TEST REPORT

Applicant:	Klipsch.
Address of Applicant:	3502 Woodview Trace, Suite 200, Indianapolis, IN 46268, United States.
Manufacturer:	Klipsch.
Address of Manufacturer:	3502 Woodview Trace, Suite 200, Indianapolis, IN 46268, United States.
Product name:	HD Control Center
Model:	RP-HUB1
Rating(s):	Input : AC 100-240V, 50/60 Hz, 600mA (For Switching Power Supply) Output : DC 5.0V, 3500mA (For Switching Power Supply) Input : DC 5.0V (For main)
Trademark:	Klipsch
FCC register number：	935596
IC register number：	8368A-1
FCC ID:	STI-RPHUB1
Standards:	FCC Part15 subpart B：2015 ICES(Interference-Causing Equipment Standard)-003 Issue 5 August 2012
Date of Receipt:	2015-11-17
Date of Test:	2015-11-17~2015-12-02
Date of Issue:	2015-12-02
Test Result	**Pass***

* In the configuration tested, the test item complied with the standards specified above.

Authorized for issue by:

Test by:			***Reviewed by:***		
Dec.02, 2015	Jumy Qiu Project Engineer	Jumy qiu	Dec.02, 2015	Pauler Li Project Manager	Pauler Li
Date	*Name/Position*	*Signature*	*Date*	*Name/Position*	*Signature*

Testing Laboratory information:

Testing Laboratory Name ..... :	I-Test Laboratory
Address ..... :	1-2 floor, South Block, Building A2 , No 3 Keyan Lu, Science City, Guangzhou, Guangdong Province, P.R. China
Testing location ..... :	Same as above
Tel..... :	0086-20-32209330
Fax ..... :	0086-20-62824387
E-mail ..... :	itl@i-testlab.com

Possible test case verdicts:

- test case does not apply to the test object.. : N/A
- test object does meet the requirement..... : P (Pass)
- test object does not meet the requirement .: F (Fail)

General remarks:

The test results presented in this report relate only to the object tested.

The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.

This report would be invalid test report without all the signatures of testing technician and approver.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

General product information:

/

Test Summary:

The following standards have been applied to ensure the product conforms with the protection requirements of the council directive FCC part 15B / ICES-003.

Electromagnetic Emissions				
Test Item	**Test Standard**	**Test Method**	**Class/Severity**	**Result**
Conducted Emission(0.15-30MHz)	FCC part 15.107/ ICES-003	ANSI C63.4:2009/ ICES-003	Class B	PASS
Radiated Emission(30-1000MHz)	FCC part 15.109/ ICES-003	ANSI C63.4:2009/ ICES-003	Class B	PASS
Radiated Emission above 1GHz	FCC part 15.109 / ICES-003	ANSI C63.4:2009 / ICES-003	Class B	PASS

Test Location:

All the tests were performed in I-Test Laboratory. Which is located at 1-2 floor, South Block, Building A2 , No 3 Keyan Lu, Science City, Guangzhou, Guangdong Province, P.R. China

Tel: 0086-20-32209330, Fax: 0086-20-62824387

No test is subcontracted

TABLE OF CONTENTS

Section 1 General Information and Equipment Used

1.1 Client Information

Applicant:	Klipsch.
Address of Applicant:	3502 Woodview Trace, Suite 200, Indianapolis, IN 46268, United States.

1.2 EUT General and Technical Descriptions

EUT Name:	HD Control Center
EUT Model:	RP-HUB1
EUT Trademark:	Klipsch
Input Voltage:	100-240V~ (For Switching Power Supply) DC 5.0V (For main)
Frequency:	50/60Hz (For Switching Power Supply)
Input Power/Current:	600mA (For Switching Power Supply)
Output rated:	DC 5.0V, 3500mA (For Switching Power Supply)
Power Cable Description:	/
Other Cables Description:	/
I/O Ports:	USB, Coaxial in, IR in, Optical in, Analog in, HDMI in 1, HDMI in 2, HDMI in 3, HDMI in 4, HDMI OUT/TV
Function(s) Description:	/
Accessories information:	/
Highest operating frequency：	3G

1.3 Support Equipment(s) and Test Configuration

1.3.1 Details of Support Equipment(s)

Description	Manufacturer	Model No.	Connection	Working state
PC	lenovo	H300	/	Normal
LED display	HKC	F3000	/	Normal

1.3.2 Working State of EUT

Power Supply of EUT:	120V~ 60Hz
EUT Status:	Exchange music data with PC

1.4 Equipment Used during Test

Conducted Emission						
No.	**Test Equipment**	**Manufacturer**	**Model**	**Serial No.**	**Last Cal.**	**Cal. Due**
ITL-102	EMI Test receiver	R&S	ESCI	100910	2015/06/23	2016/06/23
ITL-103	Two-line v-network	R&S	ENV216	100120	2015/06/23	2016/06/23
ITL-101	Shielded Room	ETS•Lindgren	8*4*3	CT09010	2015/03/09	2018/03/09
ITL-156	Conduction Cable	Sat	CE1	C001	2015/06/23	2016/06/23

Radiated Emission						
No.	**Test Equipment**	**Manufacturer**	**Model**	**Serial No.**	**Last Cal.**	**Cal. Due**
ITL-100	Semi-Anechoic chamber	ETS•Lindgren	FACT3 2.0	CT09015	2013/06/17	2016/06/17
ITL-111	EMI Test receiver	R&S	ESVS10	833616/003	2015/01/19	2016/01/19
ITL-114	EXA Spectrum Analyzer	Agilent Technologies	N9010A	MY51250936	2015/01/19	2016/01/19
ITL-105	Biconilog Antenna	ETS•Lindgren	3142D	00108096	2015/01/24	2018/01/24
ITL-116	Pre Amplifier	HP	8447F	3113A05905	2015/01/19	2016/01/19
ITL-157	Radiation Cable 1	Sat	RE1	R001	2015/01/19	2016/01/19
ITL-158	Radiation Cable 2	Sat	RE2	R002	2015/01/19	2016/01/19
ITL-117	Wideband Amplifier Super Ultra	Mini-circuits	ZVA-183-S+	469101134	2015/01/19	2016/01/19
ITL-110	Horn Antenna	A-INFOMW	JXTXLB-10180-N	J2031090612133	2015/01/24	2018/01/24

Section 2 Emission Test Results

2.1 Conducted Emission at Mains Terminals, 150 kHz to 30MHz

Test Requirement: FCC part 15.107/ ICES-003

Test Method: ANSI C63.4:2009/ ICES-003

Test Voltage: 120V AC, 60Hz

Test Date: 2015-11-30

Frequency Range: 150 kHz to 30MHz

Detector: Peak for pre-scan
Quasi-Peak and Average at frequency with maximum peak
(9 kHz resolution bandwidth)

Uncertainty: 2Uc（V）= 2.3dB

Class / Limit: Class B

Frequency range MHz	**Class B Limits dB (μV)**	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
NOTE 1 :The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz. NOTE 2: The lower limit is applicable at the transition frequency.		

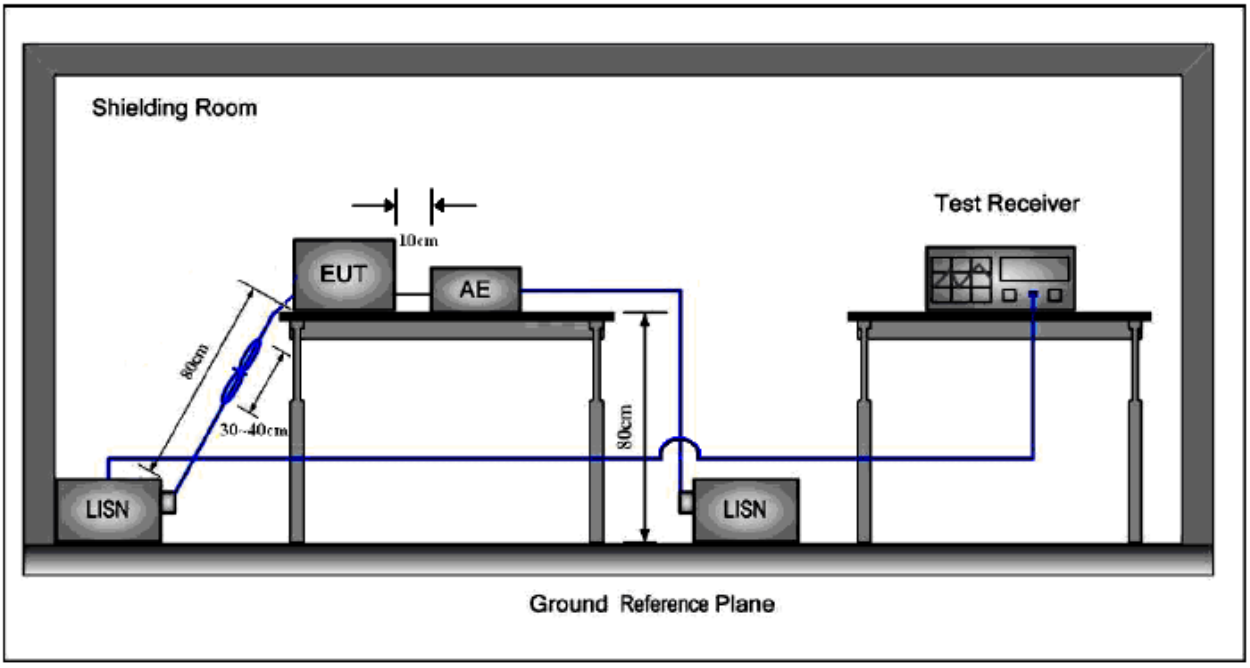
2.1.1 E.U.T. Operation

Operating Environment:

Temperature: 24.0 °C Humidity: 51 % RH Atmospheric Pressure: 101 kPa

EUT Operation: Exchange music data with PC, test the EUT in HDMI in 1 mode, HDMI in 2 mode, HDMI in 3 mode and HDMI in 4mode.

2.1.2 Test Setup and Procedure

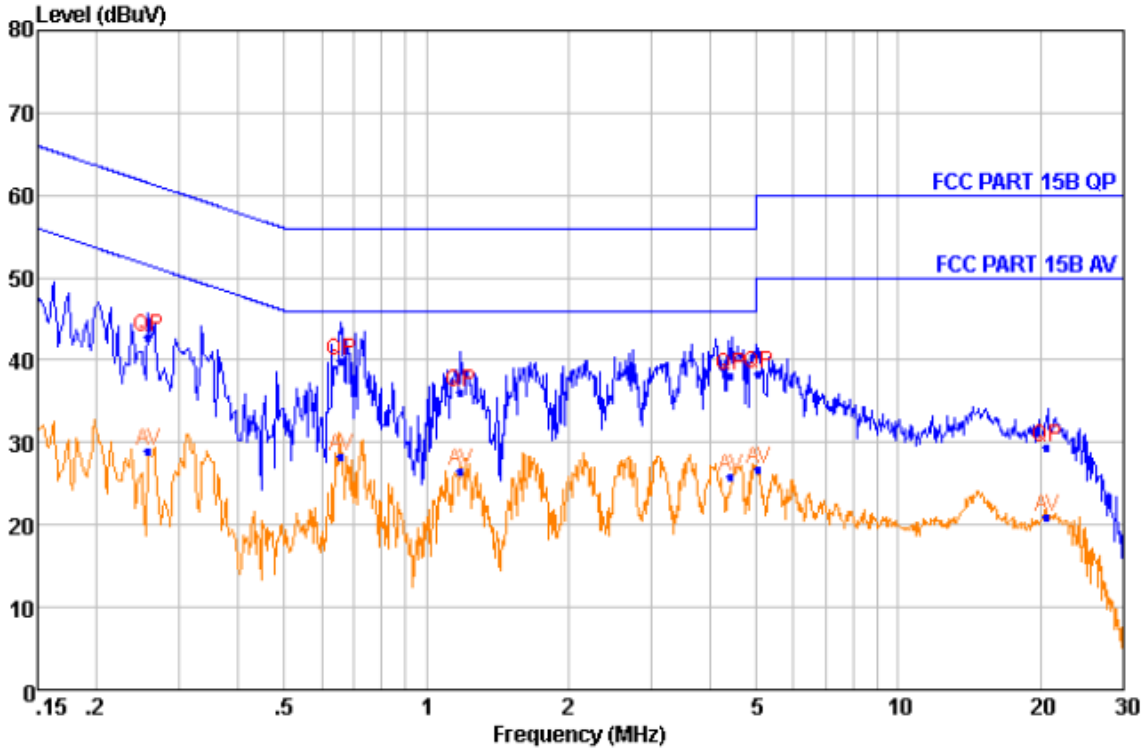


1. The mains terminal disturbance voltage test was conducted in a shielded room.
2. The EUT was connected to nominal power supply through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH+5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
3. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
4. The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.

2.1.3 Measurement Data

Pre-scan was performed with peak detected on both live and neutral cable. Quasi-peak & average measurements were performed at the frequencies which maximum peak emission level was detected. Please see the attached Quasi-peak and Average test results.

Model: RP-HUB1
Mode: HDMI in 1
Live Line:
Peak Scan:
Level (dBμV)



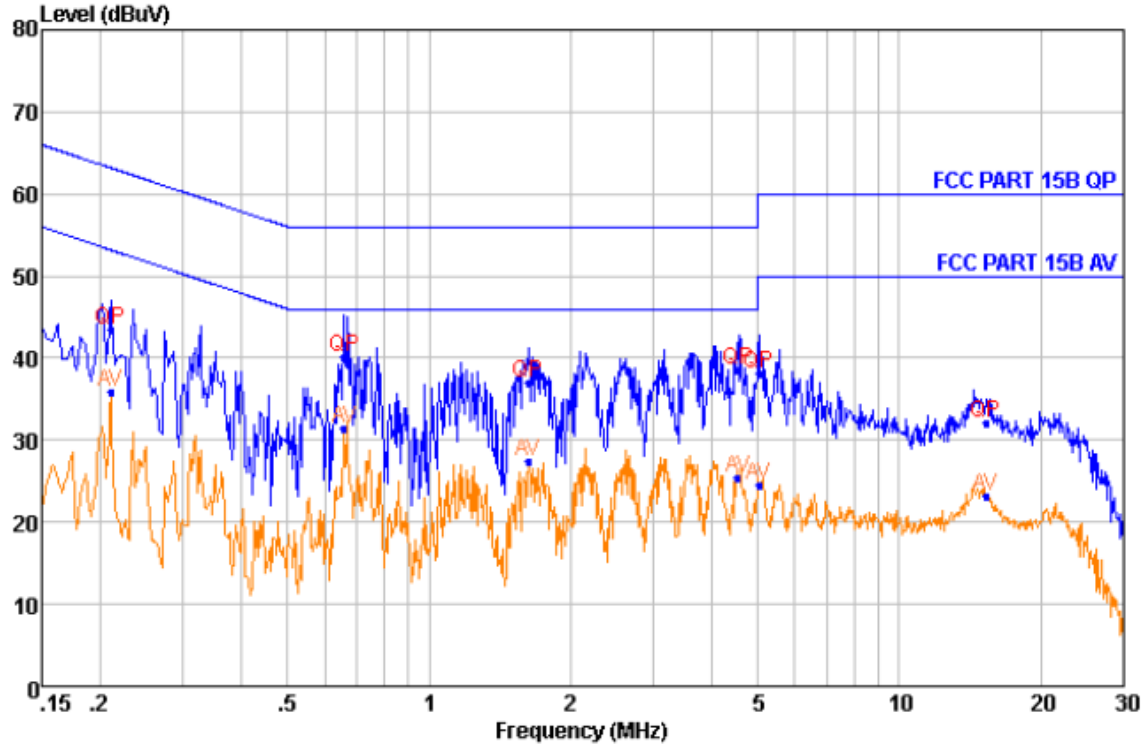
Quasi-peak and Average measurement

NO.	Freq MHz	Level dBuV	Remark	LISN Factor dB	Cable Loss dB	Limit Line dBuV	Over Limit dB
1	0.258	42.69	QP	9.49	0.41	61.51	-18.82
2	0.258	28.98	Average	9.49	0.41	51.51	-22.53
3	0.660	39.84	QP	9.28	0.45	56.00	-16.16
4	0.660	28.27	Average	9.28	0.45	46.00	-17.73
5	1.182	36.20	QP	9.28	0.47	56.00	-19.80
6	1.182	26.59	Average	9.28	0.47	46.00	-19.41
7	4.422	38.02	QP	9.29	0.52	56.00	-17.98
8	4.422	25.89	Average	9.29	0.52	46.00	-20.11
9	5.050	38.36	QP	9.29	0.53	60.00	-21.64
10	5.050	26.79	Average	9.29	0.53	50.00	-23.21
11	20.662	29.32	QP	9.75	0.59	60.00	-30.68
12	20.662	20.92	Average	9.75	0.59	50.00	-29.08

Neutral Line:

Peak Scan:

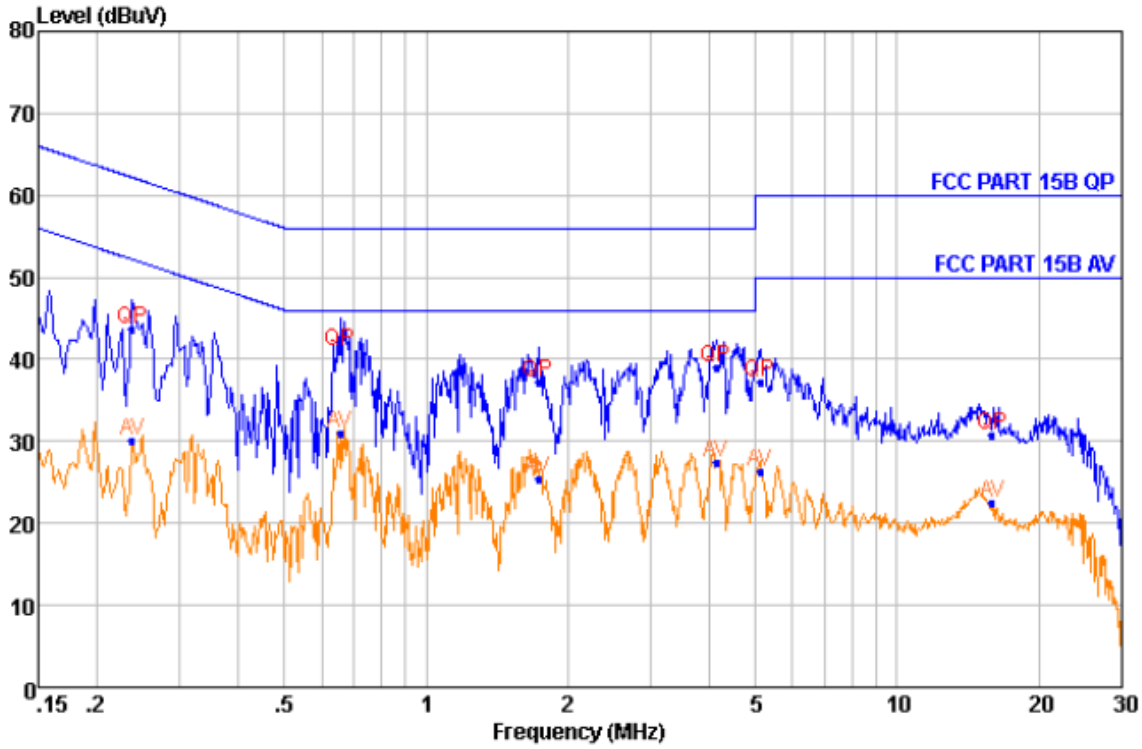
Level (dBμV)



Quasi-peak and Average measurement

NO.	Freq MHz	Level dBuV	Remark	LISN Factor dB	Cable Loss dB	Limit Line dBuV	Over Limit dB
1	0.211	43.38	QP	9.37	0.40	63.18	-19.80
2	0.211	35.81	Average	9.37	0.40	53.18	-17.37
3	0.660	40.14	QP	9.36	0.45	56.00	-15.86
4	0.660	31.50	Average	9.36	0.45	46.00	-14.50
5	1.624	36.93	QP	9.38	0.48	56.00	-19.07
6	1.624	27.30	Average	9.38	0.48	46.00	-18.70
7	4.541	38.53	QP	9.43	0.53	56.00	-17.47
8	4.541	25.31	Average	9.43	0.53	46.00	-20.69
9	5.022	38.20	QP	9.43	0.53	60.00	-21.80
10	5.022	24.43	Average	9.43	0.53	50.00	-25.57
11	15.273	32.00	QP	9.68	0.57	60.00	-28.00
12	15.273	23.21	Average	9.68	0.57	50.00	-26.79

Mode: HDMI in 2
Live Line:
Peak Scan:
Level (dBµV)



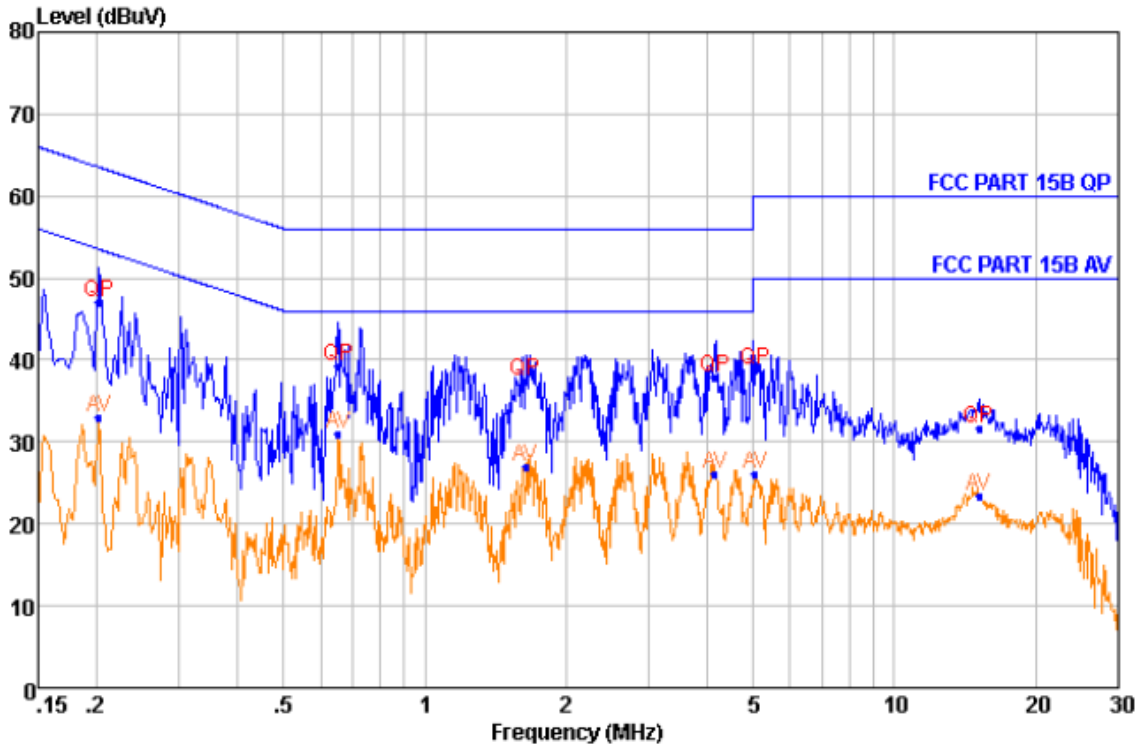
Quasi-peak and Average measurement

NO.	Freq MHz	Level dBuV	Remark	LISN Factor dB	Cable Loss dB	Limit Line dBuV	Over Limit dB
1	0.238	43.66	QP	9.51	0.41	62.17	-18.51
2	0.238	30.17	Average	9.51	0.41	52.17	-22.00
3	0.656	40.99	QP	9.28	0.45	56.00	-15.01
4	0.656	31.01	Average	9.28	0.45	46.00	-14.99
5	1.730	37.30	QP	9.31	0.49	56.00	-18.70
6	1.730	25.49	Average	9.31	0.49	46.00	-20.51
7	4.125	39.08	QP	9.30	0.52	56.00	-16.92
8	4.125	27.44	Average	9.30	0.52	46.00	-18.56
9	5.128	37.30	QP	9.29	0.53	60.00	-22.70
10	5.128	26.19	Average	9.29	0.53	50.00	-23.81
11	15.932	30.72	QP	9.44	0.58	60.00	-29.28
12	15.932	22.49	Average	9.44	0.58	50.00	-27.51

Neutral Line:

Peak Scan:

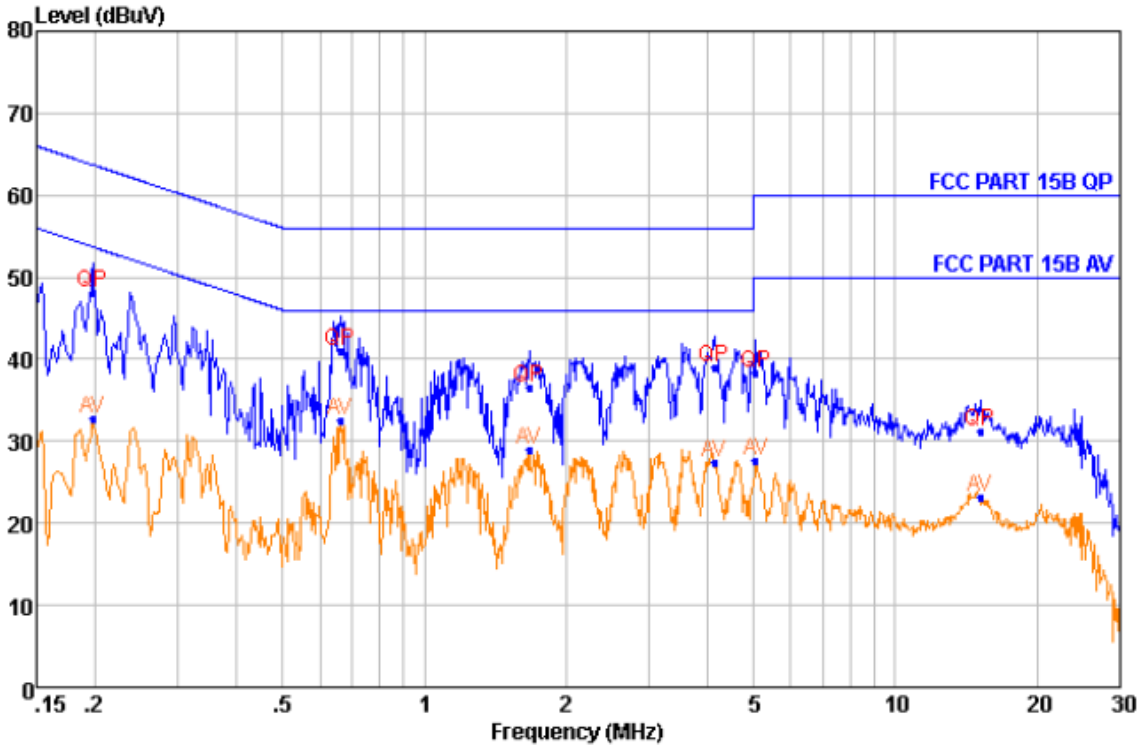
Level (dBµV)



Quasi-peak and Average measurement

NO.	Freq MHz	Level dBuV	Remark	LISN Factor dB	Cable Loss dB	Limit Line dBuV	Over Limit dB
1	0.202	47.13	QP	9.37	0.40	63.54	-16.41
2	0.202	32.90	Average	9.37	0.40	53.54	-20.64
3	0.653	39.24	QP	9.36	0.45	56.00	-16.76
4	0.653	30.95	Average	9.36	0.45	46.00	-15.05
5	1.641	37.44	QP	9.38	0.49	56.00	-18.56
6	1.641	26.90	Average	9.38	0.49	46.00	-19.10
7	4.148	37.81	QP	9.42	0.52	56.00	-18.19
8	4.148	26.16	Average	9.42	0.52	46.00	-19.84
9	5.050	38.88	QP	9.43	0.53	60.00	-21.12
10	5.050	26.03	Average	9.43	0.53	50.00	-23.97
11	15.115	31.75	QP	9.67	0.57	60.00	-28.25
12	15.115	23.41	Average	9.67	0.57	50.00	-26.59

Mode: HDMI in 3
Live Line:
Peak Scan:
Level (dBμV)



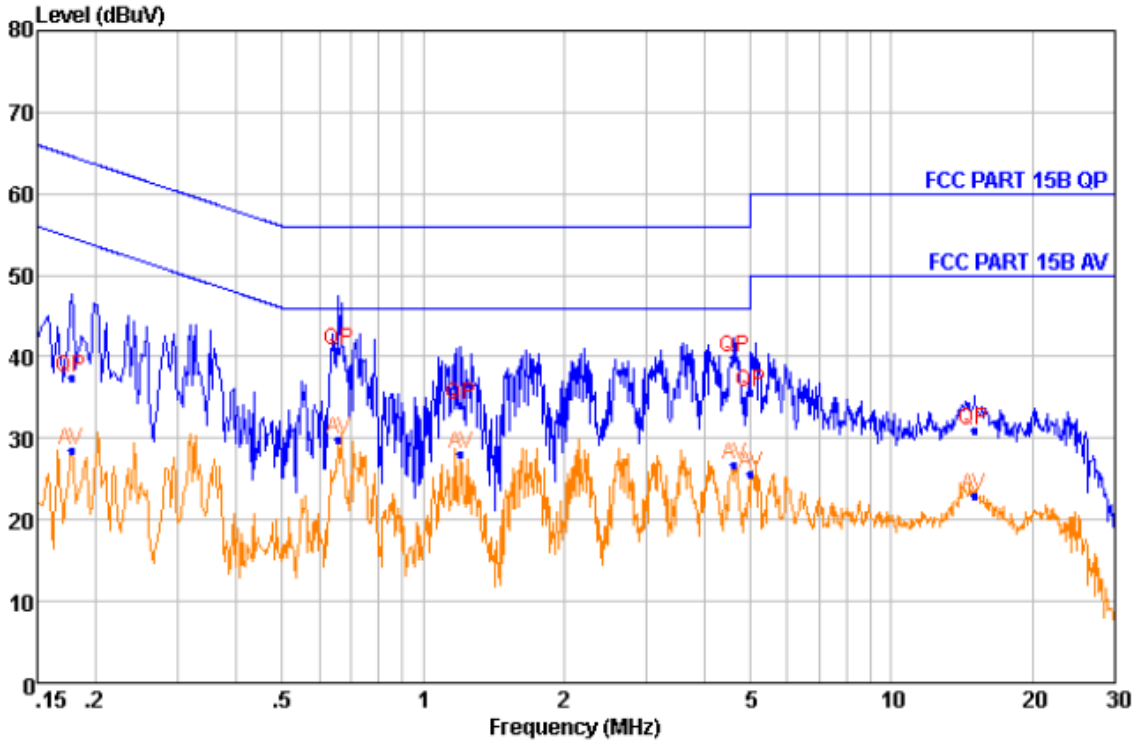
Quasi-peak and Average measurement

NO.	Freq MHz	Level dBuV	Remark	LISN Factor dB	Cable Loss dB	Limit Line dBuV	Over Limit dB
1	0.198	48.24	QP	9.54	0.40	63.71	-15.47
2	0.198	32.76	Average	9.54	0.40	53.71	-20.95
3	0.663	41.05	QP	9.28	0.45	56.00	-14.95
4	0.663	32.55	Average	9.28	0.45	46.00	-13.45
5	1.668	36.44	QP	9.31	0.49	56.00	-19.56
6	1.668	29.04	Average	9.31	0.49	46.00	-16.96
7	4.125	38.93	QP	9.30	0.52	56.00	-17.07
8	4.125	27.48	Average	9.30	0.52	46.00	-18.52
9	5.050	38.35	QP	9.29	0.53	60.00	-21.65
10	5.050	27.62	Average	9.29	0.53	50.00	-22.38
11	15.115	31.09	QP	9.37	0.57	60.00	-28.91
12	15.115	23.11	Average	9.37	0.57	50.00	-26.89

Neutral Line:

Peak Scan:

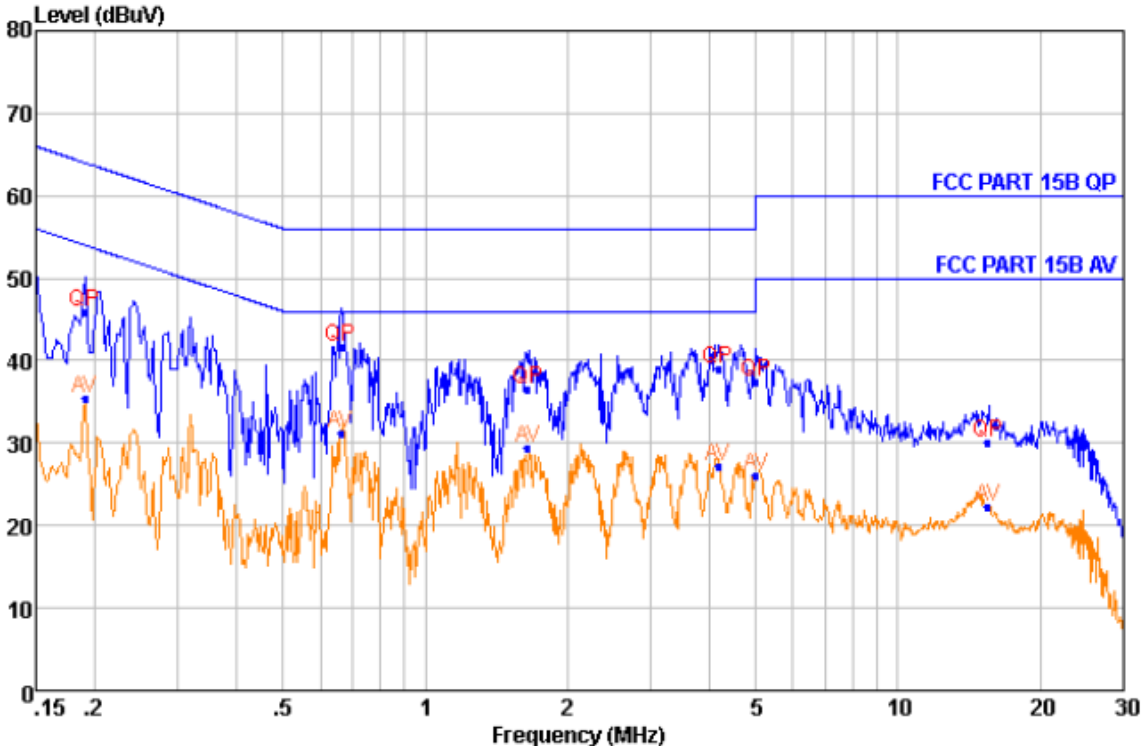
Level (dBμV)



Quasi-peak and Average measurement

NO.	Freq MHz	Level dBuV	Remark	LISN Factor dB	Cable Loss dB	Limit Line dBuV	Over Limit dB
1	0.178	37.41	QP	9.37	0.40	64.59	-27.18
2	0.178	28.52	Average	9.37	0.40	54.59	-26.07
3	0.660	40.78	QP	9.36	0.45	56.00	-15.22
4	0.660	29.95	Average	9.36	0.45	46.00	-16.05
5	1.201	34.04	QP	9.38	0.47	56.00	-21.96
6	1.201	28.14	Average	9.38	0.47	46.00	-17.86
7	4.613	39.78	QP	9.43	0.53	56.00	-16.22
8	4.613	26.82	Average	9.43	0.53	46.00	-19.18
9	5.000	35.57	QP	9.43	0.53	56.00	-20.43
10	5.000	25.58	Average	9.43	0.53	46.00	-20.42
11	15.031	30.94	QP	9.66	0.57	60.00	-29.06
12	15.031	23.05	Average	9.66	0.57	50.00	-26.95

Mode: HDMI in 4
Live Line:
Peak Scan:
Level (dBμV)



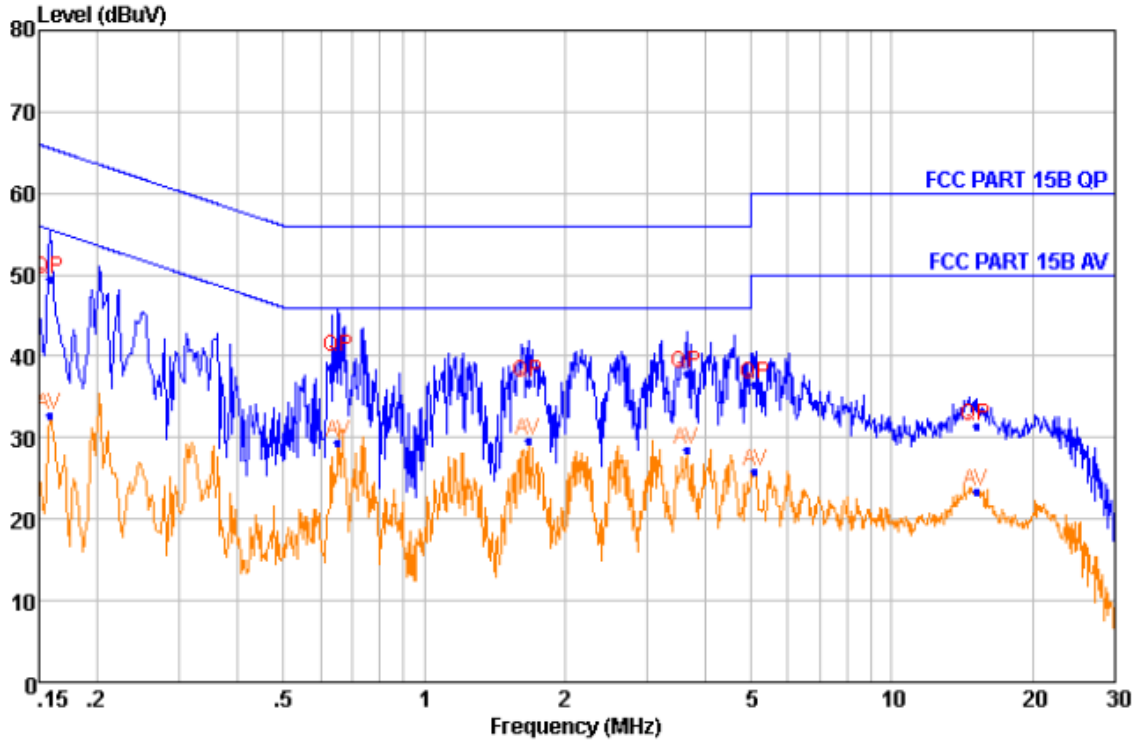
Quasi-peak and Average measurement

NO.	Freq MHz	Level dBuV	Remark	LISN Factor dB	Cable Loss dB	Limit Line dBuV	Over Limit dB
1	0.190	45.81	QP	9.52	0.40	64.02	-18.21
2	0.190	35.46	Average	9.52	0.40	54.02	-18.56
3	0.663	41.60	QP	9.28	0.45	56.00	-14.40
4	0.663	31.21	Average	9.28	0.45	46.00	-14.79
5	1.650	36.44	QP	9.31	0.49	56.00	-19.56
6	1.650	29.37	Average	9.31	0.49	46.00	-16.63
7	4.170	39.01	QP	9.30	0.52	56.00	-16.99
8	4.170	27.21	Average	9.30	0.52	46.00	-18.79
9	5.000	37.54	QP	9.29	0.53	56.00	-18.46
10	5.000	26.00	Average	9.29	0.53	46.00	-20.00
11	15.518	30.19	QP	9.41	0.57	60.00	-29.81
12	15.518	22.30	Average	9.41	0.57	50.00	-27.70

Neutral Line:

Peak Scan:

Level (dBμV)



Quasi-peak and Average measurement

NO.	Freq MHz	Level dBuV	Remark	LISN Factor dB	Cable Loss dB	Limit Line dBuV	Over Limit dB
1	0.158	49.49	QP	9.38	0.39	65.56	-16.07
2	0.158	32.66	Average	9.38	0.39	55.56	-22.90
3	0.653	39.90	QP	9.36	0.45	56.00	-16.10
4	0.653	29.45	Average	9.36	0.45	46.00	-16.55
5	1.668	36.82	QP	9.38	0.49	56.00	-19.18
6	1.668	29.72	Average	9.38	0.49	46.00	-16.28
7	3.635	37.83	QP	9.42	0.52	56.00	-18.17
8	3.635	28.51	Average	9.42	0.52	46.00	-17.49
9	5.100	36.44	QP	9.43	0.53	60.00	-23.56
10	5.100	25.87	Average	9.43	0.53	50.00	-24.13
11	15.115	31.49	QP	9.67	0.57	60.00	-28.51
12	15.115	23.50	Average	9.67	0.57	50.00	-26.50

2.2 Radiated Emissions, 30MHz to 1GHz

Test Requirement:	FCC part 15.109/ ICES-003
Test Method:	ANSI C63.4:2009/ ICES-003
Test Voltage:	120V AC, 60Hz
Test Date:	2015-12-01
Frequency Range:	30MHz to 1GHz
Measurement Distance	3m
Detector:	Peak for pre-scan
	Quasi-Peak if maximised peak within 6dB of limit (120 kHz resolution bandwidth)
Uncertainty:	2Uc（V）= 3.35dB
Class / Limit:	Class B

Frequency range MHz	**Quasi-peak limits** dB (μV/m)
30 to 88	40
88 to 216	43.5
216 to 960	46
960 to 1000	54
At transitional frequencies the lower limit applies	

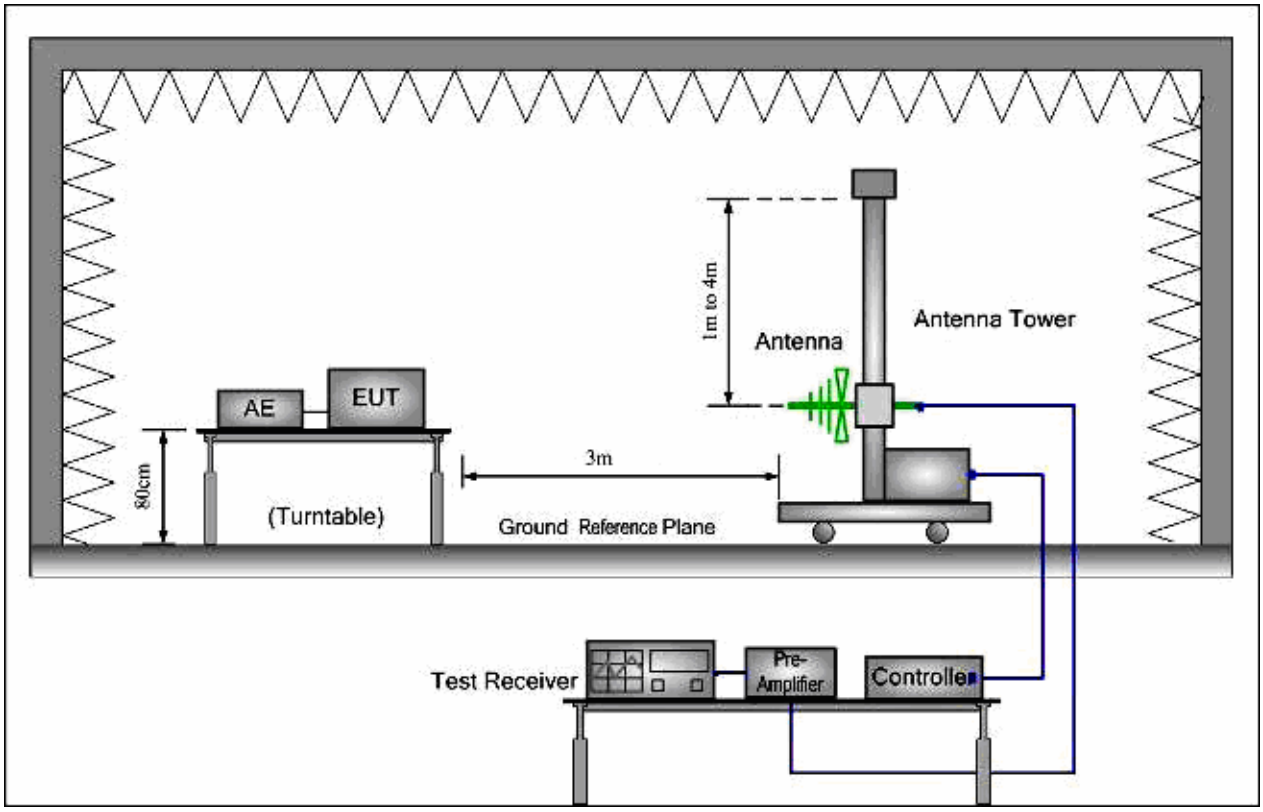
2.2.1 E.U.T. Operation

Operating Environment:

Temperature: 24.0 °C Humidity: 50 % RH Atmospheric Pressure: 101 kPa

EUT Operation: Exchange music data with PC, test the EUT in HDMI in 1 mode, HDMI in 2 mode, HDMI in 3 mode and HDMI in 4mode.

2.2.2 Test Setup and Procedure



1. The radiated emissions test was conducted in a semi-anechoic chamber.
2. Biconical and log periodic antenna was used for the frequency range from 30MHz to 1GHz
3. The EUT was connected to nominal power supply through a mains power outlet which was bonded to the ground reference plane; The mains cables were draped to the ground reference plane. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
4. Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emissions spectrum plots of the EUT.
5. The frequencies of maximum emission were determined in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.

2.2.3 Measurement Data

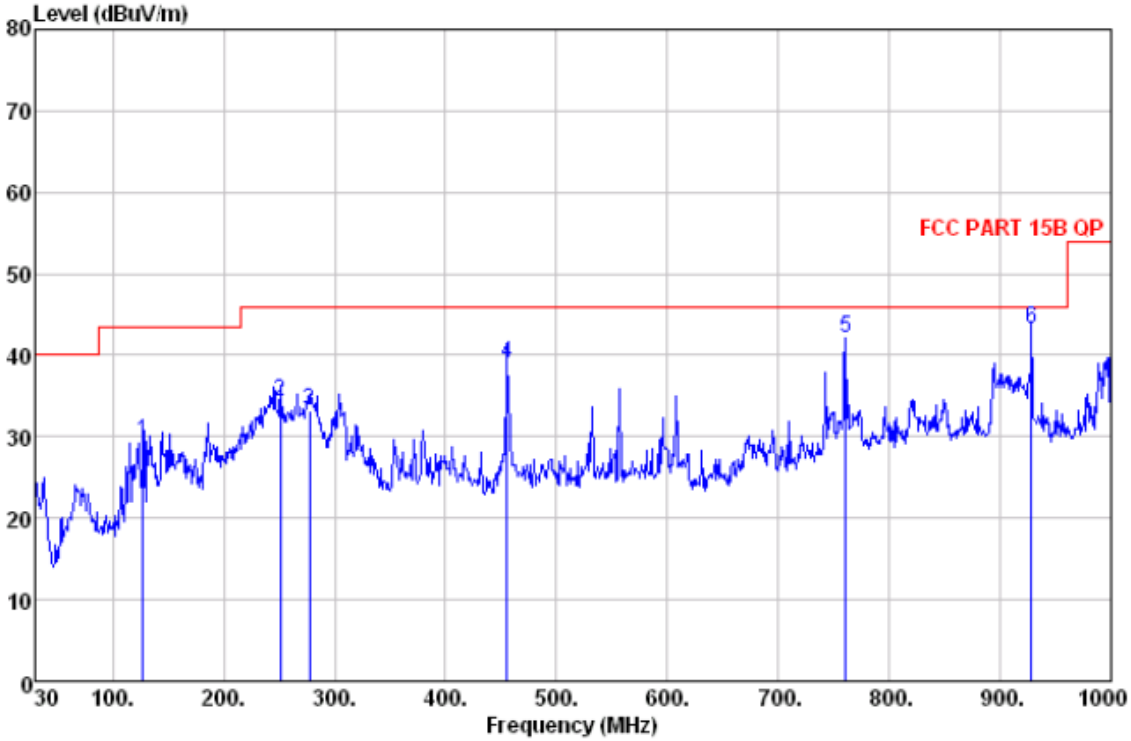
Model: RP-HUB1

Mode: HDMI in 1

Horizontal:

Peak scan

Level (dBμV/m)



Quasi-peak measurement

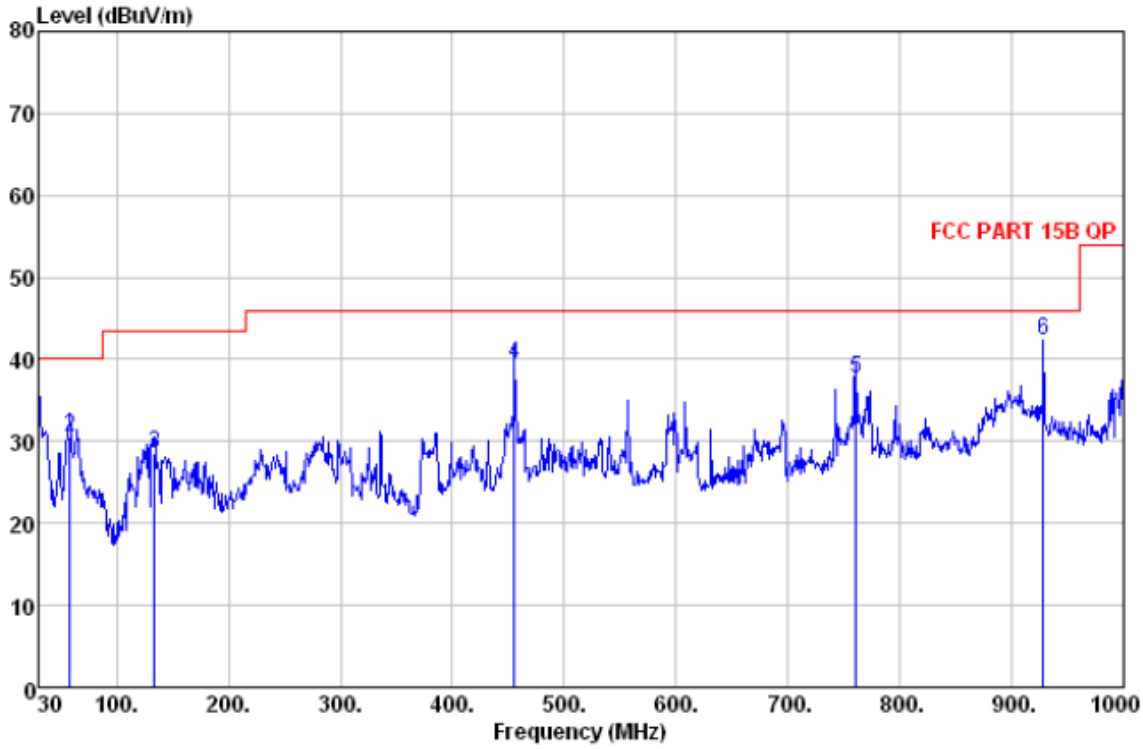
No.	Freq	Level	Remark	Antenna Factor	Cable Loss	Limit Line	Margin	A/pos	T/pos
	MHz	dBuV/m		dB/m	dB	dBuV/m	dB	cm	deg
1	127.000	29.50	QP	7.58	1.34	43.50	-14.00	100	124
2	251.160	34.24	QP	11.85	1.93	46.00	-11.76	100	245
3	277.350	33.21	QP	12.79	2.03	46.00	-12.79	100	163
4	455.830	38.92	QP	17.09	2.64	46.00	-7.08	200	333
5	760.410	42.20	QP	22.00	3.47	46.00	-3.80	200	241
6	928.220	43.14	QP	24.05	3.86	46.00	-2.86	200	245

Level=Read Level + Antenna Factor + Cable Loss

Vertical:

Peak scan

Level (dBμV/m)

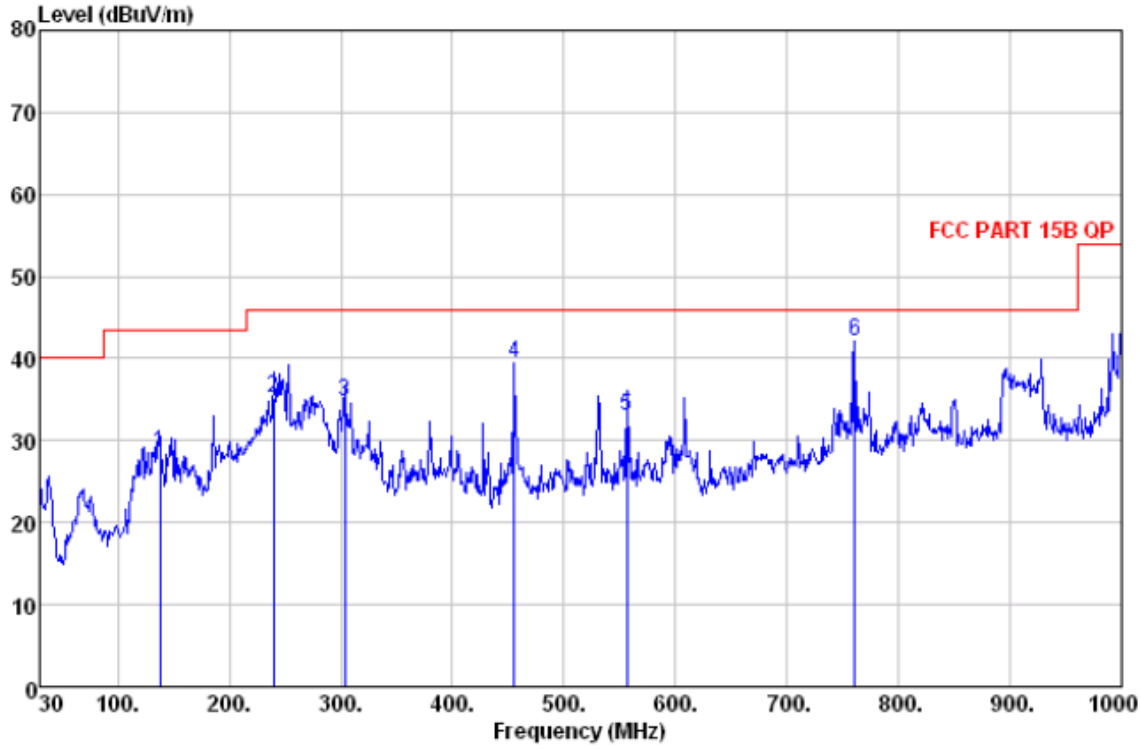


Quasi-peak measurement

No.	Freq	Level	Remark	Antenna Factor	Cable Loss	Limit Line	Margin	A/pos	T/pos
	MHz	dBuV/m		dB/m	dB	dBuV/m	dB	cm	deg
1	30.000	33.87	QP	17.90	0.63	40.00	-6.13	100	223
2	58.130	30.50	QP	6.98	0.88	40.00	-9.50	100	142
3	133.790	28.57	QP	7.40	1.38	43.50	-14.93	100	183
4	455.830	39.34	QP	17.09	2.64	46.00	-6.66	200	254
5	760.410	37.56	QP	22.00	3.47	46.00	-8.44	200	253
6	928.220	42.25	QP	24.05	3.86	46.00	-3.75	200	274

Level=Read Level + Antenna Factor + Cable Loss

Mode: HDMI in 2
Horizontal:
Peak scan
Level (dBμV/m)



Quasi-peak measurement

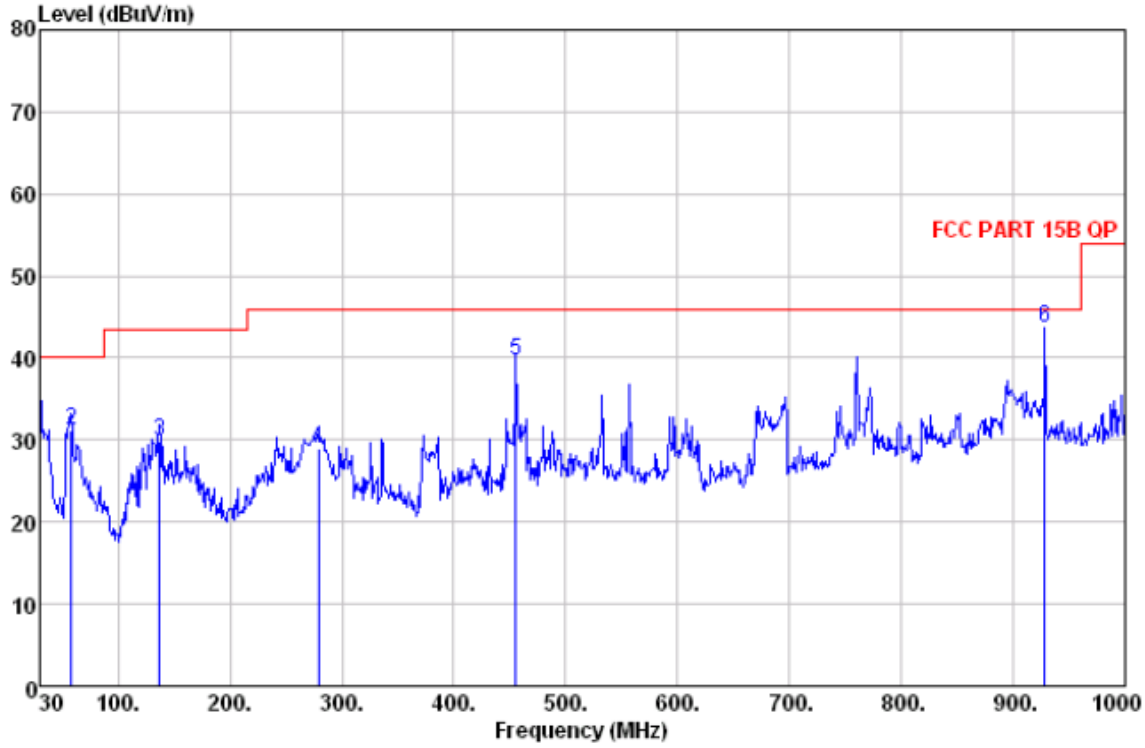
No.	Freq	Level	Remark	Antenna Factor	Cable Loss	Limit Line	Margin	A/pos	T/pos
	MHz	dBuV/m		dB/m	dB	dBuV/m	dB	cm	deg
1	137.670	28.43	QP	7.40	1.40	43.50	-15.07	100	221
2	239.520	35.26	QP	10.90	1.88	46.00	-10.74	100	153
3	303.540	34.67	QP	13.73	2.14	46.00	-11.33	100	286
4	455.830	39.51	QP	17.09	2.64	46.00	-6.49	200	235
5	556.710	32.99	QP	19.46	2.94	46.00	-13.01	200	153
6	760.410	42.15	QP	22.00	3.47	46.00	-3.85	200	256

Level=Read Level + Antenna Factor + Cable Loss

Vertical:

Peak scan

Level (dBµV/m)

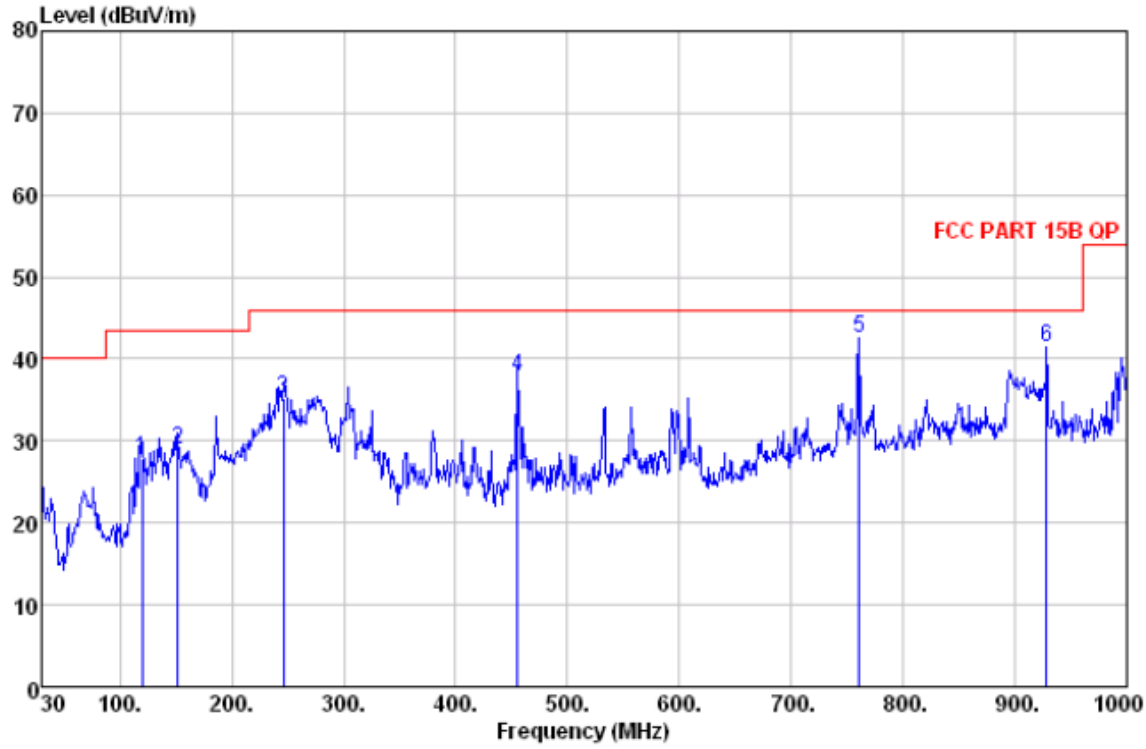


Quasi-peak measurement

No.	Freq	Level	Remark	Antenna Factor	Cable Loss	Limit Line	Margin	A/pos	T/pos
	MHz	dBuV/m		dB/m	dB	dBuV/m	dB	cm	deg
1	30.000	34.68	QP	17.90	0.63	40.00	-5.32	100	253
2	58.130	31.23	QP	6.98	0.88	40.00	-8.77	100	253
3	136.700	29.93	QP	7.40	1.39	43.50	-13.57	100	21
4	279.290	29.02	QP	12.94	2.04	46.00	-16.98	200	331
5	455.830	39.66	QP	17.09	2.64	46.00	-6.34	200	235
6	928.220	43.77	QP	24.05	3.86	46.00	-2.23	200	245

Level=Read Level + Antenna Factor + Cable Loss

Mode: HDMI in 3
Horizontal:
Peak scan
Level (dBμV/m)



Quasi-peak measurement

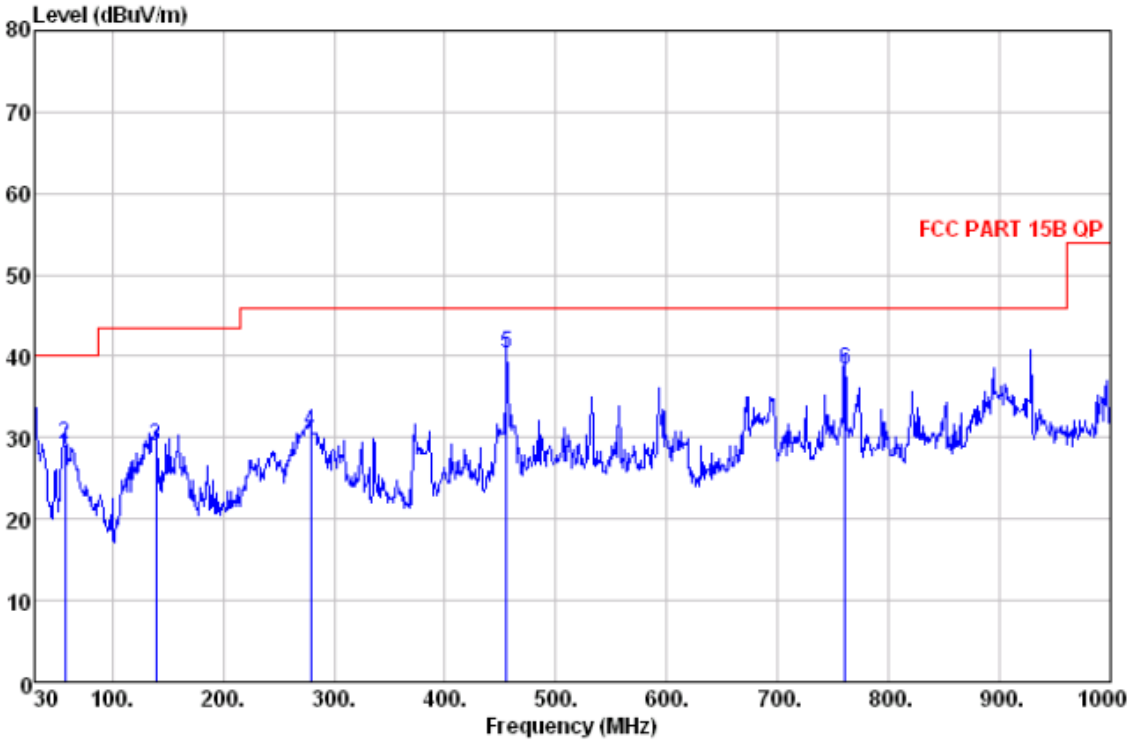
No.	Freq	Level	Remark	Antenna Factor	Cable Loss	Limit Line	Margin	A/pos	T/pos
	MHz	dBuV/m		dB/m	dB	dBuV/m	dB	cm	deg
1	120.210	27.93	QP	7.70	1.30	43.50	-15.57	100	223
2	152.220	28.95	QP	7.32	1.47	43.50	-14.55	100	245
3	246.310	35.20	QP	11.36	1.91	46.00	-10.80	100	112
4	455.830	37.96	QP	17.09	2.64	46.00	-8.04	200	231
5	760.410	42.50	QP	22.00	3.47	46.00	-3.50	200	175
6	928.220	41.46	QP	24.05	3.86	46.00	-4.54	200	286

Level=Read Level + Antenna Factor + Cable Loss

Vertical:

Peak scan

Level (dBμV/m)

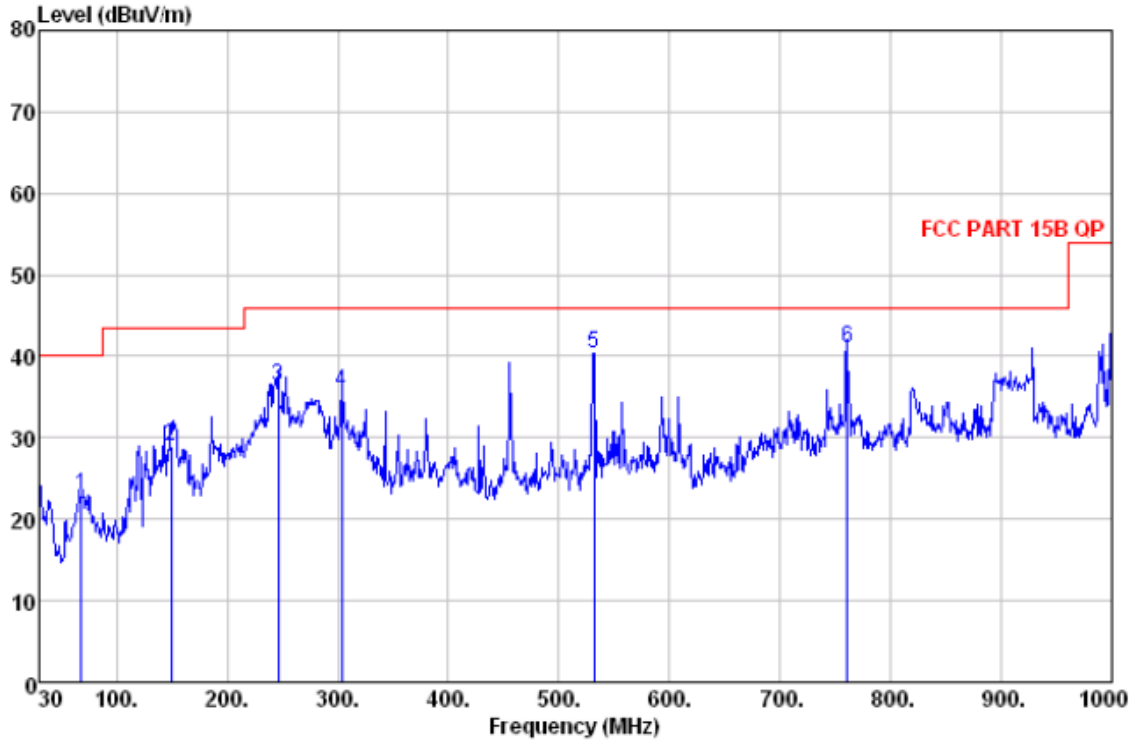


Quasi-peak measurement

No.	Freq	Level	Remark	Antenna Factor	Cable Loss	Limit Line	Margin	A/pos	T/pos
	MHz	dBuV/m		dB/m	dB	dBuV/m	dB	cm	deg
1	30.000	33.04	QP	17.90	0.63	40.00	-6.96	100	212
2	57.160	29.21	QP	7.12	0.87	40.00	-10.79	100	235
3	139.610	29.02	QP	7.40	1.41	43.50	-14.48	100	223
4	279.290	30.75	QP	12.94	2.04	46.00	-15.25	200	223
5	455.830	40.26	QP	17.09	2.64	46.00	-5.74	200	286
6	760.410	38.37	QP	22.00	3.47	46.00	-7.63	200	332

Level=Read Level + Antenna Factor + Cable Loss

Mode: HDMI in 4
Horizontal:
Peak scan
Level (dBμV/m)



Quasi-peak measurement

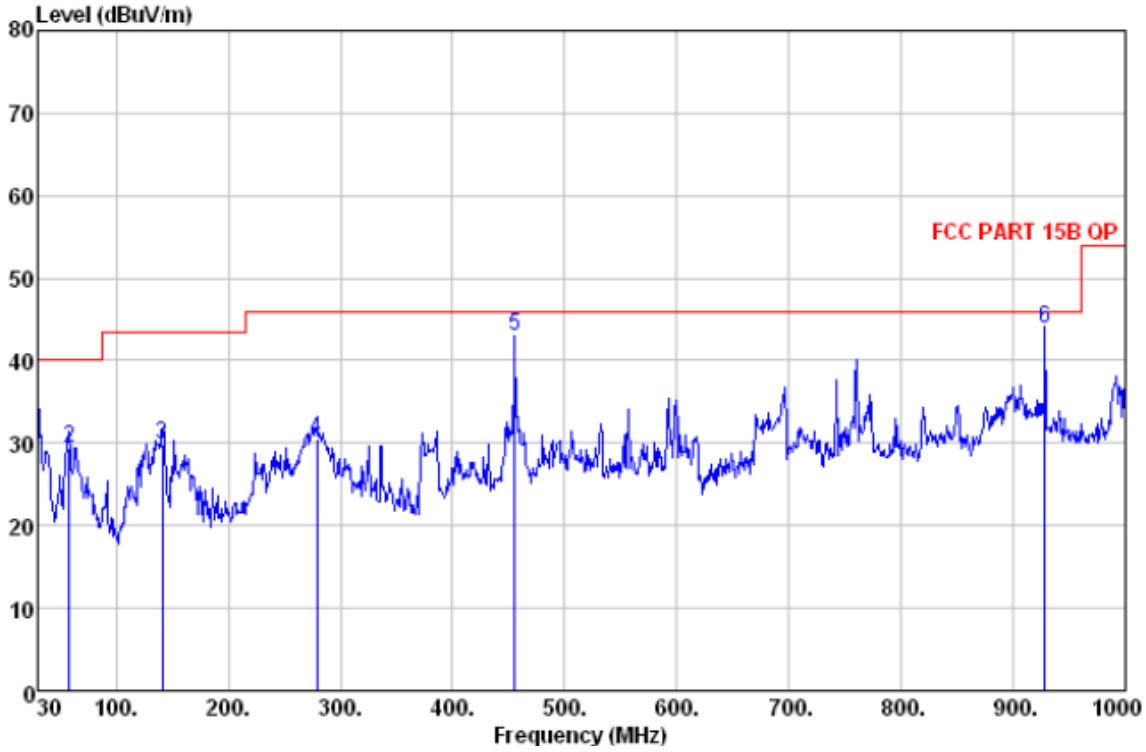
No.	Freq	Level	Remark	Antenna Factor	Cable Loss	Limit Line	Margin	A/pos	T/pos
	MHz	dBuV/m		dB/m	dB	dBuV/m	dB	cm	deg
1	67.830	22.93	QP	6.96	0.96	40.00	-17.07	100	223
2	149.310	28.95	QP	7.14	1.46	43.50	-14.55	100	34
3	246.310	36.41	QP	11.36	1.91	46.00	-9.59	100	253
4	303.540	35.66	QP	13.73	2.14	46.00	-10.34	200	314
5	531.490	40.43	QP	19.55	2.86	46.00	-5.57	200	275
6	760.410	41.02	QP	22.00	3.47	46.00	-4.98	200	176

Level=Read Level + Antenna Factor + Cable Loss

Vertical:

Peak scan

Level (dBµV/m)



Quasi-peak measurement

No.	Freq	Level	Remark	Antenna Factor	Cable Loss	Limit Line	Margin	A/pos	T/pos
	MHz	dBuV/m		dB/m	dB	dBuV/m	dB	cm	deg
1	30.000	33.35	QP	17.90	0.63	40.00	-6.65	100	223
2	58.130	29.42	QP	6.98	0.88	40.00	-10.58	100	253
3	141.550	29.78	QP	7.40	1.42	43.50	-13.72	100	223
4	279.290	30.53	QP	12.94	2.04	46.00	-15.47	200	175
5	455.830	42.94	QP	17.09	2.64	46.00	-3.06	200	276
6	928.220	43.84	QP	24.05	3.86	46.00	-2.16	100	233

Level=Read Level + Antenna Factor + Cable Loss

2.3 Radiated Emissions above 1 GHz

Test Requirement:	FCC part 15.109 / ICES-003
Test Method:	ANSI C63.4:2009 / ICES-003
Test Voltage:	120V AC, 60Hz
Test Date:	2015-12-02
Frequency Range:	1GHz to 18GHz
Measurement Distance	3m
Detector:	Peak for pre-scan
	Quasi-Peak if maximised peak within 6dB of limit (120 kHz resolution bandwidth)
Uncertainty:	2Uc（V）= 3.37dB
Class / Limit:	Class B

Frequency range GHz	**Peak limits** dB (μV/m)	**AV limits** dB (μV/m)
1 to 18	74	54

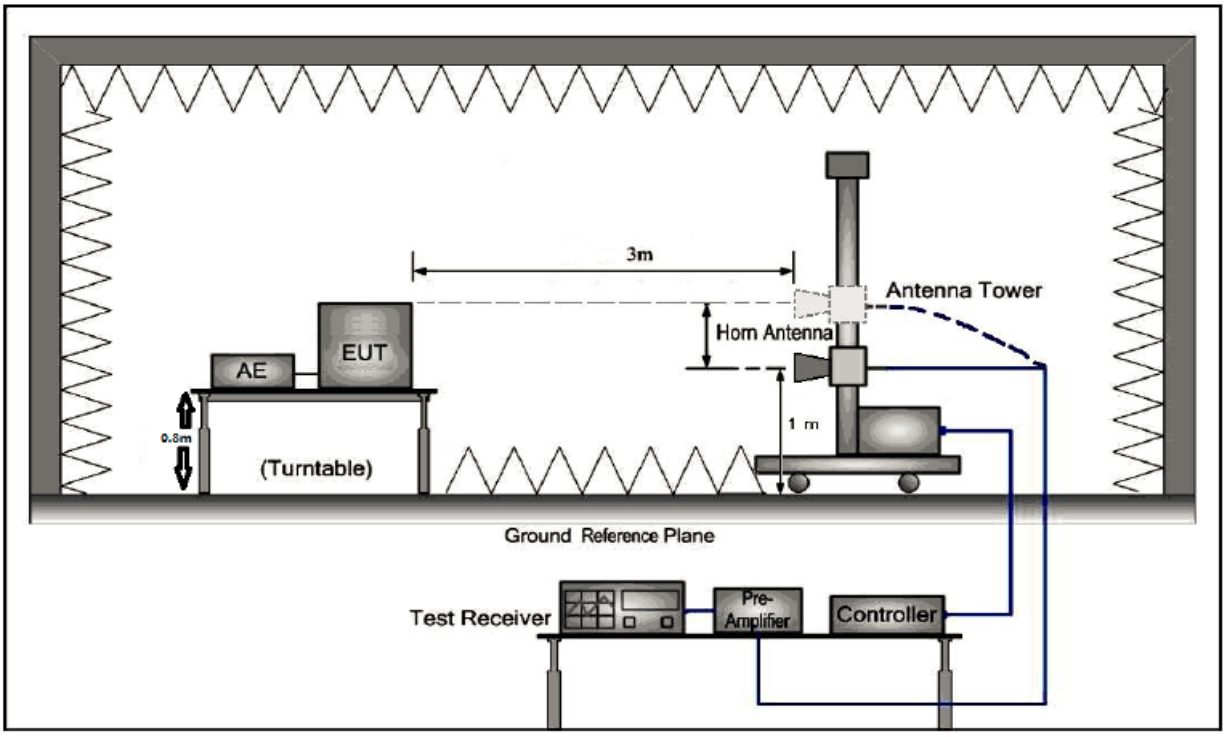
2.3.1 E.U.T. Operation

Operating Environment:

Temperature: 24°C Humidity: 52 % RH Atmospheric Pressure: 101 kPa

EUT Operation: Exchange music data with PC, test the EUT in HDMI in 1 mode, HDMI in 2 mode, HDMI in 3 mode and HDMI in 4mode.

2.3.2Test Setup and Procedure



1. The radiated emissions test was conducted in a fully-anechoic chamber.
2. Horn antenna was used for the frequency above 1GHz
3. The EUT was connected to nominal power supply through a mains power outlet which was bonded to the ground reference plane; The mains cables were draped to the ground reference plane. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
4. Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emission spectrum plots of the EUT.
5. The frequencies of maximum emission were determined in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.

For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

2.3.3 Measurement Data

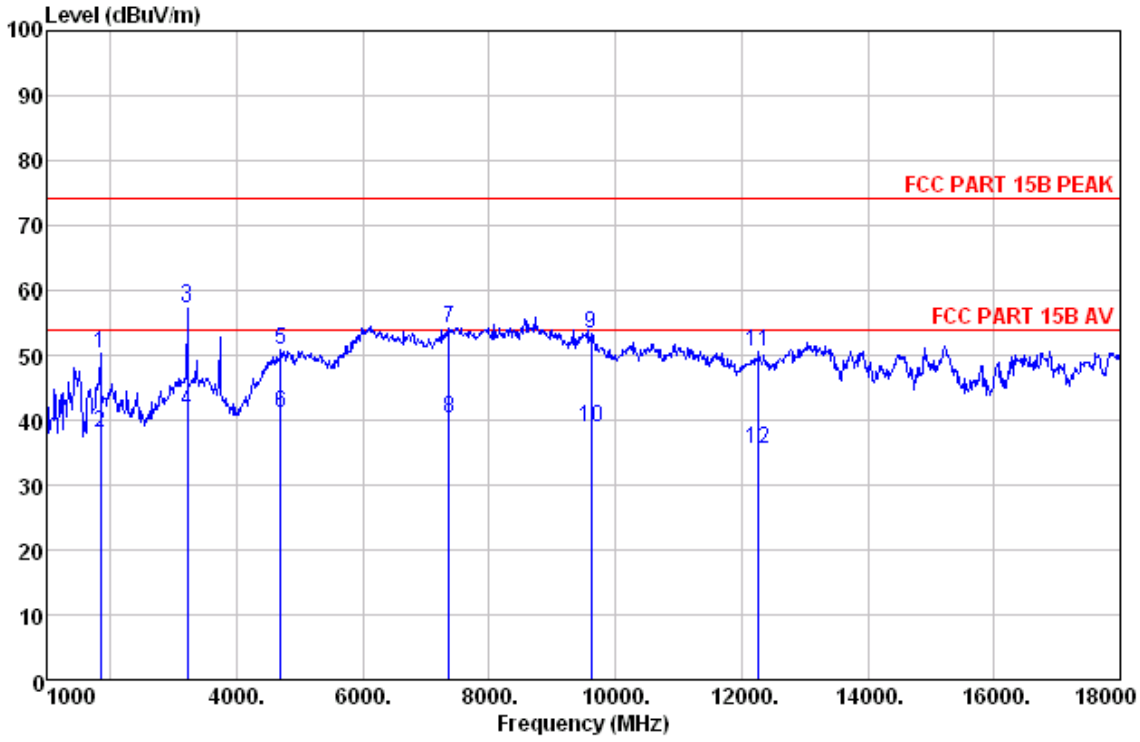
Model: RP-HUB1

Mode: HDMI in 1

Horizontal:

Peak scan

Level (dBμV/m)



Quasi-peak measurement

No.	Freq	Level	Remark	Antenna Factor	Cable Loss	Limit Line	Margin	A/pos	T/pos
	MHz	dBuV/m		dB/m	dB	dBuV/m	dB	cm	deg
1	1850.000	50.35	Peak	28.05	5.59	74.00	-23.65	100	57
2	1850.000	38.27	Average	28.05	5.59	54.00	-15.73	100	57
3	3210.000	57.52	Peak	31.52	7.61	74.00	-16.48	100	125
4	3210.000	41.41	Average	31.52	7.61	54.00	-12.59	100	125
5	4689.000	51.02	Peak	34.19	9.45	74.00	-22.98	100	235
6	4689.000	41.11	Average	34.19	9.45	54.00	-12.89	100	235
7	7358.000	54.45	Peak	35.28	12.28	74.00	-19.55	203	110
8	7358.000	40.47	Average	35.28	12.28	54.00	-13.53	203	110
9	9619.000	53.61	Peak	37.76	14.41	74.00	-20.39	203	256
10	9619.000	38.87	Average	37.76	14.41	54.00	-15.13	203	256
11	12254.000	50.59	Peak	38.37	16.57	74.00	-23.41	203	203
12	12254.000	35.59	Average	38.37	16.57	54.00	-18.41	203	203

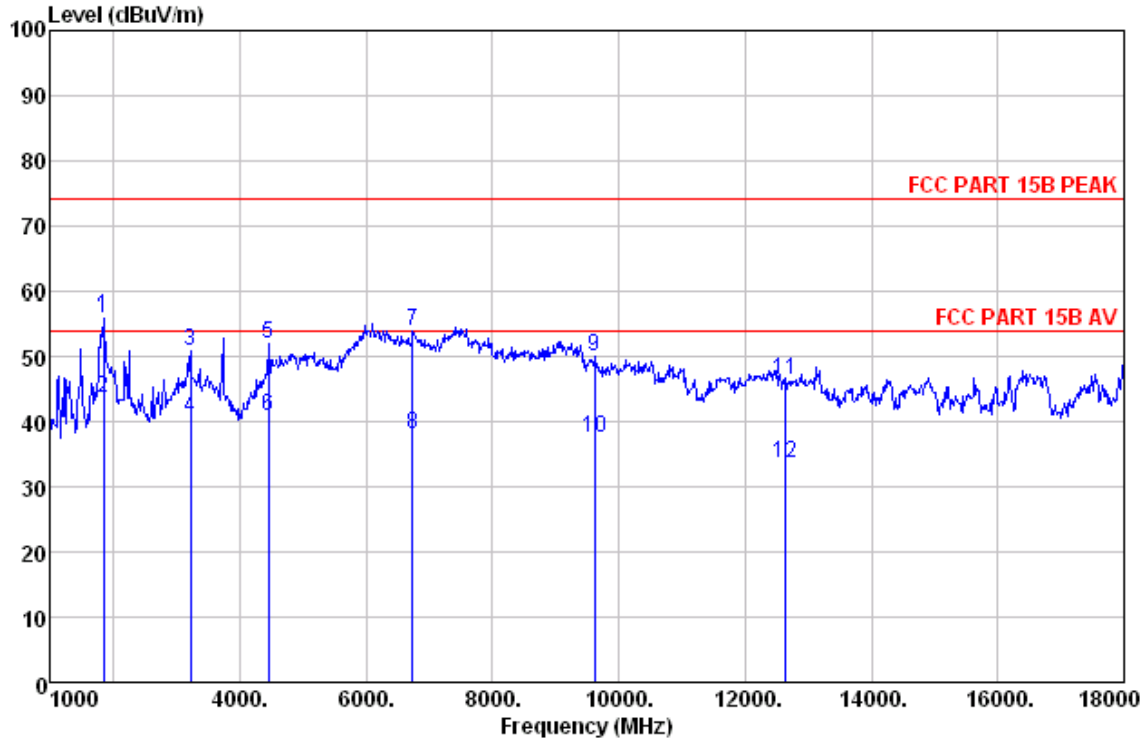
Level=Read Level + Antenna Factor + Cable Loss

Note: The frequencies on which the transmitter part of the EUT is intended to operate shall be excluded from radiated emission measurements

Vertical:

Peak scan

Level (dBμV/m)



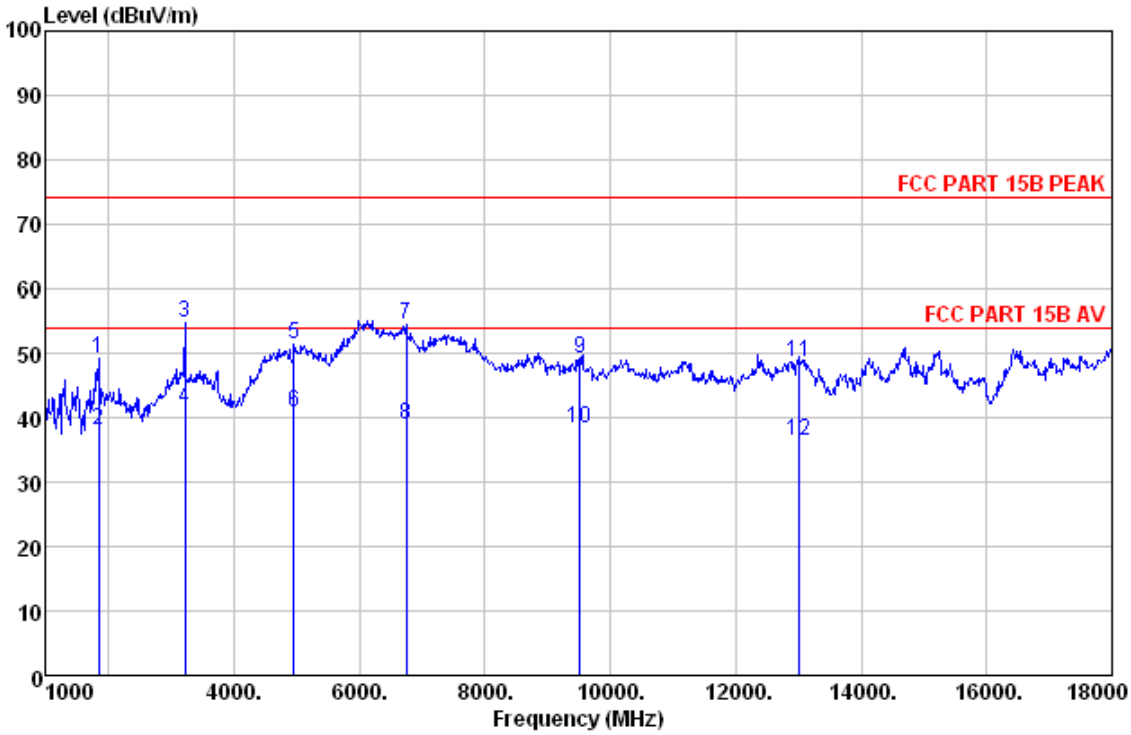
Quasi-peak measurement

No.	Freq	Level	Remark	Antenna Factor	Cable Loss	Limit Line	Margin	A/pos	T/pos
	MHz	dBuV/m		dB/m	dB	dBuV/m	dB	cm	deg
1	1850.000	56.03	Peak	28.05	5.59	74.00	-17.97	100	193
2	1850.000	43.67	Average	28.05	5.59	54.00	-10.33	100	193
3	3210.000	50.92	Peak	31.52	7.61	74.00	-23.08	100	253
4	3210.000	40.62	Average	31.52	7.61	54.00	-13.38	100	253
5	4451.000	52.08	Peak	33.36	9.17	74.00	-21.92	100	144
6	4451.000	40.95	Average	33.36	9.17	54.00	-13.05	100	144
7	6729.000	54.10	Peak	34.35	11.65	74.00	-19.90	100	336
8	6729.000	38.18	Average	34.35	11.65	54.00	-15.82	100	336
9	9619.000	50.03	Peak	37.76	14.41	74.00	-23.97	200	152
10	9619.000	37.58	Average	37.76	14.41	54.00	-16.42	200	152
11	12611.000	46.46	Peak	39.94	16.87	74.00	-27.54	200	302
12	12611.000	33.73	Average	39.94	16.87	54.00	-20.27	200	302

Level=Read Level + Antenna Factor + Cable Loss

Note: The frequencies on which the transmitter part of the EUT is intended to operate shall be excluded from radiated emission measurements

Mode: HDMI in 2
Horizontal:
Peak scan
Level (dBμV/m)



Quasi-peak measurement

No.	Freq	Level	Remark	Antenna Factor	Cable Loss	Limit Line	Margin	A/pos	T/pos
	MHz	dBuV/m		dB/m	dB	dBuV/m	dB	cm	deg
1	1850.000	49.17	Peak	28.05	5.59	74.00	-24.83	100	256
2	1850.000	38.26	Average	28.05	5.59	54.00	-15.74	100	256
3	3210.000	54.89	Peak	31.52	7.61	74.00	-19.11	100	286
4	3210.000	41.63	Average	31.52	7.61	54.00	-12.37	100	286
5	4944.000	51.39	Peak	34.44	9.74	74.00	-22.61	100	179
6	4944.000	40.91	Average	34.44	9.74	54.00	-13.09	100	179
7	6746.000	54.53	Peak	34.31	11.67	74.00	-19.47	203	330
8	6746.000	39.04	Average	34.31	11.67	54.00	-14.96	203	330
9	9517.000	49.44	Peak	37.97	14.35	74.00	-24.56	203	325
10	9517.000	38.34	Average	37.97	14.35	54.00	-15.66	203	325
11	12985.000	48.64	Peak	42.11	17.17	74.00	-25.36	203	285
12	12985.000	36.45	Average	42.11	17.17	54.00	-17.55	203	285

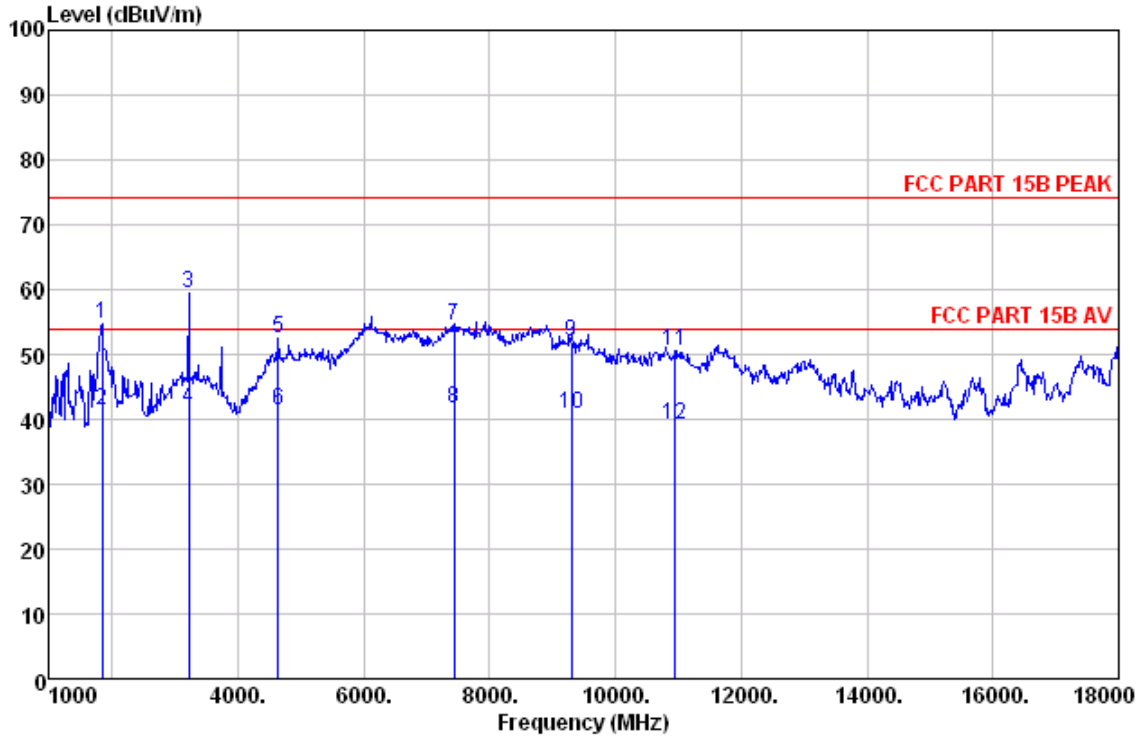
Level=Read Level + Antenna Factor + Cable Loss

Note: The frequencies on which the transmitter part of the EUT is intended to operate shall be excluded from radiated emission measurements

Vertical:

Peak scan

Level (dBμV/m)



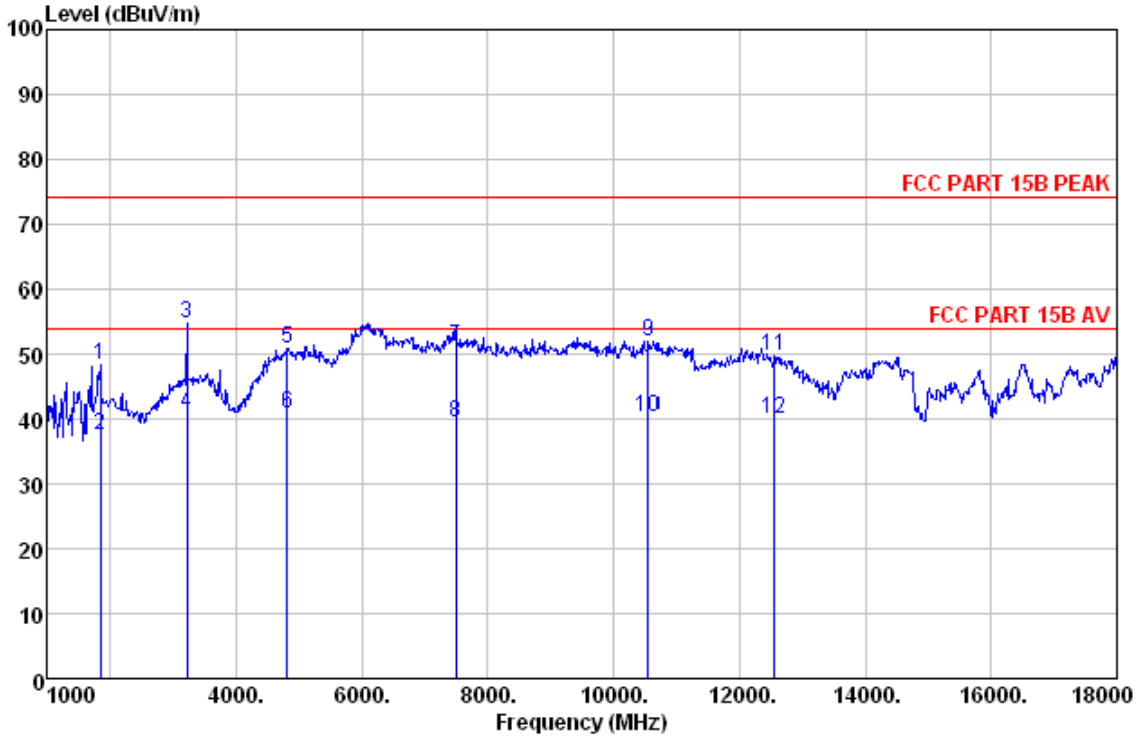
Quasi-peak measurement

No.	Freq	Level	Remark	Antenna Factor	Cable Loss	Limit Line	Margin	A/pos	T/pos
	MHz	dBuV/m		dB/m	dB	dBuV/m	dB	cm	deg
1	1850.000	54.79	Peak	28.05	5.59	74.00	-19.21	100	124
2	1850.000	41.56	Average	28.05	5.59	54.00	-12.44	100	124
3	3210.000	59.24	Peak	31.52	7.61	74.00	-14.76	100	253
4	3210.000	41.81	Average	31.52	7.61	54.00	-12.19	100	253
5	4638.000	52.61	Peak	34.14	9.39	74.00	-21.39	100	175
6	4638.000	41.39	Average	34.14	9.39	54.00	-12.61	100	175
7	7443.000	54.61	Peak	35.65	12.36	74.00	-19.39	200	286
8	7443.000	41.88	Average	35.65	12.36	54.00	-12.12	200	286
9	9313.000	52.00	Peak	37.66	14.17	74.00	-22.00	200	356
10	9313.000	40.95	Average	37.66	14.17	54.00	-13.05	200	356
11	10928.000	50.70	Peak	38.51	15.51	74.00	-23.30	200	286
12	10928.000	39.32	Average	38.51	15.51	54.00	-14.68	200	286

Level=Read Level + Antenna Factor + Cable Loss

Note: The frequencies on which the transmitter part of the EUT is intended to operate shall be excluded from radiated emission measurements

Mode: HDMI in 3
Horizontal:
Peak scan
Level (dBμV/m)



Quasi-peak measurement

No.	Freq	Level	Remark	Antenna Factor	Cable Loss	Limit Line	Margin	A/pos	T/pos
	MHz	dBuV/m		dB/m	dB	dBuV/m	dB	cm	deg
1	1850.000	48.59	Peak	28.05	5.59	74.00	-25.41	100	186
2	1850.000	37.65	Average	28.05	5.59	54.00	-16.35	100	186
3	3210.000	54.81	Peak	31.52	7.61	74.00	-19.19	100	125
4	3210.000	40.82	Average	31.52	7.61	54.00	-13.18	100	125
5	4808.000	51.05	Peak	34.31	9.58	74.00	-22.95	100	223
6	4808.000	40.90	Average	34.31	9.58	54.00	-13.10	100	223
7	7494.000	51.19	Peak	35.87	12.41	74.00	-22.81	202	103
8	7494.000	39.59	Average	35.87	12.41	54.00	-14.41	202	103
9	10554.000	52.15	Peak	38.06	15.13	74.00	-21.85	202	223
10	10554.000	40.28	Average	38.06	15.13	54.00	-13.72	202	223
11	12543.000	49.93	Peak	39.55	16.81	74.00	-24.07	202	186
12	12543.000	40.03	Average	39.55	16.81	54.00	-13.97	202	186

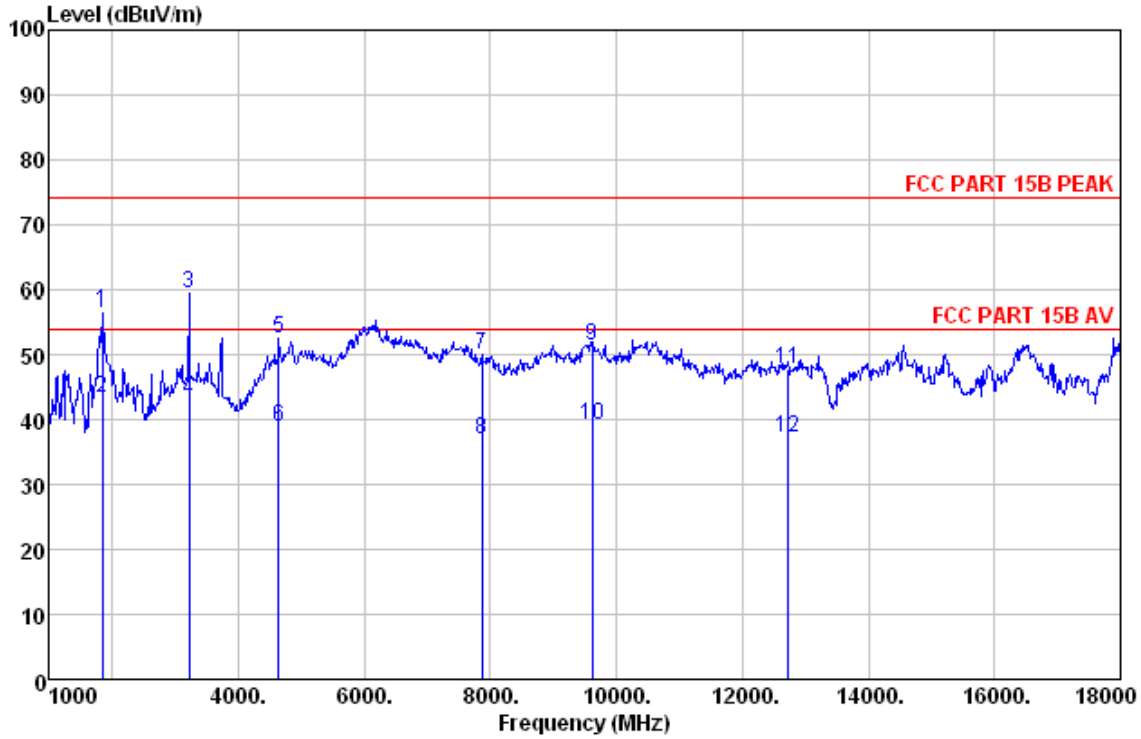
Level=Read Level + Antenna Factor + Cable Loss

Note: The frequencies on which the transmitter part of the EUT is intended to operate shall be excluded from radiated emission measurements

Vertical:

Peak scan

Level (dBμV/m)



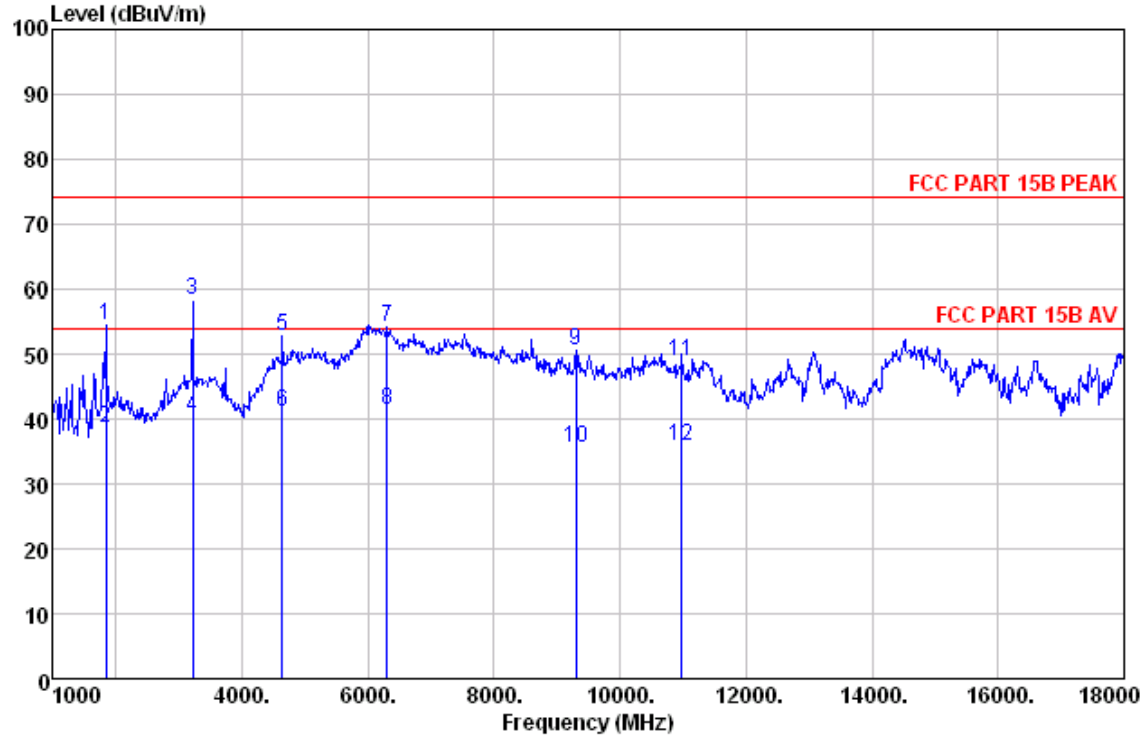
Quasi-peak measurement

No.	Freq	Level	Remark	Antenna Factor	Cable Loss	Limit Line	Margin	A/pos	T/pos
	MHz	dBuV/m		dB/m	dB	dBuV/m	dB	cm	deg
1	1850.000	56.65	Peak	28.05	5.59	74.00	-17.35	100	125
2	1850.000	43.53	Average	28.05	5.59	54.00	-10.47	100	125
3	3210.000	59.26	Peak	31.52	7.61	74.00	-14.74	100	175
4	3210.000	43.04	Average	31.52	7.61	54.00	-10.96	100	175
5	4638.000	52.73	Peak	34.14	9.39	74.00	-21.27	100	312
6	4638.000	39.12	Average	34.14	9.39	54.00	-14.88	100	312
7	7868.000	50.07	Peak	35.83	12.78	74.00	-23.93	200	153
8	7868.000	37.06	Average	35.83	12.78	54.00	-16.94	200	153
9	9619.000	51.54	Peak	37.76	14.41	74.00	-22.46	200	312
10	9636.000	39.19	Average	37.73	14.42	54.00	-14.81	200	312
11	12713.000	47.94	Peak	40.54	16.95	74.00	-26.06	200	222
12	12713.000	37.26	Average	40.54	16.95	54.00	-16.74	200	222

Level=Read Level + Antenna Factor + Cable Loss

Note: The frequencies on which the transmitter part of the EUT is intended to operate shall be excluded from radiated emission measurements

Mode: HDMI in 4
Horizontal:
Peak scan
Level (dBμV/m)



Quasi-peak measurement

No.	Freq	Level	Remark	Antenna Factor	Cable Loss	Limit Line	Margin	A/pos	T/pos
	MHz	dBuV/m		dB/m	dB	dBuV/m	dB	cm	deg
1	1850.000	54.67	Peak	28.05	5.59	74.00	-19.33	100	216
2	1850.000	38.77	Average	28.05	5.59	54.00	-15.23	100	216
3	3210.000	58.35	Peak	31.52	7.61	74.00	-15.65	100	124
4	3210.000	40.44	Average	31.52	7.61	54.00	-13.56	100	124
5	4638.000	53.06	Peak	34.14	9.39	74.00	-20.94	100	213
6	4638.000	41.13	Average	34.14	9.39	54.00	-12.87	100	213
7	6304.000	54.37	Peak	35.25	11.22	74.00	-19.63	200	225
8	6304.000	41.46	Average	35.25	11.22	54.00	-12.54	200	225
9	9313.000	50.65	Peak	37.66	14.17	74.00	-23.35	208	332
10	9313.000	35.52	Average	37.66	14.17	54.00	-18.48	208	332
11	10962.000	49.01	Peak	38.55	15.54	74.00	-24.99	208	114
12	10962.000	35.92	Average	38.55	15.54	54.00	-18.08	208	114

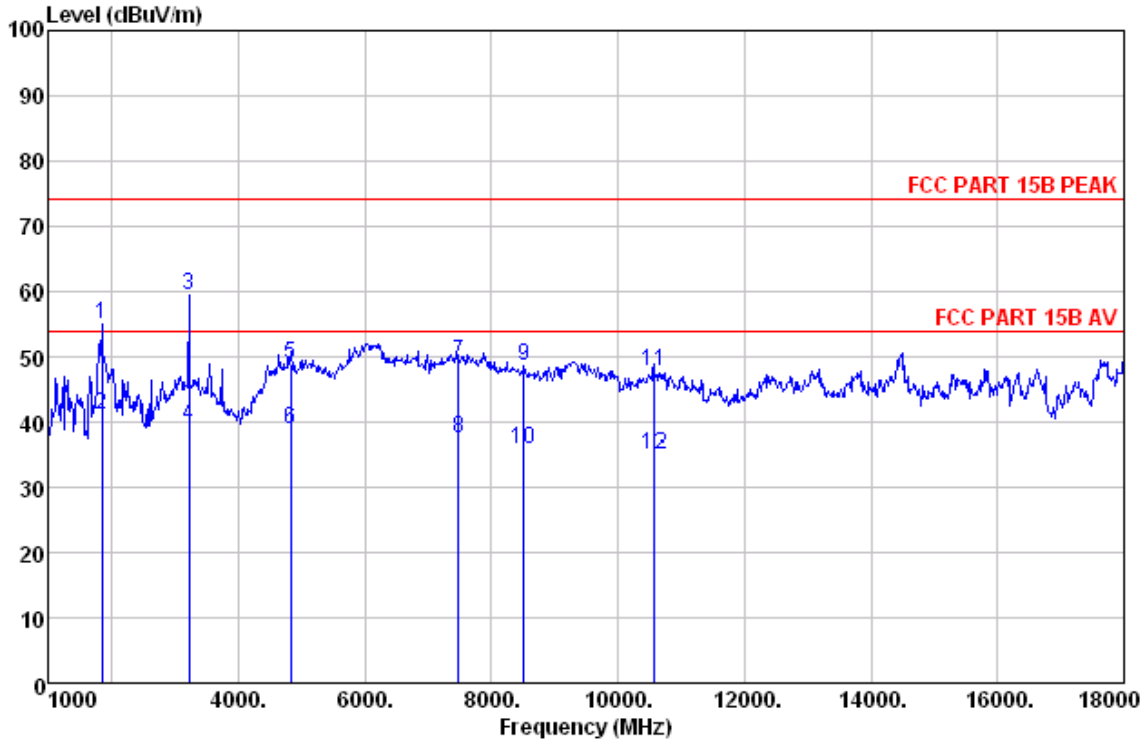
Level=Read Level + Antenna Factor + Cable Loss

Note: The frequencies on which the transmitter part of the EUT is intended to operate shall be excluded from radiated emission measurements

Vertical:

Peak scan

Level (dBμV/m)



Quasi-peak measurement

No.	Freq	Level	Remark	Antenna Factor	Cable Loss	Limit Line	Margin	A/pos	T/pos
	MHz	dBuV/m		dB/m	dB	dBuV/m	dB	cm	deg
1	1850.000	55.06	Peak	28.05	5.59	74.00	-18.94	100	108
2	1850.000	41.19	Average	28.05	5.59	54.00	-12.81	100	108
3	3210.000	59.30	Peak	31.52	7.61	74.00	-14.70	100	256
4	3210.000	39.44	Average	31.52	7.61	54.00	-14.56	100	256
5	4825.000	48.92	Peak	34.33	9.60	74.00	-25.08	100	225
6	4825.000	38.98	Average	34.33	9.60	54.00	-15.02	100	225
7	7477.000	49.22	Peak	35.80	12.40	74.00	-24.78	200	314
8	7477.000	37.63	Average	35.80	12.40	54.00	-16.37	200	314
9	8514.000	48.81	Peak	36.42	13.41	74.00	-25.19	200	32
10	8514.000	35.84	Average	36.42	13.41	54.00	-18.16	200	32
11	10571.000	48.00	Peak	38.09	15.14	74.00	-26.00	200	256
12	10571.000	35.02	Average	38.09	15.14	54.00	-18.98	200	256

Level=Read Level + Antenna Factor + Cable Loss

Note: The frequencies on which the transmitter part of the EUT is intended to operate shall be excluded from radiated emission measurements

END OF THE TEST REPORT