FCC Part 15B
Measurement and Test Report

For

Shenzhen WeDo Century Industrial Co.,Ltd

3rd Building, 6th, QingNingRoad, QingHu Village. LongHua, ShenZhen,

518109, China

FCC ID: 2AC9AHD22

Test Rule(s):	FCC Part 15 Subpart B
Product Description:	TV BOX
Tested Model:	HD22
Report No.:	STR14098131I-2
Tested Date:	2014-09-17 to 2014-11-20
Issued Date:	2014-11-21
Tested By:	Vigoss Liang / Engineer
Reviewed By:	Lahm Peng / EMC Manager
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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant:	Shenzhen WeDo Century lndustrial Co.,ltd
Address of applicant:	3rd Building, 6th, QingNingRoad, QingHu Village. LongHua, ShenZhen, 518109, China
Manufacturer:	Shenzhen WeDo Century lndustrial Co.,ltd
Address of manufacturer:	3rd Building, 6th, QingNingRoad, QingHu Village. LongHua, ShenZhen, 518109, China

General Description of EUT	
Product Name:	TV BOX
Trade Name:	WellDo
Model No.:	HD22
Adding Model(s):	AllCamHD22
Rated Voltage:	Adapter DC 5V
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 HD22, but the circuit and the electronic construction do not change, declared by the manufacturer.	

Technical Characteristics of EUT	
Rated Voltage:	5.0V
Rated Current:	1.5A
Rated Power:	7.5W
Power Adapter Model:	CH0515000C
	Input: AC100-240V~50/60Hz; Output: DC 5V, 1.5A
Lowest Internal Frequency:	32.768 KHz
Highest Internal Frequency:	1.0GHz
Classification of ITE:	Class B

1.2 Test Standards

The following report is prepared on behalf of the Shenzhen WeDo Century lndustrial 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 C63.4-2003, 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	USB & HDMI & OTG	Mouse connected to USB port HDMI video output OTG download video
TM2	TF & HDMI & USB	TF download video HDMI output Mouse connected to USB port
TM3	CAMERA & MIC & AV	Camera on AV output

EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
OTG/USB Cable	0.15	Shielded	Without Ferrite
USB/DC Cable	1.20	Unshielded	Without Ferrite

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
HDMI	2.40	Shielded	Without Ferrite

Special Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
Display	DELL	U2410f	50642P246601H(B) ZL
USB Disk	SONY	8GB	/
TF Card	/	1GB	/
Mouse	Lenovo	/	/

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

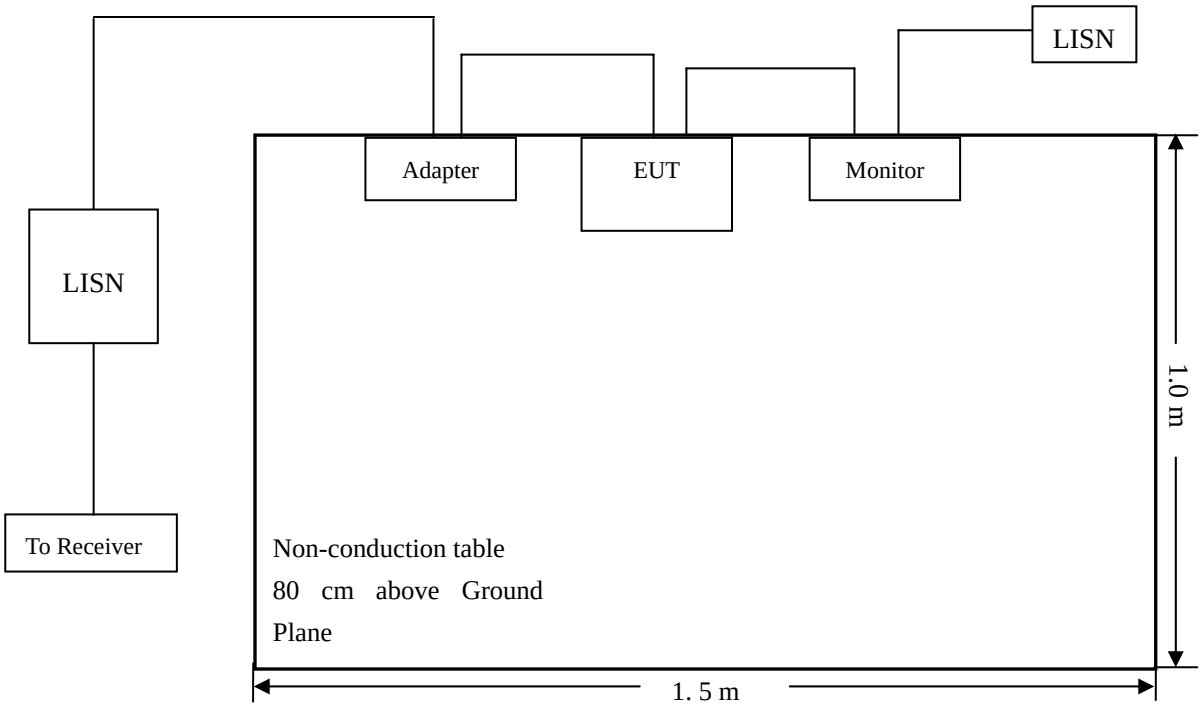
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2014-05-28	2015-05-27
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2014-05-28	2015-05-27
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2014-05-28	2015-05-27

3.3 Test Procedure

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

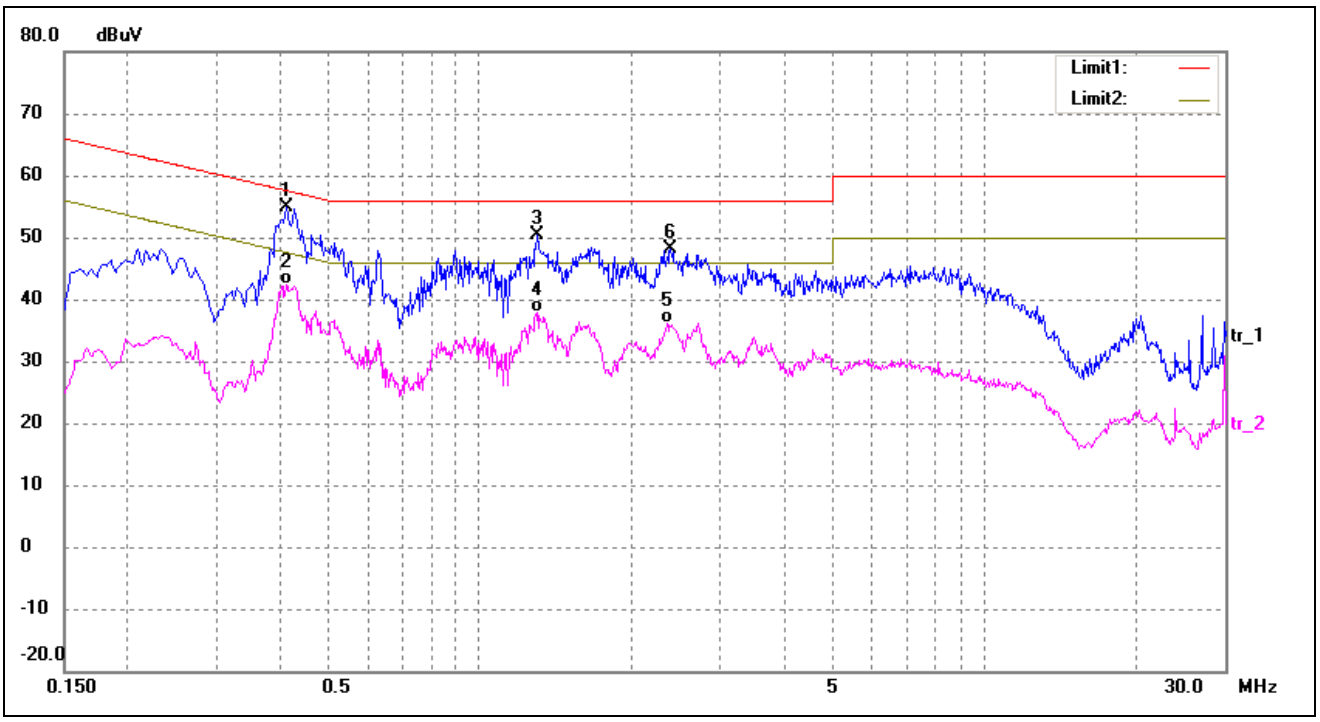
-0.85 dB at 0.4780 MHz in the **TM3 Neutral** mode**, Peak** detector, **0.15-30MHz**

3.7 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

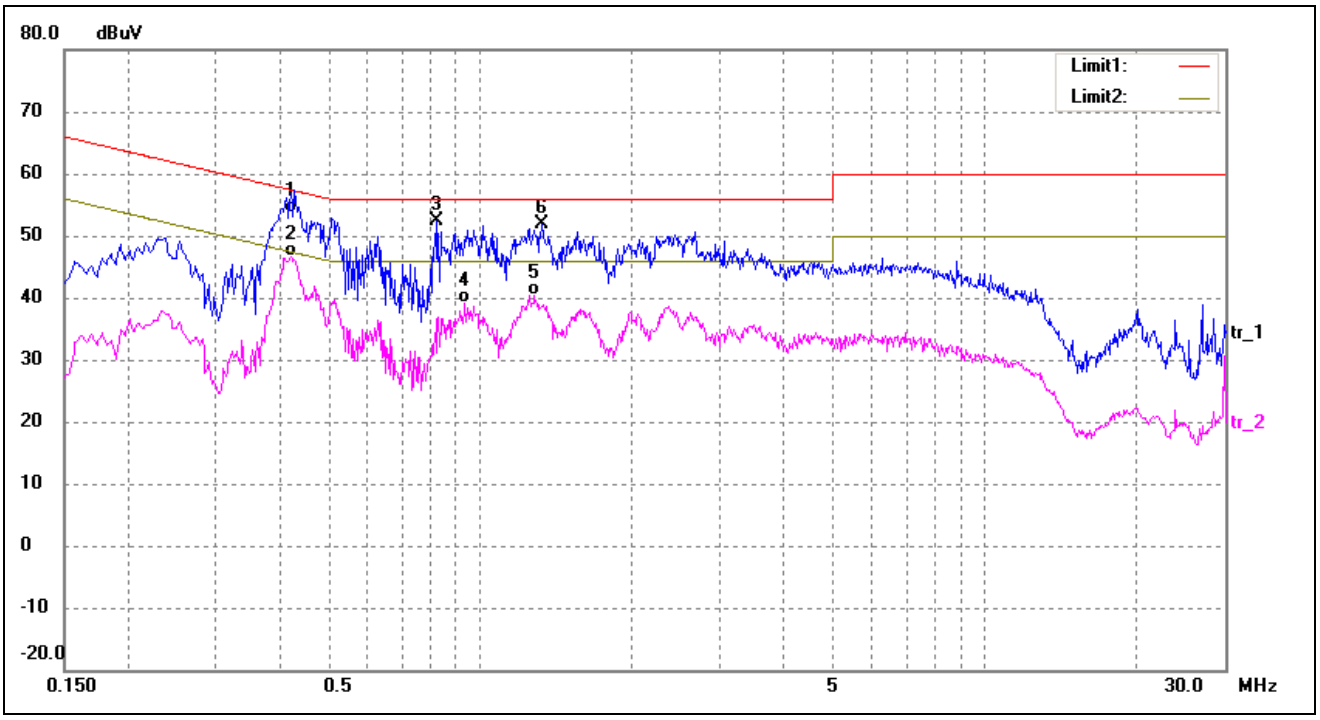
EUT: *TV BOX*
Tested Model: *HD22*
Operating Condition: *TM1*
Comment: *AC 120V/60Hz; Adapter: DC5V*

Test Specification: *Neutral*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	0.4140	45.26	9.50	54.76	57.57	-2.81	peak
2	0.4140	32.80	9.50	42.30	47.57	-5.27	AVG
3	1.3020	40.26	10.00	50.26	56.00	-5.74	peak
4	1.3020	27.83	10.00	37.83	46.00	-8.17	AVG
5	2.3580	26.15	10.00	36.15	46.00	-9.85	AVG
6	2.3860	38.02	10.00	48.02	56.00	-7.98	peak

Test Specification: *Line*

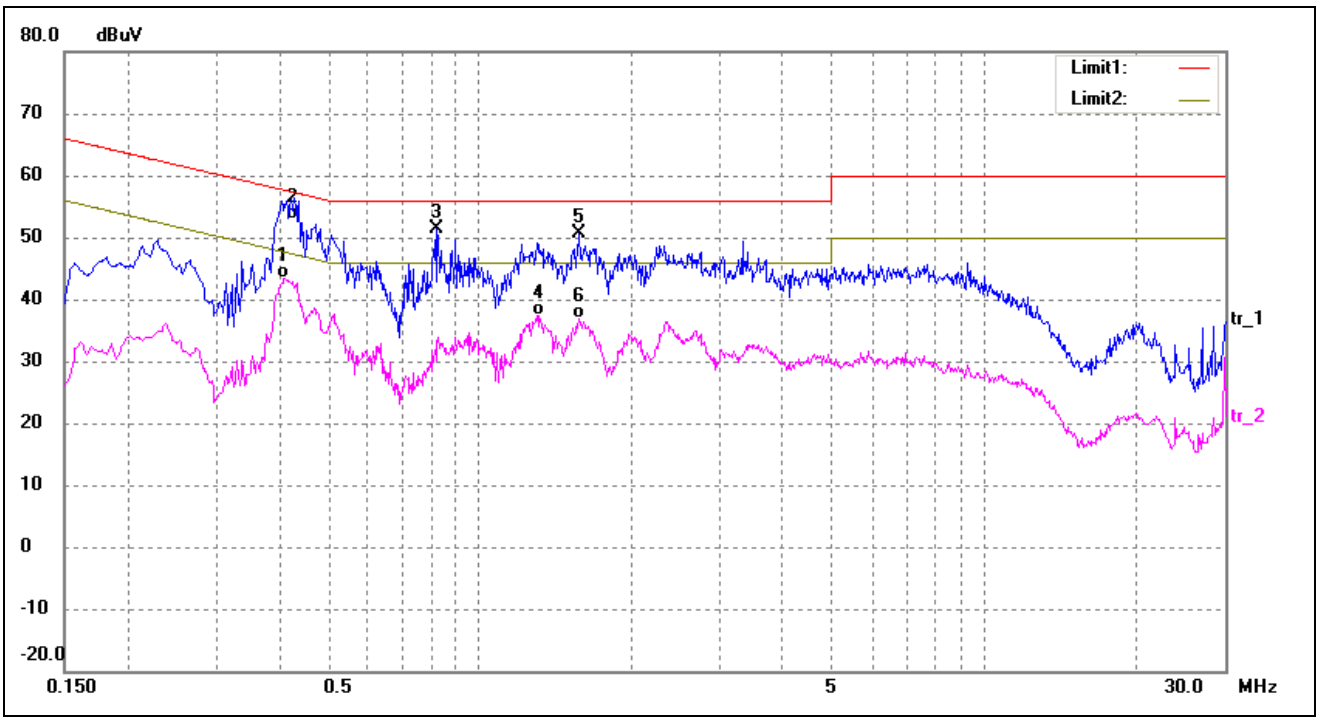


No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	0.4220	44.18	9.50	53.68	57.41	-3.73	QP
2	0.4220	37.01	9.50	46.51	47.41	-0.90	AVG
3	0.8220	42.53	9.82	52.35	56.00	-3.65	peak
4	0.9380	29.25	9.94	39.19	46.00	-6.81	AVG
5	1.2860	30.45	10.00	40.45	46.00	-5.55	AVG
6	1.3300	41.87	10.00	51.87	56.00	-4.13	peak

Plot of Conducted Emissions Test Data

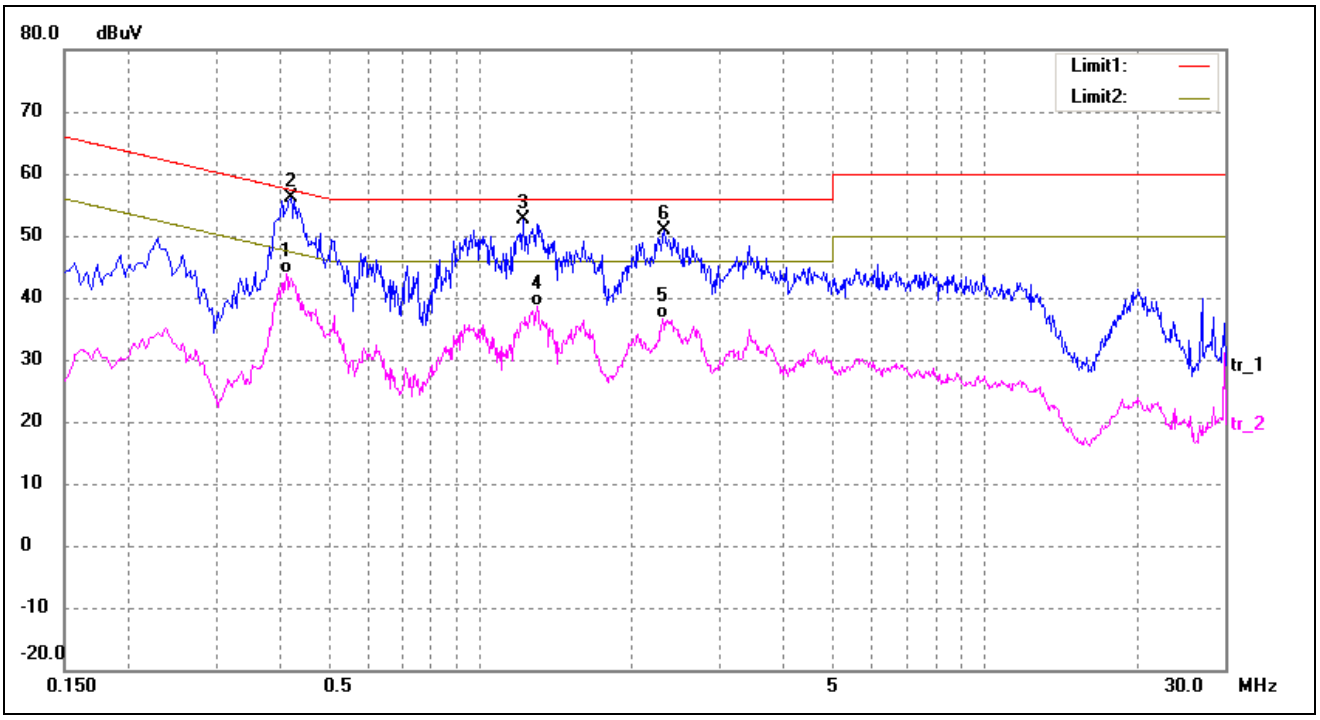
EUT: *TV BOX*
Tested Model: *HD22*
Operating Condition: *TM2*
Comment: *AC 120V/60Hz; Adapter: DC5V*

Test Specification: *Neutral*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	0.4100	33.81	9.50	43.31	47.65	-4.34	AVG
2	0.4300	43.41	9.50	52.91	57.25	-4.34	QP
3	0.8220	41.46	9.82	51.28	56.00	-4.72	peak
4	1.3100	27.38	10.00	37.38	46.00	-8.62	AVG
5	1.5740	40.54	10.00	50.54	56.00	-5.46	peak
6	1.5740	26.90	10.00	36.90	46.00	-9.10	AVG

Test Specification: *Line*

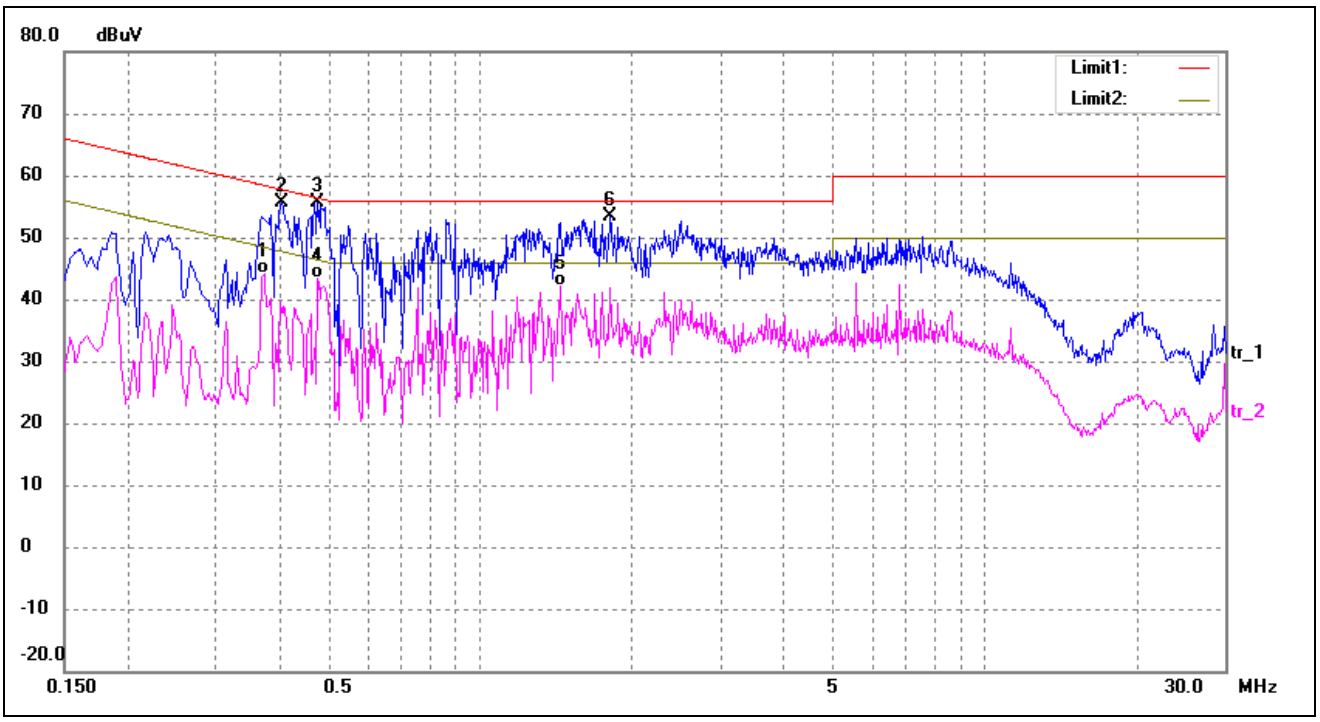


No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	0.4140	34.48	9.50	43.98	47.57	-3.59	AVG
2	0.4220	46.56	9.50	56.06	57.41	-1.35	peak
3	1.2220	42.63	10.00	52.63	56.00	-3.37	peak
4	1.2980	28.65	10.00	38.65	46.00	-7.35	AVG
5	2.3060	26.75	10.00	36.75	46.00	-9.25	AVG
6	2.3140	40.94	10.00	50.94	56.00	-5.06	peak

Plot of Conducted Emissions Test Data

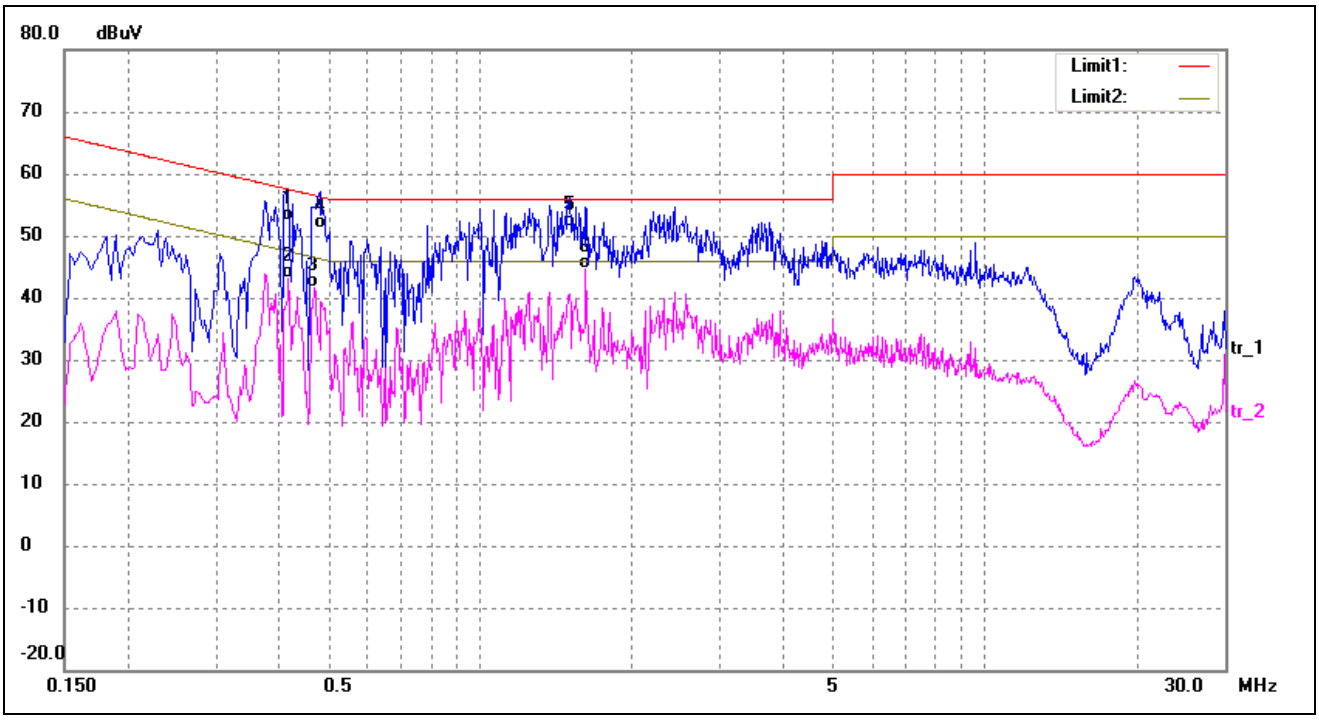
EUT: *TV BOX*
Tested Model: *HD22*
Operating Condition: *TM3*
Comment: *AC 120V/60Hz; Adapter: DC5V*

Test Specification: *Neutral*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	0.3740	34.65	9.50	44.15	48.41	-4.26	AVG
2	0.4060	46.20	9.50	55.70	57.73	-2.03	peak
3	0.4780	46.02	9.50	55.52	56.37	-0.85	peak
4	0.4780	33.99	9.50	43.49	46.37	-2.88	AVG
5	1.4420	32.09	10.00	42.09	46.00	-3.91	AVG
6	1.8180	43.37	10.00	53.37	56.00	-2.63	peak

Test Specification: *Line*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	0.4140	42.81	9.50	52.31	57.57	-5.26	QP
2	0.4180	33.57	9.50	43.07	47.49	-4.42	AVG
3	0.4700	32.12	9.50	41.62	46.51	-4.89	AVG
4	0.4820	41.62	9.50	51.12	56.30	-5.18	QP
5	1.5060	41.42	10.00	51.42	56.00	-4.58	QP
6	1.6260	34.68	10.00	44.68	46.00	-1.32	AVG

4. Radiated Emissions

4.1 Measurement Uncertainty

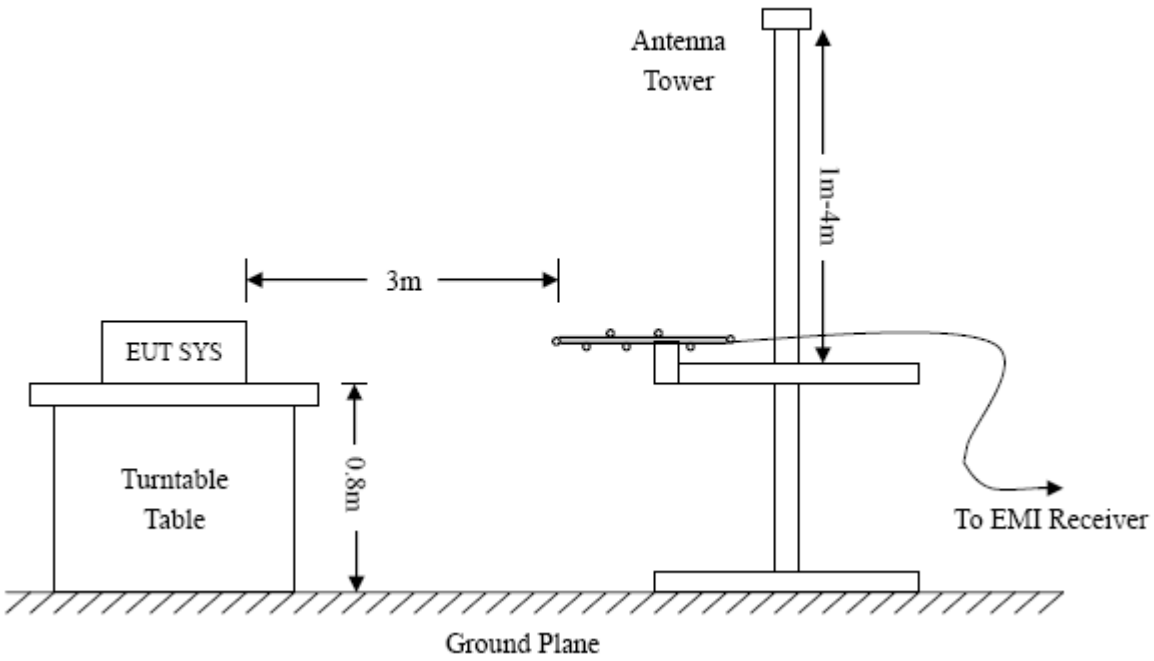
Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any radiation emissions measurement is ± 5.10 dB.

4.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2014-05-28	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	2014-05-28	2015-05-27

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	Frequency :30MHz-1GHz	Frequency :Above 1GHz
RBW=10KHz,	RBW=120KHz,	RBW=1MHz,
VBW =30KHz	VBW=300KHz	VBW=3MHz(Peak), 10Hz(AV)
Sweep time= Auto	Sweep time= Auto	Sweep time= Auto
Trace = max hold	Trace = max hold	Trace = max hold
Detector function = peak	Detector function = peak, QP	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:

Corr. Ampl. = Indicated Reading – Corr. Factor

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

Margin = Corr. Ampl. – 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

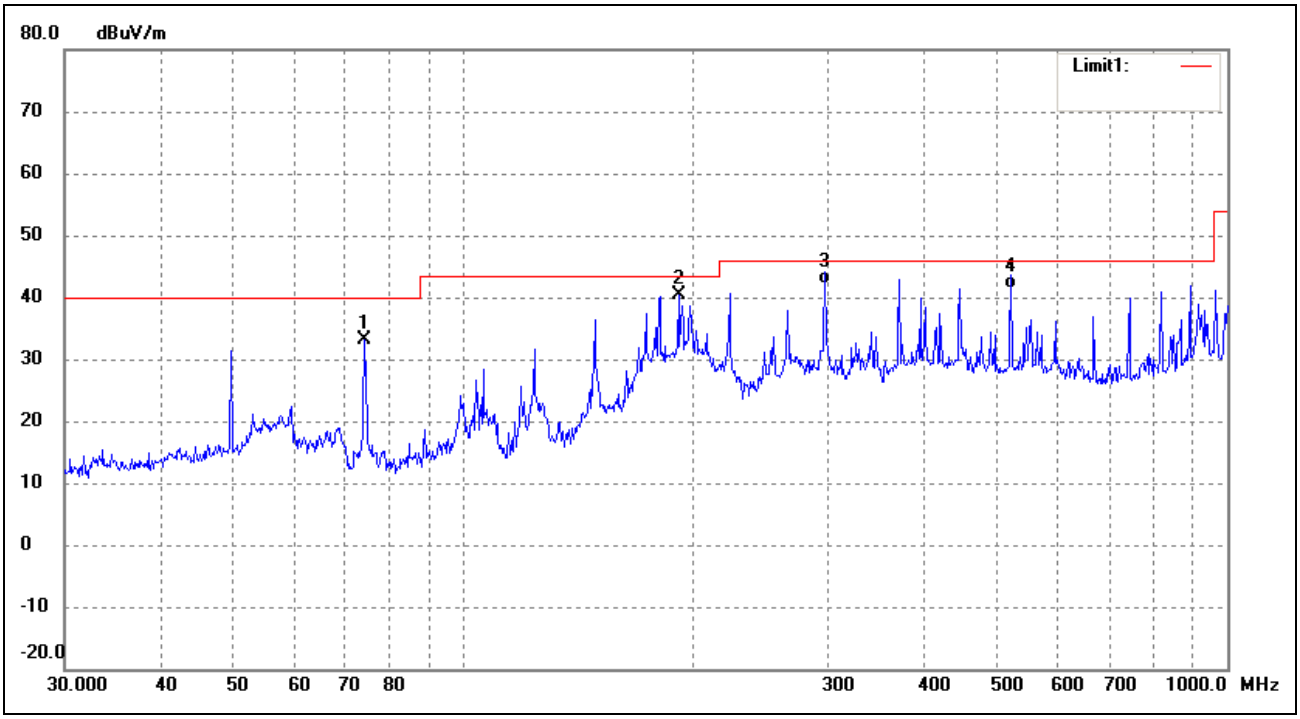
According to the data, the EUT complied with the FCC Part 15.109(a) rule, and had the worst margin of:

-3.16 dB at **191.0738 MHz** in the **Horizontal** polarization, **TM1** mode, **9 kHz** to **5 GHz**, **3Meters**

Plot of Radiated Emissions Test Data (30MHz to 1GHz)

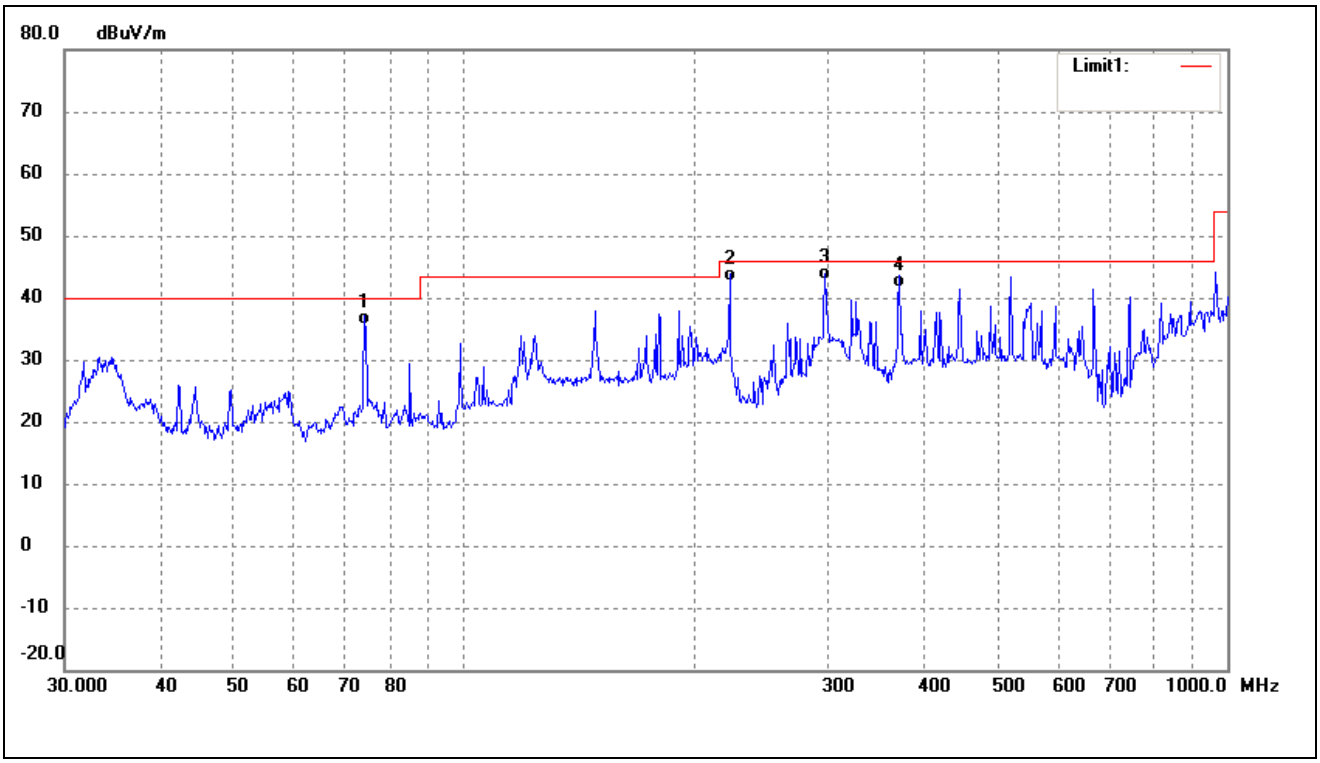
EUT: *TV BOX*
Tested Model: *HD22*
Operating Condition: *TM1*
Comment: *AC 120V/60Hz; Adapter: DC5V*

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	74.1350	46.19	-12.97	33.22	40.00	-6.78	254	100	peak
2	191.0738	50.28	-9.94	40.34	43.50	-3.16	113	100	peak
3	297.2241	48.36	-6.24	42.12	46.00	-3.88	120	150	QP
4	520.8881	42.68	-1.23	41.45	46.00	-4.55	180	200	QP

Test Specification: *Vertical*

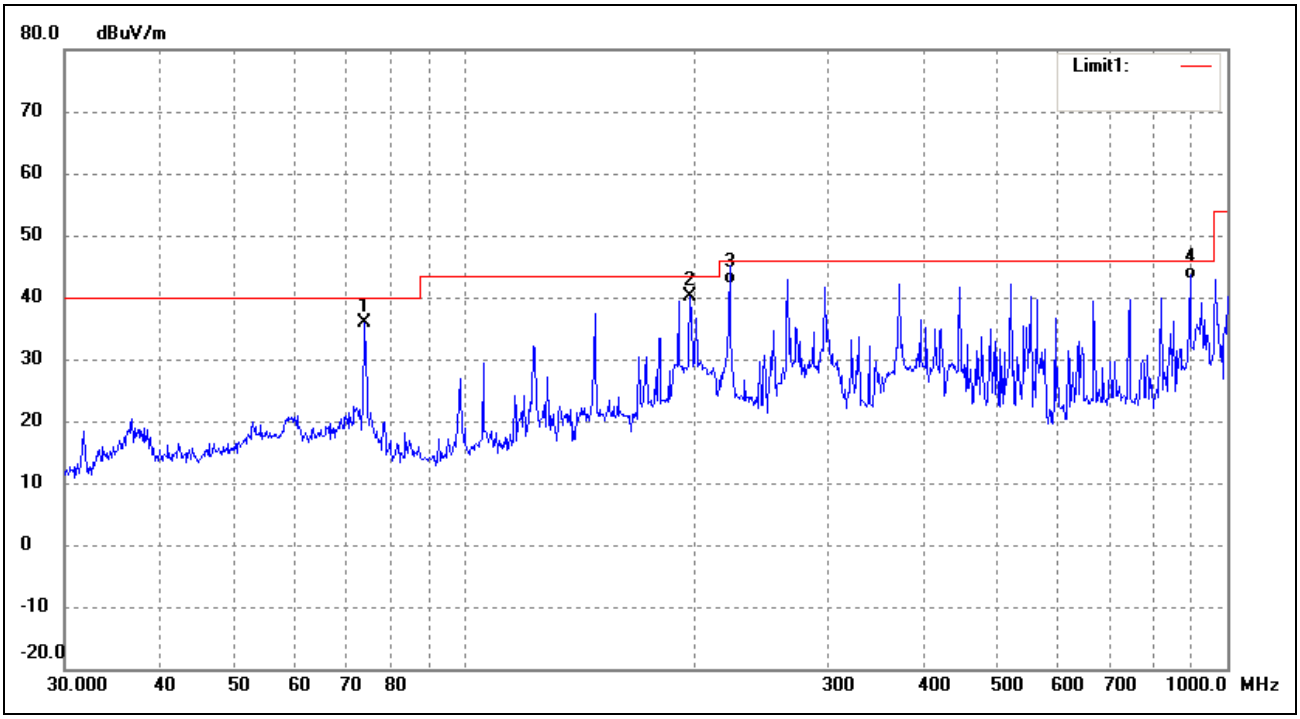


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	74.1350	48.55	-12.97	35.58	40.00	-4.42	114	100	QP
2	222.9501	51.34	-8.74	42.60	46.00	-3.40	270	100	QP
3	297.2241	49.01	-6.24	42.77	46.00	-3.23	360	100	QP
4	372.0045	45.37	-3.78	41.59	46.00	-4.41	124	200	QP

Plot of Radiated Emissions Test Data (30MHz to 1GHz)

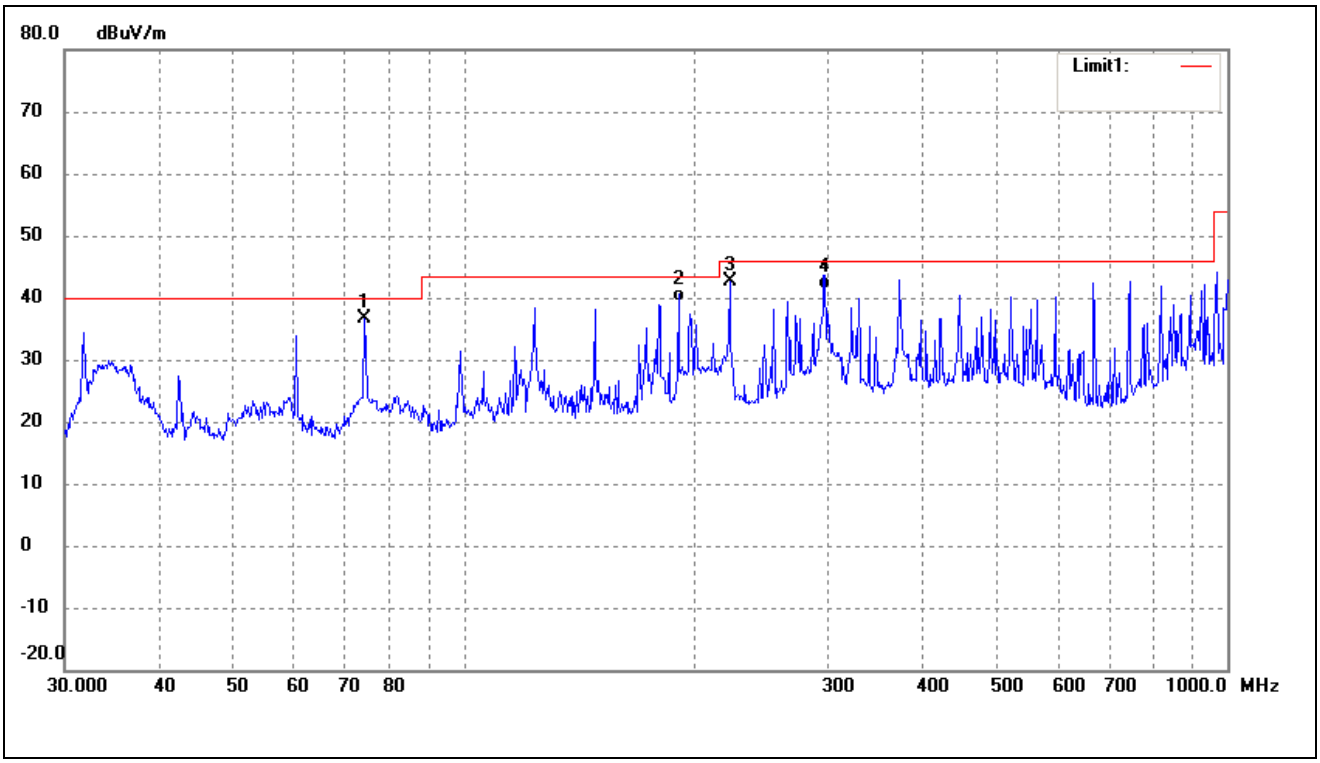
EUT: *TV BOX*
Tested Model: *HD22*
Operating Condition: *TM2*
Comment: *AC 120V/60Hz; Adapter: DC5V*

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	74.1350	48.91	-12.97	35.94	40.00	-4.06	0	100	peak
2	197.8927	49.39	-9.27	40.12	43.50	-3.38	120	100	peak
3	222.9501	50.91	-8.74	42.17	46.00	-3.83	20	100	QP
4	893.8567	37.62	5.20	42.82	46.00	-3.18	360	100	QP

Test Specification: *Vertical*

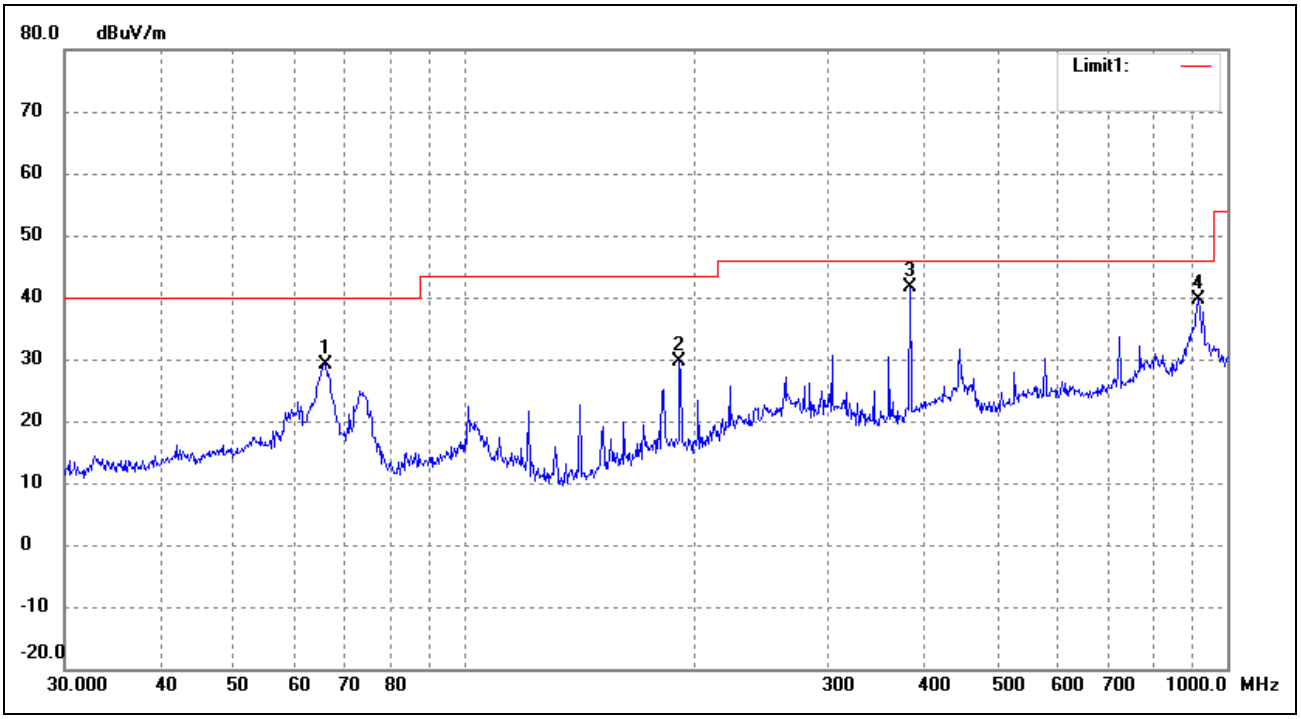


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	74.1350	49.49	-12.97	36.52	40.00	-3.48	100	100	peak
2	191.0738	49.38	-9.94	39.44	43.50	-4.06	270	100	QP
3	222.9501	51.32	-8.74	42.58	46.00	-3.42	360	100	peak
4	297.2241	47.68	-6.24	41.44	46.00	-4.56	0	100	QP

Plot of Radiated Emissions Test Data (30MHz to 1GHz)

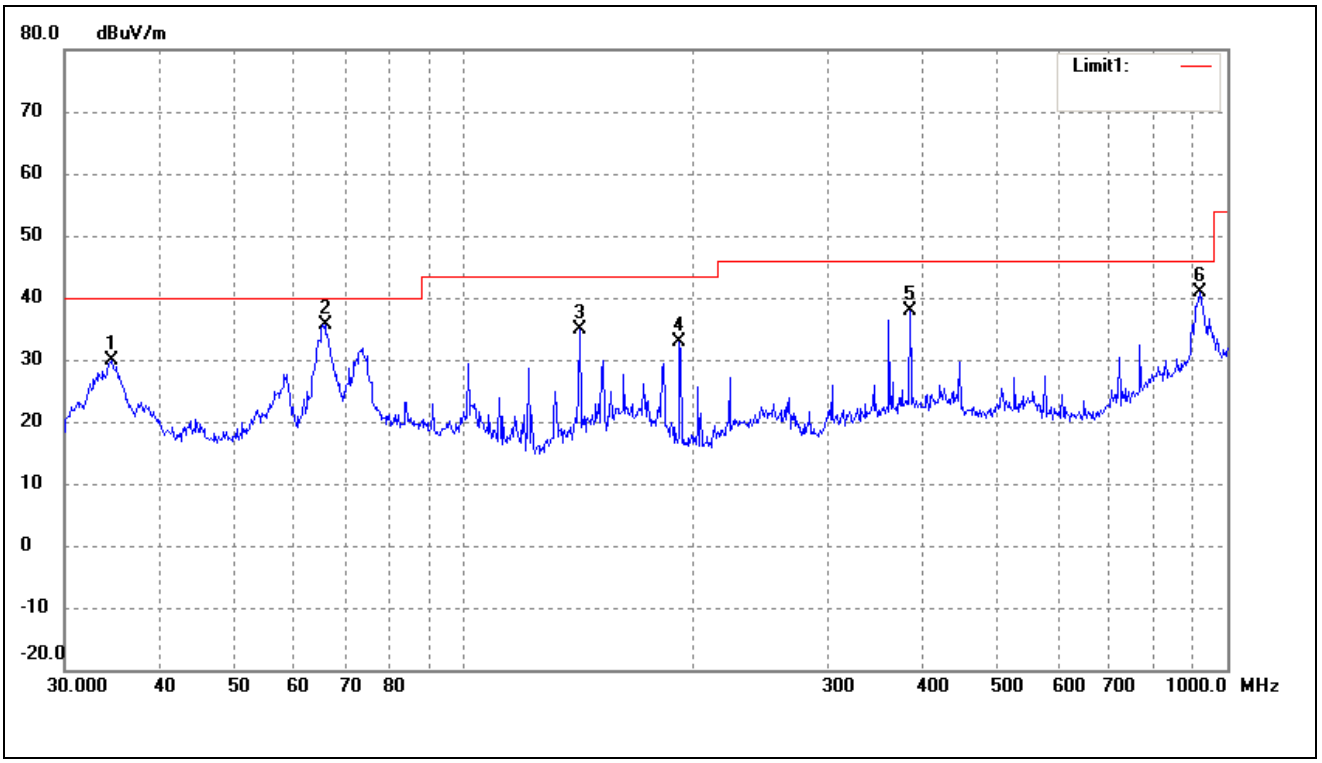
EUT: *TV BOX*
Tested Model: *HD22*
Operating Condition: *TM3*
Comment: *AC 120V/60Hz; Adapter: DC5V*

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	66.0342	39.18	-10.00	29.18	40.00	-10.82	0	100	peak
2	191.7450	39.58	-9.88	29.70	43.50	-13.80	120	100	peak
3*	383.9318	45.02	-3.46	41.56	46.00	-4.44	224	100	peak
4	916.0687	34.03	5.55	39.58	46.00	-6.42	0	100	peak

Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	34.6385	40.14	-10.14	30.00	40.00	-10.00	10	100	peak
2	65.8031	45.55	-9.96	35.59	40.00	-4.41	270	100	peak
3	141.8262	47.93	-13.12	34.81	43.50	-8.69	360	100	peak
4	191.7450	42.77	-9.88	32.89	43.50	-10.61	133	100	peak
5	383.9318	41.22	-3.46	37.76	46.00	-8.24	00	100	peak
6	919.2866	35.37	5.59	40.96	46.00	-5.04	0	100	peak

Note: Testing is carried out with frequency rang 9kHz to the 5GHz, 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 *******