

EMI CERTIFICATION REPORT

Applicant:

LG Electronics USA
1000 Sylvan Avenue, Englewood Cliffs NJ 07632

Date of Receipt: May 08, 2014

Date of Issue: May 19, 2014

Test Report No. HCT-E-1405-F021

HCT FRN: 0005866421

FCC ID:

BEJPWFMD000

Rule Part(s) / Standard(s) : FCC PART 15 Subpart B Class B
EUT Type : Internet Bridge
Model Name : PWFMD000
Port : RJ45 / DC Port
Date of Test : May 15, 2014 - May 16, 2014

The device bearing the trade name and model specified above, has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-2003. (See Test Report if any modifications were made for compliance)

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

HCT certifies that no party to application has been denial the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C 862

Tested By



Ki-Min Lee
Test Engineer
EMC Team
Certification Division

Reviewed By



Sang-Jun Lee
Technical Manager
EMC Team
Certification Division

This report only responds to the tested sample and may not be reproduced, except in full, without written approval of the HCT Co., Ltd.



DOCUMENT HISTORY

The revision history for this document is shown in table.

Version	Date	Description
HCT-E-1405-F021	May 19, 2014	Initial Release



TABLE OF CONTENTS

	PAGE
1. GENERAL INFORMATION	4
1.1 Description of EUT	4
1.2 Related Submittal(s) / Grant(s).....	4
1.3 Test Facility	4
1.4 Tested System Details.....	5
1.5 Cable Description	6
1.6 Noise Suppression Parts on Cable. (I/O Cable)	6
2. DESCRIPTION OF TEST	7
3. PRELIMINARY TEST	10
3.1 Conducted Emission Test	11
3.2 Radiated Emission Test	11
4. CONDUCTED AND RADIATED EMISSION TEST SUMMARY	11
4.1 Conducted Emission Test	11
4.2 Radiated Emission Test	12
5. LIST OF TEST EQUIPMENT	18
6. CONCLUSION	19

ATTACHMENT: **TEST SETUP PHOTOGRAPHS**



1. GENERAL INFORMATION

1.1 Description of EUT

Equipment Under Test is manufactured by **LG Electronics Inc.**
Its basic purpose is used for communications.

Model	PWFMDB000
FCC ID	BEJPWFMDB000
EUT Type	Internet Bridge

1.2 Related Submittal(s) / Grant(s)

Original submittal only.

1.3 Test Facility

Test site is located at 74, SEOICHEON-RO, 578BEON-GIL, MAJANG-MYEON, ICHEON-SI, GYEONGGI-DO, SOUTH KOREA. Those measurement facilities are constructed in conformance with the requirements of ANSI C63.4-2003.

Measurement Facilities	Reg. No.
Radiated Field strength measurement facility (3 m)	90661 (February 28, 2014)
Radiated Field strength measurement facility (10 m)	90661 (February 28, 2014)



1.4 Tested System Details

All equipment descriptions used in the tested system (including inserted cards) are:

Device Type	Model Name	Manufacturer	FCC ID / DoC	Connected To
EUT	PWFMDB000	LG	BEJPWFMDB000	Notebook PC, Adaptor
Adaptor	PA-1041-0	LITE-ON TECHNOLOGY (CHANGZHOU) CO., LTD	-	EUT
Notebook PC	ProBook6560b	HP	DoC	Notebook PC adaptor
Notebook PC adaptor	PPP009D	DELTA Electronics (JIANGSU)LTD	-	Notebook PC
Mouse	Serial 2 button mouse	Radio shack	FSUGMZE3	Notebook PC
RJ45 cable	-	-	-	EUT, Notebook PC
USB memory (4 GB)	CRUZER BLADE 4 GB	SanDisk	-	Notebook PC



1.5 Cable Description

Product Name	Port	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (m)
EUT	RJ 45	N/A	N	(D)1.5
	DC in	N	N/A	(P)1.8
Notebook PC	Serial (Mouse)	N/A	Y	(D)1.8
	DC in	N	N/A	(P)1.8

* The marked "(D)" means the data cable and "(P)" means the power cable.

1.6 Noise Suppression Parts on Cable. (I/O Cable)

Product Name	Port	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
EUT	RJ 45	N	N/A	N	N/A
Notebook PC	Serial (Mouse)	N	N/A	Y	Notebook PC End



2. DESCRIPTION OF TEST

2.1 Measurement of Conducted Emission

The test procedure was in accordance with ANSI C63.4-2003, Clause 7

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both conducted lines are measured in Quasi-Peak and Average mode, including the worst-case data points for each tested configuration.
- c. The frequency range from 150 kHz to 30 MHz was searched.

[Conducted Emission Limits]

Frequency (MHz)	Resolution Bandwidth	Quasi-Peak(dB μ V)	Average(dB μ V)
0.15 to 0.5	9 kHz	66 to 56*	56 to 46*
0.5 to 5	9 kHz	56	46
5 to 30	9 kHz	60	50

**Decreases with the logarithm of the frequency.*



2.2 Measurement of Radiated Emission

The test procedure was in accordance with ANSI C63.4-2003, Clause 8

- a. The EUT was placed on the top of a turn table 0.8 meters above the ground at a 3 m shield room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 m away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from 1 m to 4 m 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.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 m to 4 m and the turn table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to Peak and Average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.
- g. The antenna height scans apply for both horizontal and vertical polarizations, except that for vertical polarization, the minimum height of the center of the antenna shall be increased so that the lowest point of the bottom of the lowest antenna element clears the site reference ground plane by at least 25 cm. (below 1 GHz)

[Radiated Emission Limits]

Frequency (MHz)	Antenna Distance (m)	Field Strength ($\mu V/m$)	Quasi-Peak (dB $\mu V/m$)
30 to 88	3	100	40.0
88 to 216	3	150	43.5
216 to 960	3	200	46.0
Above 960	3	500	54.0
Frequency (MHz)	Antenna Distance (m)	Peak (dB $\mu V/m$)	Average (dB $\mu V/m$)
Above 1 000	3	74	54

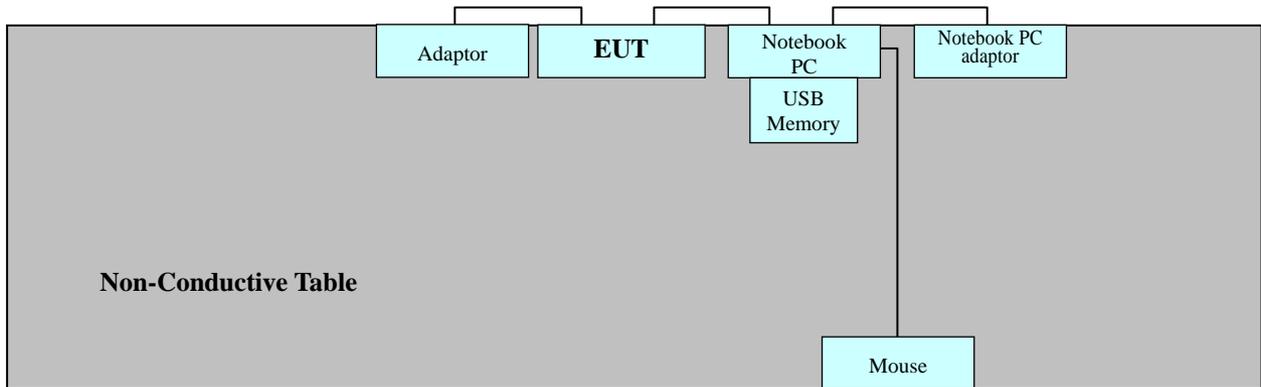


2.2.1 Frequency Range of Radiated Measurements

An unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a Radiated Emission limit is specified, up to the frequency shown in the following table

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705 to 108	1 000
108 to 500	2 000
500 to 1 000	5 000
1 000 to 13 000	5 th harmonic of the highest frequency or 40 GHz, whichever is lower

2.3 Configuration of Tested System



Power Line: 120 VAC, 60 Hz



3. PRELIMINARY TEST

3.1 Conducted Emission Test

It was tested Data Communication mode, after connecting all peripheral devices.

Operation Mode: Ping mode

3.2 Radiated Emission Test

It was tested Data Communication mode, after connecting all peripheral devices.

Operation Mode: Ping mode



4. CONDUCTED AND RADIATED EMISSION TEST SUMMARY

4.1 Conducted Emission Test

The following table shows the highest levels of conducted emissions on both polarization of hot and neutral line.

Limit Apply to	: FCC PART 15 Subpart B Class B
Detector	: Quasi-Peak, Average (6 dB Bandwidth: 9 kHz)
Operation Mode	: Ping mode
Temperature	: 22.8°C
Humidity Level	: 47.0 %
Test Date	: May 15, 2014

Frequency (MHz)	Corr. (dB)	Conductor	Quasi-Peak			Average		
			Limit (dBuV)	Measurement Level (dBuV)	Result Level (dBuV)	Limit (dBuV)	Measurement Level (dBuV)	Result Level (dBuV)
14.2745	10.6	L1	60.0	27.1	37.7	50.0	22.3	32.9
15.4445	10.7	L1	60.0	24.2	34.9	50.0	18.3	29.0
16.2275	10.6	N	60.0	-	-	50.0	25.3	35.9
17.6945	10.7	N	60.0	28.4	39.1	50.0	24.2	34.9

※ Calculation Formula:

1. Conductor L1 = Hot, Conductor N = Neutral
 2. Corr. = LISN Factor + Cable Loss
 3. Measurement Level (Receiver Reading) = Result Level - Corr.
 4. Result Level = Measurement Level + Corr.
- * 'Result Level' in above table is same as the 'Quasi-Peak' and 'CAverage' of the Test Data Graph (Refer to page 13 to page 16 for details.)



- Test Data Graph

EMI Auto Test(2)

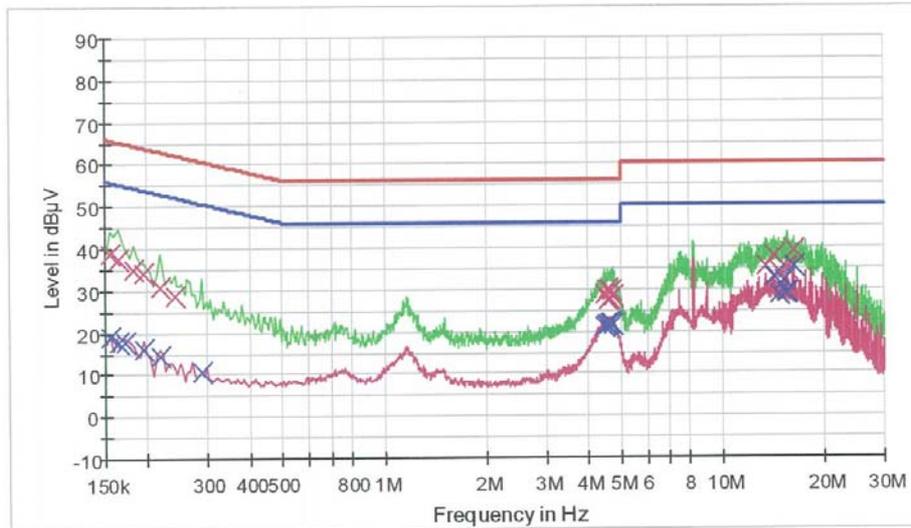
1 / 2

HCT TEST Report

Common Information

EUT: PWFMDB000
 Manufacturer: LG
 Test Site: SHIELD ROOM
 Operating Conditions: PING MODE
 Operator Name:

FCC CLASS B



— FCCCLASS B_QP — FCCCLASS B_AV — Preview Result 1-PK+
— Preview Result 2-AVG x Final Result 1-QPK x Final Result 2-CAV

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154500	38.9	9.000	Off	L1	9.7	26.9	65.8
0.163500	37.4	9.000	Off	L1	9.7	27.9	65.3
0.181500	35.0	9.000	Off	L1	9.7	29.4	64.4
0.195000	34.1	9.000	Off	L1	9.7	29.7	63.8
0.217500	30.9	9.000	Off	L1	9.7	32.0	62.9
0.240000	28.6	9.000	Off	L1	9.7	33.5	62.1
4.455500	28.7	9.000	Off	L1	10.1	27.3	56.0
4.595000	29.8	9.000	Off	L1	10.1	26.2	56.0
4.604000	27.5	9.000	Off	L1	10.1	28.5	56.0
4.617500	28.0	9.000	Off	L1	10.1	28.0	56.0
4.667000	29.3	9.000	Off	L1	10.1	26.7	56.0
4.739000	28.3	9.000	Off	L1	10.1	27.7	56.0
13.392500	35.2	9.000	Off	L1	10.6	24.8	60.0
14.274500	37.7	9.000	Off	L1	10.6	22.3	60.0
14.679500	34.1	9.000	Off	L1	10.6	25.9	60.0
15.444500	34.9	9.000	Off	L1	10.7	25.1	60.0

5/15/2014

4:51:21



EMI Auto Test(2)

2 / 2

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
15.642500	34.7	9.000	Off	L1	10.7	25.3	60.0
16.227500	39.3	9.000	Off	L1	10.7	20.7	60.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.154500	19.0	9.000	Off	L1	9.7	36.8	55.8
0.163500	17.7	9.000	Off	L1	9.7	37.6	55.3
0.172500	17.7	9.000	Off	L1	9.7	37.1	54.8
0.195000	16.2	9.000	Off	L1	9.7	37.6	53.8
0.217500	14.4	9.000	Off	L1	9.7	38.5	52.9
0.289500	10.4	9.000	Off	L1	9.7	40.1	50.5
4.455500	21.2	9.000	Off	L1	10.1	24.8	46.0
4.550000	21.7	9.000	Off	L1	10.1	24.4	46.0
4.599500	21.7	9.000	Off	L1	10.1	24.3	46.0
4.613000	21.8	9.000	Off	L1	10.1	24.2	46.0
4.667000	21.7	9.000	Off	L1	10.1	24.3	46.0
4.739000	21.3	9.000	Off	L1	10.1	24.7	46.0
14.274500	32.9	9.000	Off	L1	10.6	17.1	50.0
14.679500	28.6	9.000	Off	L1	10.6	21.4	50.0
15.251000	32.2	9.000	Off	L1	10.7	17.8	50.0
15.444500	29.0	9.000	Off	L1	10.7	21.0	50.0
15.642500	28.9	9.000	Off	L1	10.7	21.1	50.0
16.227500	35.5	9.000	Off	L1	10.7	14.5	50.0

5/15/2014

4:51:21



EMI Auto Test(2)

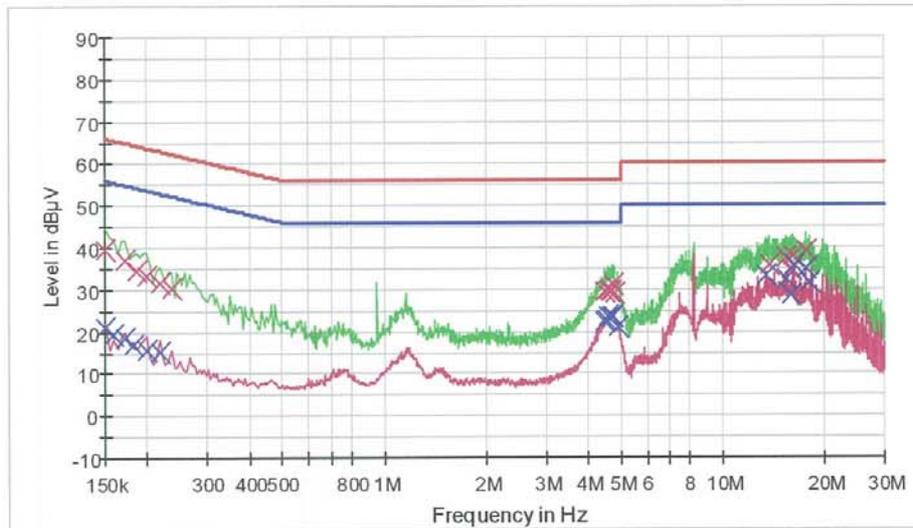
1 / 2

HCT TEST Report

Common Information

EUT: PWFMDB000
 Manufacturer: LG
 Test Site: SHIELD ROOM
 Operating Conditions: PING MODE
 Operator Name:

FCC CLASS B



— FCCCLASS B_QP
 — FCCCLASS B_AV
 — Preview Result 1-CPK
— Preview Result 2-AVG
 X Final Result 1-CPK
 X Final Result 2-CAV

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	39.5	9.000	Off	N	9.7	26.5	66.0
0.172500	37.2	9.000	Off	N	9.7	27.6	64.8
0.186000	34.6	9.000	Off	N	9.7	29.6	64.2
0.199500	33.1	9.000	Off	N	9.7	30.5	63.6
0.217500	31.4	9.000	Off	N	9.7	31.5	62.9
0.235500	30.2	9.000	Off	N	9.7	32.1	62.3
4.460000	29.6	9.000	Off	N	10.1	26.4	56.0
4.604000	29.8	9.000	Off	N	10.1	26.2	56.0
4.622000	29.6	9.000	Off	N	10.1	26.4	56.0
4.676000	29.4	9.000	Off	N	10.1	26.6	56.0
4.743500	31.2	9.000	Off	N	10.1	24.8	56.0
4.815500	29.2	9.000	Off	N	10.1	26.8	56.0
13.667000	35.6	9.000	Off	N	10.5	24.4	60.0
15.435500	37.3	9.000	Off	N	10.6	22.7	60.0
15.912500	35.1	9.000	Off	N	10.6	24.9	60.0
16.002500	34.6	9.000	Off	N	10.6	25.4	60.0

5/15/2014

4:42:15



EMI Auto Test(2)

2 / 2

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
16.164500	37.9	9.000	Off	N	10.6	22.1	60.0
17.694500	39.1	9.000	Off	N	10.7	20.9	60.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	20.9	9.000	Off	N	9.7	35.1	56.0
0.159000	19.5	9.000	Off	N	9.7	36.0	55.5
0.172500	18.7	9.000	Off	N	9.7	36.1	54.8
0.181500	16.8	9.000	Off	N	9.7	37.6	54.4
0.199500	15.7	9.000	Off	N	9.7	37.9	53.6
0.217500	15.3	9.000	Off	N	9.7	37.6	52.9
4.460000	22.2	9.000	Off	N	10.1	23.8	46.0
4.532000	22.9	9.000	Off	N	10.1	23.1	46.0
4.604000	23.4	9.000	Off	N	10.1	22.6	46.0
4.676000	23.8	9.000	Off	N	10.1	22.2	46.0
4.748000	23.6	9.000	Off	N	10.1	22.4	46.0
4.887500	21.0	9.000	Off	N	10.1	25.0	46.0
13.356500	33.5	9.000	Off	N	10.5	16.5	50.0
15.435500	32.4	9.000	Off	N	10.6	17.6	50.0
16.002500	28.7	9.000	Off	N	10.6	21.3	50.0
16.227500	35.9	9.000	Off	N	10.6	14.1	50.0
17.694500	34.9	9.000	Off	N	10.7	15.1	50.0
17.937500	31.7	9.000	Off	N	10.7	18.3	50.0

5/15/2014

4:42:15



4.2 Radiated Emission Test

The following table shows the highest levels of Radiated Emissions on both polarization of horizontal and vertical.

-For Measurement Below 1 GHz

Limit Apply to : FCC PART 15 Subpart B Class B

Detector : Quasi-Peak

6 dB Bandwidth: : RBW 120 kHz, VBW 300 kHz

Operation Mode : Ping mode

Temperature : 24.3°C

Humidity Level : 39.7 %

Test Date : May 16, 2014

Frequency (MHz)	Reading (dBUV)	Polarity (H/V)	Antenna Height (m)	Correction Factor		Limit (dBUV/m)	Total Level (dBUV/m)	Margin (dB)
				Antenna (dB/m)	Cable (dB)			
38.8	17.7	V	1.0	11.9	3.4	40.0	33.0	7.0
56.0	17.6	V	1.0	12.0	3.5	40.0	33.2	6.8
125.0	21.3	V	1.0	12.0	3.9	43.5	37.2	6.3
265.2	16.4	V	1.0	12.3	4.4	46.0	33.1	12.9
456.0	18.7	H	2.0	16.8	5.0	46.0	40.5	5.5
504.0	19.7	H	1.8	17.7	5.1	46.0	42.6	3.4

※ Calculation Formula:

1. Polarity H = Horizontal, Polarity V = Vertical
2. Reading (Receiver Reading) = Total Level – Correction Factor
3. Margin = Limit - Total Level
4. Total Level = Quasi-Peak



-For Measurement Above 1 GHz

Limit Apply to : FCC PART 15 Subpart B Class B

Detector : Peak mode: Peak (RBW: 1 MHz, VBW: 3 MHz)
Average mode: Peak (RBW: 1 MHz, VBW: 10 Hz)

Operation Mode : Ping mode

Temperature : 24.3°C
Humidity Level : 39.7 %
Test Date : 24.3°C

Frequency (GHz)	Polarity (H/V)	Antenna Height (m)	Peak			Average		
			Total Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Total Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
1.3297	V	1.0	49.9	74	24.1	31.9	54	22.1
1.8352	V	1.0	49.7	74	24.3	32.5	54	21.5
1.9961	V	1.1	53.4	74	20.6	37.5	54	16.5
2.6572	V	1.0	51.5	74	22.5	33.1	54	20.9

※ Calculation Formula:

1. Polarity H = Horizontal, Polarity V = Vertical
2. Margin = Limit - Total Level



5. LIST OF TEST EQUIPMENT

<u>Type</u>	<u>Manufacturer</u>	<u>Model Name</u>	<u>Serial Number</u>	<u>Calibration Cycle</u>	<u>Next CAL Date</u>
<u>Conducted Emission</u>					
<input checked="" type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESCI	100584	1 year	01.24.2015
<input checked="" type="checkbox"/> LISN	EMCO	3816/2SH	9706-1070	1 year	04.07. 2015
<input checked="" type="checkbox"/> LISN	Rohde & Schwarz	ENV216	100073	1 year	01.29. 2015
<input type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESCI	100033	1 year	06.23. 2014
<input type="checkbox"/> LISN	Rohde & Schwarz	ESH3-Z5	100282	1 year	07.03. 2014
<input type="checkbox"/> Attenuator	Rohde & Schwarz	ESH3-Z2	357.8810.352	1 year	07.03. 2014
<input checked="" type="checkbox"/> Software	Rohde & Schwarz	EMC32	-	-	-
<u>Radiated Emission</u>					
-For measurement below 1 GHz					
<input checked="" type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESI40	831564103	1 year	04.07. 2015
<input checked="" type="checkbox"/> Trilog Antenna	Schwarzbeck	VULB9160	3301	2 year	12.17. 2014
<input checked="" type="checkbox"/> Antenna master	HD GmbH	MA240	240/520	N/A	-
<input checked="" type="checkbox"/> Turn Table	HD GmbH	2090	9702/1224	N/A	-
<input type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESU 26	100241	1 year	07.01. 2014
<input type="checkbox"/> Trilog Antenna	Schwarzbeck	VULB9168	185	2 year	04.16. 2015
<input type="checkbox"/> Antenna master	INNCO Systems	MA4000-EP	MA4000/283	N/A	-
<input type="checkbox"/> Turn Table	INNCO Systems	DT3000-3T	DT3000/69	N/A	-
<input checked="" type="checkbox"/> Software	Rohde & Schwarz	EMC32	-	-	-
-For measurement above 1 GHz					
<input checked="" type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESI40	831564103	1 year	04.07. 2015
<input checked="" type="checkbox"/> Antenna master	HD GmbH	MA240	240/520	N/A	-
<input checked="" type="checkbox"/> Turn Table	HD GmbH	2090	9702/1224	N/A	-
<input checked="" type="checkbox"/> Power Amplifier	CERNEX	CBLU1183540	21691	1 year	07.24. 2014
<input type="checkbox"/> Power Amplifier	CERNEX	CBLU1183540	21690	1 year	07.12. 2014
<input checked="" type="checkbox"/> Horn Antenna	Schwarzbeck	BBHA 9120D	296	2 year	12.13. 2014
<input type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESU 26	100241	1 year	07.01. 2014
<input type="checkbox"/> Turn Table	INNCO Systems	DT3000-3T	DT3000/69	N/A	-
<input type="checkbox"/> Antenna master	INNCO Systems	MA4000-EP	MA4000/283	N/A	-
<input type="checkbox"/> Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170124	2 year	10.30. 2014
<input type="checkbox"/> Power Amplifier	CERNEX	CBL18265035	22966	1 year	07.24. 2014
<input type="checkbox"/> Power Amplifier	CERNEX	CBL26405040	19660	1 year	04.04. 2015
<input checked="" type="checkbox"/> Software	Rohde & Schwarz	EMC32	-	-	-



6. CONCLUSION

The data collected shows that the **EUT type: Internet Bridge, FCC ID: BEJPWFMDB000, Model: PWFMDB000** complies with §15.107 and §15.109 of the FCC rules.