

EMI CERTIFICATION REPORT

Applicant:

LG Electronics MobileComm U.S.A., Inc.
1000 Sylvan Avenue, Englewood Cliffs NJ 07632

Date of Receipt: May 12, 2014**Date of Issue: May 19, 2014****Test Report No. HCT-E-1405-F019****HCT FRN: 0005866421****FCC ID:****ZNFLS990**

Rule Part(s) / Standard(s) : FCC PART 15 Subpart B Class B
EUT Type : CDMA, GSM, WCDMA and LTE Phone with Bluetooth, WLAN, NFC and Wireless Charging
Model Name : LGLS990
Additional Model Name : LG-LS990, LS990
Port / Connector(s) : USB / Earphone Port
Date of Test : May 14, 2014 - May 15, 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 denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C 862

Tested By

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DOCUMENT HISTORY

The revision history for this document is shown in table.

Version	Date	Description
HCT-E-1405-F019	May 19, 2014	Initial Release



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ATTACHMENT: TEST SETUP PHOTOGRAPHS



1. GENERAL INFORMATION

1.1 Description of EUT

Equipment Under Test is manufactured by **LG Electronics MobileComm U.S.A., Inc.**
Its basic purpose is used for communications.

Model	LGLS990
FCC ID	ZNFLS990
Additional Model	LG-LS990, LS990
EUT Type	CDMA, GSM, WCDMA and LTE Phone with Bluetooth, WLAN, NFC and Wireless Charging
TX Frequency	824.70 MHz to 848.31 MHz (CDMA BC0) 1 851.25 MHz to 1 908.75 MHz (CDMA BC1) 817.90 MHz to 823.10 MHz (CDMA BC10) 824.20 MHz to 848.80 MHz (GSM 850) 1 850.20 MHz to 1 909.80 MHz (GSM 1 900) 1 850 MHz to 1 915 MHz (LTE B25) 814 MHz to 849 MHz (LTE B26) 2 496 MHz to 2 690 MHz (LTE B41)
RX Frequency	869.70 MHz to 893.31 MHz (CDMA BC0) 1 931.25 MHz to 1 988.75 MHz (CDMA BC1) 862.00 MHz to 894.00 MHz (CDMA BC10) 869.20 MHz to 893.80 MHz (GSM 850) 1 930.20 MHz to 1 989.80 MHz (GSM 1 900) 1 925 MHz to 1 990 MHz (LTE B25) 859 MHz to 894 MHz (LTE B26) 2 496 MHz to 2 690 MHz (LTE B41)

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	LGLS990	LG	ZNFLS990	Notebook PC Ear-phone
USB cable	EAD62588801	CRESYN	-	E.U.T Notebook PC
Ear-phone	EAB62910502	CRESYN	-	E.U.T
Standard cover	-	LG	-	E.U.T
Wireless charger cover	-	LG	-	E.U.T
Single Wireless cover	-	LG	-	EUT
Notebook PC	ProBook6560b	H.P	DoC	EUT Notebook PC adaptor
Notebook PC adaptor	PPP009D	DELTA Electronics (JIANGSU)LTD	-	Notebook PC
Gateway	MV440	Axesstel	PH7MV440	Notebook PC, Adaptor
Mouse	Serial 2 button mouse	Radio shack	FSUGMZE3	Notebook PC
Adaptor	DA-60M12	Yang Ming Industrial	-	Gateway
RJ45 cable	-	-	-	Notebook PC, Gateway
Micro SD Card	16 GB	Transcend	-	EUT



1.5 Cable Description

Product Name	Port	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (m)
EUT	Micro USB	Y	Y	(P,D)1.0
	Ear-phone	N/A	N	(D)1.2
Notebook PC	RJ 45	N/A	N	(D)1.5
	Serial (Mouse)	N/A	Y	(D)1.8
	DC in	N	N/A	(P)1.8
Gateway	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	Micro USB	N	N/A	Y	Both End
	Ear-phone	N	N/A	Y	EUT End
Notebook PC	RJ 45	N	N/A	N	N/A
	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

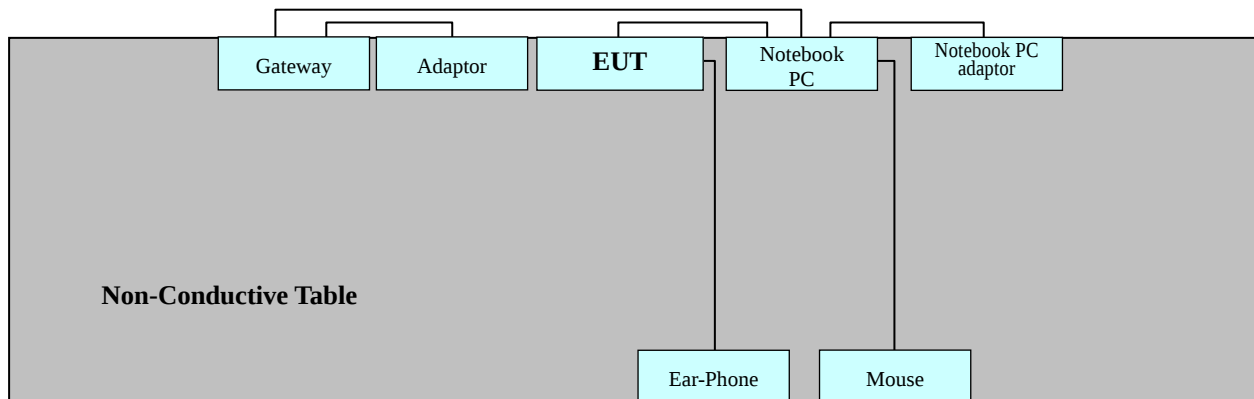


2.2.1 Frequency Range of Radiated Measurements

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: ☒ Data Communication mode

Test Configuration: ☒ USB cable & Standard cover
☒ USB cable & Wireless charger cover
☒ USB cable & Single Wireless cover

3. 2 Radiated Emission Test

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

Operation Mode: ☒ Data Communication mode

Test Configuration: ☒ USB cable & Standard cover
☒ USB cable & Wireless charger cover
☒ USB cable & Single Wireless cover



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	: Data Communication mode
Battery Type	: Standard Cover
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)
0.1995	9.7	L1	63.6	40.7	50.4	53.6	27.0	36.7
0.1950	9.7	N	63.8	41.4	51.1	53.8	-	-
0.2085	9.7	N	63.3	40.0	49.7	53.3	25.2	34.9
4.1720	10.1	L1	56.0	-	-	46.0	22.8	32.9

※ 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)

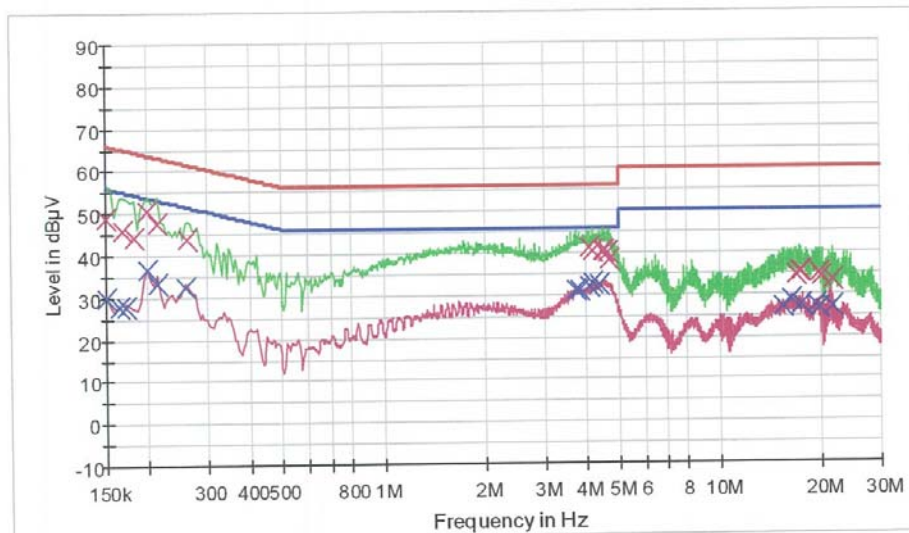
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HCT TEST Report

Common Information

EUT: LGLS990
 Manufacturer: LG
 Test Site: SHIELD ROOM
 Operating Conditions: DATA (STANDARD COVER)
 Operator Name:

FCC CLASS B



— FCC CLASS B_OP — FCC CLASS B_AV — Preview Result 1-PK+
 — Preview Result 2-AVG — Final Result 1-QPK — Final Result 2-CAV

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	48.9	9.000	Off	L1	9.7	17.1	66.0
0.168000	45.8	9.000	Off	L1	9.7	19.3	65.1
0.181500	44.2	9.000	Off	L1	9.7	20.2	64.4
0.199500	50.4	9.000	Off	L1	9.7	13.2	63.6
0.213000	47.7	9.000	Off	L1	9.7	15.4	63.1
0.262500	43.8	9.000	Off	L1	9.7	17.6	61.4
4.104500	41.4	9.000	Off	L1	10.1	14.6	56.0
4.176500	40.5	9.000	Off	L1	10.1	15.5	56.0
4.460000	40.6	9.000	Off	L1	10.1	15.4	56.0
4.527500	40.6	9.000	Off	L1	10.1	15.4	56.0
4.617500	40.1	9.000	Off	L1	10.1	15.9	56.0
4.676000	38.5	9.000	Off	L1	10.1	17.5	56.0
16.776500	34.4	9.000	Off	L1	10.7	25.6	60.0
17.199500	35.2	9.000	Off	L1	10.8	24.8	60.0
17.478500	35.4	9.000	Off	L1	10.8	24.6	60.0
19.643000	34.9	9.000	Off	L1	10.9	25.1	60.0

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EMI Auto Test(2)

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Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
19.899500	34.2	9.000	Off	L1	10.9	25.8	60.0
21.663500	33.1	9.000	Off	L1	11.0	26.9	60.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	30.1	9.000	Off	L1	9.7	25.9	56.0
0.163500	27.8	9.000	Off	L1	9.7	27.5	55.3
0.172500	27.9	9.000	Off	L1	9.7	26.9	54.8
0.199500	36.7	9.000	Off	L1	9.7	16.9	53.6
0.213000	33.2	9.000	Off	L1	9.7	19.9	53.1
0.258000	32.5	9.000	Off	L1	9.7	19.0	51.5
3.722000	31.2	9.000	Off	L1	10.0	14.8	46.0
3.749000	31.2	9.000	Off	L1	10.0	14.8	46.0
3.821000	31.0	9.000	Off	L1	10.0	15.0	46.0
4.104500	32.1	9.000	Off	L1	10.1	13.9	46.0
4.172000	32.9	9.000	Off	L1	10.1	13.1	46.0
4.388000	32.6	9.000	Off	L1	10.1	13.4	46.0
15.359000	27.0	9.000	Off	L1	10.7	23.0	50.0
16.227500	28.7	9.000	Off	L1	10.7	21.3	50.0
17.478500	27.6	9.000	Off	L1	10.8	22.4	50.0
19.229000	27.2	9.000	Off	L1	10.9	22.8	50.0
19.643000	26.4	9.000	Off	L1	10.9	23.6	50.0
21.663500	27.1	9.000	Off	L1	11.0	22.9	50.0

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EMI Auto Test(2)

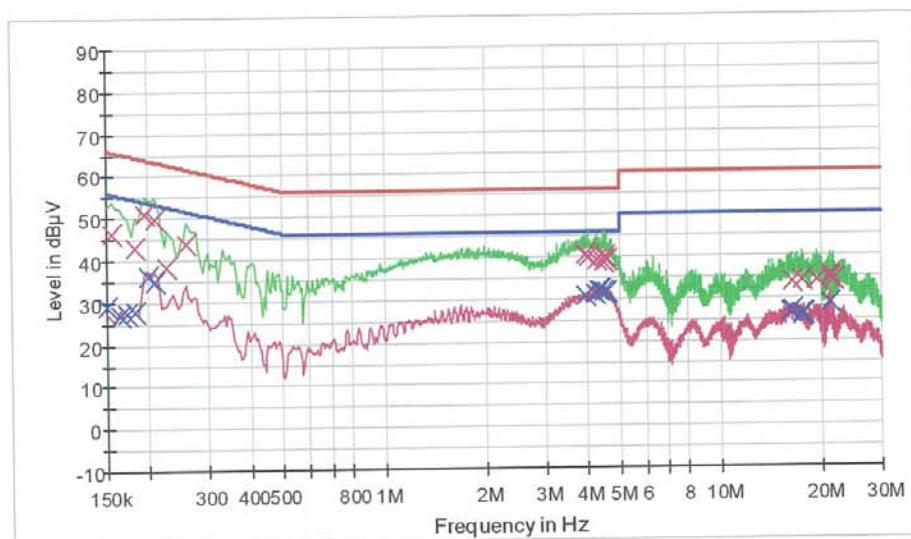
1 / 2

HCT TEST Report

Common Information

EUT: LGLS990
 Manufacturer: LG
 Test Site: SHIELD ROOM
 Operating Conditions: DATA (STANDARD COVER)
 Operator Name:

FCC CLASS B



— FCC CLASS B_AV
 — Preview Result 2-AVG
 × Final Result 1-CPK
 × Final Result 2-CAV

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.154500	46.3	9.000	Off	N	9.7	19.5	65.8
0.181500	42.8	9.000	Off	N	9.7	21.6	64.4
0.195000	51.1	9.000	Off	N	9.7	12.7	63.8
0.208500	49.7	9.000	Off	N	9.7	13.6	63.3
0.226500	38.5	9.000	Off	N	9.7	24.1	62.6
0.258000	43.6	9.000	Off	N	9.7	17.9	61.5
3.960500	40.3	9.000	Off	N	10.1	15.7	56.0
4.032500	40.2	9.000	Off	N	10.1	15.8	56.0
4.298000	39.1	9.000	Off	N	10.1	16.9	56.0
4.491500	38.8	9.000	Off	N	10.1	17.2	56.0
4.527500	40.0	9.000	Off	N	10.1	16.0	56.0
4.599500	39.3	9.000	Off	N	10.1	16.7	56.0
16.200500	33.7	9.000	Off	N	10.6	26.3	60.0
17.474000	34.1	9.000	Off	N	10.7	25.9	60.0
19.386500	34.2	9.000	Off	N	10.8	25.8	60.0
21.087500	34.7	9.000	Off	N	10.9	25.3	60.0

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EMI Auto Test(2)

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Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
21.155000	35.3	9.000	Off	N	10.9	24.7	60.0
21.506000	34.1	9.000	Off	N	10.9	25.9	60.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	29.0	9.000	Off	N	9.7	27.0	56.0
0.163500	27.1	9.000	Off	N	9.7	28.2	55.3
0.172500	27.4	9.000	Off	N	9.7	27.4	54.8
0.181500	27.8	9.000	Off	N	9.7	26.6	54.4
0.199500	36.2	9.000	Off	N	9.7	17.4	53.6
0.208500	34.9	9.000	Off	N	9.7	18.4	53.3
3.960500	30.6	9.000	Off	N	10.1	15.4	46.0
4.208000	31.0	9.000	Off	N	10.1	15.0	46.0
4.316000	32.1	9.000	Off	N	10.1	13.9	46.0
4.361000	31.9	9.000	Off	N	10.1	14.1	46.0
4.491500	31.8	9.000	Off	N	10.1	14.2	46.0
4.599500	31.7	9.000	Off	N	10.1	14.3	46.0
16.029500	26.4	9.000	Off	N	10.6	23.6	50.0
16.200500	27.1	9.000	Off	N	10.6	22.9	50.0
17.406500	26.1	9.000	Off	N	10.7	23.9	50.0
17.474000	25.6	9.000	Off	N	10.7	24.4	50.0
17.546000	26.0	9.000	Off	N	10.7	24.0	50.0
21.087500	28.9	9.000	Off	N	10.9	21.1	50.0

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Limit Apply to : FCC PART 15 Subpart B Class B

Detector : Quasi-Peak, Average (6 dB Bandwidth: 9 kHz)

Operation Mode : Data Communication mode

Battery Type : Wireless Charger Cover

Temperature : 22.8°C

Humidity Level : 47.0 %

Test Date : May 15, 2014

Frequency	Corr.	Conductor	Quasi-Peak			Average		
			Limit	Measurement Level	Result Level	Limit	Measurement Level	Result Level
(MHz)	(dB)		(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dBuV)
0.1995	9.7	N	63.6	40.7	50.4	53.6	-	-
3.6770	10.0	L1	56.0	29.7	39.7	46.0	20.4	30.4
4.1720	10.1	N	56.0	30.1	40.2	46.0	21.5	31.6
4.3835	10.1	L1	56.0	-	-	46.0	20.3	30.4

※ 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 18 to page 21 for details.)



- Test Data Graph

EMI Auto Test(2)

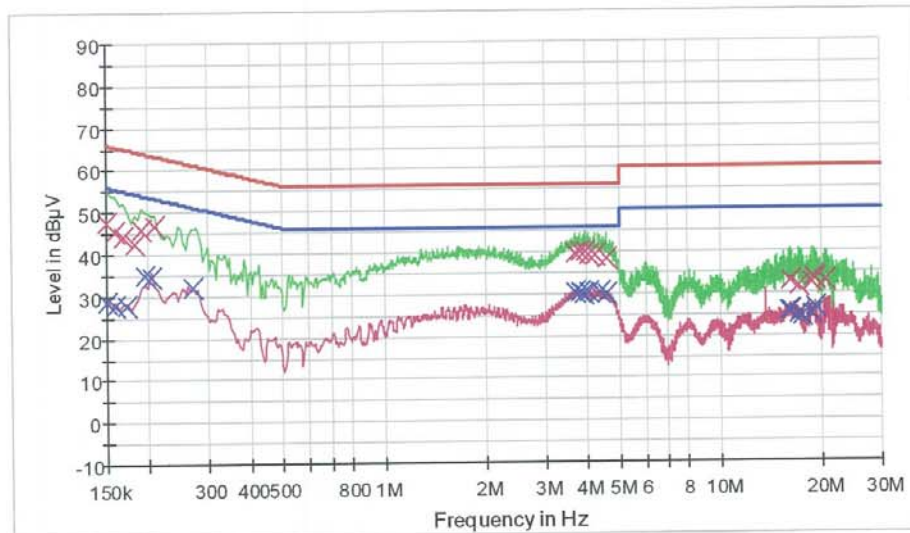
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HCT TEST Report

Common Information

EUT: LGLS990
 Manufacturer: LG
 Test Site: SHIELD ROOM
 Operating Conditions: DATA (WIRELESS COVER)
 Operator Name:

FCC CLASS B



— FCC CLASS B_OP — FCC CLASS B_AV — Preview Result 1-PK+
 — Preview Result 2-AVG — Final Result 1-CPK — Final Result 2-CAV

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	47.6	9.000	Off	L1	9.7	18.4	66.0
0.159000	45.4	9.000	Off	L1	9.7	20.1	65.5
0.168000	44.3	9.000	Off	L1	9.7	20.8	65.1
0.181500	42.5	9.000	Off	L1	9.7	21.9	64.4
0.190500	45.9	9.000	Off	L1	9.7	18.1	64.0
0.190500	46.6	9.000	Off	L1	9.7	16.7	63.3
3.677000	39.7	9.000	Off	L1	10.0	16.3	56.0
3.816500	39.9	9.000	Off	L1	10.0	16.1	56.0
3.960500	39.8	9.000	Off	L1	10.0	16.2	56.0
4.032500	39.2	9.000	Off	L1	10.1	16.8	56.0
4.239500	39.1	9.000	Off	L1	10.1	16.9	56.0
4.595000	38.3	9.000	Off	L1	10.1	17.7	56.0
16.119500	33.0	9.000	Off	L1	10.7	27.0	60.0
16.979000	31.7	9.000	Off	L1	10.8	28.3	60.0
18.594500	32.6	9.000	Off	L1	10.8	27.4	60.0
18.882500	33.8	9.000	Off	L1	10.9	26.2	60.0

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EMI Auto Test(2)

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Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
19.098500	33.4	9.000	Off	L1	10.9	26.6	60.0
20.322500	32.9	9.000	Off	L1	10.9	27.1	60.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	28.7	9.000	Off	L1	9.7	27.3	56.0
0.159000	27.8	9.000	Off	L1	9.7	27.7	55.5
0.172500	27.6	9.000	Off	L1	9.7	27.2	54.8
0.195000	34.8	9.000	Off	L1	9.7	19.0	53.8
0.204000	34.7	9.000	Off	L1	9.7	18.7	53.4
0.271500	32.1	9.000	Off	L1	9.7	19.0	51.1
3.677000	30.4	9.000	Off	L1	10.0	15.6	46.0
3.816500	30.3	9.000	Off	L1	10.0	15.7	46.0
3.888500	30.1	9.000	Off	L1	10.0	15.9	46.0
4.032500	30.3	9.000	Off	L1	10.1	15.7	46.0
4.383500	30.4	9.000	Off	L1	10.1	15.6	46.0
4.595000	30.0	9.000	Off	L1	10.1	16.0	46.0
15.980000	25.6	9.000	Off	L1	10.7	24.4	50.0
16.124000	25.9	9.000	Off	L1	10.7	24.1	50.0
16.979000	24.8	9.000	Off	L1	10.8	25.2	50.0
17.325500	24.5	9.000	Off	L1	10.8	25.5	50.0
18.594500	24.9	9.000	Off	L1	10.8	25.1	50.0
19.098500	26.4	9.000	Off	L1	10.9	23.6	50.0

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EMI Auto Test(2)

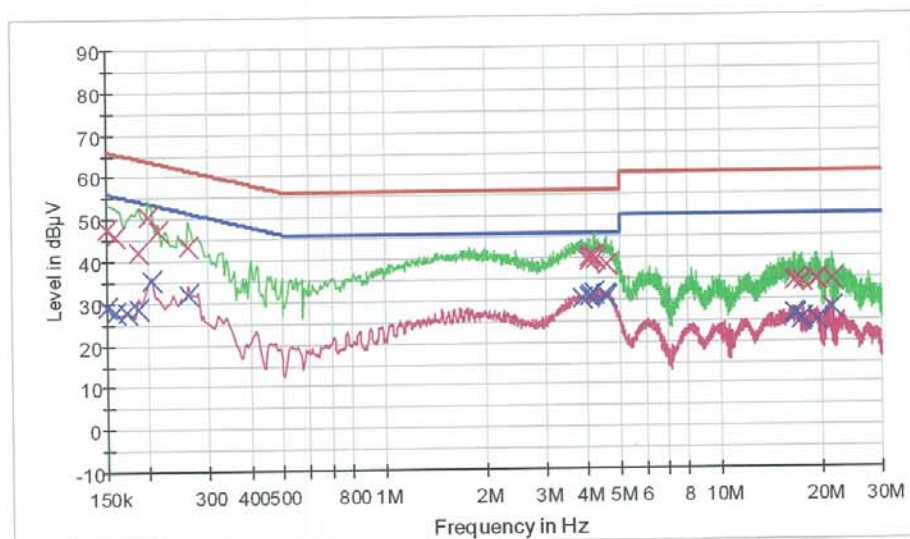
1 / 2

HCT TEST Report

Common Information

EUT: LGLS990
 Manufacturer: LG
 Test Site: SHIELD ROOM
 Operating Conditions: DATA (WIRELESS COVER)
 Operator Name:

FCC CLASS B



— FCCCLASS B_QP — FCCCLASS B_AV — Preview Result 1-PK+
 — Preview Result 2-AVG × Final Result 1-CPK × Final Result 2-CAV

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	47.5	9.000	Off	N	9.7	18.5	66.0
0.159000	45.7	9.000	Off	N	9.7	19.8	65.5
0.186000	42.2	9.000	Off	N	9.7	22.0	64.2
0.199500	50.4	9.000	Off	N	9.7	13.2	63.6
0.213000	47.0	9.000	Off	N	9.7	16.1	63.1
0.262500	43.3	9.000	Off	N	9.7	18.1	61.4
4.032500	40.1	9.000	Off	N	10.1	15.9	56.0
4.041500	39.3	9.000	Off	N	10.1	16.7	56.0
4.100000	40.3	9.000	Off	N	10.1	15.7	56.0
4.172000	40.2	9.000	Off	N	10.1	15.8	56.0
4.244000	39.6	9.000	Off	N	10.1	16.4	56.0
4.599500	38.2	9.000	Off	N	10.1	17.8	56.0
16.407500	34.2	9.000	Off	N	10.7	25.8	60.0
16.619000	34.3	9.000	Off	N	10.7	25.7	60.0
17.325500	34.0	9.000	Off	N	10.7	26.0	60.0
19.166000	34.4	9.000	Off	N	10.8	25.6	60.0

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EMI Auto Test(2)

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Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
19.305500	34.5	9.000	Off	N	10.8	25.5	60.0
21.285500	34.7	9.000	Off	N	10.9	25.3	60.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	28.9	9.000	Off	N	9.7	27.1	56.0
0.159000	27.8	9.000	Off	N	9.7	27.7	55.5
0.172500	27.8	9.000	Off	N	9.7	27.0	54.8
0.186000	28.7	9.000	Off	N	9.7	25.5	54.2
0.204000	35.5	9.000	Off	N	9.7	17.9	53.4
0.262500	32.0	9.000	Off	N	9.7	19.4	51.4
3.848000	30.3	9.000	Off	N	10.0	15.7	46.0
4.032500	30.7	9.000	Off	N	10.1	15.3	46.0
4.100000	31.2	9.000	Off	N	10.1	14.8	46.0
4.172000	31.6	9.000	Off	N	10.1	14.4	46.0
4.527500	31.2	9.000	Off	N	10.1	14.8	46.0
4.599500	30.6	9.000	Off	N	10.1	15.4	46.0
16.407500	26.4	9.000	Off	N	10.7	23.6	50.0
16.659500	26.2	9.000	Off	N	10.7	23.8	50.0
17.258000	25.1	9.000	Off	N	10.7	24.9	50.0
17.325500	25.1	9.000	Off	N	10.7	24.9	50.0
19.305500	24.9	9.000	Off	N	10.8	25.1	50.0
21.285500	27.9	9.000	Off	N	10.9	22.1	50.0

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Limit Apply to : FCC PART 15 Subpart B Class B

Detector : Quasi-Peak, Average (6 dB Bandwidth: 9 kHz)

Operation Mode : Data Communication mode

Battery Type : Single Wireless cover

Temperature : 22.8°C

Humidity Level : 47.0 %

Test Date : May 15, 2014

Frequency	Corr.	Conductor	Quasi-Peak			Average		
			Limit	Measurement Level	Result Level	Limit	Measurement Level	Result Level
(MHz)	(dB)		(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dBuV)
0.1995	9.7	L1	63.6	40.4	50.1	53.6	25.1	34.8
0.1950	9.7	N	63.8	42.8	52.5	53.8	26.0	35.7
0.2085	9.7	N	63.3	41.8	51.5	53.3	25.3	35.0
0.2130	9.7	L1	63.1	36.8	46.5	53.1	21.7	31.4

※ 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 23 to page 26 for details.)



- Test Data Graph

EMI Auto Test(2)

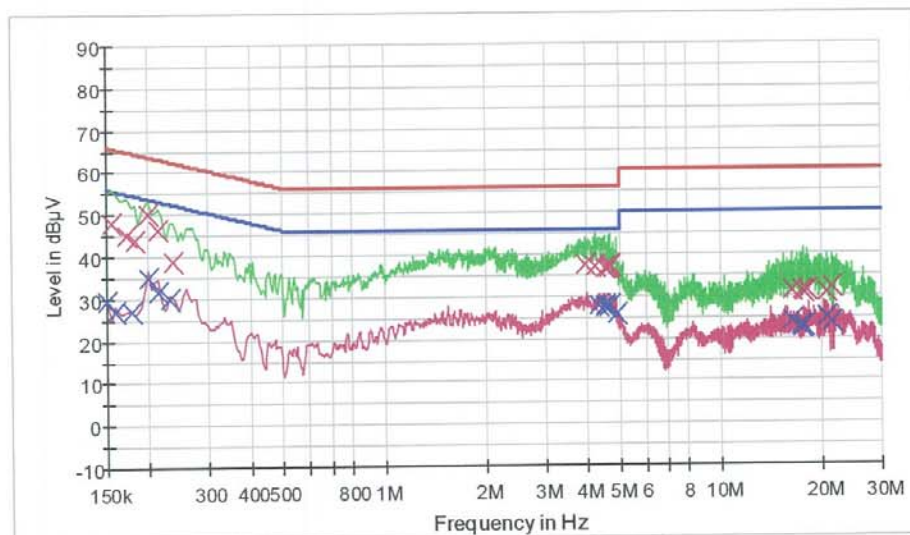
1 / 2

HCT TEST Report

Common Information

EUT: LGLS990
 Manufacturer: LG
 Test Site: SHIELD ROOM
 Operating Conditions: DATA (SINGLE WIRELESS COVER)
 Operator Name:

FCC CLASS B



— FCC CLASS B_QP — FCC CLASS B_AV — Preview Result 1-PK+
 — Preview Result 2-AVG — Final Result 1-QPK — Final Result 2-CAV

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154500	48.0	9.000	Off	L1	9.7	17.8	65.8
0.172500	45.1	9.000	Off	L1	9.7	19.7	64.8
0.181500	43.9	9.000	Off	L1	9.7	20.5	64.4
0.199500	50.1	9.000	Off	L1	9.7	13.5	63.6
0.213000	46.5	9.000	Off	L1	9.7	16.6	63.1
0.235500	38.6	9.000	Off	L1	9.7	23.7	62.3
3.965000	37.4	9.000	Off	L1	10.0	18.6	56.0
4.253000	37.3	9.000	Off	L1	10.1	18.7	56.0
4.545500	36.7	9.000	Off	L1	10.1	19.3	56.0
4.644500	36.7	9.000	Off	L1	10.1	19.3	56.0
4.676000	37.3	9.000	Off	L1	10.1	18.7	56.0
4.685000	36.9	9.000	Off	L1	10.1	19.1	56.0
16.218500	31.3	9.000	Off	L1	10.7	28.7	60.0
17.519000	31.2	9.000	Off	L1	10.8	28.8	60.0
17.631500	30.9	9.000	Off	L1	10.8	29.1	60.0
18.014000	31.4	9.000	Off	L1	10.8	28.6	60.0

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EMI Auto Test(2)

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Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
20.610500	30.6	9.000	Off	L1	10.9	29.4	60.0
21.389000	32.2	9.000	Off	L1	11.0	27.8	60.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	29.3	9.000	Off	L1	9.7	26.7	56.0
0.159000	27.1	9.000	Off	L1	9.7	28.4	55.5
0.177000	26.8	9.000	Off	L1	9.7	27.8	54.6
0.199500	34.8	9.000	Off	L1	9.7	18.8	53.6
0.213000	31.4	9.000	Off	L1	9.7	21.7	53.1
0.231000	29.8	9.000	Off	L1	9.7	22.6	52.4
4.325000	27.7	9.000	Off	L1	10.1	18.3	46.0
4.536500	27.9	9.000	Off	L1	10.1	18.1	46.0
4.545500	27.6	9.000	Off	L1	10.1	18.4	46.0
4.644500	27.5	9.000	Off	L1	10.1	18.5	46.0
4.676000	27.8	9.000	Off	L1	10.1	18.2	46.0
4.887500	25.9	9.000	Off	L1	10.1	20.1	46.0
16.218500	23.9	9.000	Off	L1	10.7	26.1	50.0
17.316500	22.8	9.000	Off	L1	10.8	27.2	50.0
17.519000	22.5	9.000	Off	L1	10.8	27.5	50.0
17.631500	22.8	9.000	Off	L1	10.8	27.2	50.0
20.610500	24.9	9.000	Off	L1	10.9	25.1	50.0
21.389000	23.8	9.000	Off	L1	11.0	26.2	50.0

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EMI Auto Test(2)

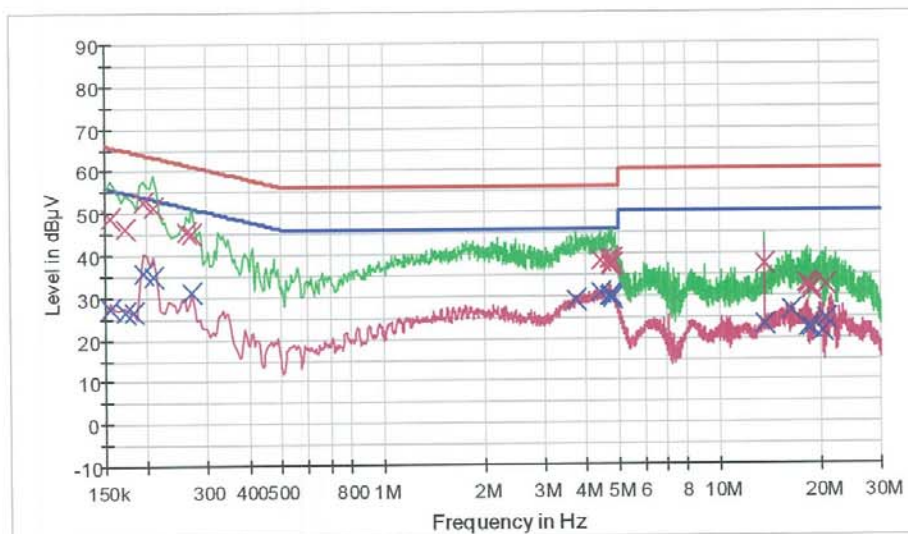
1 / 2

HCT TEST Report

Common Information

EUT: LGLS990
 Manufacturer: LG
 Test Site: SHIELD ROOM
 Operating Conditions: DATA (SINGLE WIRELESS COVER)
 Operator Name:

FCC CLASS B



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

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.154500	49.0	9.000	Off	N	9.7	16.8	65.8
0.172500	46.1	9.000	Off	N	9.7	18.7	64.8
0.195000	52.5	9.000	Off	N	9.7	11.3	63.8
0.208500	51.5	9.000	Off	N	9.7	11.8	63.3
0.262500	45.6	9.000	Off	N	9.7	15.8	61.4
0.271500	44.9	9.000	Off	N	9.7	16.2	61.1
4.446500	38.5	9.000	Off	N	10.1	17.5	56.0
4.712000	38.8	9.000	Off	N	10.1	17.2	56.0
4.721000	37.5	9.000	Off	N	10.1	18.5	56.0
4.730000	36.9	9.000	Off	N	10.1	19.1	56.0
4.770500	37.4	9.000	Off	N	10.1	18.6	56.0
4.784000	38.8	9.000	Off	N	10.1	17.2	56.0
13.559000	37.3	9.000	Off	N	10.5	22.7	60.0
18.059000	33.0	9.000	Off	N	10.7	27.0	60.0
18.212000	32.5	9.000	Off	N	10.7	27.5	60.0
18.558500	32.1	9.000	Off	N	10.8	27.9	60.0

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EMI Auto Test(2)

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Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
18.572000	31.3	9.000	Off	N	10.8	28.7	60.0
20.547500	32.4	9.000	Off	N	10.8	27.6	60.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.154500	27.3	9.000	Off	N	9.7	28.5	55.8
0.172500	26.7	9.000	Off	N	9.7	28.1	54.8
0.181500	26.5	9.000	Off	N	9.7	27.9	54.4
0.195000	35.7	9.000	Off	N	9.7	18.1	53.8
0.208500	35.0	9.000	Off	N	9.7	18.3	53.3
0.271500	31.1	9.000	Off	N	9.7	20.0	51.1
3.753500	29.2	9.000	Off	N	10.0	16.8	46.0
4.446500	30.8	9.000	Off	N	10.1	15.2	46.0
4.712000	29.7	9.000	Off	N	10.1	16.3	46.0
4.721000	29.9	9.000	Off	N	10.1	16.1	46.0
4.730000	30.2	9.000	Off	N	10.1	15.8	46.0
4.770500	29.5	9.000	Off	N	10.1	16.5	46.0
13.559000	23.2	9.000	Off	N	10.5	26.8	50.0
16.227500	26.7	9.000	Off	N	10.6	23.3	50.0
18.212000	22.5	9.000	Off	N	10.7	27.5	50.0
18.558500	22.4	9.000	Off	N	10.8	27.6	50.0
20.088500	21.4	9.000	Off	N	10.8	28.6	50.0
20.547500	24.3	9.000	Off	N	10.8	25.7	50.0

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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	: Data Communication mode
Battery Type	: Standard Cover
Temperature	: 23.6°C
Humidity Level	: 44.3 %
Test Date	: May 14, 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)			
125.0	16.5	V	1.0	12.0	3.9	43.5	32.4	11.1
265.2	12.4	H	1.1	12.3	4.4	46.0	29.1	16.9
624.8	4.6	V	1.0	20.0	5.4	46.0	30.0	16.0

※ 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



Limit Apply to : FCC PART 15 Subpart B Class B

Detector : Quasi-Peak

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

Operation Mode : Data Communication mode

Battery Type : Wireless Charger Cover

Temperature : 23.6°C

Humidity Level : 44.3 %

Test Date : May 14, 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)			
33.8	5.9	V	1.7	11.4	3.3	40.0	20.7	19.3
77.1	18.8	H	2.6	8.8	3.6	40.0	31.2	8.8
110.6	16.1	H	2.8	10.6	3.8	43.5	30.5	13.0

※ 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



Limit Apply to : FCC PART 15 Subpart B Class B

Detector : Quasi-Peak

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

Operation Mode : Data Communication mode

Battery Type : Single Wireless cover

Temperature : 23.6°C

Humidity Level : 44.3 %

Test Date : May 14, 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)			
33.8	8.8	V	1.0	11.4	3.3	40.0	23.6	16.4
125.0	15.0	H	2.8	12.0	3.9	43.5	30.9	12.6
376.0	12.2	H	2.0	15.1	4.8	46.0	32.1	13.9
624.9	10.7	V	1.0	20.0	5.4	46.0	36.1	9.9

※ 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 : Data Communication mode

Battery Type : Standard Cover

Temperature : 23.6°C

Humidity Level : 44.3 %

Test Date : May 14, 2014

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)
1.3298	V	1.0	50.9	74	23.1	32.0	54	22.0
2.0010	V	1.0	54.8	74	19.2	37.4	54	16.6
2.6606	V	1.0	51.9	74	22.1	33.3	54	20.7

※ Calculation Formula:

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



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 : Data Communication mode

Battery Type : Wireless Charger Cover

Temperature : 23.6°C

Humidity Level : 44.3 %

Test Date : May 14, 2014

Frequency (GHz)	Polarity (H/V)	Antenna Height (m)	Peak			Average		
			Total Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Total Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1.3278	V	1.0	48.4	74	25.6	31.7	54	22.3
1.9954	V	1.0	57.0	74	17.0	39.3	54	14.7
2.6592	V	1.0	52.0	74	22.0	33.6	54	20.4

※ Calculation Formula:

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



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 : Data Communication mode

Battery Type : Single Wireless cover

Temperature : 23.6°C

Humidity Level : 44.3 %

Test Date : May 14, 2014

Frequency (GHz)	Polarity (H/V)	Antenna Height (m)	Peak			Average		
			Total Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Total Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1.3288	V	1.0	46.8	74	27.2	29.4	54	24.6
1.9996	V	1.0	56.9	74	17.1	39.1	54	14.9
2.6622	V	1.0	52.3	74	21.7	33.5	54	20.5

※ 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>					
☒ EMI Test Receiver	Rohde & Schwarz	ESCI	100584	1 year	2015.01.24
☒ LISN	EMCO	3816/2SH	9706-1070	1 year	2015.04.07
☒ LISN	Rohde & Schwarz	ENV216	100073	1 year	2015.01.29
☐ EMI Test Receiver	Rohde & Schwarz	ESCI	100033	1 year	2014.06.23
☐ LISN	Rohde & Schwarz	ESH3-Z5	100282	1 year	2014.07.03
☐ Attenuator	Rohde & Schwarz	ESH3-Z2	357.8810.352	1 year	2014.07.03
☒ Software	Rohde & Schwarz	EMC32	-	-	-

Radiated Emission

-For measurement below 1 GHz

☒ EMI Test Receiver	Rohde & Schwarz	ESI40	831564103	1 year	2015.04.07
☒ Trilog Antenna	Schwarzbeck	VULB9160	3301	2 year	2014.12.17
☒ Antenna master	HD GmbH	MA240	240/520	N/A	-
☒ Turn Table	HD GmbH	2090	9702/1224	N/A	-
☐ EMI Test Receiver	Rohde & Schwarz	ESU 26	100241	1 year	2014.07.01
☐ Trilog Antenna	Schwarzbeck	VULB9168	185	2 year	2015.04.16
☐ Antenna master	INNCO Systems	MA4000-EP	MA4000/283	N/A	-
☐ Turn Table	INNCO Systems	DT3000-3T	DT3000/69	N/A	-
☒ Software	Rohde & Schwarz	EMC32	-	-	-

-For measurement above 1 GHz

☒ EMI Test Receiver	Rohde & Schwarz	ESI40	831564103	1 year	2015.04.07
☒ Antenna master	HD GmbH	MA240	240/520	N/A	-
☒ Turn Table	HD GmbH	2090	9702/1224	N/A	-
☐ Power Amplifier	CERNEX	CBLU1183540	21691	1 year	2014.07.24
☒ Power Amplifier	CERNEX	CBLU1183540	21690	1 year	2014.07.12
☒ Horn Antenna	Schwarzbeck	BBHA 9120D	296	2 year	2014.12.13
☐ EMI Test Receiver	Rohde & Schwarz	ESU 26	100241	1 year	2014.07.01
☐ Turn Table	INNCO Systems	DT3000-3T	DT3000/69	N/A	-
☐ Antenna master	INNCO Systems	MA4000-EP	MA4000/283	N/A	-
☐ Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170124	2 year	2014.10.30
☐ Power Amplifier	CERNEX	CBL18265035	22966	1 year	2014.07.24
☐ Power Amplifier	CERNEX	CBL26405040	19660	1 year	2015.04.04
☒ Software	Rohde & Schwarz	EMC32	-	-	-



6. CONCLUSION

The data collected shows that the **EUT type: CDMA, GSM, WCDMA and LTE Phone with Bluetooth, WLAN, NFC and Wireless Charging, FCC ID: ZNFLS990, Model: LGLS990** complies with §15.107 and §15.109 of the FCC rules.