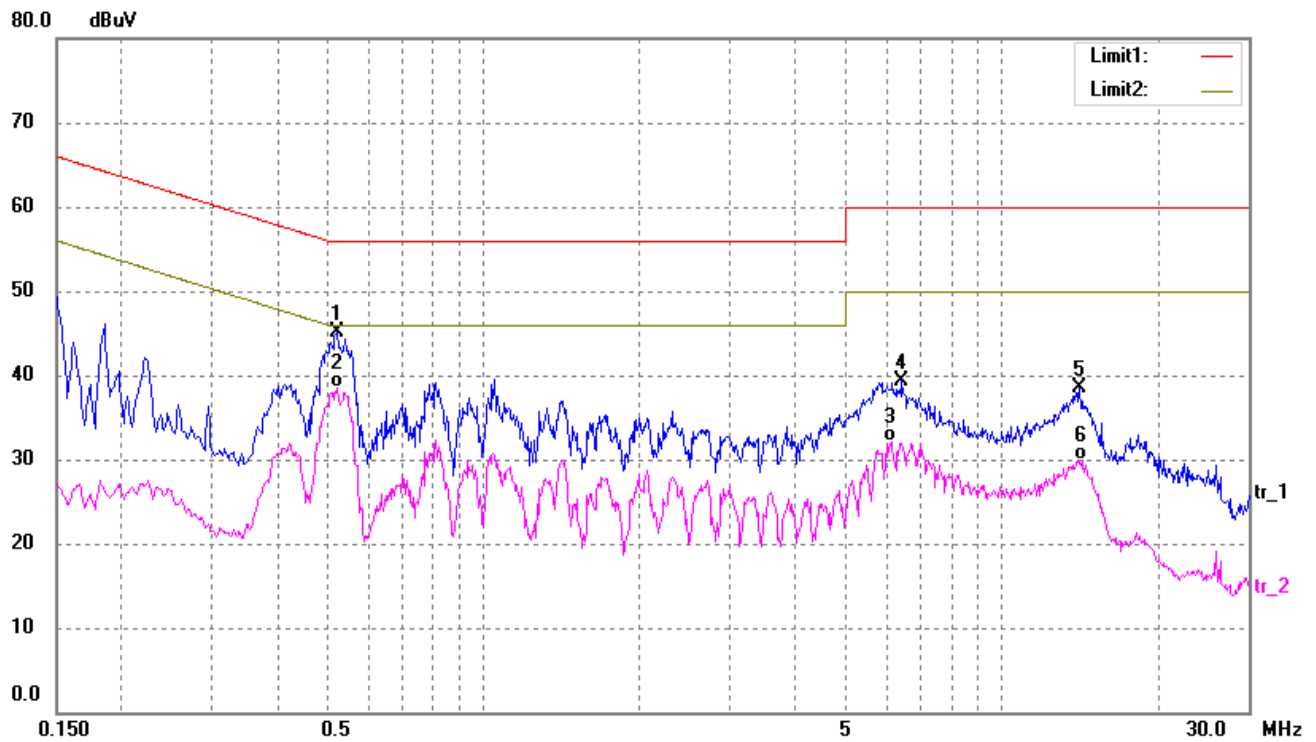


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.5300	30.87	9.53	40.40	46.00	-5.60	AVG
2	0.5420	37.57	9.54	47.11	56.00	-8.89	peak
3	0.9540	29.83	9.95	39.78	56.00	-16.22	peak
4	0.9540	23.73	9.95	33.68	46.00	-12.32	AVG
5	6.0180	29.42	10.00	39.42	60.00	-20.58	peak
6	6.2700	22.00	10.00	32.00	50.00	-18.00	AVG

Plot of Conducted Emissions Test Data

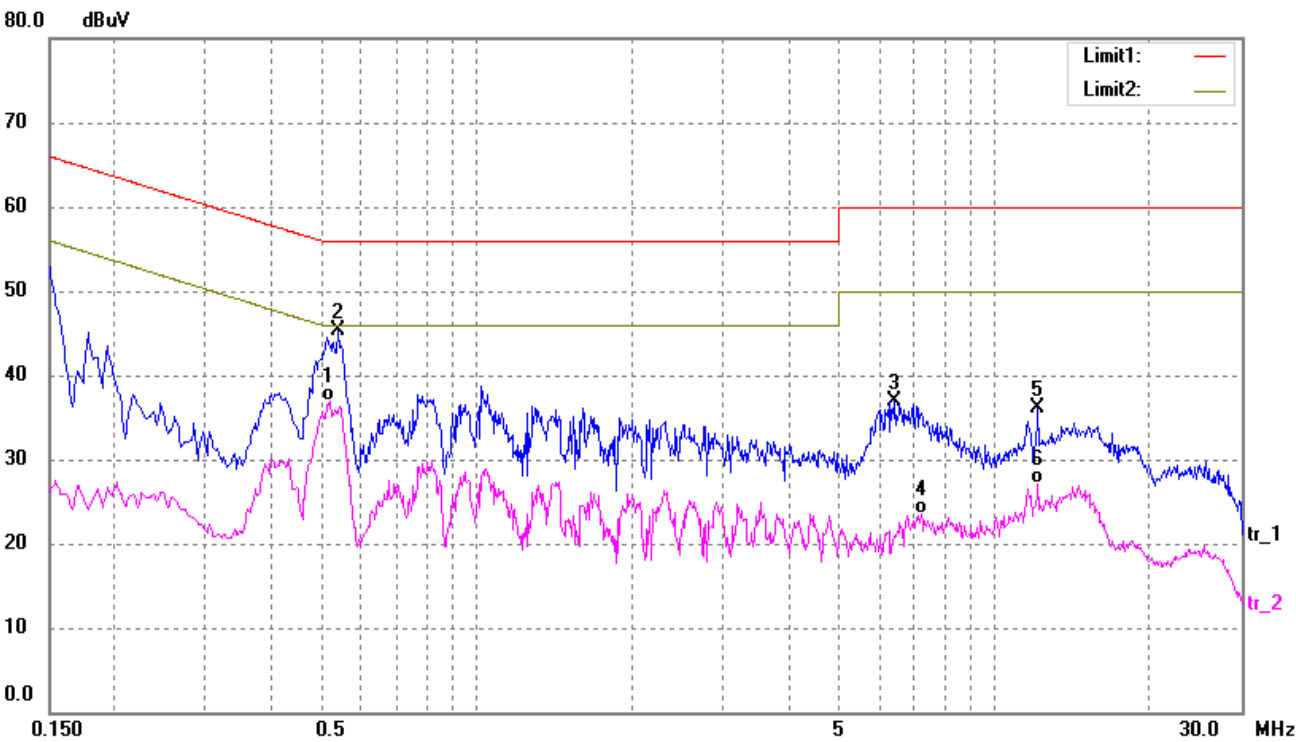
EUT: Android TV Dongle
 Tested Model: A08S
 Operating Condition: AC 120V/60Hz; Adapter DC 5V/2A
 Comment: TM3

Test Specification: Neutral



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	0.5220	35.58	9.52	45.10	56.00	-10.90	peak
2	0.5220	28.99	9.52	38.51	46.00	-7.49	AVG
3	6.1380	22.16	10.00	32.16	50.00	-17.84	AVG
4	6.4420	29.23	10.00	39.23	60.00	-20.77	peak
5	14.1500	27.63	10.83	38.46	60.00	-21.54	peak
6	14.2900	19.05	10.86	29.91	50.00	-20.09	AVG

Test Specification: Line



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	0.5220	27.29	9.52	36.81	46.00	-9.19	AVG
2	0.5420	35.77	9.54	45.31	56.00	-10.69	peak
3	6.4380	26.83	10.00	36.83	60.00	-23.17	peak
4	7.2140	13.41	10.00	23.41	50.00	-26.59	AVG
5	12.1620	25.70	10.43	36.13	60.00	-23.87	peak
6	12.1620	16.74	10.43	27.17	50.00	-22.83	AVG

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

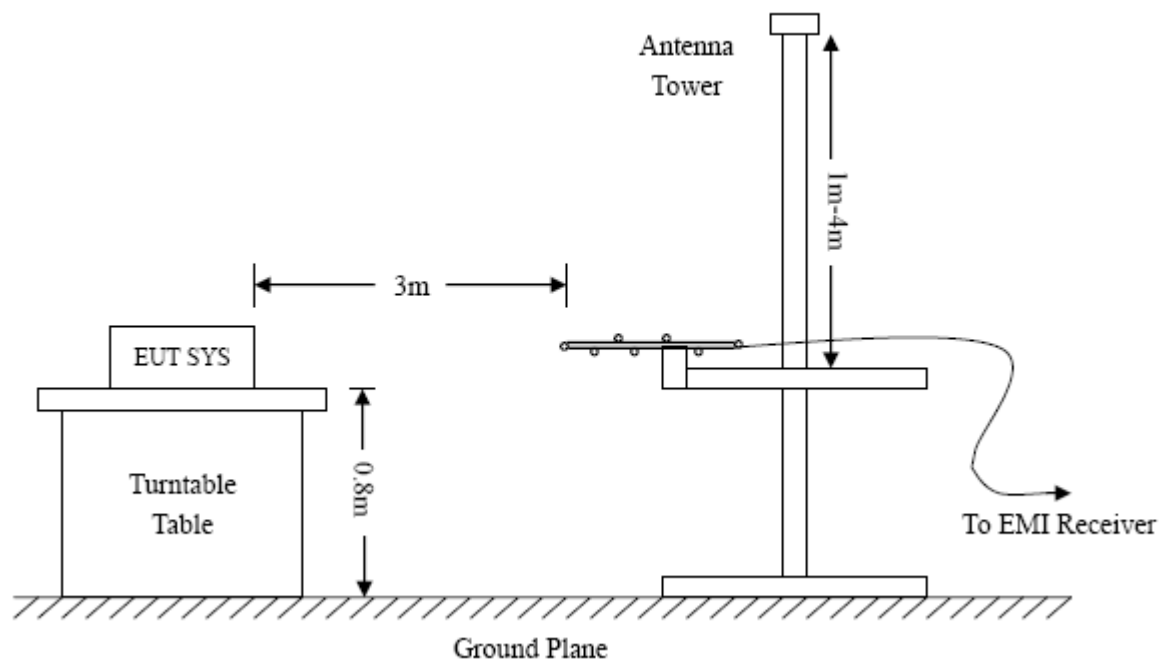
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2014-05-07	2015-05-06
EMI Test Receiver	R&S	ESVB	825471/005	2014-05-07	2015-05-06
Pre-amplifier	Agilent	8447F	3113A06717	2014-05-07	2015-05-06
Pre-amplifier	Compliance Direction	PAP-0118	24002	2014-05-07	2015-05-06
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2014-04-20	2015-04-19
Horn Antenna	ETS	3117	00086197	2014-04-20	2015-04-19
Loop Antenna	SCHWARZECK	HFRA 5165	9365	2014-04-20	2015-04-19

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

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:

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

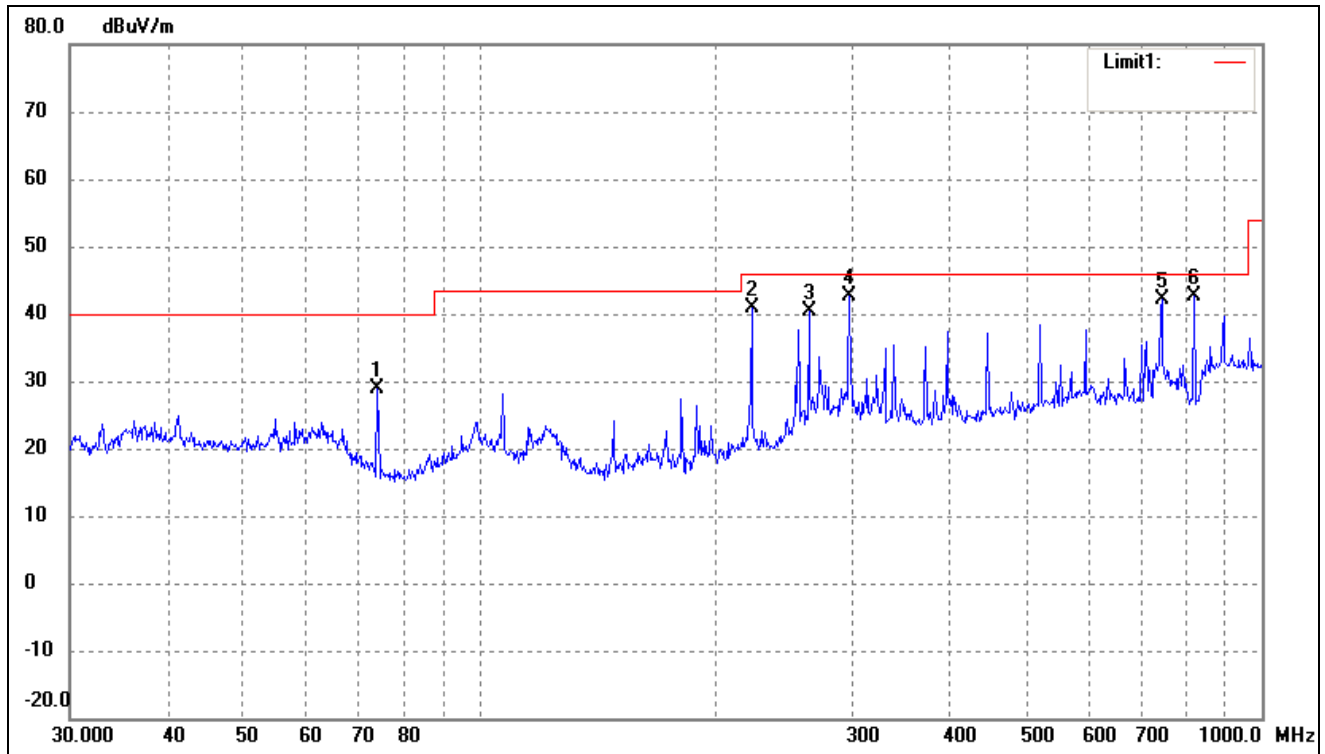
4.6 Environmental Conditions

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

4.7 Summary of Test Results/Plots

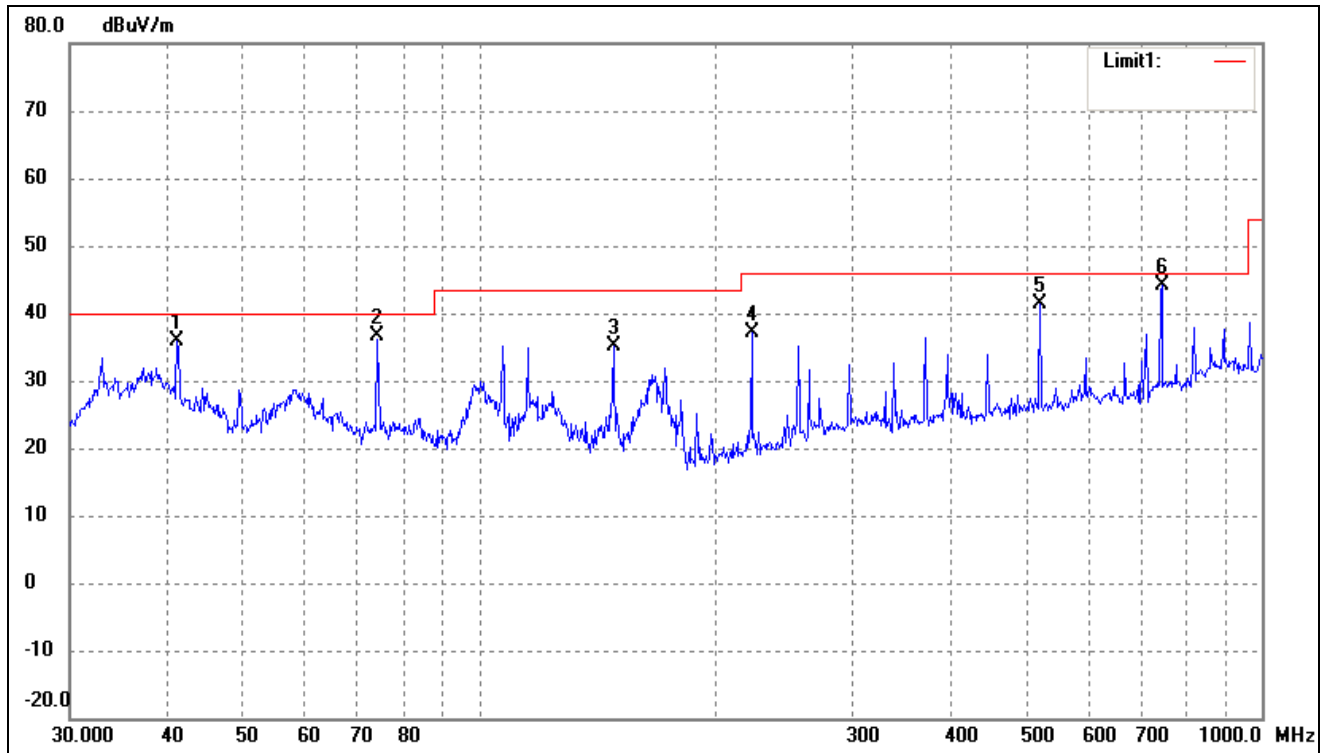
According to the data, the EUT complied with the FCC Part 15.109(a) rule, and had the worst margin of:

-1.82 dB at 744.8660 MHz in the Horizontal polarization, TM1 Mode, 9 kHz to 1 GHz, 3Meters

Plot of Radiated Emissions Test DataEUT: *Android TV Dongle*Tested Model: *A08S*Operating Condition: *AC 120V/60Hz; Adapter DC 5V/2A*Comment: *TM1*Test Specification: *Horizontal*

No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	74.1351	27.23	1.70	28.93	40.00	-11.07	58	200	peak
2	222.9502	35.50	5.28	40.78	46.00	-5.22	326	100	peak
3	263.8190	32.99	7.29	40.28	46.00	-5.72	29	100	peak
4	297.2241	33.51	9.06	42.57	46.00	-3.43	209	100	peak
5	744.8660	28.31	13.82	42.13	46.00	-3.87	145	100	peak
6	818.8341	27.65	14.90	42.55	46.00	-3.45	359	200	peak

Test Specification: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	41.1319	27.00	8.91	35.91	40.00	-4.09	115	100	peak
2	74.1351	34.95	1.70	36.65	40.00	-3.35	308	100	peak
3	148.4410	32.59	2.49	35.08	43.50	-8.42	120	100	peak
4	222.9502	31.78	5.28	37.06	46.00	-8.94	145	100	peak
5	520.8882	30.08	11.37	41.45	46.00	-4.55	156	100	peak
6	744.8660	28.85	15.33	44.18	46.00	-1.82	330	100	peak

Plot of Radiated Emissions Test Data

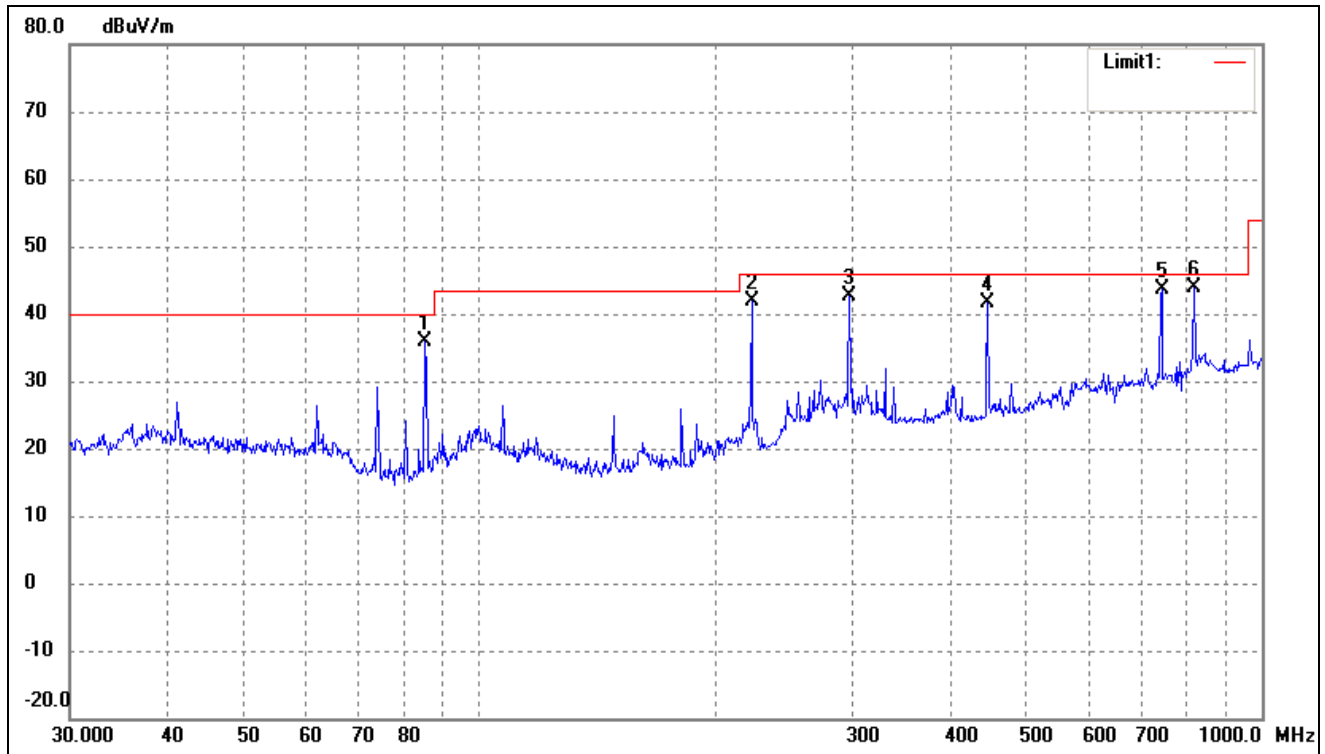
EUT: Android TV Dongle

Tested Model: A08S

Operating Condition: AC 120V/60Hz; Adapter DC 5V/2A

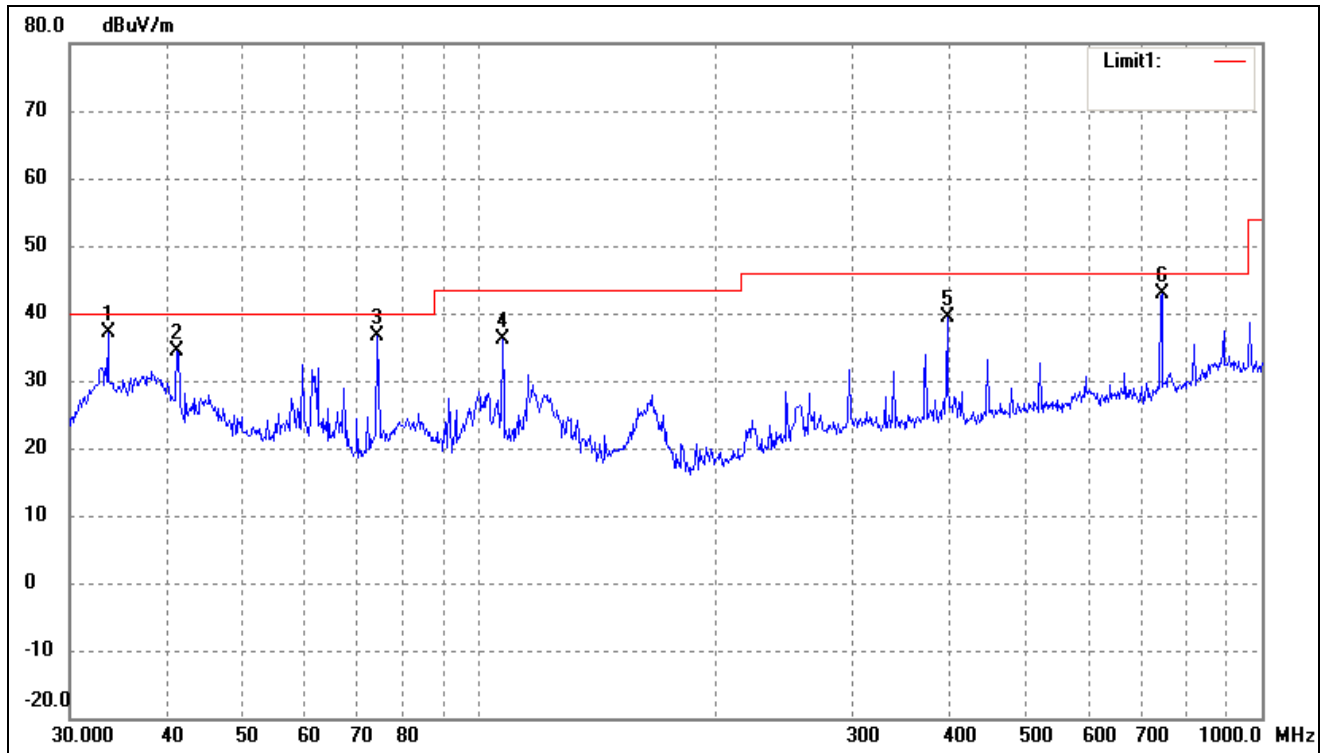
Comment: TM2

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	85.2980	33.58	2.39	35.97	40.00	-4.03	158	100	peak
2	222.9502	36.59	5.28	41.87	46.00	-4.13	326	100	peak
3	297.2241	33.51	9.06	42.57	46.00	-3.43	294	100	peak
4	446.4141	31.35	10.19	41.54	46.00	-4.46	209	100	peak
5	744.8660	29.90	13.82	43.72	46.00	-2.28	178	100	peak
6	818.8341	29.00	14.90	43.90	46.00	-2.10	359	200	peak

Test Specification: Vertical

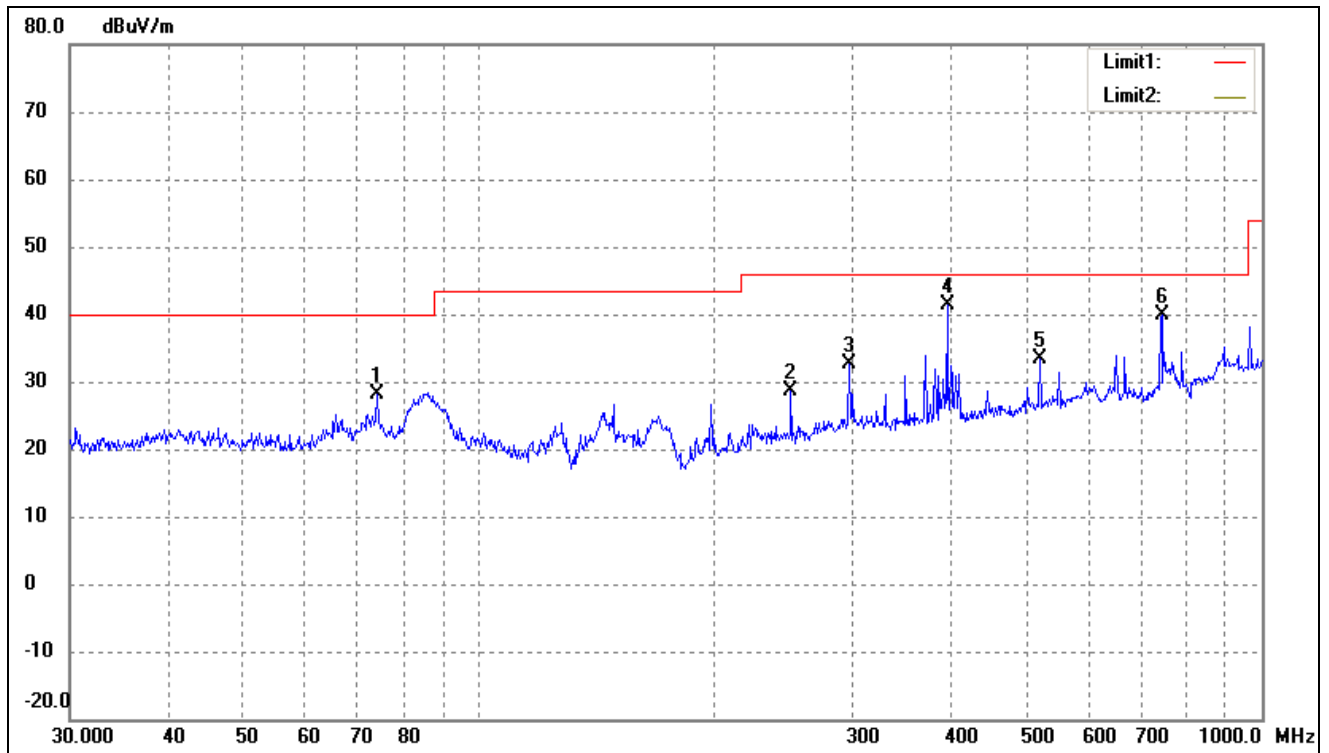


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	33.5623	29.01	8.17	37.18	40.00	-2.82	151	100	peak
2	41.1319	25.45	8.91	34.36	40.00	-5.64	308	100	peak
3	74.1351	34.99	1.70	36.69	40.00	-3.31	120	100	peak
4	107.1337	30.85	5.38	36.23	43.50	-7.27	359	100	peak
5	396.2415	29.40	9.95	39.35	46.00	-6.65	178	100	peak
6	744.8661	27.66	15.33	42.99	46.00	-3.01	359	100	peak

Plot of Radiated Emissions Test Data

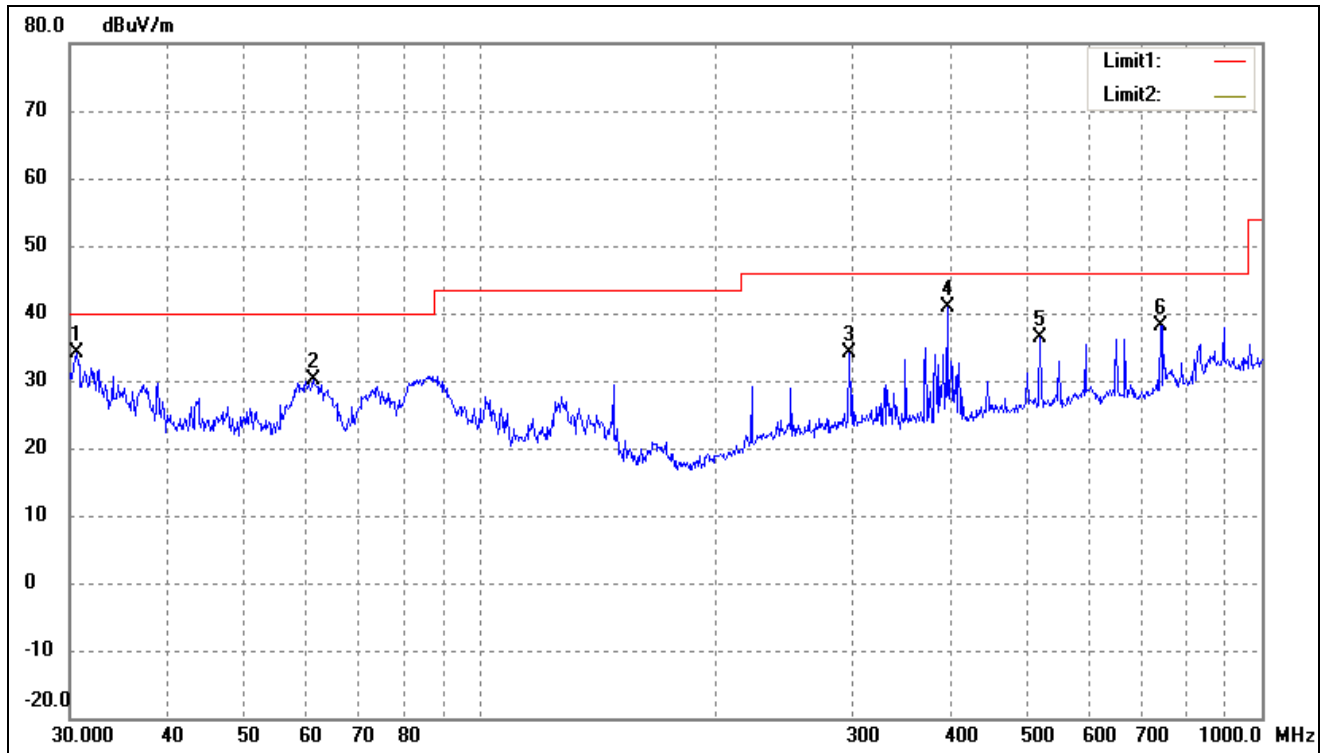
EUT: *Android TV Dongle*
 Tested Model: *A08S*
 Operating Condition: *AC 120V/60Hz; Adapter DC 5V/2A*
 Comment: *TM3*

Test Specification: *Horizontal*



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	74.1351	26.40	1.70	28.10	40.00	-11.90	158	100	peak
2	250.3012	21.82	6.71	28.53	46.00	-17.47	326	100	peak
3	297.2241	23.55	9.06	32.61	46.00	-13.39	129	100	peak
4	396.2415	31.46	9.95	41.41	46.00	-4.59	209	100	peak
5	520.8882	21.91	11.37	33.28	46.00	-12.72	145	100	peak
6	744.8661	26.11	13.82	39.93	46.00	-6.07	359	200	peak

Test Specification: Vertical

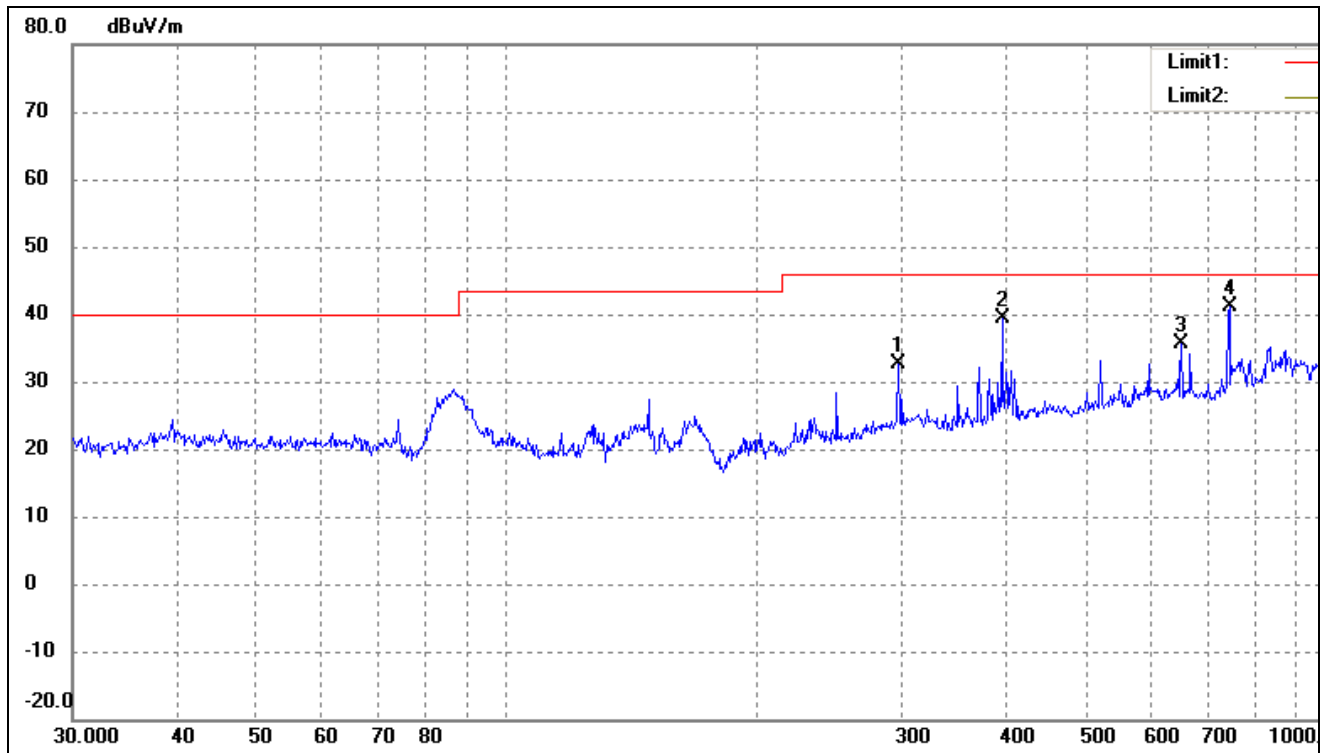


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	30.6379	26.37	7.74	34.11	40.00	-5.89	151	100	peak
2	61.3463	25.10	4.95	30.05	40.00	-9.95	308	100	peak
3	297.2241	24.98	9.06	34.04	46.00	-11.96	120	100	peak
4	396.2415	30.81	9.95	40.76	46.00	-5.24	359	100	peak
5	520.8882	25.01	11.37	36.38	46.00	-9.62	178	100	peak
6	742.2587	22.69	15.45	38.14	46.00	-7.86	359	100	peak

Plot of Radiated Emissions Test Data

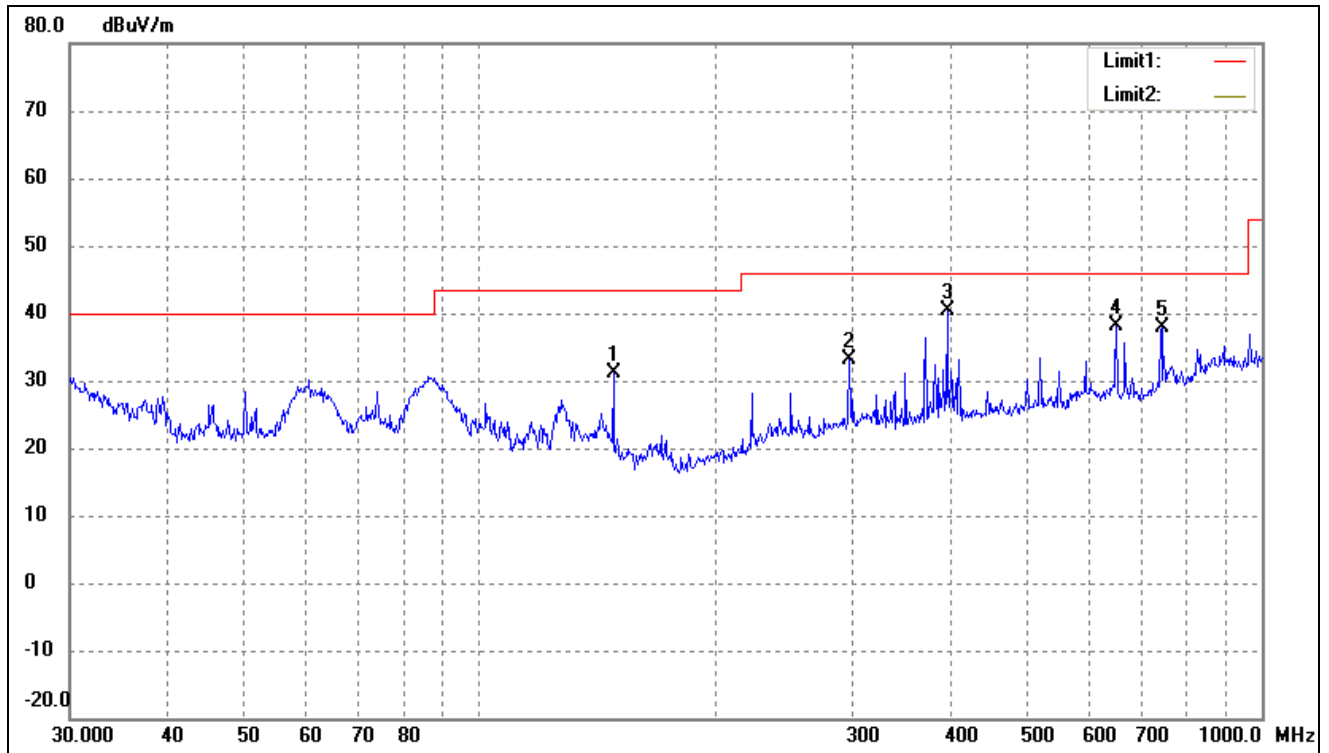
EUT: Android TV Dongle
 Tested Model: A08S
 Operating Condition: AC 120V/60Hz; Adapter DC 5V/2A
 Comment: TM4

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	297.2241	23.56	9.06	32.62	46.00	-13.38	58	200	peak
2	396.2415	29.47	9.95	39.42	46.00	-6.58	326	100	peak
3	651.9417	23.28	12.32	35.60	46.00	-10.40	29	100	peak
4	744.8661	27.30	13.82	41.12	46.00	-4.88	209	100	peak

Test Specification: Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	148.4410	28.60	2.49	31.09	43.50	-12.41	251	100	peak
2	297.2241	24.16	9.06	33.22	46.00	-12.78	308	100	peak
3	396.2415	30.42	9.95	40.37	46.00	-5.63	120	100	peak
4	651.9417	25.81	12.32	38.13	46.00	-7.87	359	100	peak
5	744.8661	22.60	15.33	37.93	46.00	-8.07	359	100	peak

Note: Testing is carried out with frequency rang 9kHz to the 6GHz, which above 1GHz is close to the noise base even antenna close up to 1meter distance according the measurement of ANSI C63.4.

The measurements greater than 20dB below the limit from 9kHz to 30MHz and test data are not provided.

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