EMC TEST REPORT

For

DVD Receiver

Model Number: HT-X715, HT-X710

Report Number **:** WT088000312

Test Laboratory	:	Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory Guangdong EMC Compliance Test Center
Site Location	:	Bldg. Of Metrology &Quality Inspection, Longzhu Road, Shenzhen, Guangdong, China
Tel	:	0086-755-26941637, 26941529, 26941531
Fax	:	0086-755-26941545
Email	:	emc@smq.com.cn

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TEST REPORT DECLARATION

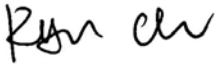
Applicant	:	Samsung Electronics Huizhou Co., Ltd
Address	:	Chenjiang Town, Huizhou City, Guangdong Province, China
Manufacturer	:	Samsung Electronics Huizhou Co., Ltd
Address	:	Chenjiang Town, Huizhou City, Guangdong Province, China
Factory 1	:	Samsung Electronics Huizhou Co., Ltd
Address 1	:	Chenjiang Town, Huizhou City, Guangdong Province, China
Factory 2	:	Tianjin Samsung Electronics Company
Address 2	:	300457, TSWC12, 4th Avenue, TEDA, Tianjin, China
Factory 3	:	Samsung Electronics Slovakia s.r.o
Address 3	:	Hviezdoslavova 807,924 27 Galanta, Slovakia
Factory 4	:	P.T. Samsung Electronics Indonesia Co
Address 4	:	Cikarang Industrial Estate JI, Jababeka Raya Blok F 29-33 Cikarang. Bekasi 17530, INDONESIA
EUT Description	:	DVD Receiver
MODEL No	:	HT-X715, HT-X710

Test Standards:

FCC Part 15 Subpart B

The EUT described above is tested by Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory to determine the maximum emissions from the EUT.Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory is assumed full responsibility for the accuracy of the test results.

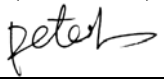
The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the laboratory.

Tested by:  Date: Dec.26.2007

(Ryan Chen)

Checked by:  Date: Dec.26.2007

(Louis Lin)

Approved by:  Date: Dec.26.2007

(Peter Lin)

1. TEST RESULTS SUMMARY

Table 1 Test Results Summary

Test Items	Section	Test Results
Conducted Disturbance	Section 15.107	Pass
Radiated Disturbance	Section 15.109	Pass
Antenna Power Conduction	Section 15.111	Pass

2. GENERAL INFORMATION

2.1. Report information

2.1.1.This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that SMQ approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that SMQ in any way guarantees the later performance of the product/equipment.

2.1.2.The sample/s mentioned in this report is/are supplied by Applicant, SMQ therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.

2.1.3.Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through SMQ, unless the applicant has authorized SMQ in writing to do so.

2.2. Laboratory Accreditation and Relationship to Customer

The testing report were performed by the Shenzhen Academy of Metrology and quality Inspection EMC Laboratory (Guangdong EMC compliance testing center), in their facilities located at Bldg. of Metrology & Quality Inspection, Longzhu Road, Nanshan District, Shenzhen, Guangdong, China. At the time of testing, Laboratory is accredited by the following organizations:
China National Accreditation Committee for Laboratories (**CNAS**) accredits the Laboratory for conformance to FCC standards, EMC international standards and EN standards. The Registration Number is L0579.

The Laboratory is listed in the United States of American Federal Communications Commission (**FCC**), and the registration number are **97379**(open area test site) and **274801**(semi anechoic chamber).
The Laboratory is listed in Voluntary Control Council for Interference by Information Technology Equipment (**VCCI**), and the registration number are **R-1974**(open area test site) , **R-1966**(semi anechoic chamber),**C-2117**(mains ports conducted interference measurement) and **T-180**(telecommunication ports conducted interference measurement).

The Laboratory is registered to perform emission tests with Industry Canada (**IC**), and the registration number is **IC4174**.

TUV Rhineland accredits the Laboratory for conformance to IEC and EN standards, the registration number is **E2024086Z02**.
Measurement Uncertainty

2.3. Measurement Uncertainty

Available upon request.

3. PRODUCT DESCRIPTION

3.1. EUT Description

Description : DVD Receiver

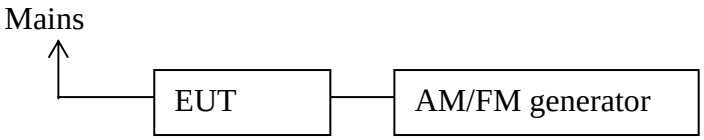
Applicant : Samsung Electronics Huizhou Co., Ltd

Model Number : HT-X715, HT-X710

Input Power : AC 120V/60Hz

Remark: HT-X715 and HT-X710 use the same electrical circuit, components, except that model and enclosure different. EMC test shall perform on model HT-X715 only.

3.2. Block Diagram of EUT Configuration



3.3. Support Equipment List

Table 2 Ancillary Equipment

Name	Model No	S/N	Manufacturer	Cables and Cords	Used "✓"
DVD Standard test disc	TDVP-501	--	A.BEX	--	✓
CD Standard test disc	TCD-782	--	A.BEX	--	
iPod	MA446ZP	8K63899YV9M	APPLE	1.2m	✓
USB Disk	Cruzer Micro	--	SanDisk	--	✓

3.4. Operating Condition of EUT

Test mode 1: Play DVD
Test mode 2: Connect to memory and play mp3
Test mode 3: Amplifier
Test mode 4: FM 88.1MHz
Test mode 5: FM 98.1MHz
Test mode 6: FM 107.9Hz

3.5. Test Conditions

Temperature: 21-23℃
Relative Humidity: 44-58%

4. TEST EQUIPMENT USED

4.1. Test Equipment Used to Measure Conducted Disturbance

Table 3 Conducted Disturbance Test Equipment

No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
SB3319	EMI Test Receiver	Rohde & Schwarz	ESCS30	Jan.25 2007	1 year
SB4357	AMN	Rohde & Schwarz	ESH2-Z5	Jan.25 2007	1 year
SB2585	AM/FM generator	Jung Jin	JSG-1101B	Jan.27 2007	1 year

4.2. Test Equipment Used to Measure Radiated Disturbance

Table 4 Radiated Disturbance Test Equipment

No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
SB4538	EMI Test Receiver	Rohde & Schwarz	ESIB7	Jan.25 2007	1 year
SB5472/02	Bilog Antenna	SCHWARZBECK	VULB9163	Jan.25 2007	1 year
SB2585	AM/FM generator	Jung Jin	JSG-1101B	Jun.27 2007	1 year

4.3. Test Equipment Used to Antenna Power Conduction

Table 5 Antenna Power Conduction Test Equipment

No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
SB3319	EMI Test Receiver	Rohde & Schwarz	ESCS30	Jan.25 2007	1 year
SB3436/01	Combine network	Rohde & Schwarz	SCA-Comp	Jan.25 2007	1 year
SB2585	AM/FM generator	Jung Jin	JSG-1101B	Jun.27 2007	1 year

5. CONDUCTED DISTURBANCE TEST

5.1. Test Standard and Limit

5.1.1.Test Standard

FCC Part 15 Section 15.107

5.1.2.Test Limit

Table 6 Conducted Disturbance Test Limit (Class B)

Frequency	Maximum RF Line Voltage (dBμV)	
	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50

* Decreasing linearly with logarithm of the frequency

5.2. Test Procedure

The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI test receiver (R&S Test Receiver ESCS30) is used to test the emissions form both sides of AC line. The bandwidth of EMI test receiver is set at 9kHz.

5.3. Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

5.4. Test Data

The emissions don’t show in below are too low against the limits, the test curves are shown in the APPENDIX Ⅰ

Table 7 Conducted Disturbance Test Data

Model No.: HT-X715

Test Mode: 1

Line					Neutral				
Frequency (MHz)	Quasi-Peak		Average		Frequency (MHz)	Quasi-Peak		Average	
	Reading (dBμV)	Limit (dBμV)	Reading (dBμV)	Limit (dBμV)		Reading (dBμV)	Limit (dBμV)	Reading (dBμV)	Limit (dBμV)
0.166	54.6	65.2	46.4	55.2	0.170	54.5	65.0	45.7	55.0
0.186	51.9	64.2	44.0	54.2	0.186	53.3	64.2	46.3	54.2

Table 8 Conducted Disturbance Test Data

Model No.: HT-X715

Test Mode: 2

Line					Neutral				
Frequency (MHz)	Quasi-Peak		Average		Frequency (MHz)	Quasi-Peak		Average	
	Reading (dBμV)	Limit (dBμV)	Reading (dBμV)	Limit (dBμV)		Reading (dBμV)	Limit (dBμV)	Reading (dBμV)	Limit (dBμV)
0.166	54.6	65.2	47.6	55.2	0.166	54.2	65.2	46.5	55.2
0.186	47.5	64.2	38.2	54.2	0.186	49.6	64.2	41.6	54.2

Table 9 Conducted Disturbance Test Data

Model No.: HT-X715

Test Mode: 3

Line					Neutral				
Frequency (MHz)	Quasi-Peak		Average		Frequency (MHz)	Quasi-Peak		Average	
	Reading (dBμV)	Limit (dBμV)	Reading (dBμV)	Limit (dBμV)		Reading (dBμV)	Limit (dBμV)	Reading (dBμV)	Limit (dBμV)
0.166	51.6	65.2	43.1	55.2	0.166	53.3	65.2	43.0	55.2
0.186	51.2	64.2	45.3	54.2	0.186	53.4	64.2	47.3	54.2
0.560	45.6	56	41.9	46	2.465	42.8	56	40.0	46

Table 10 Conducted Disturbance Test Data

Model No.: HT-X715

Test Mode: 4

Line					Neutral				
Frequency (MHz)	Quasi-Peak		Average		Frequency (MHz)	Quasi-Peak		Average	
	Reading (dBμV)	Limit (dBμV)	Reading (dBμV)	Limit (dBμV)		Reading (dBμV)	Limit (dBμV)	Reading (dBμV)	Limit (dBμV)
0.166	54.1	65.2	46.2	55.2	0.166	52.4	65.2	45.3	55.2
2.740	42.4	56	40.8	46	2.795	42.9	56	40.5	46

Table 11 Conducted Disturbance Test Data

Model No.: HT-X715

Test Mode: 5

Line					Neutral				
Frequency (MHz)	Quasi-Peak		Average		Frequency (MHz)	Quasi-Peak		Average	
	Reading (dBμV)	Limit (dBμV)	Reading (dBμV)	Limit (dBμV)		Reading (dBμV)	Limit (dBμV)	Reading (dBμV)	Limit (dBμV)
0.170	50.3	65.0	44.0	55.0	0.166	53.7	65.2	45.8	55.2
2.795	41.7	56	40.3	46	0.186	47.5	64.2	40.1	54.2

Table 12 Conducted Disturbance Test Data

Model No.: HT-X715

Test Mode: 6

Line					Neutral				
Frequency (MHz)	Quasi-Peak		Average		Frequency (MHz)	Quasi-Peak		Average	
	Reading (dBμV)	Limit (dBμV)	Reading (dBμV)	Limit (dBμV)		Reading (dBμV)	Limit (dBμV)	Reading (dBμV)	Limit (dBμV)
0.166	52.9	65.4	45.6	55.2	0.166	54.1	65.2	46.8	55.2
0.186	45.4	64.2	38.1	54.2	0.186	46.0	64.2	39.0	54.2

6. RADIATED DISTURBANCE TEST

6.1. Test Standard and Limit

6.1.1.Test Standard

FCC Part 15 Section 15.109

6.1.2.Test Limit

Table 13 Radiated Disturbance Test Limit (Class B)

FREQUENCY MHz	FIELD STRENGTHS LIMITS dB (μV/m)
30 ~ 88	40.0
88 ~ 216	43.5
216 ~ 960	46.0
960 ~	54.0

* The lower limit shall apply at the transition frequency.
* The test distance is 3m.

6.2. Test Procedure

The EUT is placed on a turntable, which is 0.8 meter above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set **3 meters** away from the receiving antenna, which is mounted on an antenna tower. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna is used as a receiving antenna. Both horizontal and vertical polarization of the antenna is set on test.

6.3. Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

6.4. Test Data

Emissions don't show below are too low against the limits, the test curves are shown in the APPENDIX Ⅰ

Table 14 Radiated Disturbance Test Data

Model No.: HT-X715

Test Mode: 1

Frequency MHz	Readings dB(μ V/m)	Polarization	Limits dB (μ V/m)
46.092	36.3	Vertical	40.0
52.237	32.8	Vertical	40.0
64.504	35.2	Vertical	40.0
296.986	37.8	Horizontal	46.0

Table 15 Radiated Disturbance Test Data

Model No.: HT-X715

Test Mode: 2

Frequency MHz	Readings dB(μ V/m)	Polarization	Limits dB (μ V/m)
36.688	36.6	Vertical	40.0
47.985	36.0	Vertical	40.0
53.645	31.8	Vertical	40.0
595.988	41.1	Vertical	46.0
595.983	42.0	Horizontal	46.0

Table 16 Radiated Disturbance Test Data

Model No.: HT-X715

Test Mode: 3

Frequency MHz	Readings dB(μ V/m)	Polarization	Limits dB (μ V/m)
593.980	41.0	Vertical	46.0
64.913	37.0	Horizontal	40.0

Table 17 Radiated Disturbance Test Data

Model No.: HT-X715 Test Mode: 4			
Frequency MHz	Readings dB(μ V/m)	Polarization	Limits dB(μ V/m)
60.441	31.9	Vertical	40.0

Table 18 Radiated Disturbance Test Data

Model No.: HT-X715 Test Mode: 5			
Frequency MHz	Readings dB(μ V/m)	Polarization	Limits dB(μ V/m)
268.197	34.8	Horizontal	46.0
60.601	31.2	Vertical	40.0

Table 19 Radiated Disturbance Test Data

Model No.: HT-X715 Test Mode: 6			
Frequency MHz	Readings dB(μ V/m)	Polarization	Limits dB(μ V/m)
60.371	30.7	Vertical	40.0
268.197	34.9	Horizontal	46.0

7. ANTENNA POWER CONDUCTION TEST

7.1. Test Standard and Limit

7.1.1.Test Standard

FCC Part 15 Section 15.111

7.1.2.Test Limit

Table 20 Antenna Power Conduction Test Limit

Equipment Type	Limit Values dB(μV) 75Ω
Frequency modulation sound receivers	51.7

7.2. Test Procedure

The antenna terminals of the receivers or associated equipment and the auxiliary signal generator are connected to the measuring set by means of coaxial cables and a resistive combining network having a minimum attenuation of 6dB.The impedance as seen from the receiver or associated equipment shall be equal to the nominal antenna input impedance for which the receiver has been designed. The equipment under test shall be tuned to the wanted signal.

The measuring set is tuned to the relevant radiated frequency and the disturbance level is measured taking into account the attenuation between the receiver antenna terminal and the measuring set input.

7.3. Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

7.4. Test Data

Table 21 Antenna Power Conduction Test Data

Model No.: HT-X715 Test Mode: 5		
Frequency MHz	Readings (dB μ V)	Limits (dB μ V)
98.687	39.6	51.7
197.375	37.1	51.7

Table 22 Antenna Power Conduction Test Data

Model No.: HT-X715 Test Mode: 6		
Frequency MHz	Readings (dB μ V)	Limits (dB μ V)
108.687	40.5	51.7
217.375	37.7	51.7

Table 23 Antenna Power Conduction Test Data

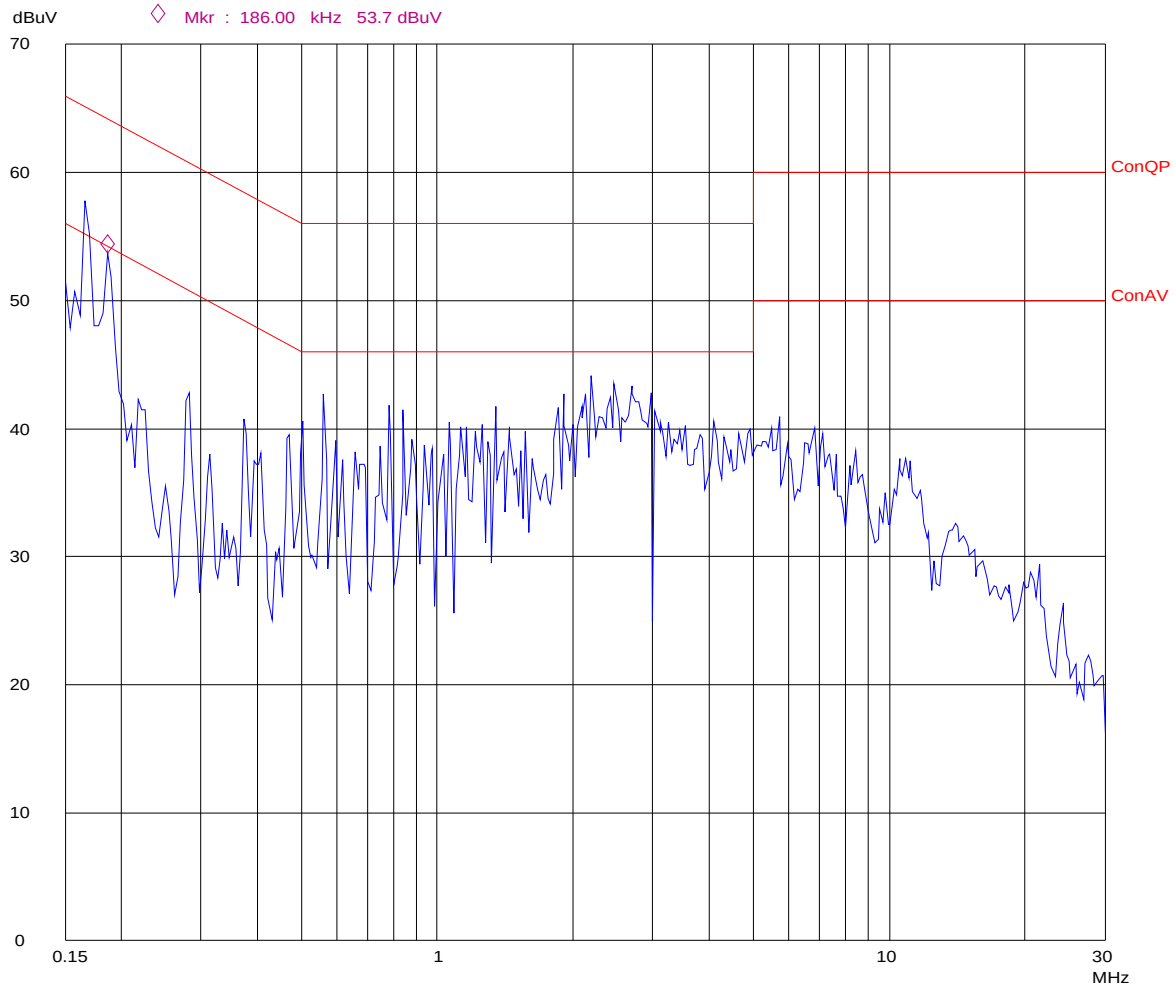
Model No.: HT-X715 Test Mode: 7		
Frequency MHz	Readings (dB μ V)	Limits (dB μ V)
118.687	41.4	51.7
237.437	37.5	51.7
356.125	36.4	51.7

8. TABLE LIST

APPENDIX I TEST CURVES

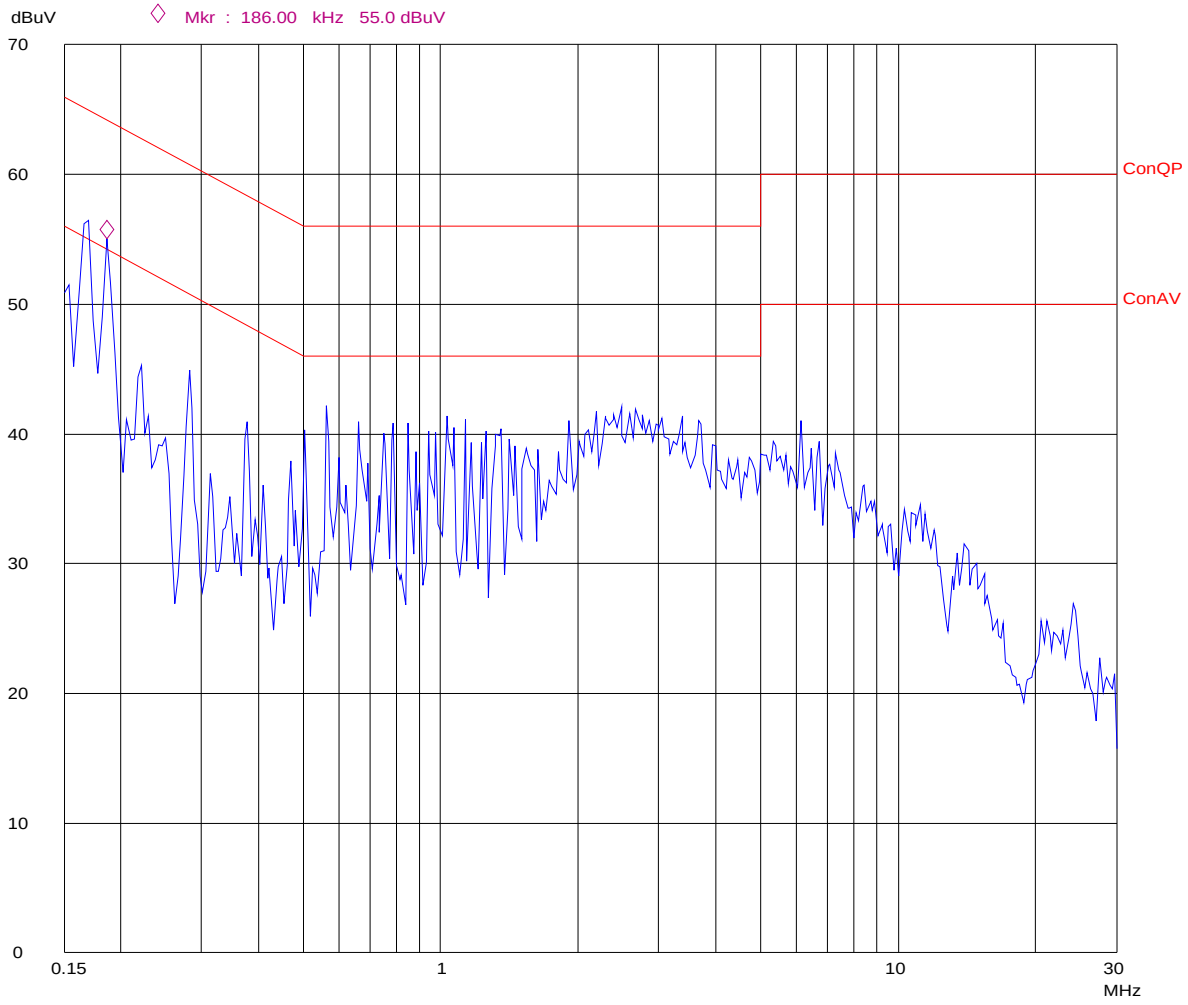
Conducted Disturbance

EUT:	M/N:HT-X715
Op Cond:	Play DVD
Test Spec:	L
Comment:	AC 120V/60Hz



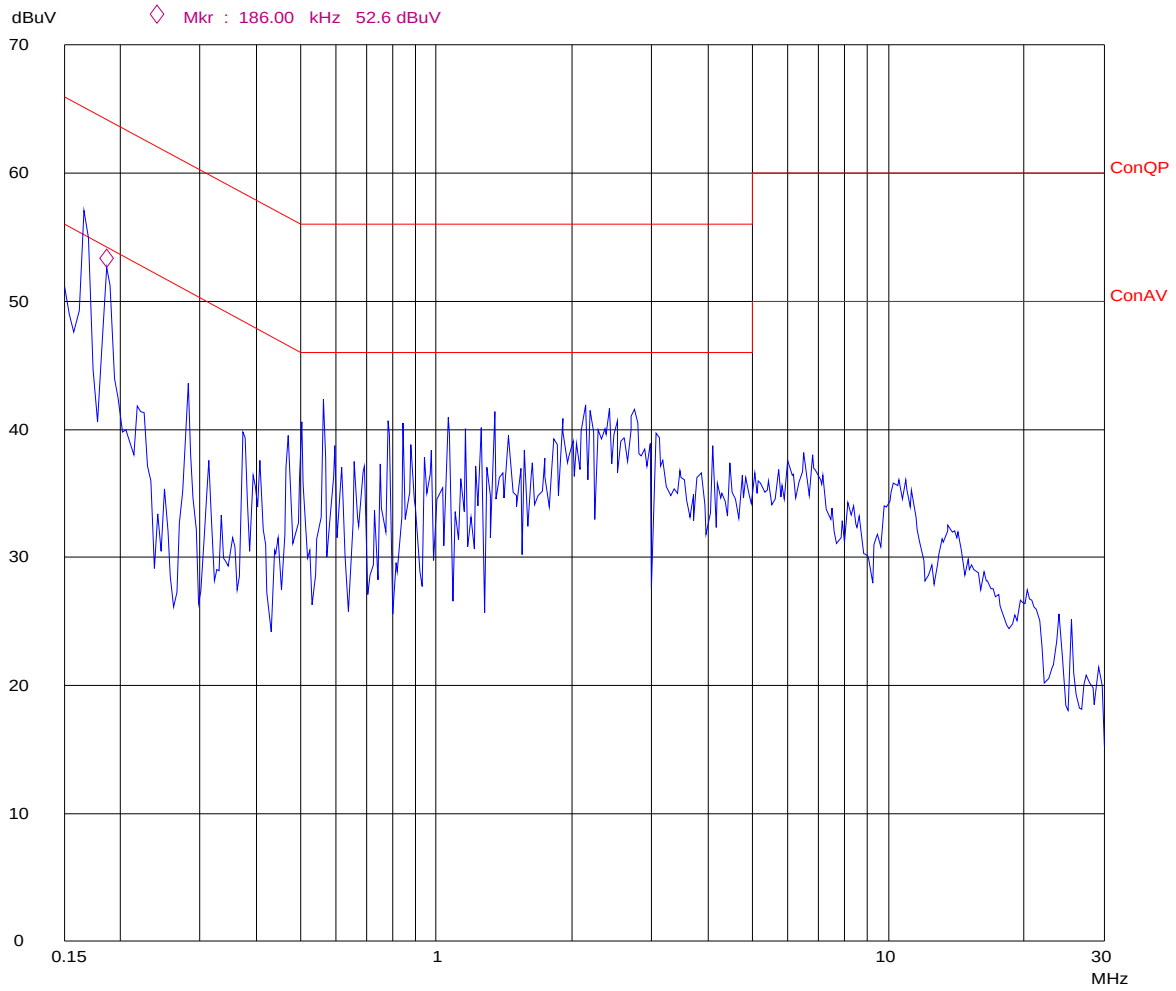
Conducted Disturbance

EUT:	M/N:HT-X715
Op Cond:	Play DVD
Test Spec:	N
Comment:	AC 120V/60Hz



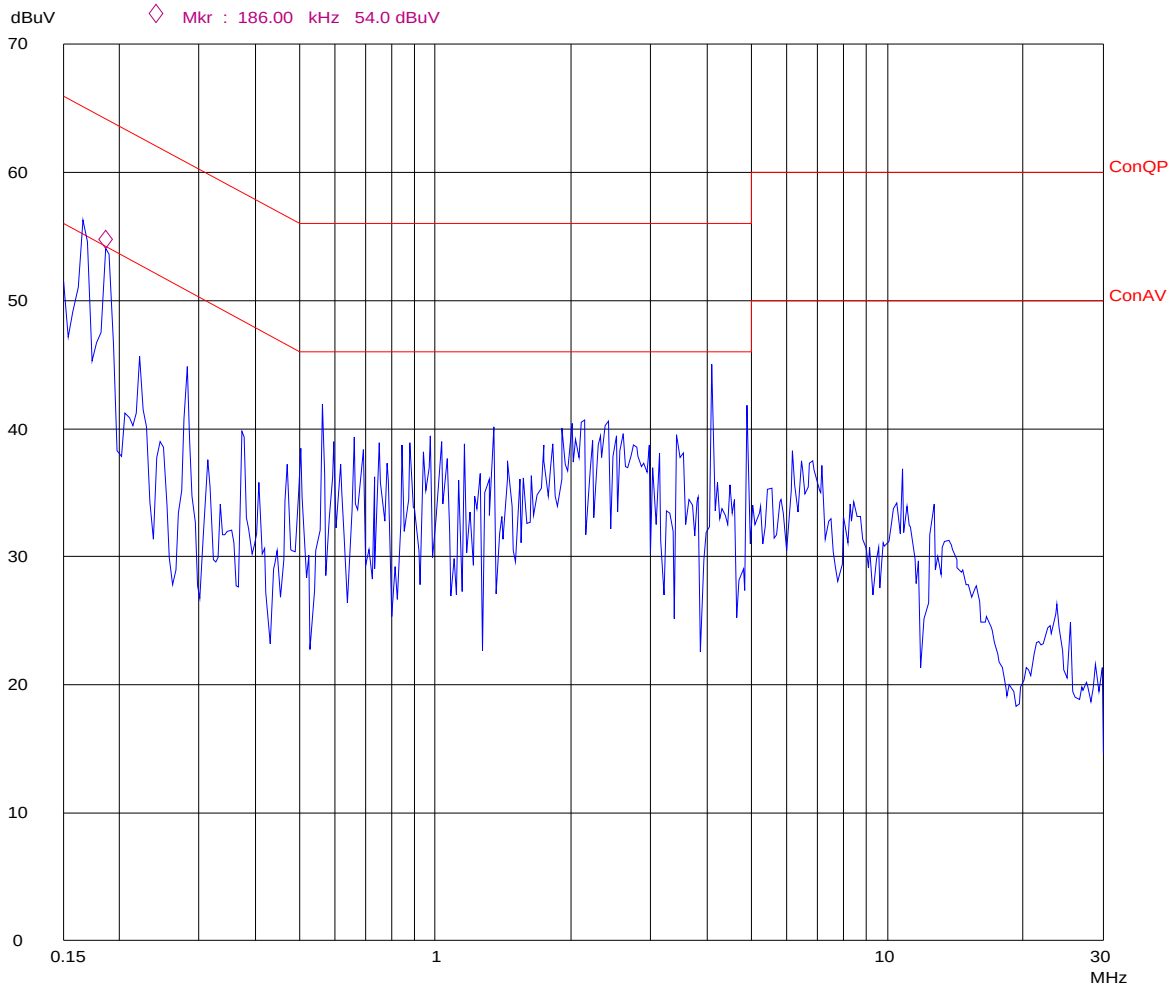
Conducted Disturbance

EUT:	M/N:HT-X715
Op Cond:	Connect to memory and play MP3
Test Spec:	L
Comment:	AC 120V/60Hz



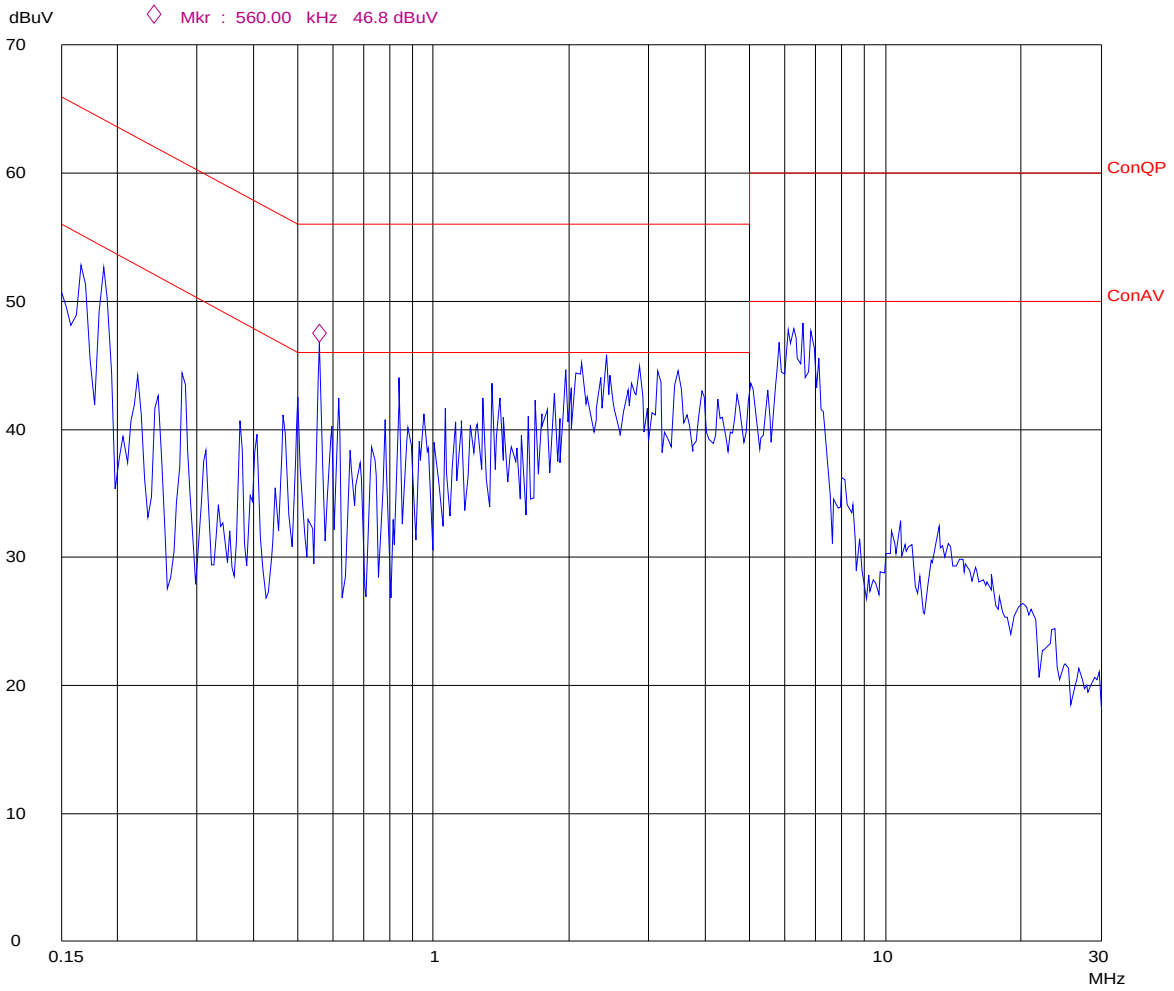
Conducted Disturbance

EUT:	M/N:HT-X715
Op Cond:	Connect to memory and play MP3
Test Spec:	N
Comment:	AC 120V/60Hz



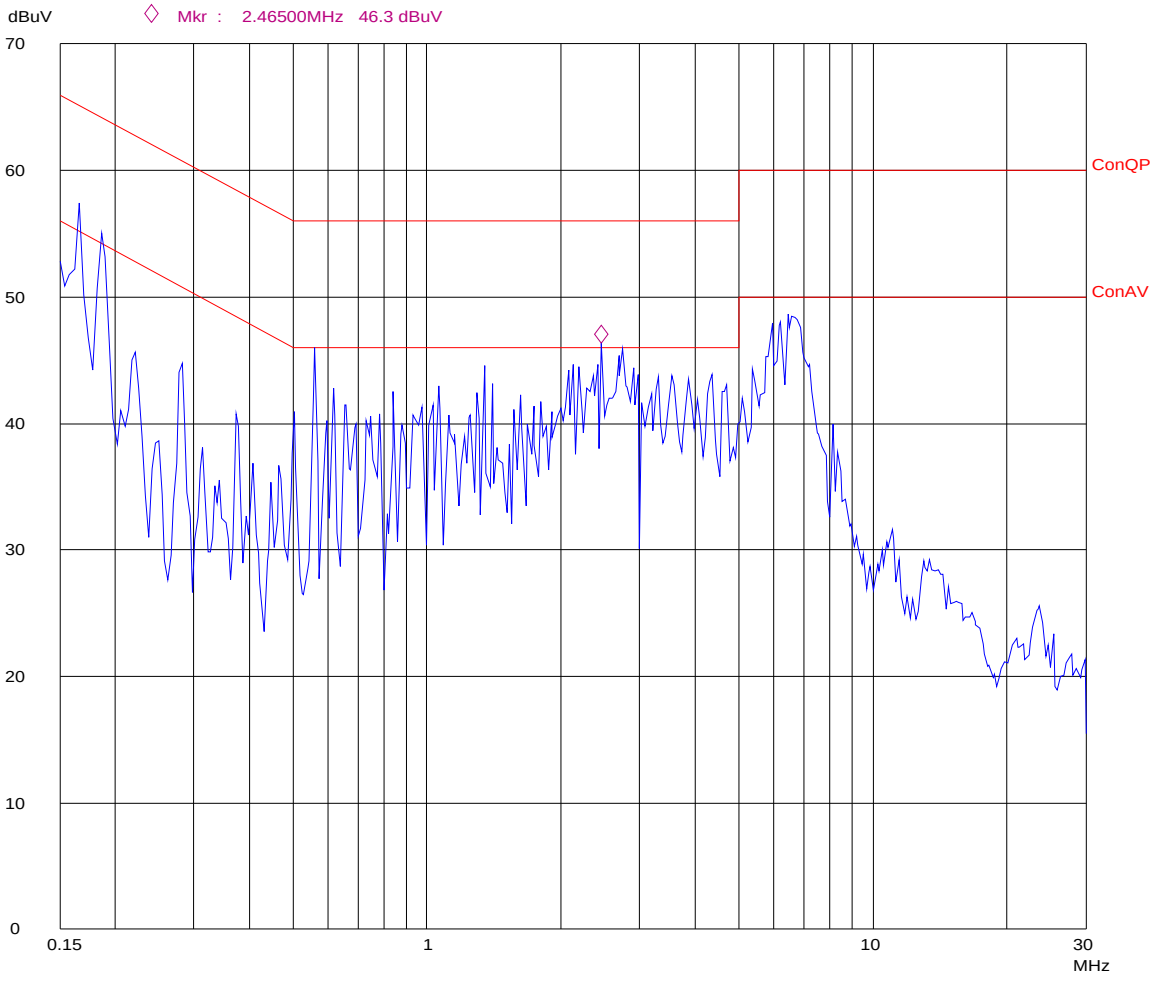
Conducted Disturbance

EUT: M/N:HT-X715
Op Cond: Amplifier
Test Spec: L
Comment: AC 120V/60Hz



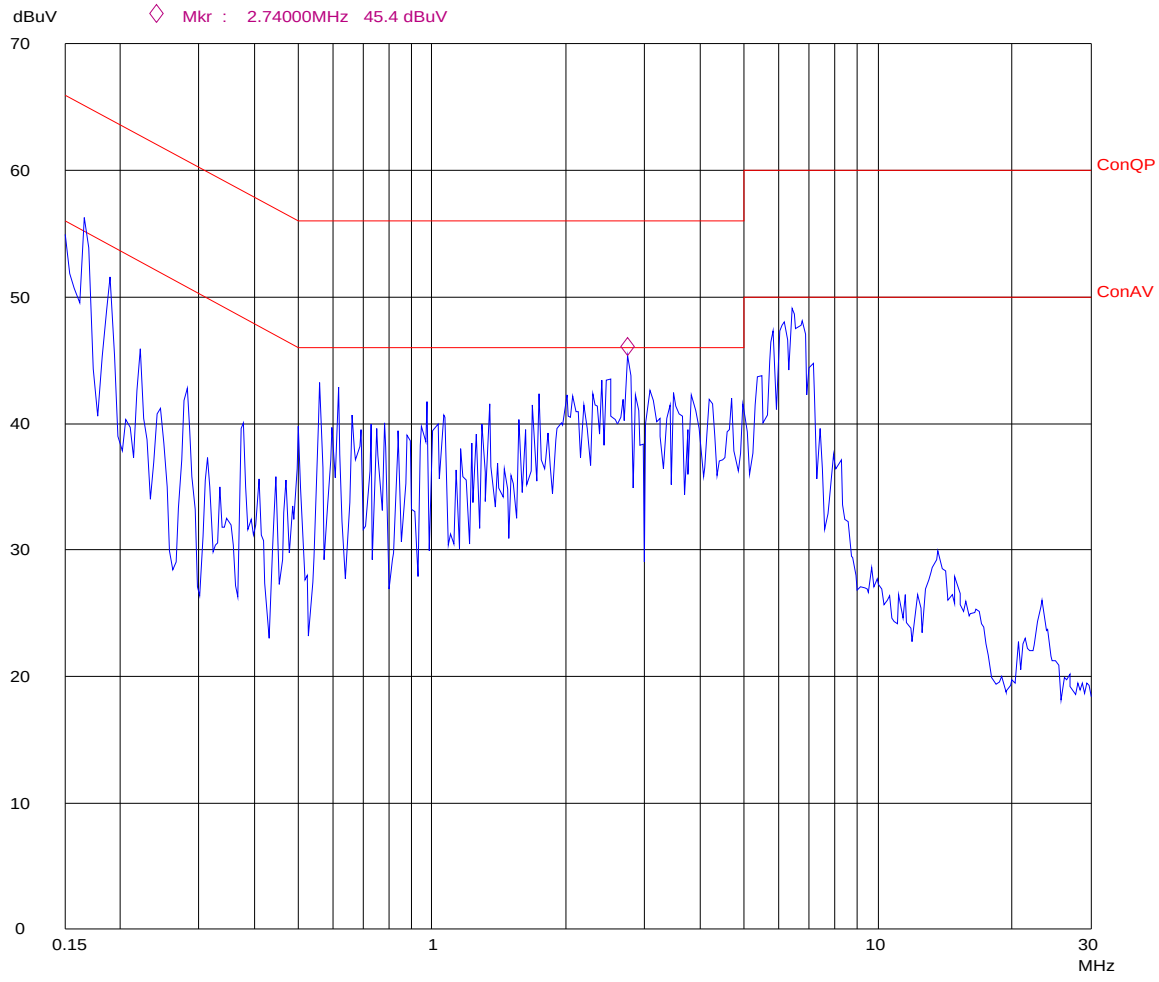
Conducted Disturbance

EUT:	M/N:HT-X715
Op Cond:	Amplifier
Test Spec:	N
Comment:	AC 120V/60Hz



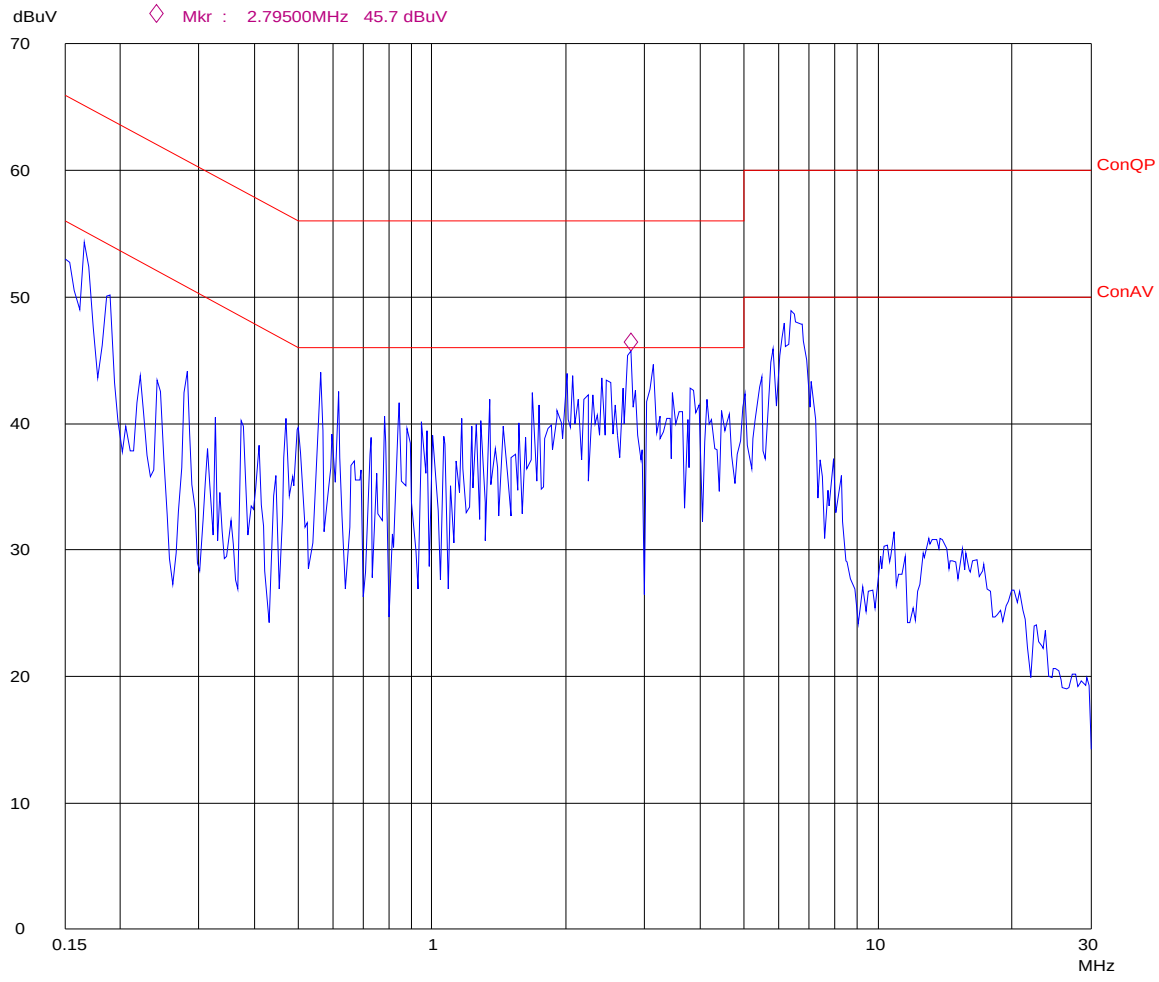
Conducted Disturbance

EUT: M/N:HT-X715
Op Cond: FM88MHz
Test Spec: L
Comment: AC 120V/60Hz



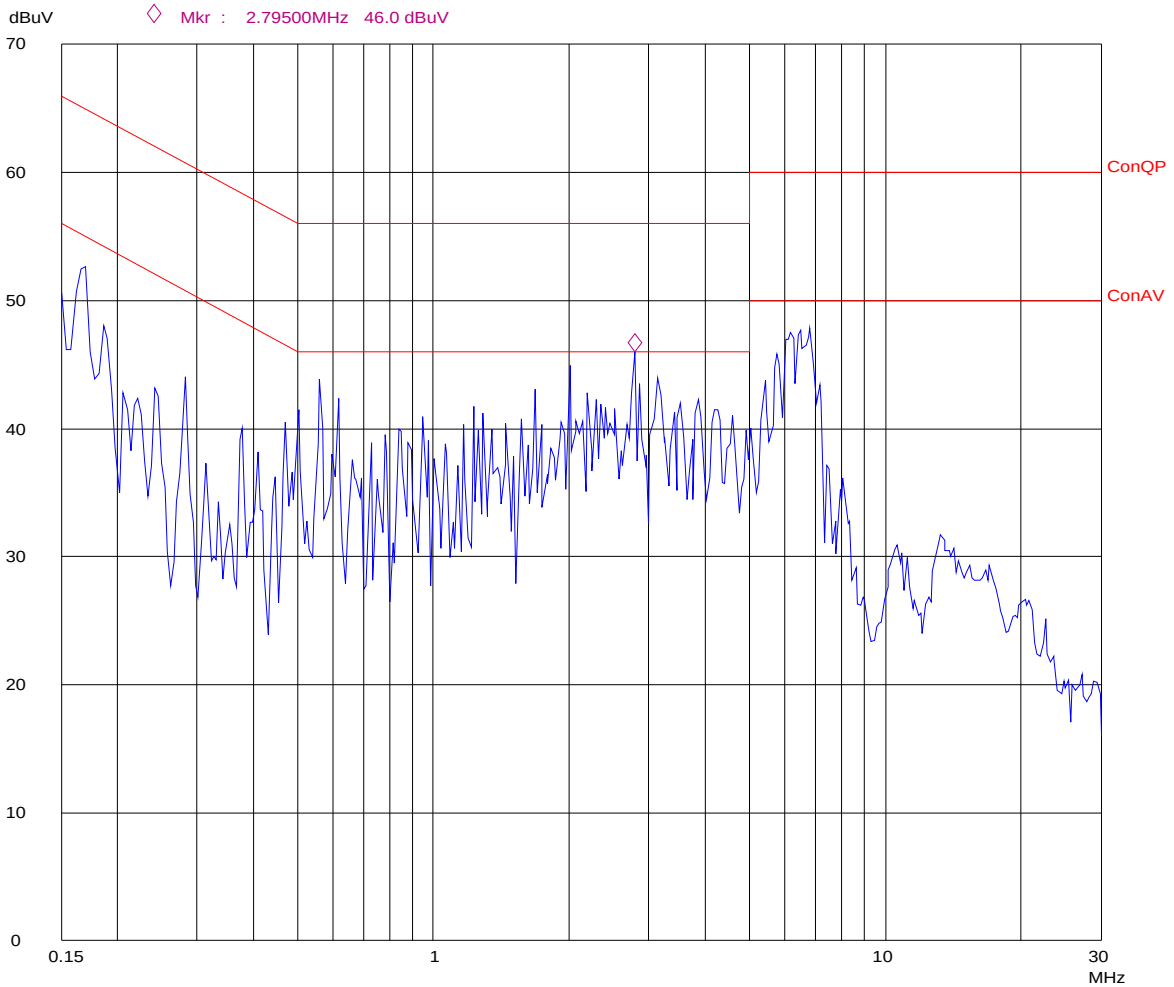
Conducted Disturbance

EUT: M/N:HT-X715
Op Cond: FM88MHz
Test Spec: N
Comment: AC 120V/60Hz



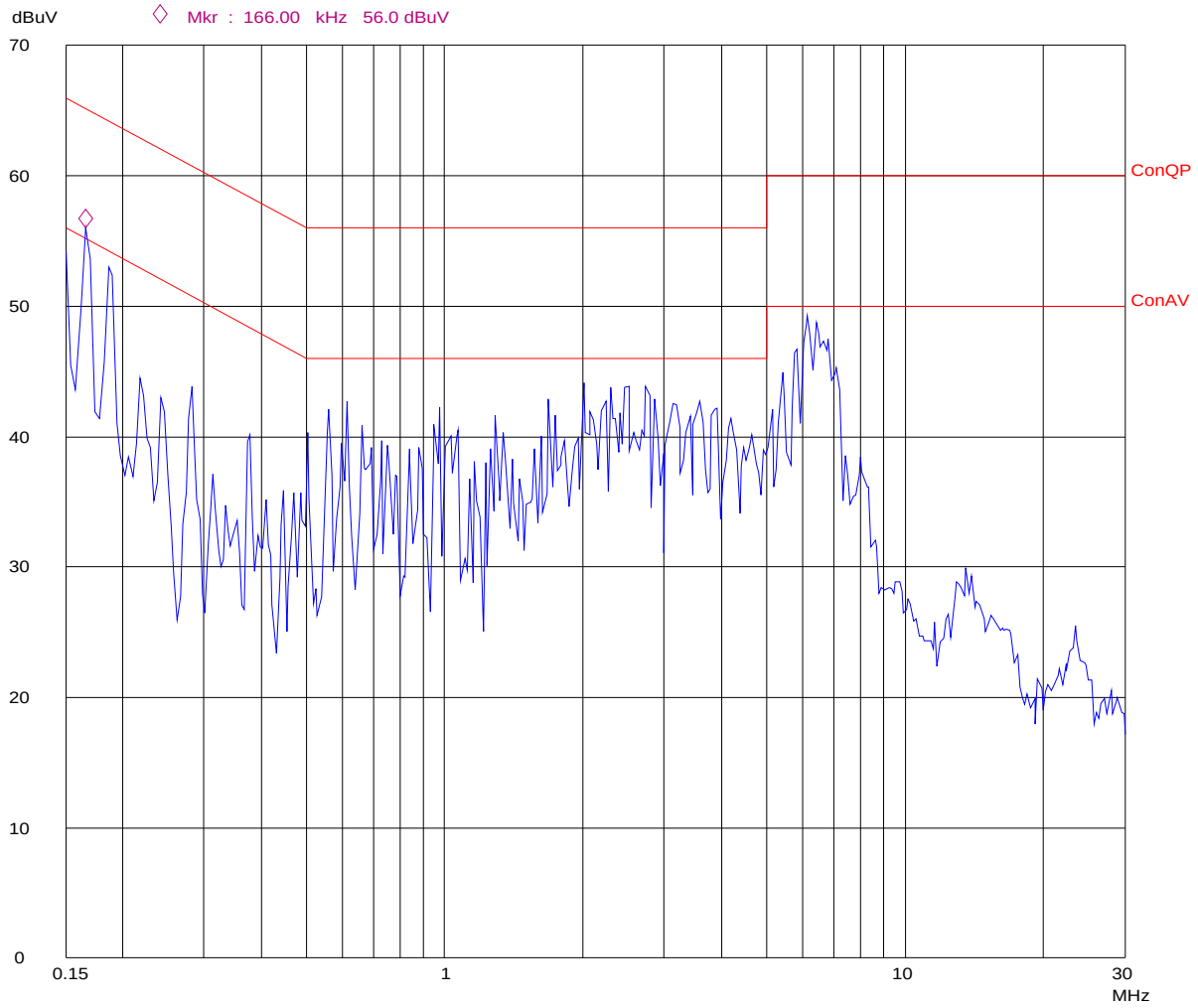
Conducted Disturbance

EUT: M/N:HT-X715
Op Cond: FM98MHz
Test Spec: L
Comment: AC 120V/60Hz



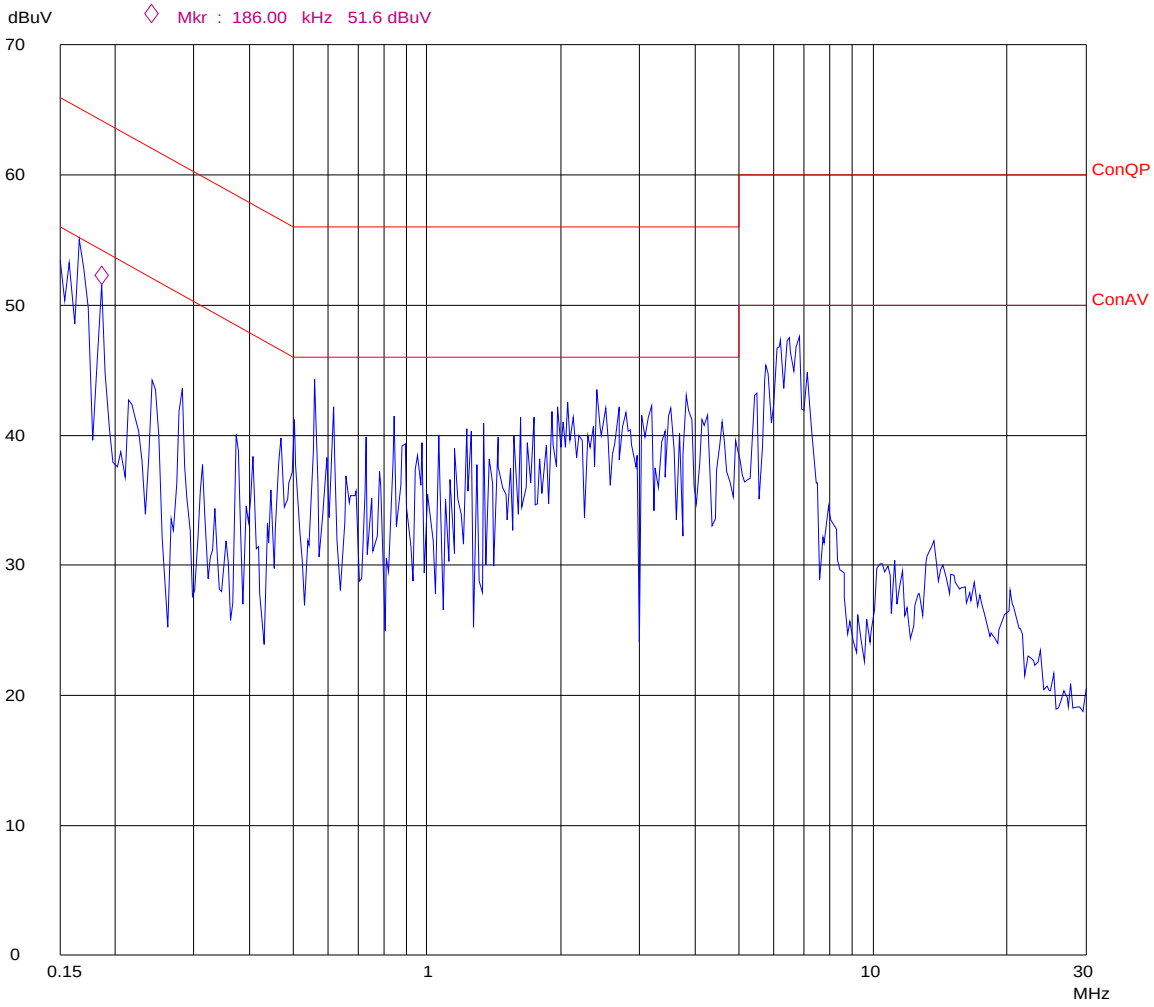
Conducted Disturbance

EUT: M/N:HT-X715
Op Cond: FM98MHz
Test Spec: N
Comment: AC 120V/60Hz



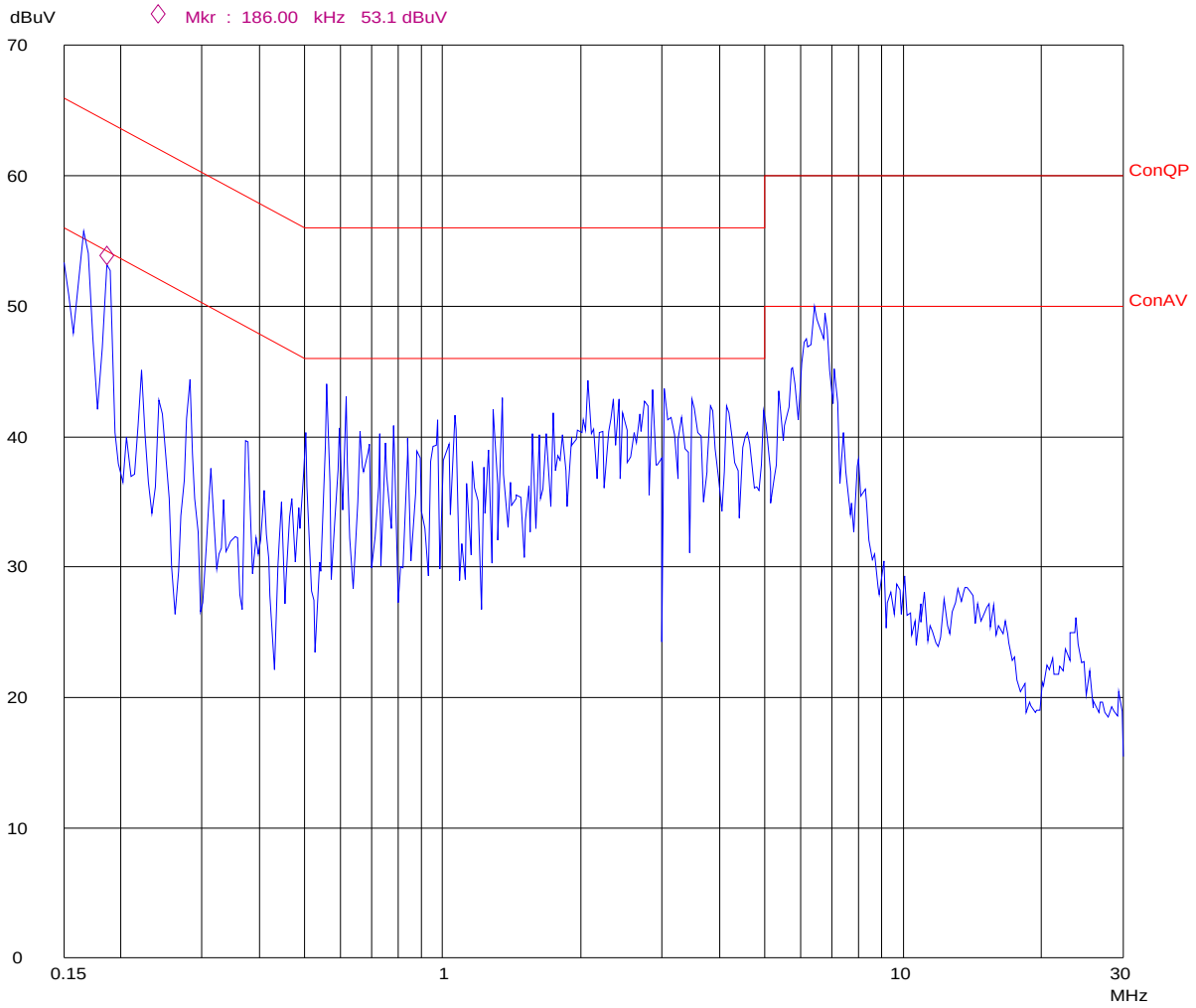
Conducted Disturbance

EUT:	M/N:HT-X715
Op Cond:	FM108MHz
Test Spec:	L
Comment:	AC 120V/60Hz

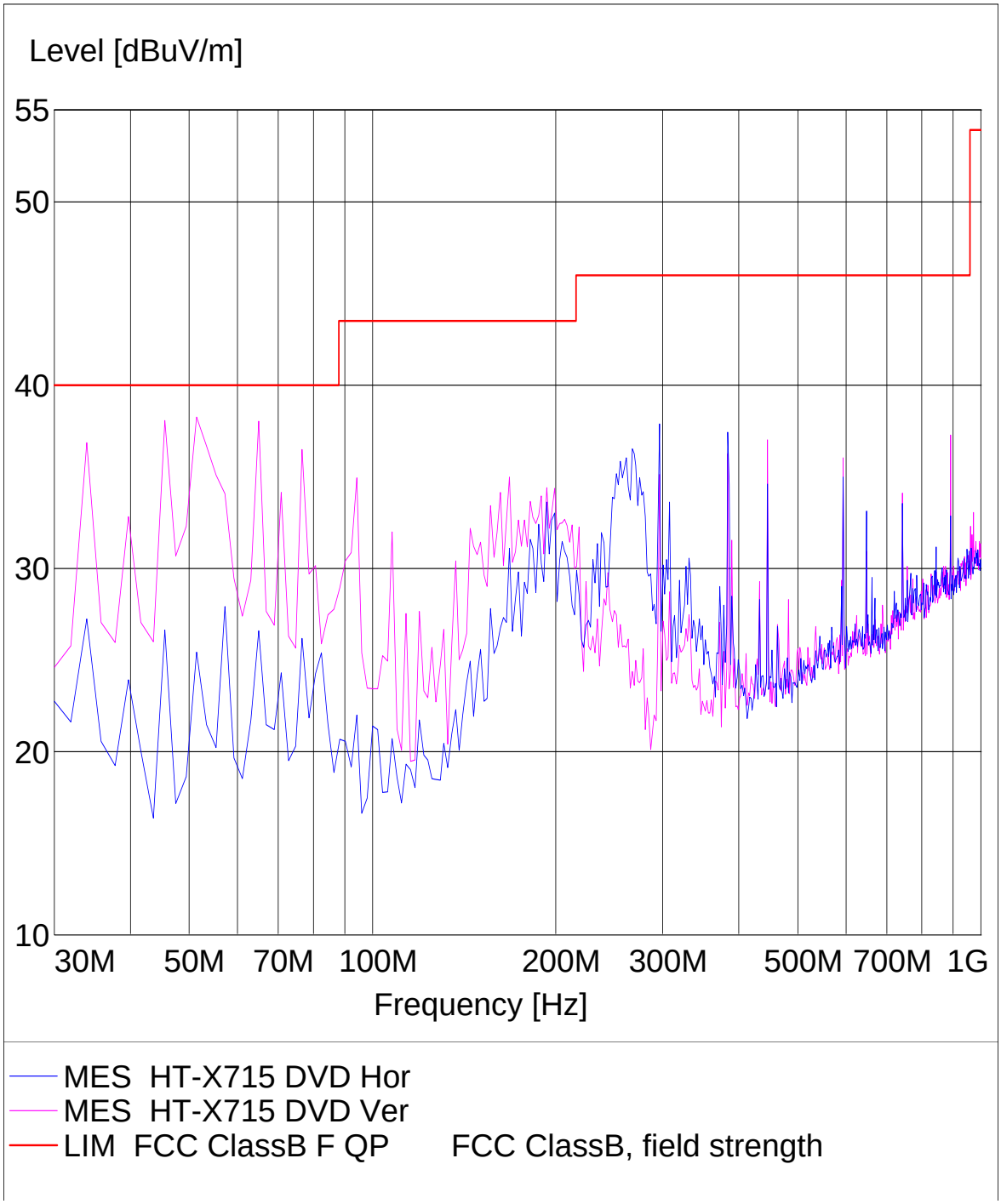


Conducted Disturbance

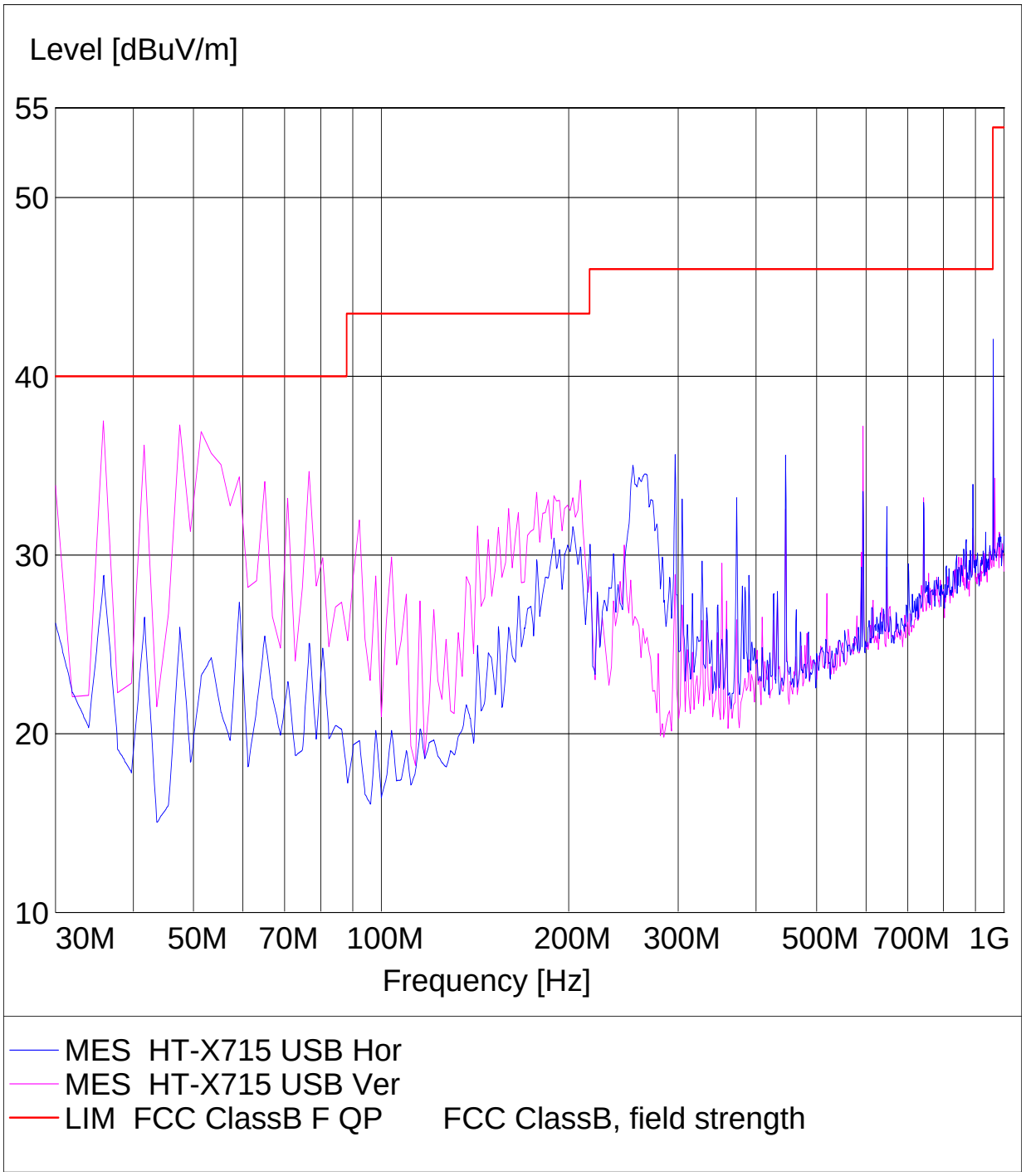
EUT:	M/N:HT-X715
Op Cond:	FM108MHz
Test Spec:	N
Comment:	AC 120V/60Hz



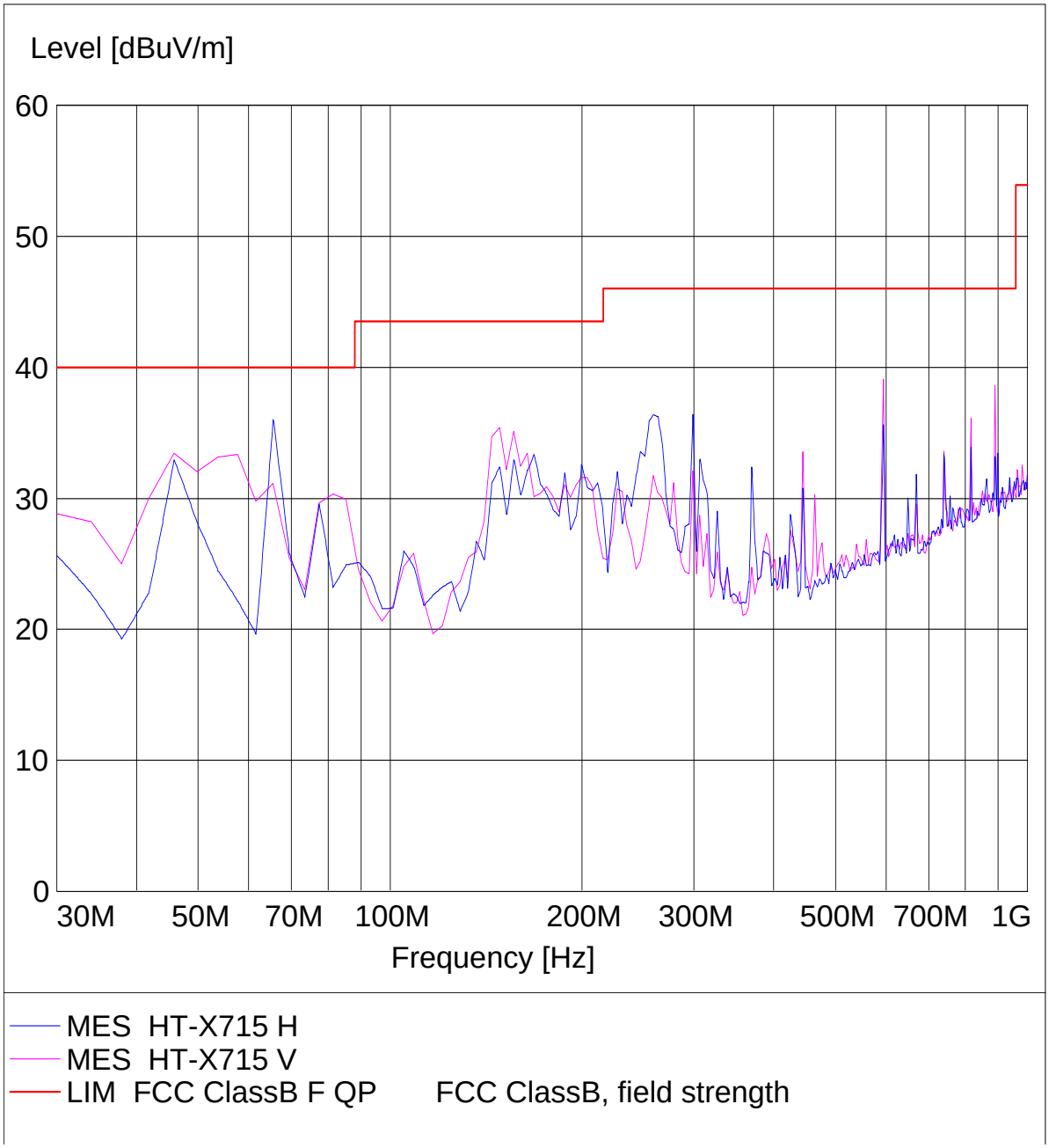
Radiated Disturbance
EUT: M/N:HT-X715
Operating Condition: Play DVD
Test Site: SMQ EMC Lab.SAC
Test Specification: Horizontal & Vertical
Comment: AC 120V/60Hz



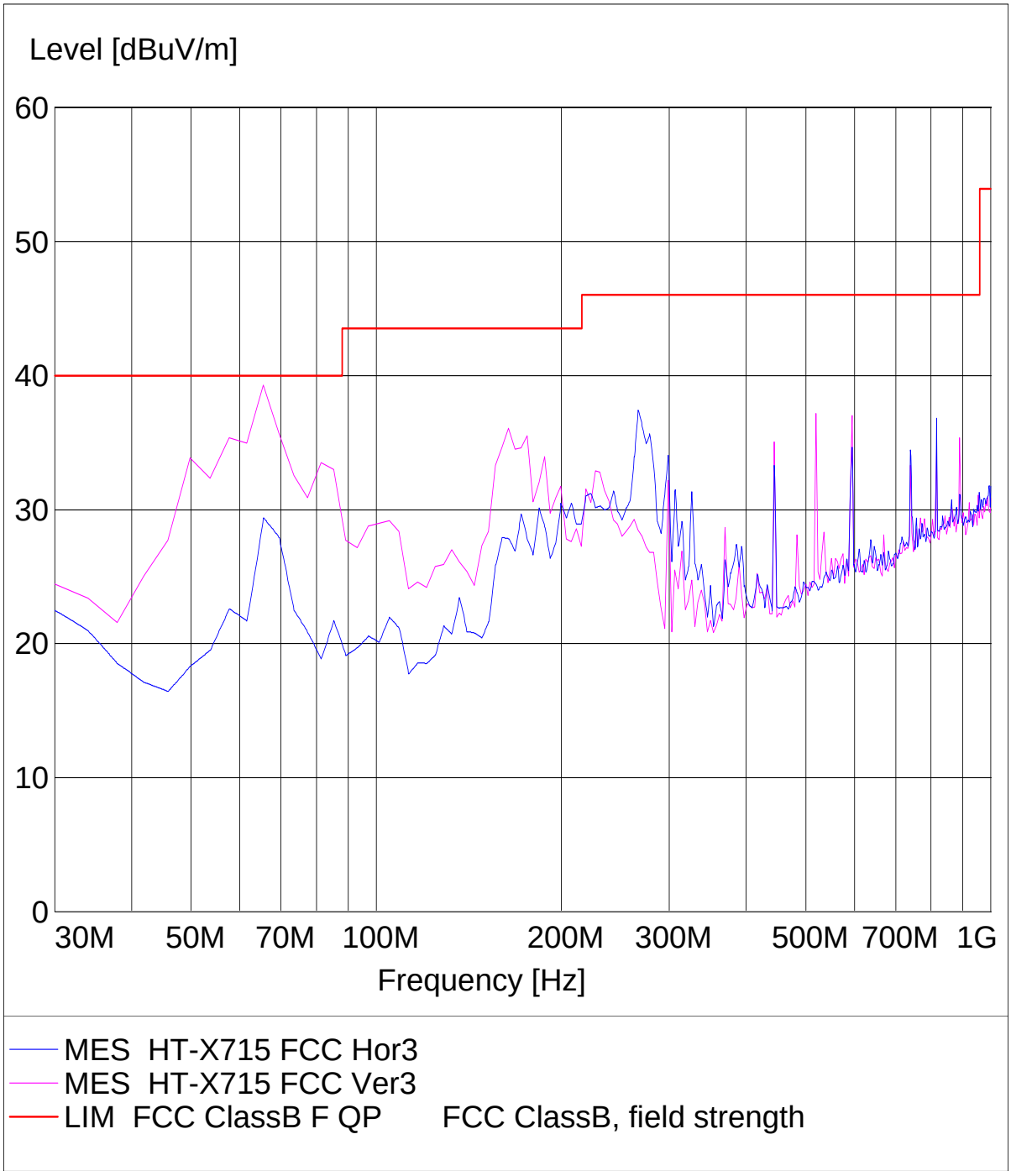
Radiated Disturbance
EUT: ***M/N:HT-X715***
Operating Condition: Connect to memory and paly mp3
Test Site: ***SMQ EMC Lab.SAC***
Test Specification: ***Horizontal & Vertical***
Comment: ***AC 120V/60Hz***



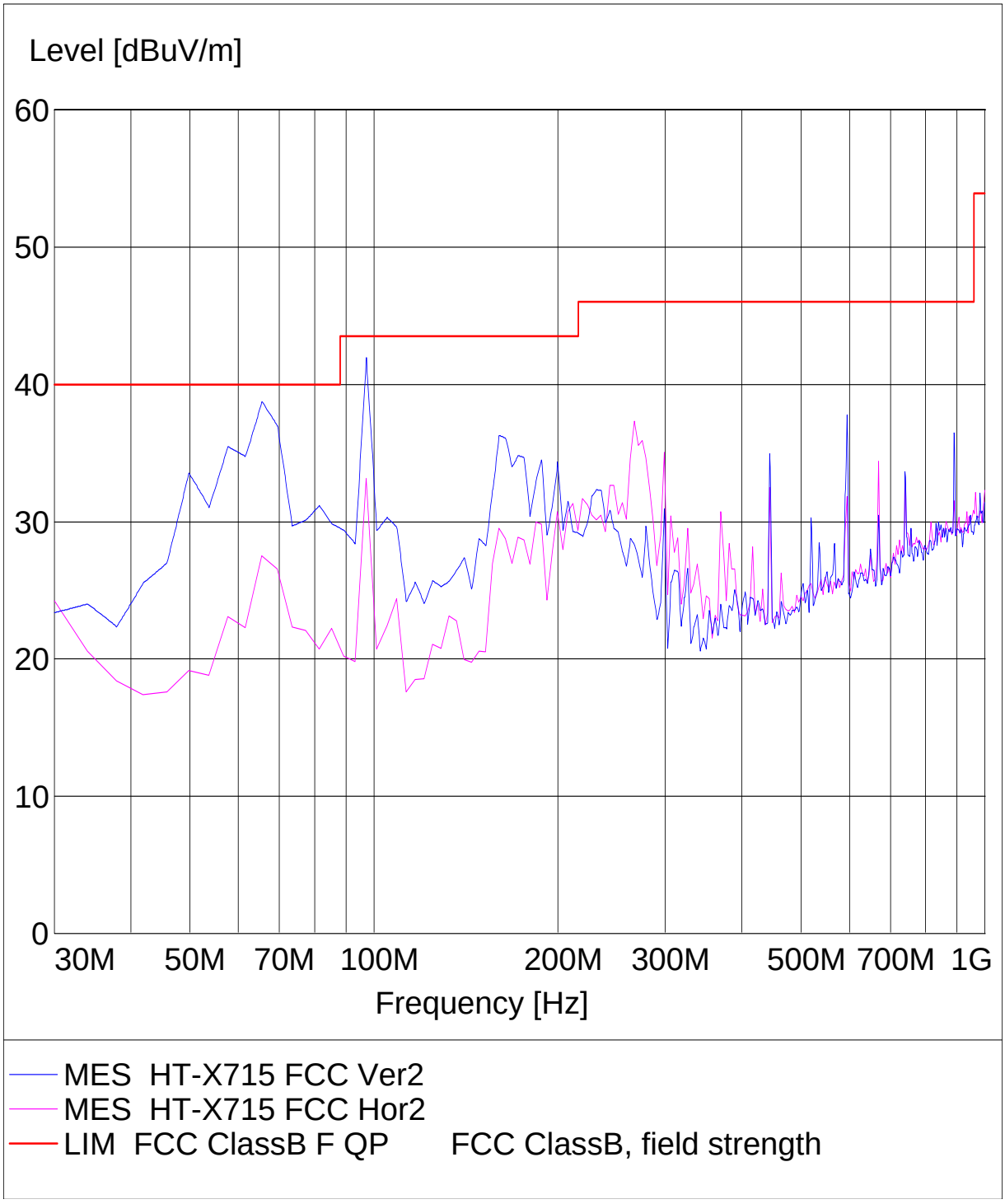
Radiated Disturbance
EUT: ***M/N:HT-X715***
Operating Condition: Amplifier
Test Site: ***SMQ EMC Lab.SAC***
Test Specification: ***Horizontal & Vertical***
Comment: ***AC 120V/60Hz***



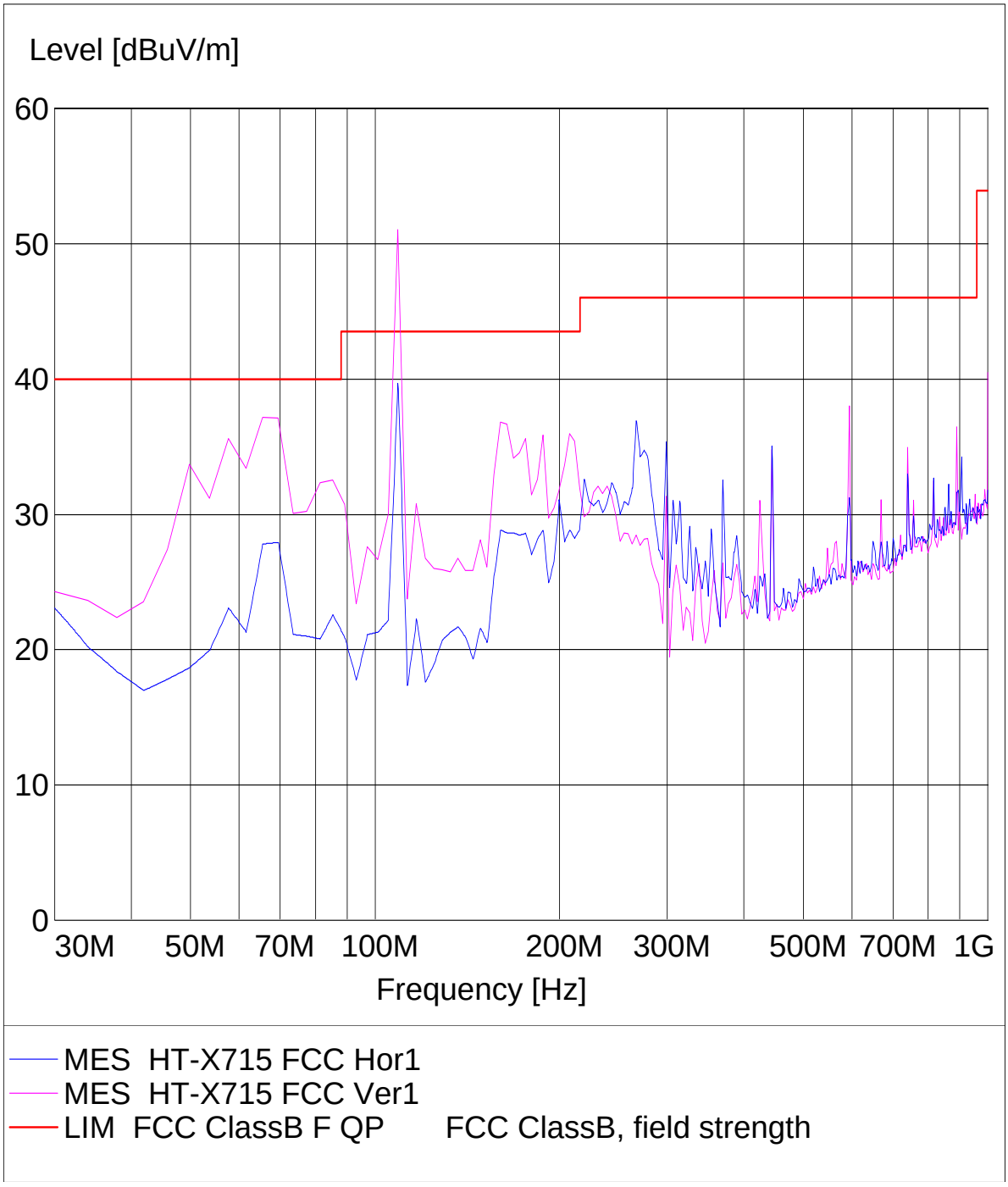
Radiated Disturbance
EUT: ***M/N:HT-X715***
Operating Condition: ***FM 88MHz***
Test Site: ***SMQ EMC Lab.SAC***
Test Specification: ***Horizontal & Vertical***
Comment: ***AC 120V/60Hz***



Radiated Disturbance
EUT: ***M/N:HT-X715***
Operating Condition: ***FM 98MHz***
Test Site: ***SMQ EMC Lab.SAC***
Test Specification: ***Horizontal & Vertical***
Comment: ***AC 120V/60Hz***



Radiated Disturbance
EUT: ***M/N:HT-X715***
Operating Condition: FM 108MHz
Test Site: ***SMQ EMC Lab.SAC***
Test Specification: ***Horizontal & Vertical***
Comment: ***AC 120V/60Hz***



APPENDIX II TEST PICTURE

Photo 1 Conducted Disturbance Test

Photo 2 Antenna Terminal Voltage Disturbance Test

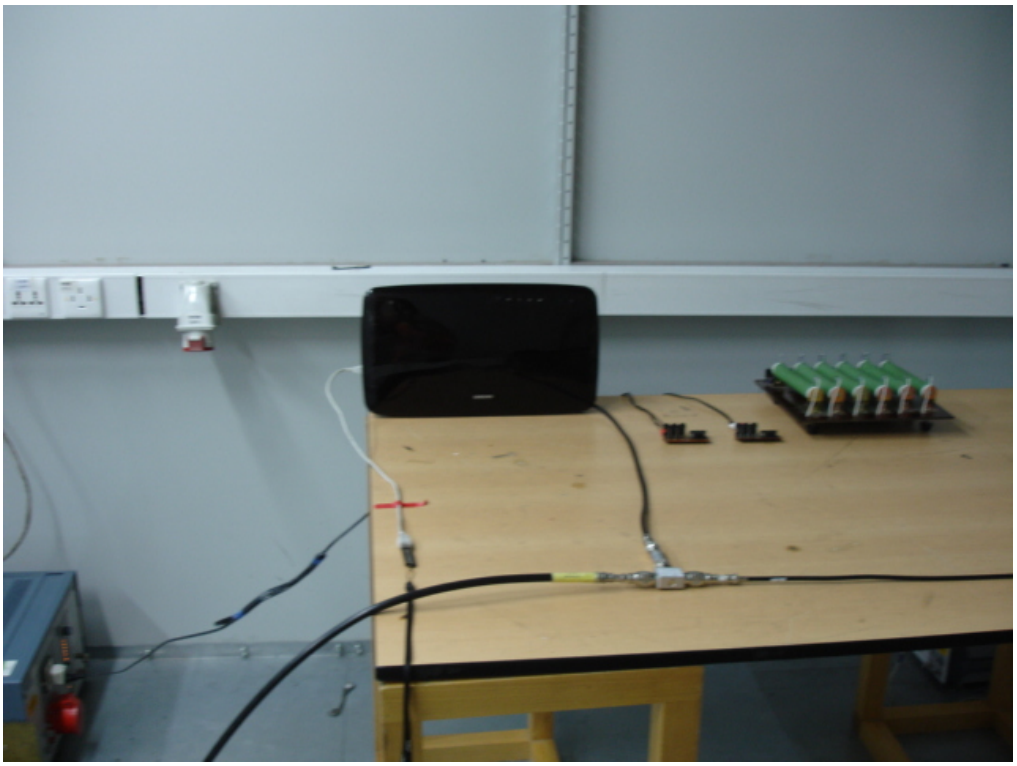


Photo 3 Radiated disturbances Test

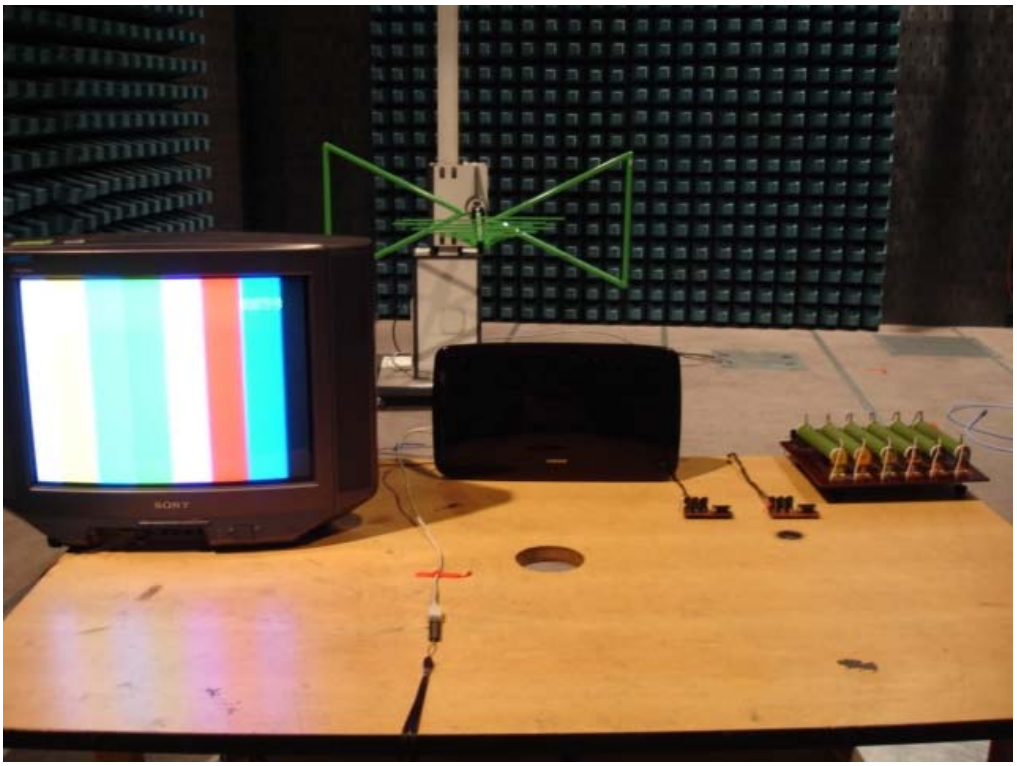


Photo 4 Appearance of EUT

Photo 5 Appearance of EUT