

HCT CO., LTD.



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## EMI CERTIFICATION REPORT

**Applicant:**

LG Electronics Inc.

60-39, Gasan-dong, Gumchon-gu, Seoul  
153-023, Korea

**Date of Issue:** January 12, 2011

**Test Report No.:** HCTE1012FE18-1

**Test Site:** HCT CO., LTD.

**HCT FRN:** 0005-8664-21

**FCC ID:**

**BEJP999DW**

Rule Part(s) / Standard(s) : FCC PART 15 Subpart B / CISPR 22 Class B

Equipment Type : Cellular/PCS GSM/GPRS/EDGE and AWS WCDMA/HSPA  
Phone with Bluetooth and WLAN

Model Name : P999DW, LG-P999DW, LG-P999, P999

Manufacture : LG Electronics Inc.

Port / Connector(s) : USB Data Port / Headset Port / HDMI Port

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 subject to a denial of Federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C 862

**Report prepared by**  
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**Approved by**  
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**Manager of EMC Tech. Part**

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## TABLE OF CONTENTS

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	<b>PAGE</b>
<b>1. GENERAL INFORMATION</b>	
1.1 Product description	<u>3</u>
1.2 Related submittal(s)/Grant(s)	<u>3</u>
1.3 Tested system details	<u>4</u>
1.4 Cable description	<u>5</u>
1.5 Noise suppression parts on cable. (I/O cable)	<u>5</u>
1.6 Test methodology	<u>6</u>
1.7 Test facility	<u>6</u>
1.8 Frequency Range of Radiated Measurements	<u>6</u>
<b>2. SYSTEM TEST CONFIGURATION</b>	
2.1 Configuration of tested system	<u>7</u>
<b>3. PRELIMINARY TEST</b>	
3.1 Conducted Emission test	<u>8</u>
3.2 Radiated Emission test	<u>8</u>
<b>4. CONDUCTED AND RADIATED EMISSION TESTS SUMMARY</b>	
4.1 Conducted Emission test	<u>9</u>
4.2 Radiated Emission test	<u>14</u>
<b>5. FIELD STRENGTH CALCULATION</b>	<u>15</u>
<b>6. TEST EQUIPMENT</b>	<u>16</u>
<b>7. CONCLUSION</b>	<u>17</u>

**ATTACHMENT: TEST SETUP PHOTOGRAPHS**

## 1. GENERAL INFORMATION

### 1.1 Product Description

Equipment Under Test (E.U.T) is **Cellular/PCS GSM/GPRS/EDGE and AWS WCDMA/HSPA Phone with Bluetooth and WLAN, Model: P999DW** manufactured by **LG Electronics Inc.**

Its basic purpose is used for communications.

<b>Model (s)</b>	P999DW
<b>Additional Model</b>	LG-P999DW, LG-P999, P999
<b>FCC ID</b>	BEJP999DW
<b>E.U.T Type</b>	Cellular/PCS GSM/GPRS/EDGE and AWS WCDMA/HSPA Phone with Bluetooth and WLAN
<b>TX Frequency</b>	824.20 MHz to 848.80 MHz (GSM 850) 1 850.20 MHz to 1 909.80 MHz (GSM 1 900) 1 711.25 MHz to 1 753.75 MHz (AWS)
<b>RX Frequency</b>	869.20 MHz to 893.80 MHz (GSM 850) 1 930.20 MHz to 1 989.80 MHz (GSM 1 900) 2 111.25 MHz to 2 153.75 MHz (AWS)

### 1.2 Related Submittal(s) / Grant(s)

Original submittal only.

### 1.3 Tested System Details

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

Device Type	Manufacturer	Model Number/ Serial Number	FCC ID / DoC	Connected To
Cellular/PCS GSM/ GPRS/EDGE and AWS WCDMA/HSPA Phone with Bluetooth and WLAN	LG Electronics Inc	P999DW	BEJP999DW	Notebook PC TV monitor
Notebook PC	SAMSUNG	NT-R519 ZLA693AS900033M	DoC	E.U.T
Notebook PC adaptor	DELTA (JIANG SU)	ADP-60ZH D AD-6019R DA44-00242A	-	Notebook PC
Mouse	Microsoft	Intellimouse optical USB and PS/2 compatible 3902B008	DoC	Notebook PC
TV monitor	LG Electronics Inc	W2261VP-PF 912NDDMOC242	-	E.U.T
USB cable	-	-	-	Notebook PC E.U.T
HDMI cable	-	-	-	E.U.T TV monitor
Headset	-	-	-	E.U.T
SD card (2 GB)	SANDISK	-	-	E.U.T

### 1.4 Cable Description

Product Name	Port	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (m)
Cellular/PCS GSM/ GPRS/EDGE and AWS WCDMA/HSPA Phone with Bluetooth and WLAN	Headset jack	-	N	(D)1.0
	USB data	Y	Y	(P,D)1.2
	HDMI	N	Y	(D)1.8
Notebook PC	USB (Mouse)	-	Y	(D)1.8

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

### 1.5 Noise Suppression Parts on Cable. (I/O cable)

Product Name	Port	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
Cellular/PCS GSM/ GPRS/EDGE and AWS WCDMA/HSPA Phone with Bluetooth and WLAN	Headset jack	N	-	Y	E.U.T End
	USB data	N	-	Y	Both End
	HDMI	N	-	Y	Both End
Notebook PC	USB (Mouse)	Y	Notebook PC End	Y	Notebook PC End

## 1.6 Test Methodology

Both Conducted and Radiated testing was performed according to the procedures in ANSI C63.4/2003. Radiated testing was performed at an antenna to E.U.T distance of 3 m

## 1.7 Test Facility

The 10 m semi anechoic chamber used to collect the radiated data is located at the 105-1, Jangam-Ri, Majang-Myeon, Icheon-Si, Kyoungki-Do, South Korea, and the conducted measurement facility used to measure the conducted data are located at San 136-1, Ami-Ri Bubal-Eup, Icheon-Si, Kyoungki-Do, 467-701, South Korea. Those measurement facilities are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. Detailed description of test facilities was submitted to the Commission and accepted dated Sep. 03, 2010 (Registration Number: 90661)

## 1.8 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
Above 1 000	5 <sup>th</sup> harmonic of the highest frequency or 40 GHz, whichever is lower

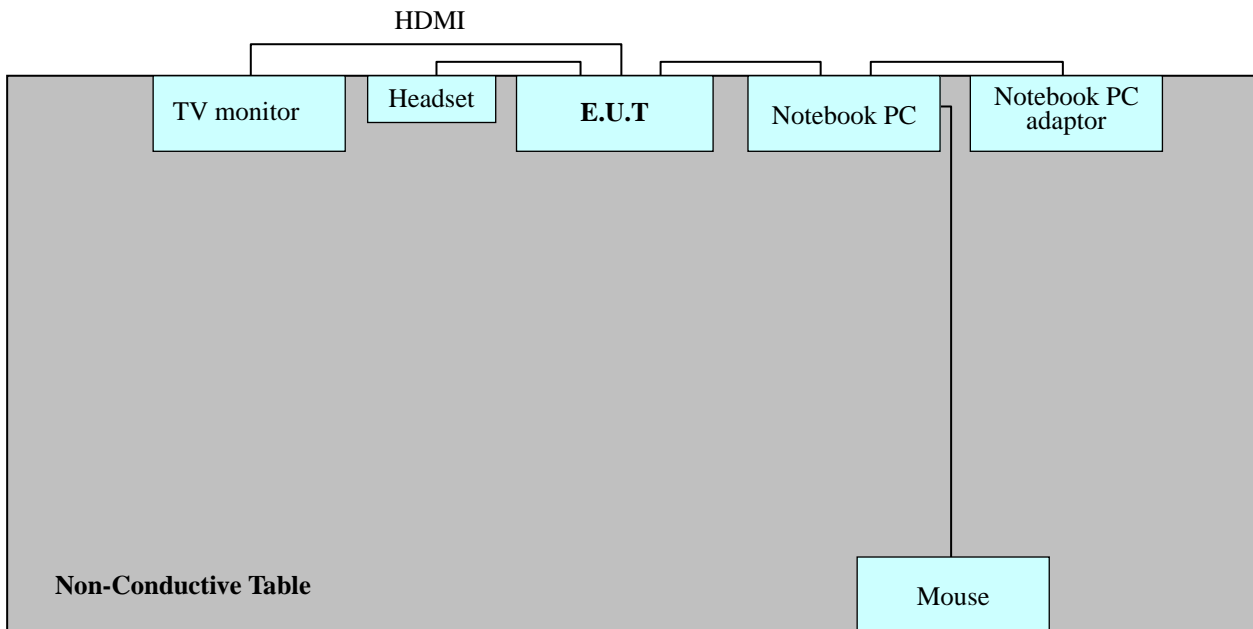
## 2. SYSTEM TEST CONFIGURATION

### 2.1 Configuration of Test System

Power Line Conducted test : E.U.T was connected to LISN via Notebook PC adaptor.  
Preliminary Power Line Conducted Emission tests were performed by using the procedure in ANSI C63.4/2003 7.2.3 to determine the worst operating conditions.

Radiated Emission test : Preliminary Radiated Emission tests were performed by using the procedure in ANSI C63.4/2003 8.3.1.1 to determine the worst operating condition. Final Radiated Emission tests were performed at 3 m semi-anechoic chamber.

#### [Configuration of Tested System]



Power Line: 110 VAC

### **3. PRELIMINARY TEST**

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#### **3.1 Conducted Emission Test**

- Test E.U.T with Data Communication mode, after connecting all peripheral devices.

During preliminary tests, the following operating mode was investigated:

<b>Operation Mode</b>	<b>The Worst Operating Condition</b>
Data Communication	○

#### **3. 2 Radiated Emission Test**

- Test E.U.T with Data Communication mode, after connecting all peripheral devices.

During preliminary tests, the following operating mode was investigated:

<b>Operation Mode</b>	<b>The Worst Operating Condition</b>
Data Communication	○

## 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	: CISPR 22 Class B
Result	: Passed by 10.0 dB
Operating condition	: Data Communication mode
Detector	: Quasi-Peak, Average (6 dB Bandwidth: 9 kHz)
Temperature	: 25.0 °C
Humidity level	: 44.7 %
Test date	: December 16, 2010

Power Line Conducted Emissions			CISPR 22 Class B		
Frequency (MHz)	Amplitude (dB $\mu$ V)	Conductor	Detector	Limit (dB $\mu$ V)	Margin (dB)
0.1900	38.4	HOT	Average	54	15.6
0.2060	53.0*	HOT	Quasi-Peak	63	10.0
4.1560	41.2	NEUTRAL	Quasi-Peak	56	14.8
4.4480	31.1	NEUTRAL	Average	46	14.9

※ **NOTE:** Refer to page 10 to page 13 for details.

1. \* There are errors in rounding differences (Compared to the data)

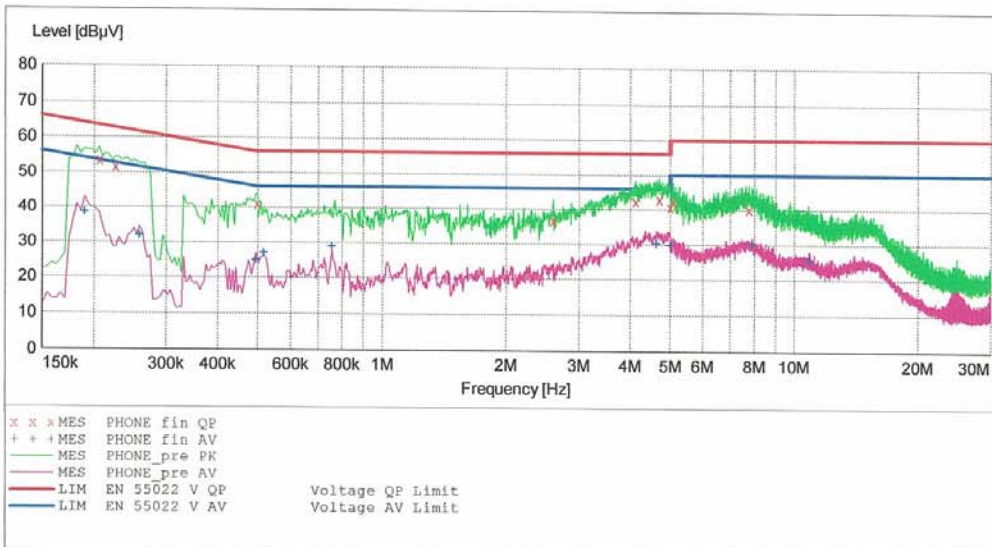
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**EMC**

EUT: P999DW  
 Manufacturer: LG  
 Operating Condition: DATA MODE (HDMI)  
 Test Site: SHIELD ROOM  
 Operator: DS-KIM  
 Test Specification: CISPR22 CLASS B  
 Comment: H

**SCAN TABLE: "CISPR22 CLASS B"**

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	500.0 kHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
500.0 kHz	5.0 MHz	4.0 kHz	Average	10.0 ms	9 kHz	None
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			



**MEASUREMENT RESULT: "PHONE\_fin QP"**

12/16/2010 10:55AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.206010	53.40	10.1	63	10.0	---	---
0.226010	51.50	10.1	63	11.1	---	---
0.498010	41.00	10.1	56	15.0	---	---
2.600000	36.70	10.3	56	19.3	---	---
4.124000	42.30	10.4	56	13.7	---	---
4.716000	42.90	10.5	56	13.1	---	---
5.008000	40.70	10.5	60	19.3	---	---
5.092000	42.30	10.5	60	17.7	---	---
7.764000	40.20	10.7	60	19.8	---	---

**MEASUREMENT RESULT: "PHONE\_fin AV"**

12/16/2010 10:55AM

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Line	PE
0.190010	38.40	10.1	54	15.6	---	---
0.258010	31.90	10.1	52	19.6	---	---
0.494010	24.80	10.1	46	21.3	---	---
0.516000	26.90	10.1	46	19.1	---	---
0.756000	28.80	10.1	46	17.2	---	---
4.640000	30.10	10.5	46	15.9	---	---
5.000000	29.70	10.5	46	16.3	---	---
7.900000	30.10	10.7	50	19.9	---	---
10.892000	25.50	10.9	50	24.5	---	---

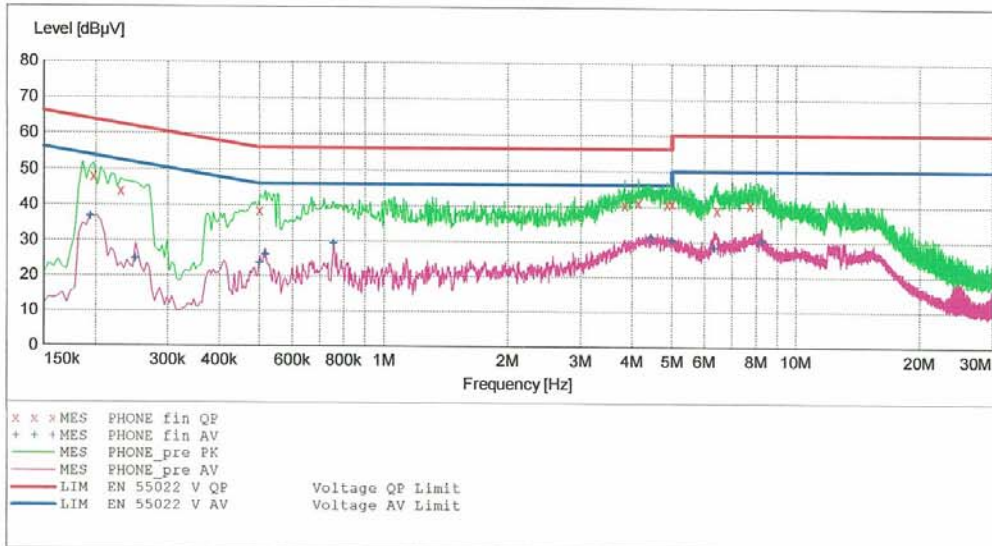
**HCT**

**EMC**

EUT: P999DW  
 Manufacturer: LG  
 Operating Condition: DATA MODE (HDMI)  
 Test Site: SHIELD ROOM  
 Operator: DS-KIM  
 Test Specification: CISPR22 CLASS B  
 Comment: N

**SCAN TABLE: "CISPR22 CLASS B"**

Short Description:			CISPR 22 CLASS B			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	500.0 kHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			



**MEASUREMENT RESULT: "PHONE\_fin QP"**

12/16/2010 10:52AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.198010	48.00	10.1	64	15.7	---	---
0.230010	43.90	10.1	62	18.6	---	---
0.500000	38.60	10.1	56	17.4	---	---
3.844000	40.50	10.4	56	15.5	---	---
4.156000	41.20	10.4	56	14.8	---	---
4.880000	40.80	10.5	56	15.2	---	---
5.000000	41.10	10.5	56	14.9	---	---
6.436000	39.10	10.6	60	20.9	---	---
7.748000	40.60	10.7	60	19.4	---	---

**MEASUREMENT RESULT: "PHONE\_fin AV"**

12/16/2010 10:52AM

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Line	PE
0.194010	36.60	10.1	54	17.3	---	---
0.250010	24.80	10.1	52	27.0	---	---
0.500000	23.80	10.1	46	22.2	---	---
0.516000	26.10	10.1	46	19.9	---	---
0.756000	29.20	10.1	46	16.8	---	---
4.448000	31.10	10.4	46	14.9	---	---
5.000000	30.40	10.5	46	15.6	---	---
6.332000	28.30	10.6	50	21.7	---	---
8.260000	30.10	10.7	50	19.9	---	---

## 4.2 Radiated Emission Test

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

Limit apply to : FCC PART 15 Subpart B  
 Result : Passed by 13.0 dB  
 Operating condition : Data Communication mode  
 Detector : Quasi-Peak (6 dB Bandwidth: 120 kHz)  
 Temperature : 23.5 °C  
 Humidity level : 41.0 %  
 Test date : December 14, 2010

Frequency	Reading	Ant. Factor	Cable Loss	Ant. POL	Total	Limit	Margin
MHz	dB $\mu$ V	dB/m	dB	(H/V)	dB $\mu$ V/m	dB $\mu$ V/m	dB
37.2	14.3	11.9	0.8	V	27.0	40.0	13.0
65.4	12.8	11.2	1.0	V	25.0	40.0	15.0
120.8	14.7	11.9	1.4	H	28.0	43.5	15.5
140.1	12.8	12.8	1.5	H	27.1	43.5	16.4
160.9	13.4	13.3	1.6	H	28.3	43.5	15.2
719.9	8.3	21.2	3.5	V	33.0	46.0	13.0

※ **NOTE:**

1. All modes of operation were investigated, and the worst-case emissions are reported.
2. For measurement above 1 GHz, noise level is more than 10 dB below the limit, specified in FCC Part 15.35

## 5. FIELD STRENGTH CALCULATION

The field strength is calculated by adding the antenna factor and cable factor.  
The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF$$

Where FS = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor

CF = Cable Attenuation Factor

Assume a receiver reading of 21.5 dB $\mu$ V is obtained. The antenna factor of 7.4 dB/m and a cable factor of 1.1 dB are added. The 30 dB $\mu$ V/m value is mathematically converted to its corresponding level in  $\mu$ V/m.

$$FS = 21.5 + 7.4 + 1.1 = 30 \text{ dB}\mu\text{V/m}$$

### [Radiated Emission Limits]

Frequency of Emission (MHz)	Field Strength	
	$\mu$ V/m	dB $\mu$ V/m
30 to 88	100	40.0
88 to 216	150	43.5
216 to 960	200	46.0
Above 960	500	54.0

## 6. TEST EQUIPMENT

<u>Type</u>	<u>Manufacturer</u>	<u>Model Number</u>	<u>Serial Number</u>	<u>Next CAL Date</u>
<b><u>Conducted Emission</u></b>				
EMI Test Receiver	Rohde & Schwarz	ESCI	100033	2011.02.19
LISN	Rohde & Schwarz	ESH3-Z5	100282	2011.02.05
LISN	Rohde & Schwarz	ENV216	3560.6550.02	2011.04.06
Attenuator	Rohde & Schwarz	ESH3-Z2	357.8810.52	2011.10.25
<b><u>Radiated Emission</u></b>				
EMI Test Receiver	Rohde & Schwarz	ESI40	831564103	2011.10.29
EMI Test Receiver	Rohde & Schwarz	ESU26	100241	2011.09.01
Trilog Antenna	Schwarzbeck	VULB9160	3301	2012.09.13
Antenna master	INNCO Systems	MA4000-EP	MA4000/283	-
Turn Table	INNCO Systems	DT3000-3T	DT3000/69	-
Communication Antenna	Schwarzbeck	USLP9142	9142-248	-
Horn Antenna	Schwarzbeck	BBHA 9120D	-	2012.04.13
RF-Amplifier	MITEQ	AMF-6D-0010 1800-35.20P.PS	-	2011.05.20
Base Station	Rohde & Schwarz	CMU 200	1100000802	2011.02.17

## **7. CONCLUSION**

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The data collected shows that the **Cellular/PCS GSM/GPRS/EDGE and AWS WCDMA/HSPA Phone with Bluetooth and WLAN, Model: P999DW, FCC ID: BEJP999DW** complies with §15.107 and §15.109 of the FCC rules.