

# TEST REPORT

of

FCC Part 15 Subpart B&C §15.247/RSS-210 Issue 7, RSS-Gen Issue 2

FCC ID/IC Certification: BEJLUV300 / 2703H-LUV300

Equipment Under Test : Vacuum cleaner  
Model Name : LUV300  
Serial No. : N/A  
Applicant : LG Electronics Inc.  
Manufacturer : LG Electronics Inc.  
Date of Test(s) : 2010.04.16 ~ 2010.04.22  
Date of Issue : 2010.04.22

In the configuration tested with the standards specified above.

Tested By:



Date

2010.04.22

Duke Ko

Approved By



Date

2010.04.22

Charles Kim

*The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.*

## Table of contents

1. General information -----	3
2. Transmitter radiated spurious emissions -----	7
3. Receiver Radiated Spurious Emission-----	11
4. Transmitter AC Power Line Conducted Emission-----	13
5. Receiver AC Power Line Conducted Emission-----	18

---

*The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.*

## 1. General information

### 1.1 Testing laboratory

SGS Testing Korea Co., Ltd.

Wireless Div. 2FL, 18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea 435-040

[www.electrolab.kr.sgs.com](http://www.electrolab.kr.sgs.com)

Telephone : +82 +31 428 5700

FAX : +82 +31 427 2371

### 1.2 Details of applicant

Applicant : LG Electronics Inc.

Address : 391-2, Gaeumjeong-dong, Changwon, Gyeongnam, 641-711, Korea

Contact Person : ImHwa, Jung

Phone No. : +82 +55 260 3463

### 1.3 Description of EUT

<b>Kind of Product</b>	Vacuum cleaner
<b>Model Name</b>	LUV300
<b>Serial Number</b>	N/A
<b>Power Supply</b>	AC 120 V
<b>Frequency Range</b>	2402 ~ 2478 MHz
<b>Modulation Technique</b>	DSSS(GFSK)
<b>Number of Channels</b>	77
<b>Antenna Type</b>	PCB Type
<b>Antenna Gain</b>	-5.05 dBi

### 1.4 Details of modification

- Power supply module is changed.

*The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.*

## 1.5 Test equipment list

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Preamplifier	H.P	8447F	Jul. 02, 2010
Test Receiver	R & S	ESU26	Jun. 04, 2010
Bilog Antenna	SCHWARZBECK MESSELEKTRONIK	VULB9163	Jul. 22, 2010
Antenna Master	EMCO	1050	N.C.R
Turn Table	Daeil EMC	DI-1500	N.C.R
Anechoic Chamber	SY Corporation	L x W x H (9.6 m x 6.4 m x 6.6 m)	Jan. 27, 2011
Two-Line V-Network	R & S	ENV216	Jan. 06, 2011
Test Receiver	R & S	ESHS10	Jul. 13, 2010
Anechoic Chamber	SY Corporation	L x W x H (6.5 m x 3.5 m x 3.5 m)	N.C.R

*The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.*

### 1.6. Summary of test results

The EUT has been tested according to the following specifications:

Applied standard : FCC Part15 subpart B&C, RSS-210, RSS-Gen			
Standard section		Test item	Result
15.205(a) 15.209 15.247(d)	A8.5	Transmitter radiated spurious emissions	Complied
15.109(a)	RSS-Gen 6	Receiver Radiated Spurious Emission	Complied
15.207	RSS-Gen 7.2.2	Transmitter AC Power Line Conducted Emission	Complied
15.107	RSS-Gen 7.2.2	Receiver AC Power Line Conducted Emission	Complied

*The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.*

---

**1.7. Test report revision**

Revision	Report number	Description
0	F690501/RF-RTL003768	Initial

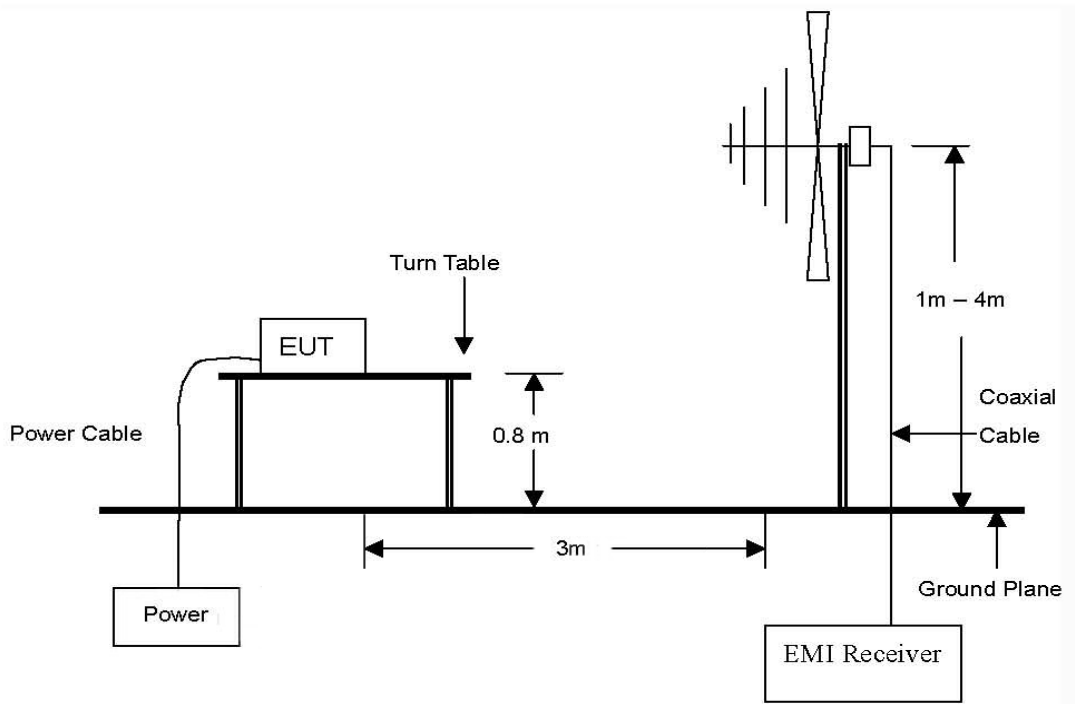
---

*The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.*

## 2. Transmitter radiated spurious emissions

### 2.1. Test setup

The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 1 GHz Emissions.



*The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.*

## 2.2. Limit

According to §15.247(d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of  $R_{ms}$  averaging over a time interval, as permitted under paragraph(b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in section §15.209(a) is not required. In addition, radiated emission which in the restricted band, as define in section §15.205(a), must also comply the radiated emission limits specified in section §15.209(a) (see section §15.205(c))

According to § 15.109(a), for an intentional radiator devices, the general required of field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values :

Frequency (MHz)	Distance (m)	Radiated (dB $\mu$ V/m)	Radiated ( $\mu$ V/m)
30 - 88	3	40.0	100
88 – 216	3	43.5	150
216 – 960	3	46.0	200
Above 960	3	54.0	500

*The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.*

### 2.3. Test procedures

Radiated emissions from the EUT were measured according to the dictates of ANSI C63.4:2003

1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
2. During performing radiated emission below 1 GHz, the EUT was set 3 meters away from the interference receiving antenna, which was mounted on the top of a variable-height antenna tower. During performing radiated emission above 1 GHz, the EUT was set 3 meter away from the interference-receiving antenna.
3. The antenna is a broa dB and antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

■ Note

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Peak detection (PK) or Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection and frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1 GHz.

---

*The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.*

## 2.4. Test result

Ambient temperature : (24 ± 2) °C

Relative humidity : 47 % R.H.

The frequency spectrum from 30 MHz to 1 000 MHz was investigated. Emission levels are not reported much lower than the limits by over 30 dB.

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	Amp Gain+CL (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
40.023	39.8	Peak	V	12.33	-27.63	24.5	40.0	15.5
59.989	46.6	Peak	V	11.44	-27.42	30.6	40.0	9.4
79.995	44.3	Peak	V	7.29	-27.26	24.3	40.0	15.7
120.008	41.5	Peak	V	9.23	-26.91	23.8	43.5	19.7
160.020	42.1	Peak	H	8.03	-26.58	23.6	43.5	19.9
199.993	39.2	Peak	V	10.32	-26.24	23.3	43.5	20.2
240.045	39.7	Peak	H	12.10	-25.90	25.9	46.0	20.1
260.052	37.0	Peak	H	12.17	-25.78	23.4	46.0	22.6
280.018	36.7	Peak	H	12.87	-25.71	23.9	46.0	22.1
537.229	34.9	Peak	H	17.83	-26.52	26.2	46.0	19.8
Above 600.000	Not detected	-	-	-	-	-	-	-

■ Remark:

1. All spurious emission at low, middle and high channel are almost the same below 1 GHz, so the spurious emission test result of the middle channel was chosen as representative in final test.
2. To get a maximum emission level from the EUT, the EUT was moved throughout the XY, XZ and YZ planes
3. The emission levels above 600 MHz are very lower than the limit by over 30 dB.

*The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.*

### 3. Receiver radiated spurious emissions

#### 3.1. Test setup

Same as clause 4.1.

##### 3.1.1. Receiver radiated spurious emissions

Same as clause 4.1.1.

#### 3.2. Limit

According to §15.109(a), Except for Class A digital devices, the field strength of radiated emission from unintentional radiator at a distance of 3 m shall not exceed the following values:

Frequency (MHz)	Distance (Meters)	Radiated (dB $\mu$ V/m)	Radiated ( $\mu$ V/m)
30 - 88	3	40.0	100
88 – 216	3	43.5	150
216 – 960	3	46.0	200
Above 960	3	54.0	500

#### 3.3. Test procedures

Same as clause 4.3.

##### 3.3.1. Test procedures for radiated spurious emissions

Same as clause 4.3.1.

*The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.*

### 3.4. Test result

Ambient temperature : (24 ± 2) °C  
 Relative humidity : 47 % R.H.

All emissions are not reported much lower than the prescribed limits.

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	Amp Gain+CL (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
39.983	40.4	Peak	V	12.33	-27.63	25.1	40.0	14.9
59.989	46.7	Peak	V	11.44	-27.42	30.7	40.0	9.3
79.995	44.4	Peak	V	7.29	-27.26	24.4	40.0	15.6
120.008	41.9	Peak	V	9.23	-26.91	24.2	43.5	19.3
160.020	42.1	Peak	H	8.03	-26.58	23.6	43.5	19.9
199.993	40.3	Peak	V	10.32	-26.24	24.4	43.5	19.1
240.045	38.5	Peak	H	12.10	-25.90	24.7	46.0	21.3
280.058	36.8	Peak	H	12.87	-25.71	24.0	46.0	22.0
537.270	34.0	Peak	H	17.83	-26.52	25.3	46.0	20.7
Above 600.000	Not detected	-	-	-	-	-	-	-

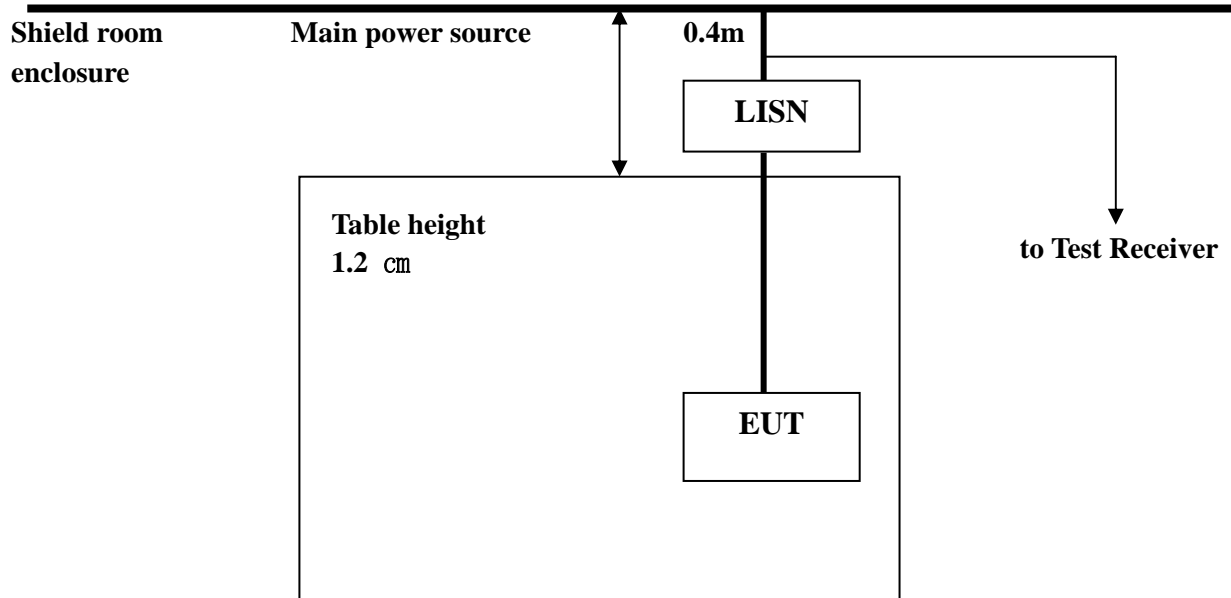
■ Remark:

1. All spurious emission at low, middle and high channel are almost the same below 1 GHz, so the spurious emission test result of the middle channel was chosen as representative in final test.
2. To get a maximum emission level from the EUT, the EUT was moved throughout the XY, XZ and YZ planes
3. The emission levels above 600 MHz are very lower than the limit by over 30 dB.

*The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.*

## 4. Transmitter AC Power Line Conducted Emission

### 4.1. Test Setup



### 4.2. Limit

According to §15.207(a) for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 uH/50 ohm line impedance stabilization network(LISN).

Compliance with the provision of this paragraph shall on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower applies at the boundary between the frequency ranges.

Frequency of Emission (MHz)	Conducted limit (dB µV)	
	Quasi-peak	Average
0.15 – 0.50	66 - 56*	56 - 46*
0.50 – 5.00	56	46
5.00 – 30.0	60	50

\* Decreases with the logarithm of the frequency.

*The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.*

### 4.3. Test Procedures

Radiated emissions from the EUT were measured according to the dictates of ANSI C63.4:2003

1. The test procedure is performed in a 6.5 m × 3.5 m × 3.5 m (L × W × H) shielded room. The EUT along with its peripherals were placed on a 1.0 m (W) × 1.5 m (L) and 0.8 m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane.
2. The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room.
3. All peripherals were connected to the second LISN and the chassis ground also bounded to the horizontal ground plane of shielded room.
4. The excess power cable between the EUT and the LISN was bundled. The power cables of peripherals were unbundled. All connecting cables of EUT and peripherals were moved to find the maximum emission.

---

*The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.*

#### 4.4. Test Results

The following table shows the highest levels of conducted emissions on both phase of Hot and Neutral line.

Ambient temperature : (24 ± 2) °C

Relative humidity : 47 % R.H.

Frequency range : 0.15 MHz – 30 MHz

Measured Bandwidth : 9 kHz

FREQ. (MHz)	LEVEL(dB $\mu$ V)		LINE	LIMIT(dB $\mu$ V)		MARGIN(dB)	
	Q-Peak	Average		Q-Peak	Average	Q-Peak	Average
20.00	25.7	25.3	H	60.0	50.0	34.3	24.7
24.53	12.2	6.1	H	60.0	50.0	47.8	43.9
30.00	20.5	13.5	H	60.0	50.0	39.5	36.5
20.00	17.3	15.2	N	60.0	50.0	42.7	34.8
24.37	12.1	5.8	N	60.0	50.0	47.9	44.2
30.00	13.3	7.8	N	60.0	50.0	46.7	42.2

Note ;

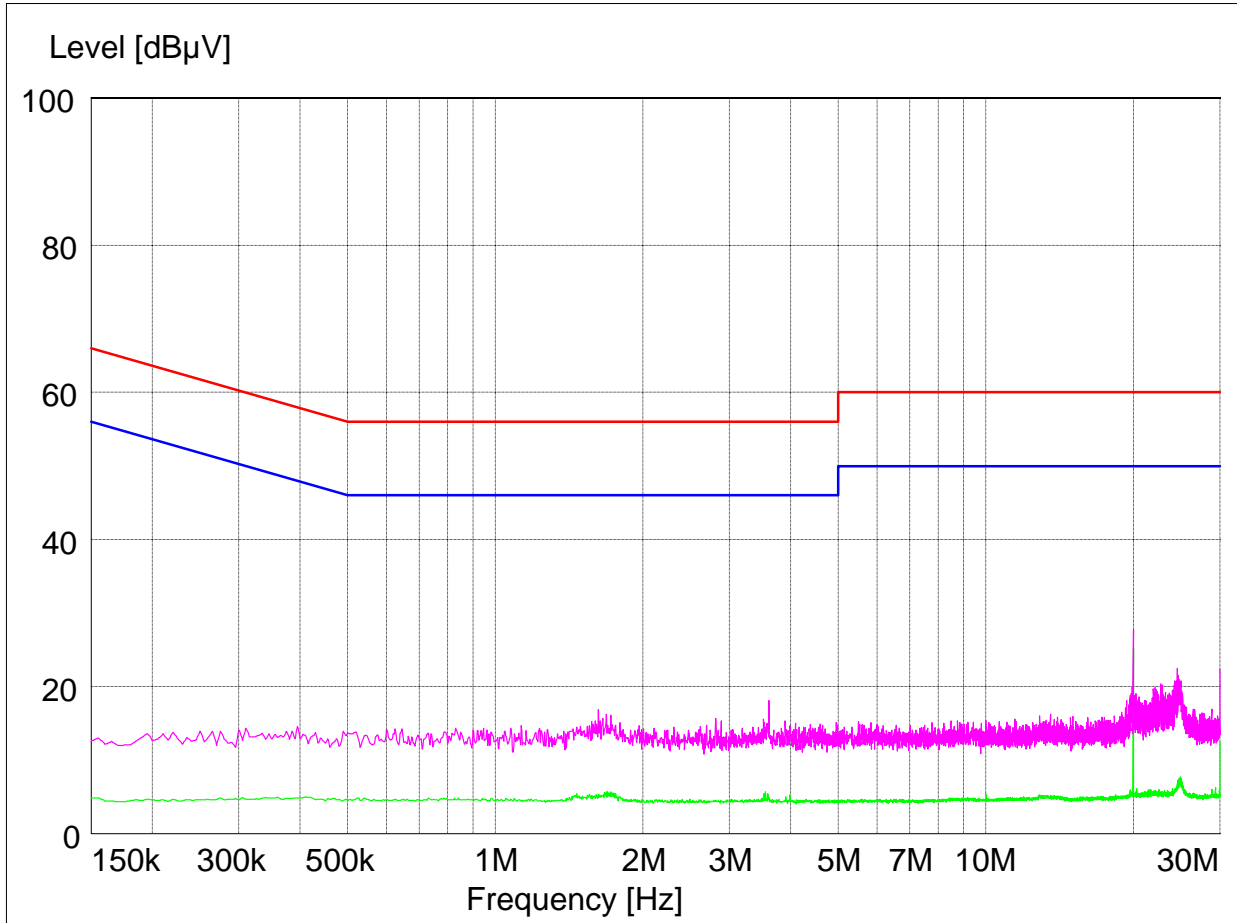
Line ( H ) : Hot

Line ( N ) : Neutral

*The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.*

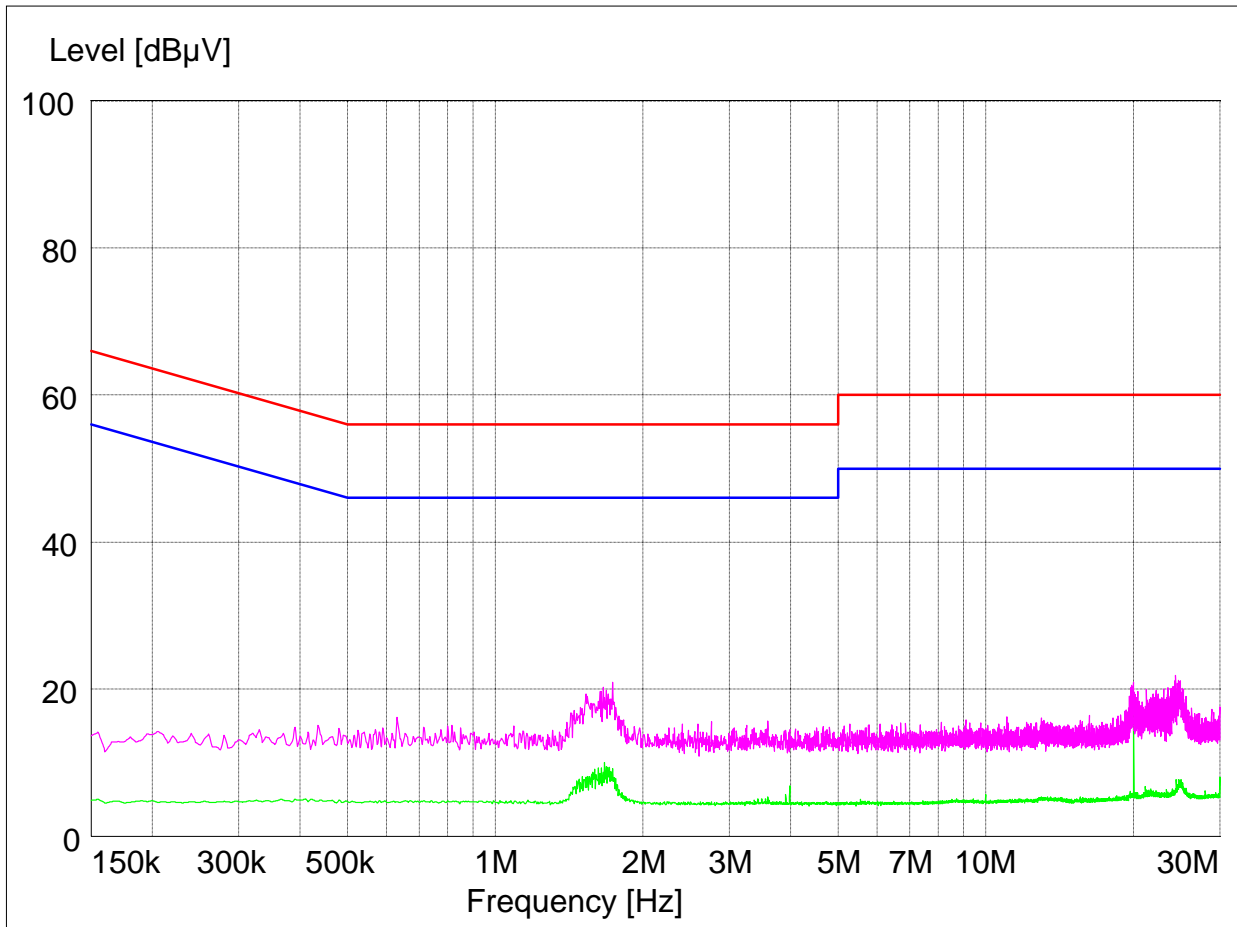
**Plot of Conducted Power line**

Test mode : (Hot)



*The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.*

Test mode : (Neutral)



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

## 5. Receiver AC Power Line Conducted Emission

### 5.1. Test Setup- Same as clause 9.1.

### 5.2. Limit

According to §15.107(a) Except for Class A digital devices, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 oh<sub>ms</sub> line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the band edges.

Frequency of Emission (MHz)	Conducted limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15 – 0.50	66-56*	56-46*
0.50 – 5.00	56	46
5.00 – 30.0	60	50

\* Decreases with the logarithm of the frequency.

*The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.*

### 5.3. Test Procedures- Same as clause 9.3.

### 5.4. Test Results

The following table shows the highest levels of conducted emissions on both phase of Hot and Neutral line; Addition,

Ambient temperature : (24 ± 2) °C  
 Relative humidity : 47 % R.H.

Frequency range : 0.15 MHz – 30 MHz  
 Measured Bandwidth : 9 kHz

FREQ. (MHz)	LEVEL(dB $\mu$ V)		LINE	LIMIT(dB $\mu$ V)		MARGIN(dB)	
	Q-Peak	Average		Q-Peak	Average	Q-Peak	Average
20.00	25.7	25.3	H	60.0	50.0	34.3	24.7
24.51	12.3	5.7	H	60.0	50.0	47.7	44.3
30.00	20.5	13.4	H	60.0	50.0	39.5	36.6
1.54	14.4	8.1	N	56.0	46.0	41.6	37.9
1.72	14.9	9.4	N	56.0	46.0	41.1	36.6
20.01	15.7	13.2	N	60.0	50.0	44.3	36.8
24.57	13.0	6.4	N	60.0	50.0	47.0	43.6

Note ;

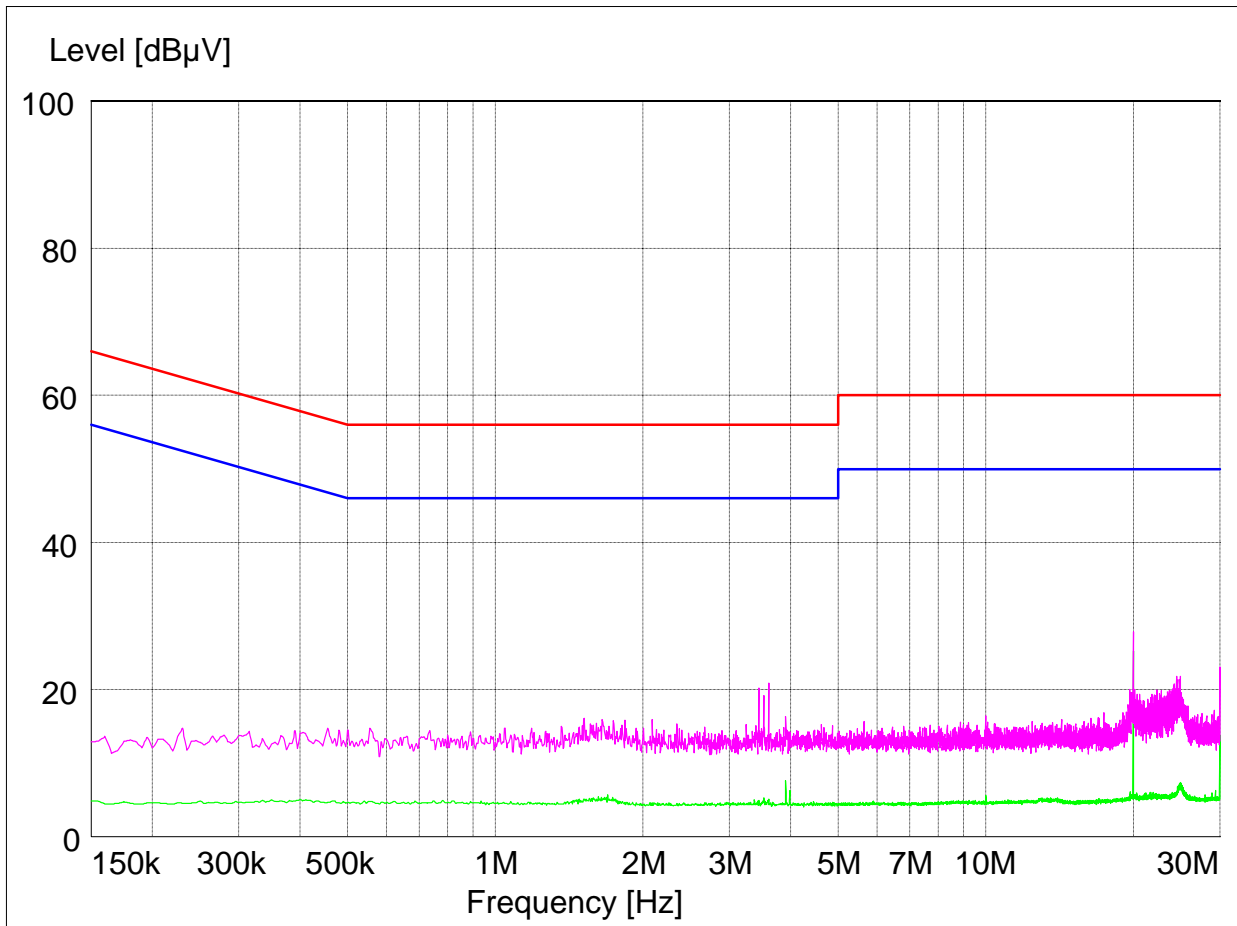
Line ( H ) : Hot

Line ( N ) : Neutral

*The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.*

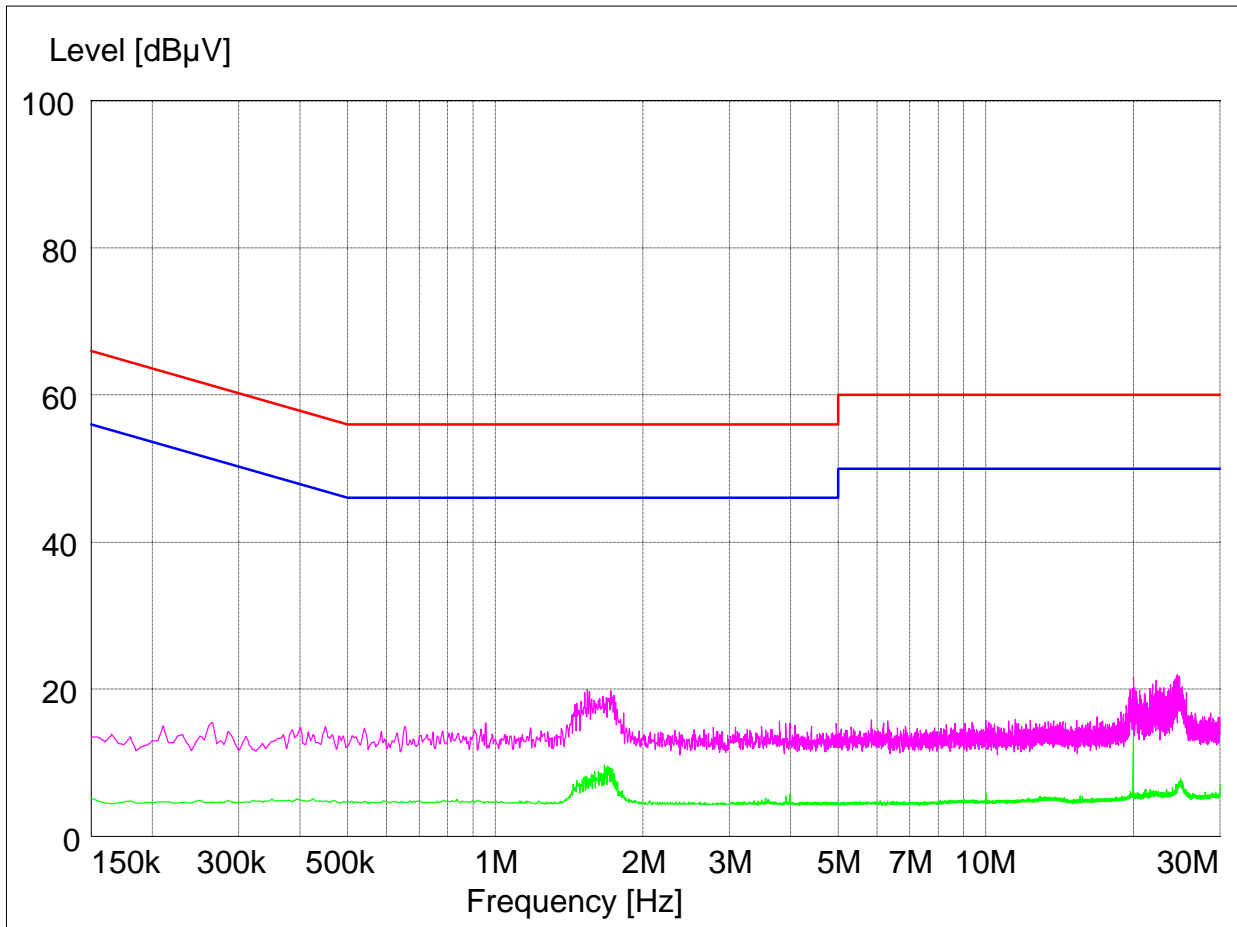
**Plot of Conducted Power line**

Test mode : (Hot)



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

Test mode : (Neutral)



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.